Chapter 5 Marine accident and incident investigations

1 Marine accidents and incidents to be investigated

<Marine accidents to be investigated>

◎Article 2, paragraph (5) of the Act for Establishment of the Japan Transport Safety Board (Definition of marine accident)

The term "Marine Accident" as used in this Act shall mean as follows:

1 Damage to a ship or facilities other than a ship related to the operations of a ship.

2 Death or injury of the people concerned with the construction, equipment or operation of a ship.

<Marine incidents to be investigated>

◎Article 2, paragraph (6), item (ii) of the Act for Establishment of the Japan Transport Safety Board (Definition of marine incident)

A situation, prescribed by Ordinance of Ministry of Land, Infrastructure, Transport and Tourism, where deemed to bear a risk of Marine Accident occurring.

◎Article 4 of Ordinance for Enforcement of the Act for Establishment of the Japan Transport Safety Board

(A situation, prescribed by Ordinance of the Ministry of Land, Infrastructure, Transport and Tourism, stipulated in Article 2, paragraph (6), item (ii) of the Act for Establishment of the Japan Transport Safety Board)

1 The situation wherein a ship became a loss of control due to any of the following reasons:

(a) navigational equipment failure;

(b) listing of a ship; or

(c) short of fuel or fresh water required for engine operation.

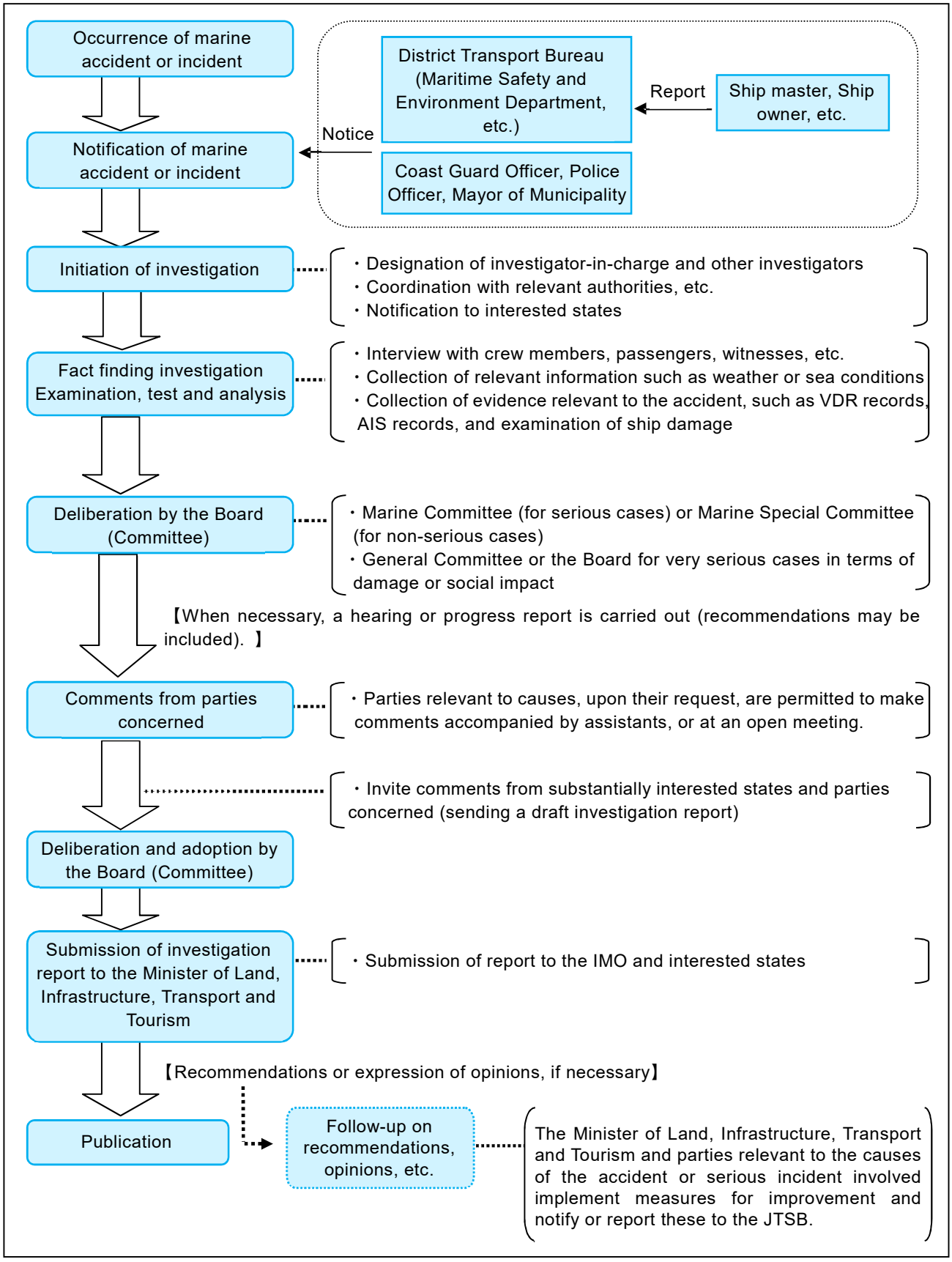
2 The situation where a ship grounded without any damage to the hull; and

3 In addition to what is provided for in the preceding two items, the situation where safety or navigation of a ship was obstructed.

<Category of marine accident and incident>

Marine accident and incident to be investigated		Type of marine accident and incident
Marine accident	Damage to ships or other facilities involved in ship operation	Collision, Grounding, Sinking, Flooding, Capsizing, Fire, Explosion, Missing, Damage to facilities
	Casualty related to ship structures, equipment or operations	Fatality, Fatality and injury, Missing person, Injury
Marine incident	Navigational equipment failure	Loss of control (engine failure, propeller failure, rudder failure)
	Listing of ship	Loss of control (extraordinary listing)
	Short of fuel or fresh water required for engine operation	Loss of control (fuel shortage, fresh water shortage)
	Grounding without hull damage	Stranded
	Obstruction of ship safety or navigation	Safety obstruction, Navigation obstruction

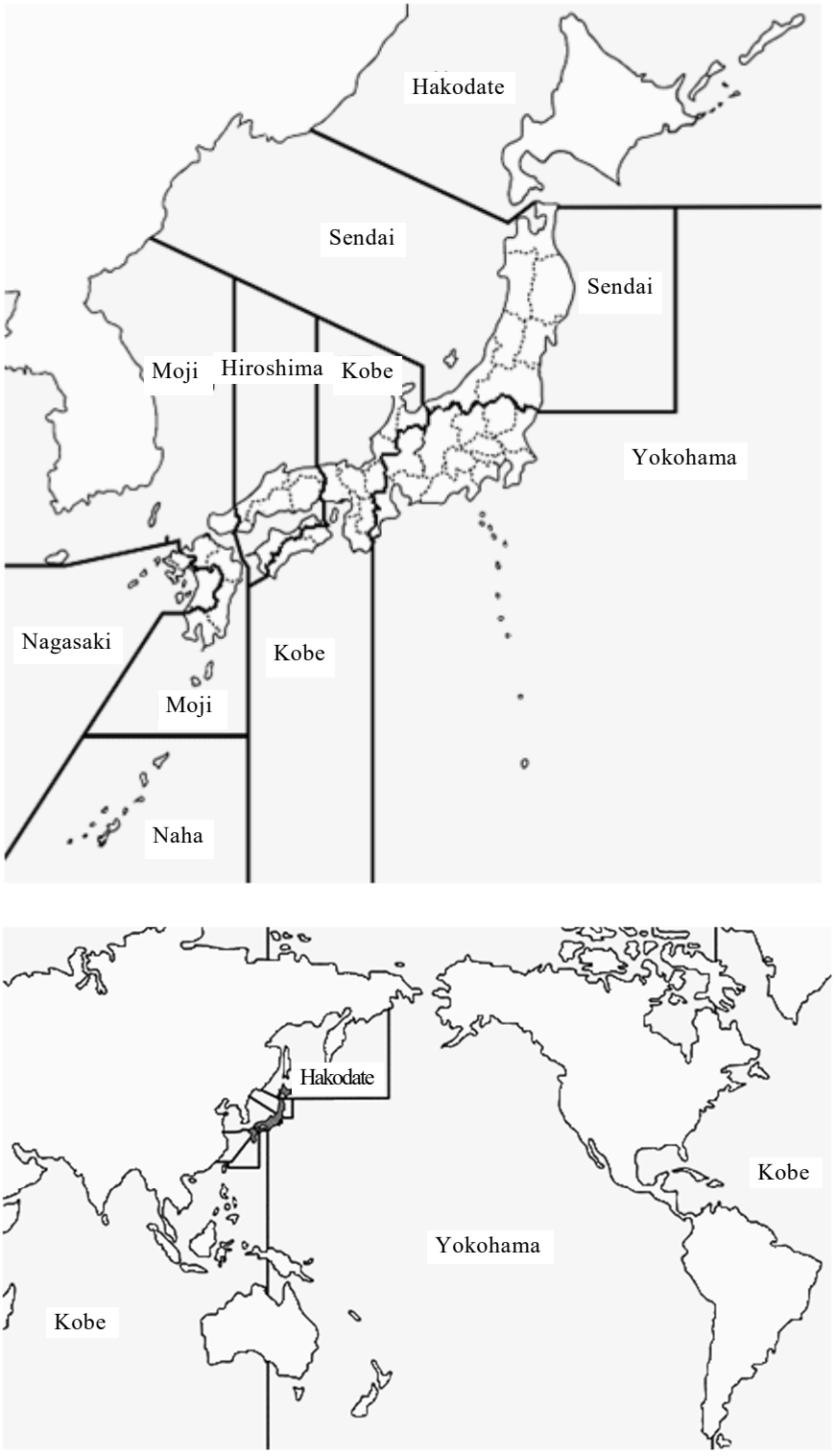
2 Procedure of marine accident/incident investigation



* Opinions may be expressed in a flow chart (as above) or whenever and however necessary to prevent accidents or incidents or mitigate damage thereof.

3 Jurisdiction of the Offices over marine accidents and incidents

For the investigation of marine accidents and incidents regional investigators are stationed in the regional offices (eight offices). Our jurisdiction covers marine accidents and incidents in the waters around the world, including rivers and lakes in Japan. The regional offices are in charge of investigations in the respective areas shown in the following map. Marine accident investigators in the Tokyo Office (Headquarters) are in charge of serious marine accidents and incidents.



Jurisdiction map

4 Role of the Offices and Committees according to category of accident and incident

Serious marine accidents and incidents are investigated by the marine accident investigators in the Headquarters, and are deliberated in the Marine Committee. However, particularly serious accidents are deliberated in the General Committee, and extremely serious accidents are deliberated in the Board.

Non-serious marine accidents and incidents are investigated by regional investigators stationed in the eight regional offices, and deliberated in the Marine Special Committee.

(For the deliberation items of the Board and each Committee, refer to page 2 of the Appendixes)

<table>
<tr><td>Serious marine accidents and incidents</td><td>Office in charge of investigation: Marine accident investigators in the Headquarters
Committee in charge of deliberation and adoption: Marine Committee</td></tr>
<tr><td colspan="2">Definition of “serious marine accidents and incidents”.
• Cases where a passenger died or went missing, or two or more passengers were severely injured.
• Cases where five or more persons died or went missing.
• Cases involved a vessel engaged on international voyages where the vessel was a total loss, or a person on the vessel died or went missing.
• Cases of spills of oil or other substances where the environment was severely damaged.
• Cases where unprecedented damage occurred following a marine accident or incident.
• Cases which made a significant social impact.
• Cases where identification of the causes is expected to be significantly difficult.
• Cases where essential lessons for the mitigation of damage are expected to be learned.</td></tr>
<tr><td>Non-serious marine accidents and incidents</td><td>Office in charge of investigation: Regional investigators in the regional offices
Committee in charge of deliberation and adoption: Marine Special Committee</td></tr>
</table>

5 Statistics of investigations of marine accidents and incidents (As of end of February 2021)

The JTSB carried out investigations of marine accidents and incidents in 2020 as follows:

In 2020, 590 accident investigations had been carried over from 2019, and 732 accident investigations were newly launched. Besides, 708 investigation reports were published in 2020, and thereby 611 accident investigations were carried over to 2021.

Moreover, 151 incident investigations were carried over from 2019, and 173 incident investigations were newly launched in 2020. Furthermore, 187 investigation reports were published in 2020 and thereby 135 incident investigations were carried over to 2021.

Among the 708 investigation reports published in 2020, two were issued with recommendations, one with safety recommendation and none was issued with opinions.

Investigations of marine accidents and incidents in 2020

(Cases)

Category	Carried over from 2019	Launched in 2020	Not applicable	Transferred to Tokyo Office	Total	Publication of investigation report	(Recommendations)	(Safety recommendations)	(Opinions)	Carried over to 2021	(Interim report)
Marine accident	590	732	△3	0	1,319	708	(2)	(1)	(0)	611	(0)
Tokyo Office (Serious cases)	24	12	0	2	38	15	(2)	(1)	(0)	23	(0)
Regional Offices (Non-serious cases)	566	720	△3	△2	1,281	693				588	
Marine incident	151	173	△2	0	322	187	(0)	(0)	(0)	135	(0)
Tokyo Office (Serious cases)	1	0	0	0	1	0	(0)	(0)	(0)	1	(0)
Regional Offices (Non-serious cases)	150	173	△2	0	321	187				134	
Total	741	905	△5	0	1,641	895	(2)	(1)	(0)	746	(0)

Note 1. The figures for “Launched in 2020” includes cases which occurred in 2019 or earlier, and which the JTSB was notified of in 2020 as subjects of investigation.

Note 2: The column “Not applicable” shows the number of cases which did not come under the category of accident or incident as defined in Article 2 of the Act for Establishment of the Japan Transport Safety Board.

Note 3: The column “Transferred to Tokyo Office” shows the number of cases where the investigation found out that it was serious and the jurisdiction was transferred from the regional office to the Tokyo Office.

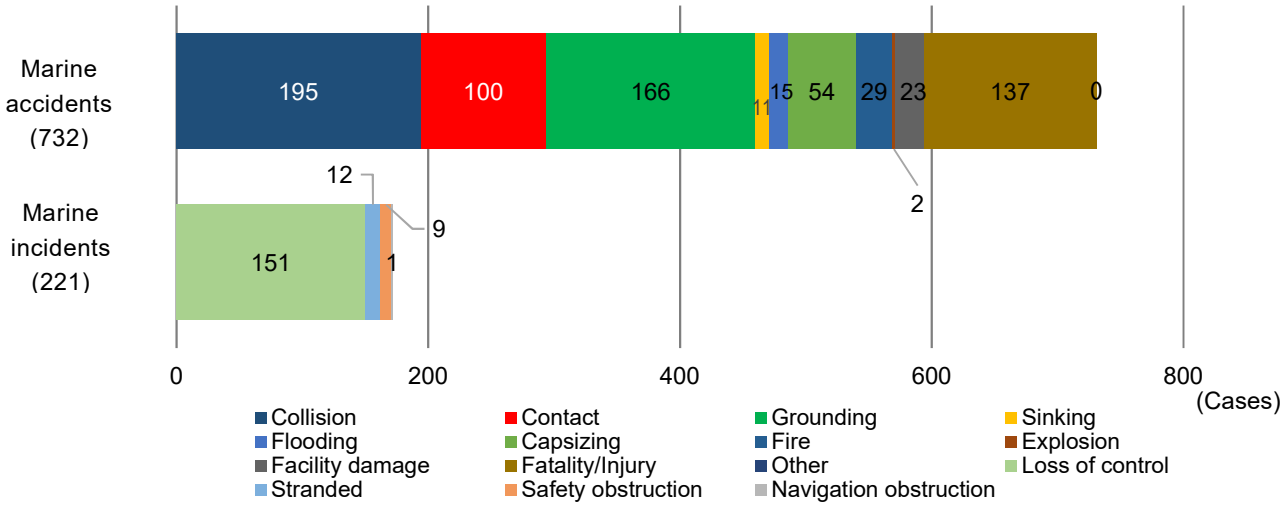
6 Statistics of investigated marine accidents and incidents in 2020

(As of end of February 2021)

(1) Types of accidents and incidents

The breakdown of the 905 investigations launched in 2020 by type of accidents and incidents is as follows: The marine accidents included 195 cases of collision, 166 cases of grounding, 137 cases of fatality/injury (not involved in other types of accidents), and 100 cases of contact. The marine incidents included 151 cases of loss of control, 12 cases of stranded, and nine cases of navigation obstructions. Objects that collided with ships included quays in 25 cases, buoys in 20 cases, and breakwaters in 14 cases.

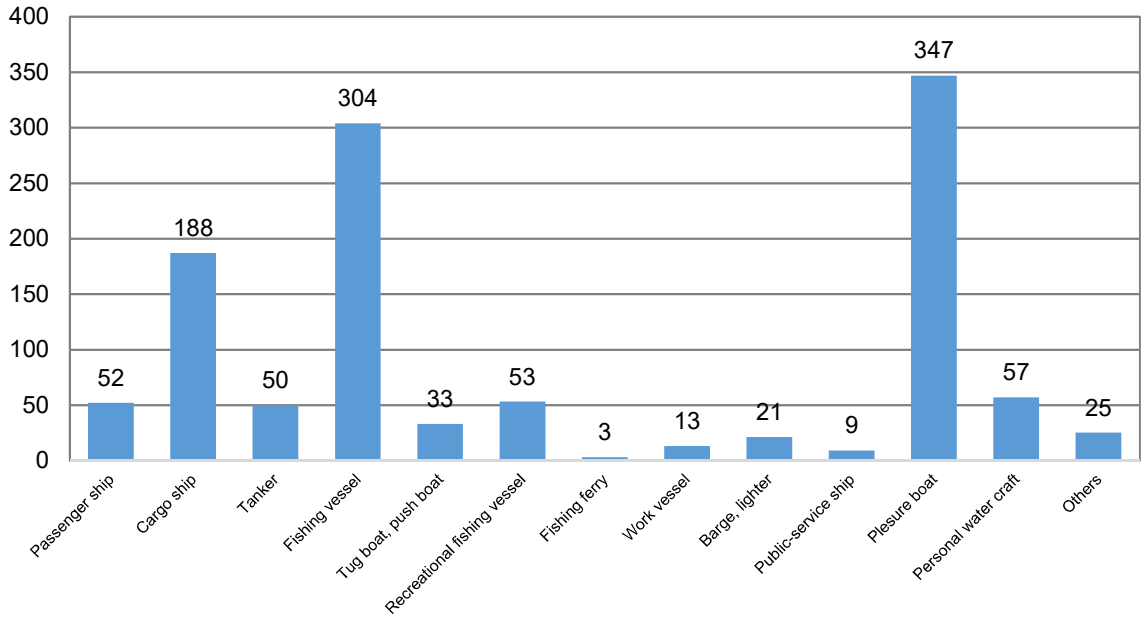
Number of investigated marine accidents and incidents by type in 2020



(2) Types of vessels

The number of vessels involved in marine accidents and incidents was 1,155. By type of vessel, they included 347 pleasure boats, 304 fishing vessels, 188 cargo ships, 57 personal water craft and 53 recreational fishing vessels.

Number of vessels involved in marine accidents and incidents by type in 2020



The number of foreign-registered vessels involved in marine accidents and incidents was 51, and they were classified by accident type as follows: 28 vessels in collision, nine vessels in contact and six vessels in grounding. As for the flag of vessels, 20 vessels were registered in Panama, 12 vessels in Republic of Korea, four vessels in Belize.

Number of foreign-registered vessels by flag

(Vessels)

Panama	20	Republic of Korea	12	Belize	4
Singapore	2	Bahamas	2	Others	11

(3) Number of casualties

The number of casualties was 346, consisting of 84 deaths, 35 missing persons, and 227 injured persons. By type of vessel, 111 persons in fishing vessels, 104 persons in pleasure boats and 36 persons in cargo ships. By type of accident, 158 persons in fatality/injury, 89 persons in collision, 47 persons in contact, 23 persons in capsizing, and 18 persons in grounding.

With regard to the number of person's dead or missing, 64 persons were involved in fishing vessel accidents, 22 persons in pleasure boat accidents, 20 persons in cargo ship accidents, indicating dead or missing cases occurred frequently in fishing vessels.

Number of casualties (marine accident)

(Persons)

2020										
Vessel type	Dead			Missing			Injured			Total
	Crew	Passengers	Others	Crew	Passengers	Others	Crew	Passengers	Others	
Passenger ship	1	0	0	0	0	0	2	6	8	17
Cargo ship	2	0	2	16	0	0	11	0	5	36
Tanker	1	0	0	0	0	0	1	0	0	2
Fishing vessel	46	0	0	18	0	0	44	0	3	111
Tug boat, push boat	1	0	0	0	0	0	1	0	0	2
Recreational fishing vessel	0	2	0	0	0	0	6	21	0	29
Fishing ferry	1	0	0	0	0	0	0	1	0	2
Work vessel	0	0	4	0	0	0	0	0	1	5
Barge, lighter	0	0	0	0	0	0	0	0	1	1
Public-service ship	0	0	0	0	0	0	0	0	0	0
Pleasure boat	11	0	10	1	0	0	35	3	44	104
Personal water craft	1	0	1	0	0	0	11	0	21	34
Others	1	0	0	0	0	0	2	0	0	3
Total	65	2	17	35	0	0	113	31	83	346
	84			35			227			

※ The figures above include accidents under investigation and therefore are subject to change depending on the course of investigations and deliberations.

7 Summaries of serious marine accidents and incidents which occurred in 2020

The serious marine accidents which occurred in 2020 are summarized as follows: The summaries are based on information available at the initial stage of the investigations and therefore are subject to change depending on the course of investigations and deliberations.

(Marine accidents)

1	Date and location	Vessel type and name, accident type
	February 16, 2020 North from No.2 small-ships basin of Hokkai-hama, Kashima Port, Ibaraki Prefecture	SAKURAIMARU No. 27, Recreational fishing vessel Collision (breakwaters)
	Summary	The vessel was returning to Kashima Port (Ibaraki Prefecture) with the captain, one worker and 21 anglers when it collided with a breakwater north from No. 2 small-ship basin of Hokkai-hama of the port, injuring six anglers, the captain and the worker.
2	Date and location	Vessel type and name, accident type
	February 29, 2020 North off the coast of Iki City, Nagasaki Prefecture	KOKYUMARU, Fishing vessel (Vessel A) SHINEIMARU, Recreational fishing vessel (Vessel B) Collision
	Summary	Vessel A departed Katsumoto Port, Iki City, Nagasaki Prefecture with the captain and ordinary seamen on board was heading toward a fishing area north of the port. Vessel B departed Kishi Fishing Port, Itoshima City, Fukuoka Prefecture with the captain and five anglers onboard and was drifting on the sea north from Katsumoto Port for the purpose of recreational fishing with its engine stopped. The two vessels collided in an offshore area north of Katsumoto Port and Vessel B capsized.
3	Date and location	Vessel type and name, accident type
	February 29, 2020 About 6.5 nautical miles off the eastern coast of Nakayamazaki, Rokkasho-mura, Aomori Prefecture	GUO XING 1, Cargo ship (vessel A) TOMIMARU No.8, Fishing vessel (vessel B) Collision
	Summary	Vessel A bound for South Korea departed Hachinohe Port, Aomori Prefecture with the captain and 13 crew members on board. Vessel B, with the captain and 14 crew members onboard left a fishing area northwest of Shiriyazaki, Aomori Prefecture and was returning to Hachinohe Port. The two vessels collided at about 6.5 nautical miles off the eastern coast of Nakayamazaki, Rokkasho-mura, Aomori Prefecture.
4	Date and location	Vessel type and name, accident type
	June 16, 2020 Osanbashi Pier, Naka Ward, Yokohama City, Kanagawa Prefecture	ASUKA II, Passenger ship Fire
	Summary	A fire broke out on the vessel was moored at Osanbashi Pier, Naka Ward, Yokohama Prefecture
5	Date and location	Vessel type and name, accident type
	June 19, 2020 Quay A5 of Honmoku Wharf, Naka Ward, Yokohama City, Kanagawa Prefecture	TIMU, Cargo ship Casualties of workers
	Summary	While the cargo ship was moored at Quay A5 of Honmoku Wharf, a cargo transfer operation was ongoing using the ship's crane, when cargo suspended from the crane fell into the hold, resulting in the death of one worker and the injury of another.
6	Date and location	Vessel type and name, accident type
	July 25, 2020 Southeast off the coast of Mauritius	WAKASHIO, Cargo ship Grounding
	Summary	The cargo ship ran aground in an offshore area southeast of Mauritius, leaking fuel oil.
	Reference	Column (page 146)
7	Date and location	Vessel type and name, accident type
	August 7, 2020	KAIMONMARU, Oil tanker

	Near the northern end of the eastern berth of the Keiyo Sea Berth, Chiba Port	Collision (pier)
	Summary	The tanker collided with the pier during mooring.
8	Date and location	Vessel type and name, accident type
	September 6, 2020 Inawashiro Lake, Fukushima Prefecture	Pleasure boat (its name unidentified) Swimmers killed or injured after contact
	Summary	The pleasure boat was navigating off the coast of Nakatahama of Inawashiro Lake when it contacted with swimmers, killing one and injuring three.
9	Date and location	Vessel type and name, accident type
	September 12, 2020 Mitsujima located at the northern end of Tsushima City, Nagasaki Prefecture	CHANG SHUN 1, Cargo ship Grounding
	Summary	On September 12, 2020, during a scheduled pause at Nishisuido in the Tsushima Strait at Busan Port, ROK, the ship ran aground in a shallow area north of Mitsujima, Tsushima City, Nagasaki Prefecture at around 02:40.
10	Date and location	Vessel type and name, accident type
	November 19, 2020 North off the coast of Yoshima (island), Sakaide City, Kagawa Prefecture	SHRIMP of ART, Passenger ship Flooding
	Summary	The ship was inundated with seawater during navigation and sank. All of the passengers and crew were rescued and transported to Yoshima.
11	Date and location	Vessel type and name, accident type
	November 28, 2020 Near Kashima Port, Ibaraki Prefecture	HAYATO (Vessel A), Cargo ship FUDOMARU No.5, Recreational fishing vessel (Vessel B) Collision
	Summary	Vessels A and B collided near Kashima Port. Among those on board Vessel B, one passenger died and 11 passengers and crew members were injured.
12	Date and location	Vessel type and name, accident type
	December 23, 2020 Location unknown	SHINKOMARU No.8, Fish carrier Missing crew members
	Summary	The fish carrier bound for Owase Port, Owase City, Mie Prefecture departed Akamizu, Ainan-cho, Minamiuwa District, Ehime Prefecture between 10:00 and 12:00, December 22. The last phone contact was made at around 1:00 PM on the same day before the ship went missing.

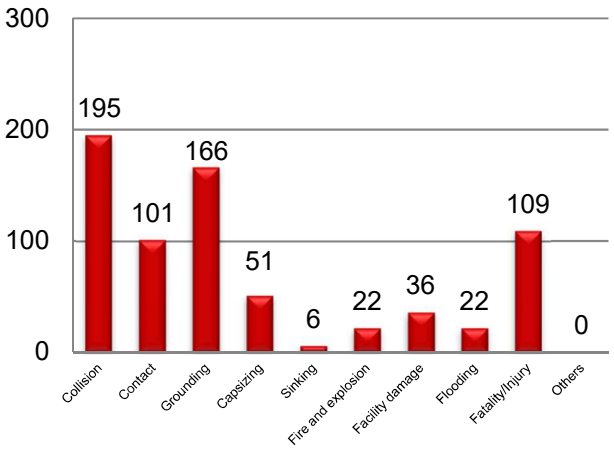
8 Publication of investigation reports

The number of investigation reports of marine accidents and incidents published in 2020 were 895, consisting of 708 marine accidents (among them, 15 were serious) and 187 marine incidents (among them, zero were serious).

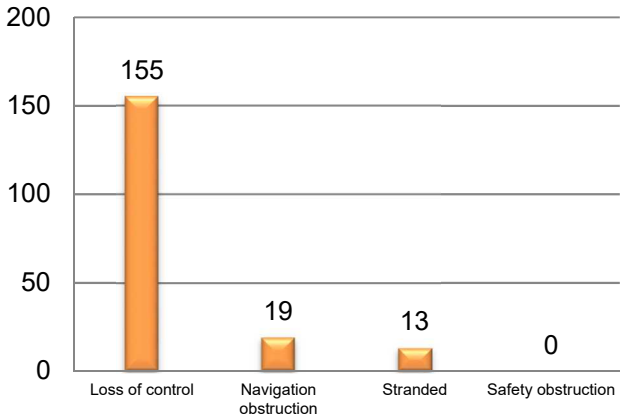
Breaking them down by type, the marine accidents included 195 cases of collision, 166 cases of grounding, 109 cases of fatality/injury, and 101 cases of contact. The marine incidents included 155 cases of losses of control, (143 cases of navigational equipment failure, 11 cases of fuel shortages, etc., one case of listing), 19 cases of navigation obstruction, and 13 cases of stranded.

As for the objects of contact, 20 were quays, 11 were breakwaters, and eight were buoys.

Marine accidents (708 cases): reports publicized in 2020



Marine incidents (187 cases): reports publicized in 2020



The number of vessels involved in marine accidents and incidents was 1,164. Breaking them down by type, the marine accidents involved 258 pleasure boats, 286 fishing vessels, 146 cargo ships, 54 passenger ships and 47 tankers. The marine incidents involved 106 pleasure boats, 25 fishing vessels, 18 cargo ships, and 16 passenger ships.

Number of vessels by type involved in marine accidents and incidents for which reports were publicized in 2020

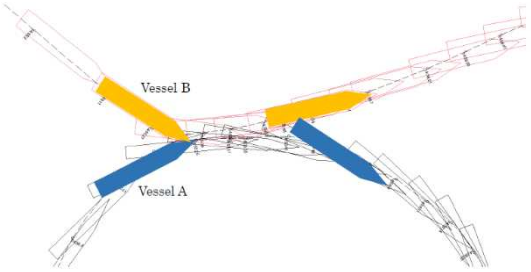
(Vessel)

Classification	Passenger ship	Cargo ship	Tanker	Fishing vessel	Tug boat, push boat	Recreational fishing vessel	Fishing ferry	Work vessel	Barge, lighter	Public-service ship	Pleasure boat	Personal water craft	Others	Total
Marine accident	54	146	47	286	38	39	4	27	23	6	258	36	12	976
Marine incident	16	18	5	25	1	9	0	0	1	0	106	4	3	188
Total	70	164	52	311	39	48	4	27	24	6	364	40	15	1,164
Composition Ratio %	6.0	14.1	4.5	26.7	3.4	4.1	0.3	2.3	2.1	0.5	31.3	3.4	1.3	100.0

The marine accidents and serious incidents which occurred in 2020 are summarized as follows:

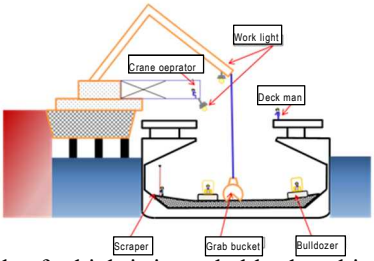
Marine serious accident reports published in 2020

1	Date of Publication	Date and location	Vessel type and name, accident type
	January 30, 2020	September 29, 2018 Wakamatsu district of Kanmon Port, Kanmon Passage	SM3, Cargo ship (Vessel A, Republic of Korea) KOUTOKU MARU, Oil tanker (Vessel B) Collision
	Summary	While Vessel A, with a master and 9 crew members on board, was proceeding north-northeast bound for Pohang Port, Republic of Korea, in Wakamatsu Passage of Kanmon Port, and while oil tanker KOUTOKU MARU, with a master, boatswain and 6 crew members on board, was proceeding southeast bound for Setonaikai in No. 2 Kanmon Passage of Kanmon Port, both vessels collided at around 14:55 on September 29, 2018, after having just entered Kanmon Passage. Vessel A suffered denting of her shell plate on her port fore side and port aft side, and KOUTOKU MARU lost her starboard anchor and suffered denting of her bulbous bow, etc.; however, there were no casualties or injuries on either vessel.	

	Probable Causes	It is probable that the accident occurred because, while SM3 was traveling eastward from Wakamatsu Passage to Kanmon Passage and KOUTOKU MARU was traveling southeastward from No. 2 Kanmon Passage to Kanmon Passage in a situation whereby the courses of both vessels would cross in Kanmon Passage, the master of SM3 intended to turn to the left and pass the bow of KOUTOKU MARU and boatswain of KOUTOKU MARU was maintaining the same course and ship speed, as a result of which both vessels collided. It is probable that the master of SM3 intended SM3 to turn to the left and pass the bow of KOUTOKU MARU because of the possibility that he wanted to move ahead of a cargo ship proceeding northwest in Kanmon Passage and because he had the experience that other vessels kept out of the way of SM3 when he called their names by VHF wireless telephone, and that, at the time of the accident, the master of SM3 similarly thought that KOUTOKU MARU would turn to the right and avoid SM3 by passing off her stern. It is probable that boatswain of KOUTOKU MARU was maintaining the same course and ship speed because, according to the navigation rules of Kanmon Port in the Ordinance for Enforcement of the Act on Port Regulations, SM3 was in a position whereby she had to keep out of the way of KOUTOKU MARU, and thus he was expecting SM3 to eventually avoid KOUTOKU MARU and diverted his attention to responding to a total three calls by VHF wireless telephone. 
	Report	https://www.mlit.go.jp/jtsb/eng-mar_report/2020/2018tk0016e.pdf
	Reference	Chapter 2 (page 32)

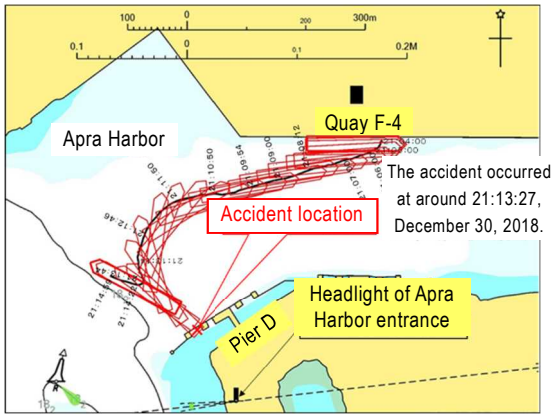
2	Date of Publication	Date and location	Vessel type and name, accident type
	January 30, 2020	July 26, 2018 Southern entrance of Ondo-no-seto (strait), Kure City, Hiroshima Prefecture	ISHITEGAWA, Passenger ferry (Vessel A) DAIEIMARU No.10, Cargo ship (carrying pebbles and stone products) (Vessel B) Collision
	Summary	Vessel A, bound for Matsuyama Port, Matsuyama City, Ehime Prefecture with the captain and eight crew members on board departed Kure port (Kure section), Kure City, Hiroshima Prefecture and was navigating southward at Ondo-no-seto (strait), Kure City. Vessel B, bound for Kure Port (Kure section) with the captain and three crew members on board were navigating westward in the Sea of Aki (Akinada). At around 07:56:30 on July 26, 2018 when they collided at the southern entrance of Ondo-no-seto.  In Vessel A, one passenger and one cabin crew member were injured and the outer hull of the portside was damaged (e.g., breached). This collision also made a hole in the bulbous bow of the Vessel B but did not cause any casualties.
	Probable Causes	It is probable that during the southward navigation of the Vessel A from the northern entrance/exit to the southern entrance/exit of Ondo-no-seto strait and the westward navigation of the Vessel B toward the southern entrance/exit of Ondo-no-seto, the captain of Vessel A judged that the vessel could clear the southern entrance/exit by means of a “port-side to ort-side” operation and continued travel, while the navigation officer of Vessel B single-handedly kept continued navigating at a full speed, deviating northward from the route designated by the Japan Coast Guard’s Public Notice No. 92. It is probable that he was late in noticing the oncoming Vessel A. Avoidance measures taken by both ships were too late to avoid a collision in the vicinity of the south entrance/exit of Ondo-no-seto. It is probable that the captain of Vessel A judged that the ship could safely pass the southern entrance/exit of Ondo-no-seto strait per usual by means of a “port-side to port-side” operation because he assumed that the Vessel B would navigate according to the navigation protocols for Ondo-no-seto sea area specified by the Japan Coast Guard’s Public Notice No. 92 and the Kure

		Maritime Safety Agency's administrative guidance. He therefore did not anticipate that the Vessel A would deviate from the route designated by Notice No. 92 enter the strait on a northward track. It is probable that the reason the navigation officer of the Vessel B steered the ship at nearly full speed while deviating northward from the route designated by Notice No. 92 was due to a failure to study his intended route by consulting a marine chart and so did not know about the method specified by the Japan Coast Guard's Public Notice No. 92 or the Kure Maritime Safety Agency's administrative guidance for this area. It is probable that the navigation officer of the Vessel B continued to steer the ship by himself because the captain had not instructed him to report when the vessel has approached Ondo-no-seto and that the captain assumed that the vessel would pass Ondo-no-seto during his scheduled shift at the helm, so he stood by in his room without attending to the navigation.
	Report	https://www.mlit.go.jp/jtsb/ship/rep-acci/2020/MA2020-1-2_2018tk0009.pdf (Japanese only)
3	Date of Publication	Date and location / Vessel type and name, accident type
	February 27, 2020	January 28, 2018 Ichimonji Breakwater of Okinoshima Fishing Port, Omihachiman City, Shiga Prefecture OKISHIMA, Passenger ship Collision (breakwater)
	Summary	The passenger ship left the floating pier of Okinoshima Fishing Port with the captain, a worker and nine passengers onboard. During navigation in the port area, the ship collided with the Ichimonji Breakwater. One passenger, the captain and the worker were severely injured in the accident while seven passengers were slightly injured. This accident caused a breach in the bow. 
	Probable Causes	It is probable that this nighttime collision occurred because after the ship navigated away from the floating pier of Okinoshima Fishing Port and passed the southern breakwater, the captain did not take the route to the south side of the Ichimonji Breakwater and continued on toward the breakwater. The reason the captain did not take the safer southern route off the Ichimonji Breakwater could not be verified because he could not remember how he had steered the ship before, during and after the accident and no one witnessed the captain's operation.
	Report	https://www.mlit.go.jp/jtsb/ship/rep-acci/2020/MA2020-2-1_2019tk0002.pdf (Japanese only)
4	Date of Publication	Date and location / Vessel type and name, accident type
	March 26, 2020	March 9, 2019 Off the eastern coast of Himesaki, Sado City, Niigata Prefecture GINGA, Passenger ship Passengers injured due to collision (floating objects in the water)
	Summary	Passenger ship GINGA with its captain, chief engineer and two crew members as well as 121 passengers onboard was navigating westward on hydrofoils at about 41.7 knots (speed relative to the seabed) at an eastern offshore area of Himesaki, Sado City, Niigata Prefecture on the way to Ryotsu Port of the same city, when the ship collided with floating objects at around 12:16, March 9, 2019. This resulted in the injuries of 108 passengers and one crew member. This accident breached the starboard quarter of the GINGA. * This accident was investigated as a "particularly serious accident."
	Probable Causes	It is probable that this accident occurred as follows: After GINGA passed the slowdown zone located east off the coast of Himesaki, it accelerated, heading westward in a foilborne state, when the captain observed floating objects in the direction of the port bow (front left side) of the ship. He attempted to avoid a collision with the objects but failed. As a result, the objects hit the rear hydrofoil wing, resulting in lumbar fractures in several passengers.

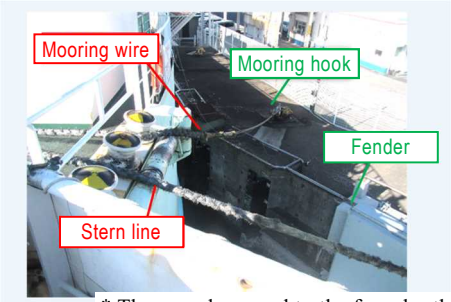
<table>
<tr><td></td><td></td><td colspan="2">It is probable that the captain could not avoid the collision despite his maneuvering because when he noticed them for the first time in the front left direction, they had already approached passed an avoidable distance.
It is probable that the reason he could not visually identify the objects until they were so close was that they were submerged.
Regarding the cause of many passengers' lumbar fractures, it is probable as follows: After the rear hydrofoil collided with the floating objects, the fuse pins fractured, causing the rear hydrofoil to pivot backward from the points where it was attached to the ship's hull. This lowered the stern and at the same time, the rear hydrofoil pulled the ship's body into the sea due to the water resistance against the rear hydrofoil. As a result, the bottom of the ship at the stern impacted the sea surface, generating significant upward and backward acceleration causing a severely impact to the passengers.
  </td></tr>
<tr><td></td><td>Report</td><td colspan="2">https://www.mlit.go.jp/jtsb/ship/rep-acci/2020/MA2020-3-1_2019tk0008.pdf (Japanese only)
https://www.mlit.go.jp/jtsb/ship/p-pdf/MA2020-3-1-p.pdf (Explanatory Material (Japanese only))</td></tr>
<tr><td></td><td>Reference</td><td colspan="2">Feature 4 (page 8), Chapter 2 (page 19), Case Studies (page 149)</td></tr>
<tr><td>5</td><td>Date of Publication</td><td>Date and location</td><td>Vessel type and name, accident type</td></tr>
<tr><td></td><td>June 25, 2020</td><td>January 17, 2019
Quay adjacent to Sumitomo Chemical Co., Ltd., Niihama Port, Niihama City, Ehime Prefecture</td><td>ISHIZUCHI, Cargo ship
Fatality of a worker</td></tr>
<tr><td></td><td>Summary</td><td colspan="2">While the vessel was unloading cargo at Niihama Port, a worker was hit by a bulldozer in the hold and died at around 03:39 on January 17, 2019</td></tr>
<tr><td></td><td>Probable Causes</td><td colspan="2">It is probable that this accident occurred as follows: The Worker of Company A was unloading coal behind Bulldozer A in No. 5 hold in Niihama Port where the Vessel moored during nighttime, Operator A thought there was nobody behind the Bulldozer A and thus moved it backward, causing the Worker to be run over by Bulldozer A.
 
It is probable that Operator A thought that there was nobody behind and moved Bulldozer A backward because there had been no signal given by either the Worker or Deck Man A.
Deck Man A, who was paying attention to the contact between Bulldozer A and the grab bucket, did not notice the positional relationship between the Worker and Bulldozer A, and there was no system established for the cargo-hold-work that enables the bulldozer to stop immediately in response to the position and actions of the Scraper, as a result of which it is probable that this accident occurred.
 
</td></tr>
<tr><td></td><td>Report</td><td colspan="2">https://www.mlit.go.jp/jtsb/eng-mar_report/2020/2019tk0004e.pdf</td></tr>
<tr><td>6</td><td>Date of Publication</td><td>Date and location</td><td>Vessel type and name, accident type</td></tr>
<tr><td></td><td>July 30, 2020</td><td>September 2, 2019
Akashi Kaikyo Traffic Route</td><td>GLOVIS COMPANION, Car carrier (Vessel A, Republic of the Marshall Islands)
HIGASHIDA MARU, Fishing vessel (Vessel B)
Collision</td></tr>
<tr><td></td><td>Summary</td><td colspan="2">Vessel A was proceeding west in the Akashi-Kaikyo Traffic Route and the fishing vessel HIGASHIDA MARU was proceeding southeast and attempting to cross the Akashi-Kaikyo Traffic Route when both vessels collided in the Akashi-Kaikyo Traffic Route.
The master of HIGASHIDA MARU was injured, and her bow sustained crushing and other damage, while GLOVIS COMPANION sustained abrasions on her starboard- side shell plating.</td></tr>
</table>

	Probable Causes	It is probable that the accident occurred when, as Vessel A was proceeding west under Pilot A's pilotage and Vessel B was proceeding southeast in the Traffic Route at night, both vessels collided because Pilot A continued navigating with his attention directed to maintaining Vessel A's path within the Traffic Route and Vessel B continued proceeding south-southwest and crossing the Traffic Route after entering the route with his attention on vessels that were proceeding east in the Traffic Route. It is likely that Master B proceeded south-southwest and continued crossing the Traffic Route after entering the route for the reason that, at the time of the accident, there were several vessels proceeding east to Vessel B's west and Master B was directing his attention to the vessels proceeding east and did not notice Vessel A proceeding west because he was considering which of the vessels to pass by their sterns. It is probable that Pilot A continued navigating with his attention directed to maintaining Vessel B's path within the route because he did not personally notice Vessel A's approach and there was no report of Vessel B's approach from Master A or Navigation Officer A. It is probable that the situation whereby Pilot A did not make any specific requests for lookout giving attention to the situation outside of the Traffic Route to Master A despite knowing that, at the time of the accident, it was a time of day when fishing vessels leave port contributed to the accident's occurrence. 
	Report	https://www.mlit.go.jp/jtsb/eng-mar_report/2020/2019tk0019e.pdf

7	Date of Publication	Date and location	Vessel type and name, accident type
	August 27, 2020	August 17, 2018 No. 26 berth of Kasumigaura-Minami Wharf, Yokkaichi Port, Yokkaichi City, Mie Prefecture	OOCL NAGOYA, Container vessel Collision (gantry crane)
	Summary	The vessel which was manned by the Master and 23 crewmembers, was navigated under escort by the pilot's pilotage, while the vessel was proceeding toward west and was approaching for berthing port side head-in to No. 26 berth of Kasumigaura-Minami Wharf, No. 3 district of Yokkaichi Port on Yokkaichi City, Mie Prefecture. At around 07:39 on August 17, her port fore collided with a gantry crane on the berth. The vessel caused damage of cutting and bending at the bulwark of the port fore part, etc. No. 26 berth of Kasumigaura-Minami Wharf caused damage of delamination at the concrete construction, derailing and deformation at the gantry cranes, etc. but there were no casualties in OOCL NAGOYA or the port facility.	
	Probable Causes	It is probable that this accident occurred, at Yokkaichi port, under conditions a of northwesterly wind blowing at wind force 5 to No. 26 berth of Kasumigaura-Minami Wharf, No. 3 district of Yokkaichi Port on Yokkaichi City, Mie Prefecture, while the Container vessel, OOCL NAGOYA was approaching No. 26 berth for mooring port side head-in by the Pilot's pilotage instruction, and then the Master intervened immediately and conducted maneuvering the vessel himself, and forward movement of the vessel was lost due to using by full astern, because the vessel was swept away toward a car carrier which was moored for starboard side head-out with her port side to No. 25 berth closely, and then taking full ahead was conducted to avoid collision with the car carrier and the vessel was proceeding forward; however, the vessel was not able to control her attitude, with the result that the port fore part of the vessel collided with the gantry crane (S2 Unit) on No. 26 berth. It is probable that the Master intervened immediately and conducted maneuvering the vessel himself, and forward movement of the vessel was lost due to using by full astern, because the Master was not able to make sufficient trusting relationship with the Pilot and felt that the approaching ship speed toward No. 26 berth was fast near the car carrier moored at No.25, and thereby the Maser thought he would abort the vessel movement completely. It is probable that the Master was not able to make sufficient trusting relationship with the Pilot, because the Master felt that the Pilot's explanation was not sufficient for him. It is probable that the accident occurred due to inadequate Bridge Resource Management (BRM)*1 including effective communication, etc. in the navigation bridge between the bridge team including the Master and the Pilot, while the vessel was in a situation of being imminently swept away toward the port side where No. 25 berth and the car carrier moored at No.25 were	

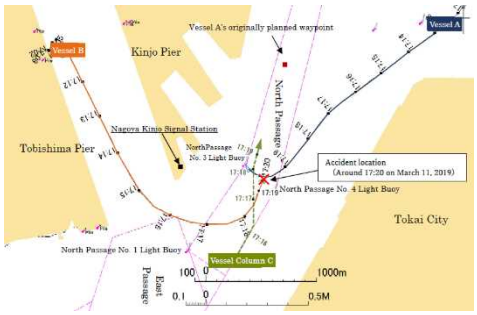
<table>
<tr><td></td><td></td><td colspan="2">located by the leeway exceeding 10°.</td></tr>
<tr><td></td><td>Report</td><td colspan="2">https://www.mlit.go.jp/jtsb/eng-mar_report/2020/2018tk0012e.pdf</td></tr>
<tr><td>8</td><td>Date of Publication</td><td>Date and location</td><td>Vessel type and name, accident type</td></tr>
<tr><td></td><td>August 27, 2020</td><td>December 30, 2018
Apra Harbor, Guam, unincorporated and organized U.S. territory</td><td>NIPPONMARU, Passenger ship
Collision (mooring equipment (a pile dolphin))</td></tr>
<tr><td></td><td>Summary</td><td colspan="2">The ship bound for Saipan with the captain, 204 crew members and 419 passengers on board left Apra Harbor quay F-4 in Saipan, US at around 21:04 (local time in Guam), December 30, 2018. After a left turn in an area west of the quay on the way to the port entrance, the ship went astern to approach pier D (a US Navy facility) on the opposite shore and collided with a pile dolphin (mooring equipment) of the pier D at around 21:13:27.
This accident resulted in holes in the outer plates of the starboard and port quarters but caused no casualties.
The accident also damaged the pile dolphin of the pier D.
After the accident, the ship cancelled its cruising schedule. Two passengers became sick and stayed in Guam to receive care until January 7, 2019. Other passengers flew back to Japan by January 3 the same year.
  </td></tr>
<tr><td></td><td>Probable Causes</td><td colspan="2">It is probable that this accident occurred as follows: When the captain steered the NIPPONMARU leftward in the sea area from quay F-4 of Apra Harbor, Guam, he tilted the joystick fully sternward in his attempt to facilitate the left turn although he should have tilted it fully in the starboard direction. Since he continued his full tilt of the sternward and was unaware of his mistake, the ship went astern while its bow was turning leftward causing the stern to collide with the pile dolphin of pier D located opposite to quay F-4.
In fact, the captain intended to tilt the joystick fully in the starboard direction but tilted it fully sternward. It is probable that although he was aware that tilting the joystick fully in the starboard direction requires tilting it fully toward the left side of his body while orienting his body toward the stern, he was in a standing position with his body positioned in a different direction from what he was used to. This resulted in him tilting the joystick fully toward the left side of his body while facing aport, and not sternward.
It is probable that the captain was unaware of his misdirection because he performed the operation without watching the way his hands controlled the joystick or the outboard display. He did not think that what was reported to him by the navigation officer in charge of the stern indicated an approach toward pier D, and he understood neither the proposals nor advice by a navigation officer supporting ship's handling nor those of the pilot.
It is probable that the captain was unaware of his misdirection because he performed the operation without watching the way his hands controlled the joystick or the outboard display. He did not think that what was reported to him by the navigation officer in charge of the stern indicated an approach toward pier D because the ship was turning leftward by means of a side thruster and a tugboat and because he interpreted what the navigation officer in charge of the stern reported to him as evidence of the ship continuing a left turn. In this way, he selectively collected information corroborating what he was thinking was right and therefore was convinced that his handling of the ship was correct.
It is probable that the reason the captain could understand neither the proposals nor advice by the support navigation officer or the pilot was that he ignored any information that might disprove what he was thinking to be right.
It is likely that the captain believed that he should always be in charge of the handling, undocking and turning around of the ship and recognized that the navigation officer in charge of steering the ship was a newcomer in training. All these factors led to his prioritizing his own judgements rather than heeding the suggestions and advice of the pilot and the support navigation officer, which likely caused his continued tilting the joystick fully sternward.</td></tr>
</table>

	Report	https://www.mlit.go.jp/jtsb/ship/rep-acci/2020/MA2020-7-2_2019tk0001.pdf (Japanese only) https://www.mlit.go.jp/jtsb/ship/p-pdf/MA2020-7-2-p.pdf (Explanatory Material (Japanese only))	
	Reference	Case Studies (page 148)	
9	Date of Publication	Date and location	Vessel type and name, accident type
	August 27, 2020	September 17, 2019 Eastern offshore from Cape Nosappu, Nemuro City, Hokkaido	KEIEIMARU No.65, Fishing vessel Capsizing
	Summary	During the port call of the fishing vessel navigating toward Hanasaki Port, Nemuro City, Hokkaido with the captain and seven crew members on board, the ship capsized of the eastern shore of Cape Nosappu in the same city at around 7:20, September 17, 2019. Among the eight crew members, one died and seven went missing. 	
	Probable Causes	It is probable that this accident occurred under circumstances in which a high wind maritime alert was issued and a low-pressure system was approaching, the fishing vessel bound for Hanasaki Port was navigating westward in an east of Cape Nosappu in the face of winds and ocean waves. Lateral waves hitting the port-side oscillated the vessel (causing a maximum expected value of 1/1000), a strong wind blast blew when its port-side (windward side) horizontally oscillated maximally, its tilt moment rapidly increased and the tilted in the starboard direction in excess of the bulwark submersion angle, causing the starboard bulwark to submerge, thereby capsizing the vessel. It is probable that as the ship oscillated horizontally due to lateral waves hitting its port-side, a strong blast of wind blew when its port-side (windward side) horizontally oscillated maximally and tilted the vessel to starboard past the bulwark submersion angle due to the choice of route and rate of speed that made it vulnerable to wind and ocean wave effects striking port-side.	
	Report	https://www.mlit.go.jp/jtsb/ship/rep-acci/2020/MA2020-7-3_2019tk0022.pdf (Japanese only) https://www.mlit.go.jp/jtsb/ship/p-pdf/MA2020-7-3-p.pdf (Explanatory Material (Japanese only))	
	Reference	Case Studies (page 151)	
10	Date of Publication	Date and location	Vessel type and name, accident type
	October 1, 2020	December 2, 2019 Ferry berth in Tokushima-Komatsushima Port, No.1 section	TSURUGI, Passenger ship Injury of a crew member
	Summary	During the undocking of the ferry with the captain and eight crew members on board at the berth at the No. 1 section of Tokushima-Komatsushima Port, Tokushima Prefecture, at around 08:02 on December 2, a mooring wire detached from a mooring hook by a remote control stroke and injured the head of a second officer in charge of the stern. The second officer suffered brain contusion, traumatic subarachnoid hemorrhage and left orbital floor fracture. A stern handrail of the vessel was also damaged.	

<table>
<tr><td></td><td>Probable Causes</td><td colspan="2">It is probable that this accident occurred under circumstances in which an onshore worker was not informed in advance of an undocking method test of a newly installed fender on the stern-side ferry berth. During the undocking procedure at the ferry berth, the onshore worker heard the pilot's transceiver conversation, "Release the stern painter." so he mistakenly thought that was an instruction directed at him to release the mooring wire and so he pushed the mooring hook release switch. This action released the taut stern-side spring line, which sprang back and struck second officer who was standing in the snapback zone of the spring line.
It is probable that the reason the onshore worker was not informed in advance was that the captain believed that "the worker was listening to cross-talk conversations through a ship's transceiver and therefore he should understand the situation even without being informed directly of the undocking method test using the fender."
It is probable that the reason the onshore worker mistook the captain's conversation "Release the stern painter." for an order to him to detach the mooring wire was that he was unfamiliar with the procedure and was only paying attention to transceiver communication so as to prevent a late execution of an order to detach the mooring line.
The procedure for undocking work at the ferry birth had been verbally informed to Nankai Ferry Co., Ltd.'s employees through safety guidance but a concrete procedure had not been specified in its safety management manual, and a manual for handling a mooring hook was not available. It is probable that these factors have contributed to this accident.
 
* The vessel moored to the ferry berth</td></tr>
<tr><td></td><td>Report</td><td colspan="2">https://www.mlit.go.jp/jtsb/ship/rep-acci/2020/MA2020-8-1_2020tk0006.pdf (Japanese only)</td></tr>
<tr><td>11</td><td>Date of Publication</td><td>Date and location</td><td>Vessel type and name, accident type</td></tr>
<tr><td></td><td>October 29, 2020</td><td>November 2, 2019
Southern sea area off the coast of Tanoshima (island), Matsuyama City, Ehime Prefecture</td><td>KAZUMARU No.3, Recreational fishing vessel
Grounding</td></tr>
<tr><td></td><td>Summary</td><td colspan="2">The recreational fishing vessel with the captain, a crew member and 10 anglers on board was navigating north in a southern sea area off the coast of Tanoshima. At around 21:31, November 2, 2019, the vessel ran aground a shallow area.
All persons on board were injured, and a hole was made in the lower bow.</td></tr>
<tr><td></td><td>Probable Causes</td><td colspan="2">It is probable that, during the night-time navigation under a slightly cloudy weather without moonlight in a southern sea area off the coast of Tanoshima (island) on the way to a fishing spot north from the same island, the captain was navigating the ship while depending solely on visual route checks, so he was late in noticing that the ship was approaching Tanoshima and although he immediately shifted to the neutral operation of the engine, the ship ran aground the shallow south of Tanoshima.</td></tr>
<tr><td></td><td>Report</td><td colspan="2">https://www.mlit.go.jp/jtsb/ship/rep-acci/2020/MA2020-9-1_2019tk0025.pdf (Japanese only)
https://www.mlit.go.jp/jtsb/ship/p-pdf/MA2019-4-2-p.pdf (Explanatory Material (Japanese only))</td></tr>
<tr><td>12</td><td>Date of Publication</td><td>Date and location</td><td>Vessel type and name, accident type</td></tr>
<tr><td></td><td>November 26, 2020</td><td>March 11, 2019
North Passage, Nagoya Port, Aichi Prefecture</td><td>EOS, Oil tanker and chemical tanker (Vessel A, Republic of Korea)
AISHO No. 8, Cargo ship (Vessel B)
Collision</td></tr>
<tr><td></td><td>Summary</td><td colspan="2">As the oil tanker and chemical tanker EOS was proceeding southwest and the cargo ship AISHO No. 8 was proceeding north, both vessels collided in the Nagoya Port North Passage.
EOS sustained a breach and other damage to her port bow plating shell and AISHO No. 8 sustained dents and other damage to her bow bulwark.</td></tr>
<tr><td></td><td>Probable Causes</td><td colspan="2">It is probable that both vessels collided in Nagoya Port because, as Vessel A was proceeding southwest toward the North Passage, Master A, when he observed Vessel B off of the bow,</td></tr>
</table>

assumed that Vessel A and Vessel B were in a meeting relationship and would pass port-to-port and, further, that Vessel B would cross the North Passage on an easterly course and head in the direction that Vessel A had come, and therefore he continued navigating at the same course and speed, and because Master B assumed that Vessel B, which was navigating within the North Passage, was in a position of maintaining her course and Vessel A, which was about to enter the North Passage, would give way to Vessel B, and therefore he turned to port and proceeded north.

It is probable that each master respectively attempted to avoid an accident, as Master A set the rudder hard to starboard, stopped the main engine with the intention of avoiding a collision by passing port-to-port because Vessel B had come too close for Vessel A to navigate to Vessel B's stern, and Master B saw Vessel A's bow approaching off the bow and make a sudden turn to starboard, sensed the danger of collision, and set the main engine to full astern.



It is probable that the fact that course signals made using international signal flags were not checked and communication by VHF or other means was not made between Vessel A and Vessel B contributed to the accident.

	Report	https://www.mlit.go.jp/jtsb/eng-mar_report/2020/2019tk0009e.pdf

13	Date of Publication	Date and location	Vessel type and name, accident type
	November 26, 2020	December 2, 2019 Outside Nejime Port, Minamiosumi-cho, Kagoshima Prefecture	NANKYU No. 10, Passenger ship Injuries

Summary

On December 2, 2019, passenger ship NANKYU No. 10 bound for Ibusuki Port, Ibusuki City, Kagoshima Prefecture with the captain, ordinary seamen and 55 passengers on board departed Nejime Port, Minamiosumi-cho, Kagoshima Prefecture, taking a north-northwest course. At around 16:24, the ship was significantly shaken horizontally by incoming tidal waves. The sudden uplift, caused seated passengers to become airborne and slam back down onto their seats. Fourteen passengers were injured.

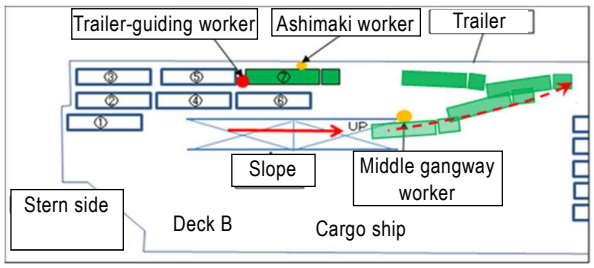
Probable Causes

It is probable that this accident occurred because the passenger ship departed Nejime Port even though the weather and hydrographic conditions had reached the standards for departure and navigation cancellation conditions specified by the safety management manual of Nankyu-Dock Co., Ltd. The vessel continued navigating outside the port at about 12 knots while taking a north-northwest course, which deviated northward from the standard navigation route. The bow of the ship was hit and violently lifted by oncoming tidal waves, causing seated passengers to become airborne and subsequently slammed back down into their seats, resulting in injuries.

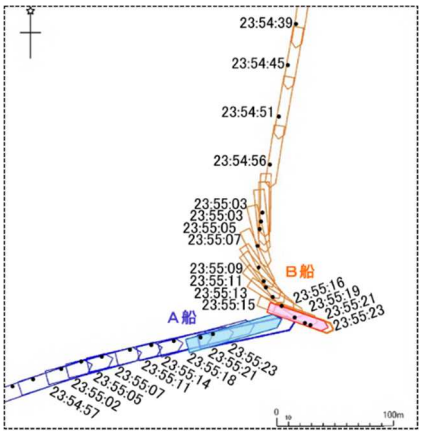
It is probable that the reasons that the ship continued navigating at about 12 knots in the direction of north-northwest, deviating northward from the standard route, were twofold: Firstly, the captain believed that, despite the up-and-down motions, the ship could safely avoid the oncoming waves by making a series of left turns and navigating at a speed slower than that specified by the navigation standard table. Secondly, he believed that even though taking the north-northwest course would subject the ship to oncoming wind and waves, the course would prevent the ship from drifting toward the aquaculture facilities located to the west from the breakwater and lighthouse of Nejime Port.

It is probable that the captain never imagined that the passengers would be thrust violently upward, slammed back into their seats and subsequently suffering injuries, including spinal fractures.

It is probable that the reasons why the ship departed Nejime Port despite the bad weather and hydrographic conditions having reached the standards for departure cancellation conditions specified by the safety management manual of Nankyu-Dock Co., Ltd. were that the captain mistakenly believed that he could cancel a departure only when wind speeds and wave heights exceeded the standards for departure cancellation condition and also the operation management

<table>
<tr><td></td><td></td><td colspan="2">director left navigation the final decision on him. It is likely that these factors have contributed to the accident.</td></tr>
<tr><td></td><td>Report</td><td colspan="2">https://www.mlit.go.jp/jtsb/ship/rep-acci/2020/MA2020-10-2_2019tk0027.pdf (Japanese only)</td></tr>
<tr><td></td><td>Reference</td><td colspan="2">Chapter 2 (page 22), Case Studies (page 152)</td></tr>
<tr><td>14</td><td>Date of Publication</td><td colspan="2">Date and location</td></tr>
<tr><td></td><td>December 17, 2020</td><td>January 20, 2019
Kashii Park Port, Hakata Port, Fukuoka pref.</td><td>CHURASHIMA, Roll-on/roll-off cargo ship
Fatality of a worker</td></tr>
<tr><td></td><td>Summary</td><td colspan="2">During the loading of container chassis onto the ship with the captain and 13 crew members on board at quay No. 8 of Kashii Park Port, Hakata Port, Fukuoka Pref., a worker in charge of trailer-guiding was crushed to death between a container chassis loaded on the deck and a reversing trailer at around 01:55, January 20, 2019.</td></tr>
<tr><td></td><td>Probable Causes</td><td colspan="2">Regarding this night-time accident during a container chassis loading operation at deck B, it is highly probable that the worker who was guiding a trailer and cargo stowage positions (hereinafter referred to as a “trailer-guiding worker”) was crushed to death between the chassis-towing trailer and a pre-loaded container chassis.
 

It is probable that the reason the trailer-guiding worker was sandwiched between the trailer and the pre-loaded container chassis is because the trailer driver lost sight of the worker but continued reversing by the whistled warning signals of the worker, and because the worker attempted to crossover to the left side of the trailer by slipping behind it after whistling.
It is probable that even though the trailer driver had lost sight of the trailer-guiding worker, he most likely continued reversing, because he felt the whistled signal was noted usual.
It is probable that another worker (ashimaki worker) said that he felt at the time of the accident that trailer moved backward even after hearing the trailer-guiding worker’s whistle sign. Since the worker also heard the trailer-guide worker’s successive whistles thereafter, it is likely that the driver did not come to a complete stop upon the first whistle sign.
The reason the trailer-guiding worker moved behind the trailer to the left side after he whistled was probably due to his intention to set a tire stopper to the tire left rear section of the container chassis, however, since nobody witnessed his actions, the reasons could not be confirmed.
Regarding alcohol intake by the trailer driver before the cargo handling operation: How his alcohol intake may have affected his driving ability could not be confirmed. However, given that even low blood-alcohol concentrations can affect driving ability and that these effects increase at higher concentrations, it is likely that his pre-accident drinking affected his situational judgment and response time.</td></tr>
<tr><td></td><td>Report</td><td colspan="2">https://www.mlit.go.jp/jtsb/ship/rep-acci/2020/MA2020-11-1_2019tk0028.pdf (Japanese only)</td></tr>
<tr><td>15</td><td>Date of Publication</td><td colspan="2">Date and location</td></tr>
<tr><td></td><td>December 17, 2020</td><td>June 26, 2019
Offshore area west from Sagishima (island), Mihara City, Hiroshima Prefecture</td><td>JK III, Cargo ship (Vessel A)
NOTOJIMA, Marine sweeper (Vessel B)
Collision</td></tr>
<tr><td></td><td>Summary</td><td colspan="2">On June 26, 2019, Vessel A bound for Fukuyama Port, Fukuyama City, Hiroshima Prefecture with the captain and four crew members on board was navigating north east, while Vessel B bound for Kure Port, Kure City, Hiroshima Prefecture with the skipper and 40 crew members on board was navigating south-south west. At around 23:55, the two ships collided at an offshore area west of Sagishima, Mihara City, Hiroshima Prefecture.
The bulbous bow of the Vessel A was dented, and a hole was made in the outer plate of the starboard quarter of the Vessel B, but there were no casualties.</td></tr>
</table>

	Probable Causes	It is probable that this accident occurred as follows: At night at an offshore area west from Sagishima, Mihara City, Hiroshima Pref between northeast-bound Vessel A and south-southwest-bound Vessel B. The navigation officer of Vessel A decided to sail past Vessel B "port-side to port-side" and continued on near the center of Aoki-seto. Meanwhile, the duty officer of Vessel B felt unsafe about navigating past Vessel A "port-side to port-side," so he decided to pass Vessel A "starboard to starboard." He asked his skipper's permission for to make a left turn and mistakenly thought that permission was granted and continued on from Kosagijima (island) through at nearly the center of the sea area west from the Toramarusho light beacon. As a result, the two ships collided.  It is probable that the reason the navigation officer of Vessel A decided to navigate past the Vessel B "port-side to port-side" and continued navigating near the center of Aoki-seto is because he usually navigated along the scheduled course line near the center of Aoki-seto displayed on the radar and avoided other ship by a portside to portside navigation, so he was mistakenly convinced that the Vessel B would soon make a right turn and navigate south east along Aokibana. It is probable that the reason the duty officer of Vessel B felt unsafe about navigating past the Vessel A "port-side to port-side" was that he thought that Vessel A was navigating near Aokibana and was concerned about the close distance to the 10-meter depth contour near Aokibana. It is probable that the reason the duty officer of the Vessel B continued navigation from Kosagijima (island) through nearly the center of the sea area west from Toramarusho light beacon is that he mistakenly thought that the Vessel A would turn left toward Aokibana and proceed north. It is probable that the reason the duty officer of the Vessel B asked the skipper's permission for a left turn but mistakenly thought that he was granted the permission is because he was confident of the skipper's trust in his steering ability and received no instructions from the skipper regarding his operation, he mistakenly thought he has obtained his approval. It is likely the fact that neither the Vessel A nor Vessel B used VHF to mutually exchange navigation information contributed to the occurrence of this accident. It is likely that the fact the Vessel B skipper fell asleep due and neglected to properly instruct the duty officer contributed to its occurrence.
	Report	https://www.mlit.go.jp/jtsb/ship/rep-acci/2020/MA2020-11-2_2019tk0015.pdf (Japanese only) https://www.mlit.go.jp/jtsb/ship/p-pdf/MA2020-11-2-p.pdf (Explanatory Material (Japanese only))
	Reference	Case Studies (page 150)

9 Actions taken in response to recommendations and opinions in 2020

Measures taken in response to recommendations in 2020 are summarized as follows:

① Passenger ship SORA contact with an approach light beacon

(Recommendations on December 20, 2018)

After its investigation of the collision of passenger ship Sora with an approach light beacon that occurred at Hanshin Port Kobe District 6 on July 26, 2017, the JTSB published its investigation report and made recommendations to OM Kobe Co., Ltd. on December 20, 2018, and received the company's completion report on its measures taken based on the JTSB's recommendations as described below.

● Summary of accident

The passenger ship SORA, with the master, the chief engineer, and 29 passengers on board, departed from the Kaijo Access Terminal of Senshu Port, heading north for a pier at the Kobe Airport Kaijo Access Terminal in Hanshin Port Kobe District 5 on July 26, 2017 around 21:29. Then the vessel collided with the Kobe Airport east approach light beacon in Hanshin Port Kobe District 6.

On SORA, four passengers were severely injured, and 21 passengers and two crew members suffered minor injuries. The hull suffered collapses and other damage to the portside bow area. The Kobe Airport east approach light beacon suffered abrasions to the support legs.

● Probable Causes

It is probable that this accident occurred in the following situation. At night, the beacon of the Kobe Airport east approach light beacon E2 was difficult to see due to the illuminating lights at Port Island's container terminal in the background. The passenger ship SORA was heading north in Hanshin Port Kobe District for a pier at Kobe Airport Kaijo Access Terminal in Hanshin Port Kobe District 5. The master was watching only visually without monitoring the radar installed on the port side of the steering stand and the GPS plotter with overlaid radar images. The master did not notice that the vessel was heading for the Kobe Airport east approach light beacon, then the ship collided with the beacon.

It is probable that the reasons why the master was watching only visually without monitoring the radar installed on the port side of the steering stand and the GPS plotter with overlaid radar images were as follows: (1) The master was chatting with the chief engineer. (2) He had been able to see in the past the light of the Kobe Airport east approach light beacon E2 when approaching the lighthouse.

By leaving ship steering to the chief engineer, the master was handling his smartphone. The master kept chatting with the chief engineer, and he was watching only visually without monitoring the radar installed on the port side of the steering stand and the GPS plotter with overlaid radar images. Paying less attention to return the vessel into the reference route, the master navigated the ship on the west side of the reference route without displaying it on the GPS plotter with overlaid radar images. Furthermore, the chief engineer transferred ship steering to the master without sharing information about the light beacon E2, and he was checking records in the engine logbook without watching the bow direction. It is probable that such behavior shows a lack of discipline in SORA's wheelhouse, which was attributable to the occurrence of this accident.

One of the reasons why the discipline in the wheelhouse was not maintained was that OM Kobe Co., Ltd. had not defined and disseminated the specific details of the standard arrangement of mariners on watch duty that the Safety Management Rule requires to be stipulated. At the same time, there was not enough safety education and training to learn the importance of ship navigation. Those include watching with the help of the radar installed on the port side of the steering stand and the GPS plotter with overlaid radar images, sharing the same information among crew members, and navigating along reference routes as much as possible. Based on this information, it is probable that the safety management of OM Kobe Co., Ltd. was not working effectively, which was attributable to the occurrence of this accident.

There were many injuries, including those who suffered severe injuries. It is probable that many passengers did not wear seat belts.

The collision caused the passengers to be thrown in the bow direction, hitting themselves against the front chairs. It is likely that the chairs that came off the floor contributed to this magnitude of human damage.

○ Recommendations to the OM Kobe Co., Ltd.

It is probable that the accident occurred when, as the passenger ship SORA was proceeding north in the Kobe section of Hanshin Port toward the pier of Kobe Airport Kaijo Access Terminal, which is in Kobe Section 5 of Hanshin Port, at night, SORA collided with the Kobe Airport East Approach Light Beacon when her master did not notice that she was navigating toward the light beacon because he was engaged in visual lookout only, without using the radar installed on the port side of the steering stand or the GPS plotter that overlaid the radar's images.

It is probable that OM Kobe Co., Ltd.'s safety management was not functioning effectively because it did not clearly indicate and make known specific information concerning ordinary navigational watch stations that are required by stipulations in safety management regulations, and because sufficient safety education and training on the importance of keeping appropriate lookout using the radar and GPS plotter and sharing information among crew members had not been provided.

Although OM Kobe Co., Ltd. implemented various measures to prevent recurrence after the accident, given that, when navigation routes were investigated following the accident, it was found that vessels are navigating near the Kobe Airport East Approach Light Beacon, it is probable that safety education and training on the importance of navigating on the standard route whenever possible were not sufficiently provided.

In view of the result of this accident investigation, the Japan Transport Safety Board recommends that OM Kobe Co., Ltd. implement the following measures pursuant to paragraph (1) of Article 27 of the Act for Establishment of the Japan Transport Safety Board in order to stably ensure the safety of passenger transport.

Owing to the importance of having preventative measures continuously and reliably implemented, continuously provide education and training to crew members of operating contractors with emphasis on the following points:

(1) The importance of lookout that includes appropriate use of navigation equipment

(2) The importance of sharing information on navigational safety among crew members

(3) The importance of safe operation that includes use of equipment that aids for preventing grounding (collision)

(4) The importance of conducting appropriate ship maneuvering, including recognizing the safety of navigating on standard routes and navigating on standard routes whenever possible

○ Measures taken by OM Kobe Co., Ltd. based on the recommendations (completion report)

Recommendation (1) The importance of lookouts that includes appropriate use of navigation equipment

Completion report

○ A Constant lookout and marine accident prevention during a navigation
Date: April 17 (Wednesday), 2019
Outside advisor: Mr. Suzuki Kunihiro, Vice President and Maritime Counselor,
Trainees: 14 trustee company crew members

○ A constant lookout and marine accident prevention during a navigation
Date: April 25 (Thursday), 2019
Navigation manager of the company: OM Kobe Co., Ltd.
Trainees: Nine trustee company crew members

○ Importance of safe operation (including constant lookout) by utilizing grounding/collision prevention devices
Date: September 28 (Saturday), 2019
Outside adviser: Mr. Suzuki Kunihiro, Vice President and Maritime Counselor, Safe Sailing Service Co.
Trainees: 15 trustee company crew members

○ Importance of safe operation (including constant lookout) by utilizing grounding/collision prevention devices
Date: October 17 (Thursday), 2019
Navigation manager of the company: OM Kobe Co., Ltd.
Trainees: 15 trustee company crew members

○ OJT by professionals
① During departure from port
Appropriate use of navigation equipment
Lookout (surveillance) by sight and navigation equipment
② During navigation
Look out (surveillance) by sight and navigation equipment
Appropriate use of navigation equipment
③ During entry into port
Appropriate use of navigation equipment

Recommendation (2) The importance of sharing information on navigational safety among crew members

Completion report

○ Safety-related educational seminar for crew members
Date: June 7 (Friday), 2019
Outside adviser: Prof. Furusho Masao, Kobe University
Trainees: 13 trustee company crew members

○ Safety-related educational seminar for crew members
Date: June 24 (Monday), 2019
Navigation manager of the company: OM Kobe Co., Ltd.
Trainees: Six trustee company crew members

○ OJT by professionals
① During navigation and departure from port
Importance of sharing navigation safety information among crew members

Recommendation (3) The importance of safe operation that includes use of equipment that aids for preventing grounding (collision)

Completion report

○ Importance of safe operation by utilizing grounding/collision prevention devices
Date: September 28 (Saturday), 2019
Outside advisor: Mr. Suzuki Kunihiro, Vice President and Maritime Counselor, Safe Sailing Service Co.
Trainees: 15 trustee company crew members

○ Importance of safe operation by utilizing grounding/collision prevention devices
Date: October 17 (Thursday), 2019
Navigation manager of the company: OM Kobe Co., Ltd.
Trainees: 15 trustee company crew members

○ OJT by professionals
① During navigation
Utilization of grounding/collision prevention devices

Recommendation (4) The importance of conducting appropriate ship maneuvering, including recognizing the safety of navigating on standard routes and navigating on standard routes whenever possible

Completion report

○ Obligation of navigating on the standard routes and importance of appropriate navigation
Date: September 28 (Saturday), 2019
Outside adviser: Mr. Suzuki Kunihiro, Vice President and Maritime Counselor, Safe Sailing Service Co.
Trainees: 15 trustee company crew members

○ Obligation of navigating on the standard routes and importance of appropriate navigation
Date: October 17 (Thursday) 2019
Navigation manager of the company: OM Kobe Co., Ltd.
Trainees: 15 trustee company crew members

○ OJT by professionals

① Ensuring safety and appropriate ship maneuvering by navigating on the standard routes during navigation and entry into port

* Notification contents including attachments are shown in the JTSB's website:

https://www.mlit.go.jp/jtsb/shiphoukoku/ship-kankoku18re_20200326.pdf (Japanese only)

② Oil tanker HOUNMARU Collision (Bridge)

(Recommendations on April 25, 2019)

After investigating the collision of oil tanker HOUNMARU with the Kansai International Airport Access Bridge that occurred on September 4, 2018, the JTSB published its investigation report and issued recommendations to Tsurumi Sunmarine Co., Ltd. on April 25, 2019, and was reported by the company (completion report) regarding the measures it took based on the recommendations as described below:

○ Summary of accident

When Typhoon No. 21 was approaching the Seto Inland Sea, including Osaka Bay, and a maritime typhoon warning was issued, the oil tanker HOUNMARU, with the master and 10 crew members on board, was anchored off the southeast of the Senshu Port. The Vessel was struck by strong wind which increased with the approach of the typhoon and being drifted to the north dragging the anchor pushed by the strong winds and waves. As a result, on September 4, 2018 around 13:40 the vessel collided with Kansai International Airport Access Bridge.

The deck on the starboard bow of the Vessel was crushed, and the road girder of Kansai International Airport Access Bridge was bent, broken, and scratched. The railway girder was collapsed, the rail was warped, and the gas pipe was broken. However, no crew members were injured.

○ Probable Causes

In this accident, the HOUNMARU continued single anchoring at the east side of the Oil Tanker Berth ("the Anchorage") located on the southwest side of the Senshu Port in Osaka Prefecture, where Kansai International Airport Access Bridge is located about one nautical miles north of the southeast of the' Kansai International Airport First Stage Airport Island' ("the Kanku Island") for the purpose of typhoon evacuation, under the condition that the Typhoon No. 21 was approaching and the maritime typhoon

warning was issued in the Seto Inland Sea including Osaka Bay. In addition, the Vessel continued to anchor at the Anchorage due to the strong wind and waves caused by the approaching typhoon. Besides, once the drifting stopped by using the main engine so the master continued to hold the joystick in the HOVER position. As a result, it is probable that the HOUNMARU was forced to drift down again and collided with Kansai International Airport Access Bridge under the condition that there was no sufficient distance to control the Vessel.

It is probable that the reason why the HOUNMARU anchored at the Anchorage, which is located about one nautical miles north of the southeast of the Kanku Island, was that the master thought that Typhoon No. 21 would pass the east side of the Anchorage and the left semicircle of the typhoon would enter the Anchorage, that the typhoon was traveling at a high speed and that strong wind would not blow for a long time, that the area was surrounded by the shore, that the seabed material was mud and the anchor would be highly effective, that other vessels were anchoring at the time of typhoon evacuation, that the next loading was planned to be carried out in the Sakai-Senboku Area of the Hanshin Port, and that he did not know the 2011 leaflet "Let's Prevent Anchor Dragging Maritime Accident ." and did not recognize to anchor avoiding the sea area within three nautical miles from the Kanku Island.

It is probable that the reason why the HOUNMARU kept single anchoring at the Anchorage was that the master thought that the double anchoring would be entangled when the wind direction changed and the mooring force would decrease, and that the master had the experience of using the main engine to cope with the typhoon wind.

It is probable that the master set the joystick in the HOVER position because he thought that the anchor was stopped when the GPS speed over the ground indicated on the radar became zero, and that the HOUNMARU would move forward if the joystick was in the forward position.

It is probable that the reason why the HOUNMARU was drifted down again that, under the situation where the forward thrust was lost due to the dispersion of the propeller thrust while the joystick was kept in the HOVER position, the anchor chain left the seabed with the increase of the water depth due to the high tide, the mooring force decreased, and the wind pressure on the hull and the wave drifting force increased.

It is likely that Hinode Shipping Co., Ltd. and Tsurumi Sunmarine Co., Ltd. were involved in the occurrence of this accident because they did not provide the master with confirmation of the rough anchoring, information on the typhoon and information on the anchorage, and did not discuss the safe operation.

○ Recommendations to the Tsurumi Sunmarine Co., Ltd.

In this accident, while Typhoon No. 21 was approaching and a maritime typhoon warning was issued in the Seto Inland Sea including Osaka Bay, HOUNMARU continued single anchoring at the east side of the oil tanker berth located on the southwest side of the Senshu Port, Osaka Prefecture where Kansai International Airport Access Bridge is located about one nautical miles north of the southeast of the Kansai International Airport first Stage Airport Island, for the purpose of typhoon evacuation, and HOUNMARU started to drift dragging the anchor pushed by the strong winds and

waves with the approach of the typhoon. The master tried to stop anchor dragging using the main engine and it seemed the drift was stopped. He thought that he succeeded to stop anchor dragging so he kept the joystick HOVER position. As a result, it is probable that HOUNMARU was again drifted and collided with Kansai International Airport Access Bridge in a situation where there was no sufficient distance to control HOUNMARU.

It is likely that Tsurumi Sunmarine Co., Ltd. was involved in the occurrence of this accident because they did not provide the master with confirmation of the rough anchoring, information on the typhoon, and information on the anchorage, and did not discuss the safe operation.

Based on the results of this accident investigation, the JTSB makes the following recommendations to Tsurumi Sunmarine Co., Ltd. pursuant to the provision of Paragraph 1, Article 27 of the Act for Establishment of the Japan Transport Safety Board in order to ensure the safety of ships and facilities in a stable manner.

Additionally, the Japan Transport Safety Board requests that Tsurumi Sunmarine Co., Ltd. report measures taken based on these recommendations pursuant to paragraph (2) of the same Article.

(1) In order to prevent accidents due to anchor dragging during extremely strong typhoons, Tsurumi Sunmarine Co., Ltd. shall make following things thoroughly known to the master.

[1] When a vessel is anchored, basically two anchors must be used and all possible measures must be taken to, for example, ensure that anchors and anchor chains provide secure sufficient anchor-holding power with the anchor chains extended as long as possible.
The method of anchoring and the amount of extension of the anchor chain should be determined according to the situation of the ship (size, shape, type, cargo, etc.) and the environment of the anchor chain (congestion, bottom sediment, water depth, etc.).

[2] It must be ensured that with the engine placed in a standby state, the output is appropriately adjusted by continuously using the engine according to rapidly changing wind directions and velocities so that anchor dragging will not be caused.

[3] An anchorage must be chosen so that no important facilities will be located on the leeward side of the anchorage and that sufficient distances to other vessels will be secured.

[4] Since the wind direction and wind velocity change rapidly when a typhoon passes, the latest weather information, sea state (typhoon) information, etc. have to be obtained to make accurate predictions.

(2) In the event that there is a risk of danger due to abnormal weather or sea conditions, Tsurumi Sunmarine Co., Ltd. shall provide necessary information to the vessels it operates, examine the safety of the vessels, and revise the operation plan as necessary, by establishing a safety support system.

○Measures taken by Tsurumi Sunmarine Co., Ltd. based on the recommendations (completion report)

A completion report in response to the recommendations in (1).

According to the implementation plan and safety management manual, the company made it known

to the captains (masters) of the ships it manages that they shall comply with [1] to [4] of recommendation (1) regarding key points during anchoring (selection of anchorage, anchoring method, engine standby, main anchor supervision, etc.: hereinafter referred to as "points to note during anchoring").

(1) Distribution of a safety notice

The company obtained the JTSB's summary of accident prevention measures "Measures for Preventing an Anchor Dragging Accident during an Extremely Strong Typhoon" from the Japan Coastal Tanker Association and distributed it as a safety notice to its captains and shipowners (Attachment 1).

(2) Issuance of an alert in case of an extremely strong typhoon

The company instructed its safety manager and navigation manager to issue an alert including typhoon information and an anchor dragging accident prevention alert to the captains of operating ships, in cases of an extremely strong typhoon (Attachment 2).

(3) Other measures

The company took the following measures for the captains and owners of the ships operated by it and instructed them with regard to points of note during the anchoring of a ship.

● Instructions as wake-up calls by the Tsurumi Sunmarine Ship Safety Board

The Tsurumi Sunmarine Ship Safety Board held a general and regular branch meetings to inform owners and captains of the ships whose operations are managed by the company regarding the anchor dragging accident in question and points of note during anchoring. It also distributed a poster and a leaflet to each shipowner and ship (Attachment 3).

[Date of meetings]
General meeting: April 15
Keihin Branch meeting: October 21
Nagoya Branch meeting: May 21 and November 12
Osaka Branch meeting: May 22 and October 2
Shikoku Branch meeting: June 4 and November 6
Fukuoka Branch meeting: May 17 and October 25

● Monthly safety priorities

The general meeting of the Tsurumi Sunmarine Ship Safety Board has decided to designate the "appropriate selection of anchorage (anchoring location) and anchor dragging countermeasures" as "monthly safety priorities" to distribute it through each regular branch meeting to the owners and the captains of the ships operated by the company. Each shipowner and ship set their concrete goals in the monthly safety priorities and carried them out. (Attachment 4).

● Repetitive calls for attention to the anchor dragging accident in preparation for the typhoon season

The company regularly brought to the attention to the navigation manager, the captains and the

owners of the ships operated by the company the anchor dragging accident and provided them with information on the behaviors of typhoons, or storms with a cold wave and high waves toward the prevention of recurrences of the incident.

Date of the above: June 5 (before the typhoon season) and January 7 (before the wild winter weather season)

Instructed by: Navigation manager

Instructed to: Captains and owners of the 130 ships operated by the company

Distribution method: Attention to anchor dragging accident prevention was brought up and information on the behaviors of typhoons was distributed through faxes and e-mails (Attachment 5).

Completion report in response to recommendation (2)

In order to clarify the company's safety support system in anticipation of risks due to abnormal weather and hydrographic conditions, the company modified its safety management manual, and at the same time, in order to prevent the recurrence of the anchor dragging accident even in the face of an extremely strong typhoon, it additionally stipulated points to take note of during anchoring (selection of anchorage, anchoring method, engine standby, main anchor supervision, etc.) in their navigation standard and submitted the revised standard to the Kanto District Transport Bureau, which accepted it (Attachments 6 to 8).

The contents of the revision are as follows:

Revised safety management manual

① Safety management manual

[Term definitions]

Article 2 (23) previously defined "onshore facilities as a quay (including fender facilities) and facilities used for loading or unloading cargo (i.e., a movable bridge.)." However, due to the impracticality of this definition at during actual situation, the definition of onshore facilities was revised as "a quay, facilities used for loading or unloading cargo (including a movable bridge [including a fender facility and an adjunct materials-handling facility]) and other onshore facilities such as a breakwater and a bridge."

[Support by the navigation manager]

Article 25 previously specified events/incidents upon which navigation cancellation should be forwarded to a captain, but the company modified the title of this provision to "Support by the Navigation Manger" and clearly specified that support be provided by the navigation manager (provision of information, safety review and, when necessary, operation schedule modification) and additionally stipulated that, upon a navigation cancellation notification from the captain, the captain must be provided with information for selecting a harbor shelter (including a harbor of refuge and anchoring point) for discussion.

[Instructions by the top management or the safety manager]

Article 26 previously specified only the "issuance of a dense fog advisory" as information based

on which the top management or the safety manager should urge the navigation manager to judge whether the navigation is possible or not, but the wording of the article was modified to "in case a storm is anticipated due to a large typhoon or the like, or an issuance of a dense fog advisory" thereby reinforcing crisis management against storms.

② Navigation standard

[Selection of a harbor shelter]

The company modified the title of Article 5 to the "Selection of a Harbor Shelter" and clearly specified how a captain, in case a storm is anticipated due to a large typhoon or the like, should select a safe harbor shelter and that the captain must strengthen surveillance and make the main engine ready for immediate use.

The article was added with a provision to the effect that a captain, upon his/her decision on harborage or anchoring, must inform the navigation manager of his/her decision plus the harbor shelter and harborage means.

[Discussion of harborage]

The title of Article 6 was modified to the "Discussion of Harborage" and added with a provision stating, "Especially when a large typhoon is anticipated and the selection of a harbor shelter or the harborage means may significantly affect the safety of the cargo, the captain must discuss with the navigation manager to decide the best harbor shelter and harborage means on his/her own judgment."

* Notification contents including attachments are posted on the JTSB's website:
https://www.mlit.go.jp/jtsb/shiphoukoku/ship-kankoku19re_20200625.pdf (Japanese only)

③ **Passengers injured after the collision of passenger ship GINGA with floating objects**

(Recommendations on March 26, 2020)

See "Chapter 2. Summary of recommendations and opinions issued in 2020 – 1. Recommendations" (page 19 (1)).

10 Provision of factual information in 2020 (marine accidents and incidents)

The JTSB provided factual information on one case (marine accidents) to relevant administrative organs in 2020. The details are as follows.

① Information provided by the JTSB regarding the accident injury of passengers of passenger ship NANKYU No. 10 on December 2, 2019

Information provided on March 6, 2020

Provision of information on the accident involving passenger ship NANKYU No. 10, which resulted in passenger injuries

Regarding the accident that injured passengers of passenger ship NANKYU No. 10 on December 2019, the Kyushu District Transport Bureau issued an "order regarding transport safety" to Nankyu-Dock Co., Ltd. on February 19, 2020. In addition to the facts found by that point, the JTSB, in its investigation process thus far, found the below-mentioned facts, so it reported them to the Ministry of Land, Infrastructure, Transport and Tourism as follows:

1. Summary of the accident

(1) Date: December 2, 2019

(2) Location: An offshore area north west from Nejime Port, Minamiosumi-cho, Kagoshima Prefecture

(3) Description of the accident

At around 16:20 on December 2, 2019, passenger ship NANKYU No. 10 bound for Ibusuki Port, Ibusuki City, Kagoshima Prefecture with the captain, a crew member and 55 passengers on board departed Nejime Port, Minamiosumi-cho, Kagoshima Prefecture and was navigating in an offshore area northwest of Nejime Port. When the ship was struck by oncoming tidal waves, and was violently thrust upward, that resulted in injuries such as lumbar compression fractures on passengers seated in the anterior passenger compartment.

2. Factual information

The facts revealed through investigation thus far are as follows:

(1) Information on the passenger ship

Gross tonnage: 19 tons

Maximum capacity: 66 persons (64 passengers and 2 crew members)

Navigation speed: 20 knots

Route: from Nejime Port to Ibusuki Port

(2) Situation of the seats of the passengers

The ship was not required to be equipped with seatbelts. Anterior and posterior passenger compartments behind the control compartment had 46 and 7 seats respectively, among which only 3 seats in the posterior compartment were equipped with seatbelts.

(3) Injuries of passengers

Passengers who later suffered injuries were seated in the bow-side anterior passenger compartment. When the ship was shaken vertically and the uplifted bow slammed back hard onto the sea surface, nine passengers suffered lumbar compression fractures and other injuries.

(4) Weather and hydrographic conditions

・ Weather: cloudy

Wind direction: North-northwest, wind speed: 5.4 m/s on average, maximum instantaneous wind speed: 9.2 m/s (Values observed at Ibusuki Regional Meteorological Observing Station located 12 km west-northwest from where the accident occurred)

・ According to the Kagoshima Local Meteorological Observatory, a high wind, high-seas and frost warning was issued in Minamiosumi-cho at 15:35, December 2, 2019.

3. Past similar accidents

Among accidents investigated and published by the JTSB between October 2008 and December 2019, the number of casualties on passenger ships excluding hydrofoil craft was 45, among which 15 injury accidents occurred due to ships contacts with tidal waves (similar to the passenger ship in question) and did not take appropriate measures (e.g. course changes or deceleration) for mitigating ship motion or did not require passenger movement to posterior seats despite anticipated tidal waves. Each accident is summarized in the attachment below.

4. Similar accidents under investigations

Currently, in addition to the accident in question, the JTSB is investigating three accidents similar to it.

① January 26, 2019, passenger ship REPID 2 (gross tonnage: 19 tons) with the captain, chief engineer and 14 passengers on board was navigating north-northeast off the western coast of Matsuyamazaki, Saikai City, Nagasaki Prefecture when the ship crested a wave and its bow dropped steeply. The ship oscillated vertically and one passenger seated at the bow side suffered a lumbar compression fracture and other injuries.

② On August 14, 2019, a recreational fishing and sightseeing vessel, PROPOW III (gross tonnage: 2.6 tons) with the captain and 8 passengers on board was navigating off the coast of Akaiwa, Otaru City bound for Otaru Port. When the ship crested tidal waves and two passengers seated at the bow side suffered lumbar vertebral fractures.

③ On September 19, 2019, during a sightseeing navigation, a pleasure boat GURILAND 900 (gross tonnage: 3 tons) with the captain and 12 passengers on board, was hit by large waves and the boat and bounced vertically. One passenger seated at the bow side suffered lumbar spine burst fracture.

Attachment

List of passenger injuries due to the oscillations of ships climbing over tidal waves

Date	Ship	Human damage	Situation during accident	Summary	Measures in case of recurrence or other	Date of report publication
May 3, 2008	Pleasure boat KEIMARU, weighing 2.9 tons	Thoracic compression fracture and lumbar compression fracture on one passenger	Navigation speed: 10 knots Wave height: 0.5 m	While navigating with the captain and nine passengers onboard, the captain found high waves ahead but neglected to mitigate ship motion by changing the course or decelerating when the ship was violently shaken vertically. As a result, one passenger seated at the left front underwent a severe jolt and suffered a thoracic compression fracture and lumbar compression fracture.	・Attachment of handrails to passenger seats (due to passengers who felt an impact thrusting them up from below) ・A course change or deceleration for mitigating ship motion upon finding tidal waves	June 2009
Jan. 11, 2009	Pleasure boat SAKAMOTO, weighing 311 tons	Lumbar compression fractures on two passengers	Navigation speed: 15 knots Wave height: 1.0 m or more	The boat with the captain, one crew member and 28 passengers on board was struck by waves from the right front. Due to the captain's decision to maintain course and speed, the bow crested the waves and dropped with a violent vertical impact. The inertial force sent two passengers seated right front section of the anterior compartment airborne and the impact of the free-fall into their seats caused lumbar compression fractures.	・N/A	April 2010
Apr.30, 2009	Pleasure boat ANEI No. 98, weighing 19 tons	Lumbar compression fracture and head banging of one passenger and lumbar compression fracture of another passenger	Navigation speed: 25-26 knots Wave height: 2.5 m	The boat with the captain, one crew member and 28 passengers on board was struck by waves from the left front. Due to the captain's failure to notice the oncoming tidal waves until immediately before they hit, the bow crested the waves and slammed into the sea. This caused two passengers seated in the anterior compartment to go airborne and the impact of the fall back into their seats resulted in lumbar compression fractures and head injuries.	Recommendations to the boat owner: ・The boat owner shall continue appropriate safety education for crew members including measures for safe navigation through wild weather and make them comply with the contents of the safety education. ・In order to implement the safety management manual, the boat owner shall review safety measures under wild weather conditions according to each passenger boat size and compartment situation – measures such as route selection, deceleration, seatbelt requirements and guiding passengers to seats less prone to motion impacts, and compiling these into a for safe	March 2011

					navigation under a wild weather manual, mandate the manual to crew members and make them comply with required compliance.	
Mar. 8, 2010	Diver ship LA MER, weighing 15 tons	Lumber compression fracture of one passenger	Navigation speed: 15 knots Wave height: 0.5-1.0 m	During its navigation with the captain, two crew members and three passengers on board, the crew noticed wakes generated from another vessel. Since the ship maintained the same course and speed, the bow climbed and dropped between the crests of the wakes, sending a passenger seated on a bench at the anterior passenger compartment to go airborne, the impact upon landing fractured his lumbar vertebra.	▪N/A	May 2011

Date	Ship	Human damage	Situation during accident	Summary	Measures for preventing recurrence and others	Date of report publication
June 16, 2012	Passenger ship REPID 2, weighing 19 tons	Thoracic compression fracture and lumbar compression fracture of one passenger	Navigation speed: 23 knots Wave height: 2.0 m	The ship was navigating with the captain, one crew member and eight passengers on board while facing ocean swells from the left front side. Because the captain failed to follow the safety navigation manual for wild weather, when the ship climbed over the swell, it was rocked vertically, which sent one passenger seated in the anterior compartment airborne, and slamming his head against the ceiling and subsequently dropped him back into his seat, resulting in thoracic compression and lumbar compression fractures.	・The shipowner should ensure the compliance with the safety navigation manual for wild weathers by crew members through instructions and consider equipping each seat with a seat belt.	January 2013
June 24, 2012	Passenger ship ANEI No. 3, weighing 19 tons	Lumbar compression fracture of one passenger	Navigation speed: 15-22 knots Wave height: 2.0-2.5 m	The ship with the captain, one crew member and 56 passengers on board was struck by successive waves from the left bow side. Since the crew did not guide the passengers to the posterior seats where ship motion was relatively small and neglected to instruct them to fasten their seat belts properly, the vertical oscillations of the ship sent one passenger seated in the anterior passenger compartment without his seatbelt fastened airborne then slammed him back into his seat. The impact resulted in the lumbar compression fracture.	・The shipowner should ensure the following: guiding of passengers to posterior seats, restriction on the number of passengers, provision of information on the proper fastening of seatbelts to passengers (and ensuring their proper use), navigation speed adjustment according to ocean waves, sharing of marine information, proper installation of seatbelts, attachment of shock absorbers such as cushions to seats, safety education such as compliance with the safety navigation manual for wild weather, improvement of communications and the setting of navigation schedules with less burden on crew. Business operator of small high-speed vessels should comply with the company's safety navigation manual	March 2013

					for wild weather, ensure in particular the guiding of passengers to posterior seats and fasten seatbelts, and in the case of a ship whose passenger seats are located at the anterior part of it, equip each seat with a shock absorber such as a cushion. With regard to a newly built small high-speed vessel, the business operator must ensure that passenger compartments are located in placed with minimal vertical acceleration and that each seat is equipped with a shock absorber.	
June 26, 2012	Passenger ship ANEI No. 38, weighing 19 tons	Lumber compression fracture of a passenger	Navigation speed: 15-20 knots Wave height: 2.0 m	The ship with the captain, one crew member and 66 passengers on board was struck by successive waves from the left bow side. Since the crew did not guide passengers to the posterior seats where ship motion was relatively small or instruct them to fasten their seatbelts properly, the vertical motion of the ship sent one passenger seated without a fastened seatbelt in the anterior compartment airborne and slammed him down into his seat, resulting in a lumbar compression fracture.	・The same as those for passenger ship No. 3 ANEI described above	March 2013

Date	Vessel	Human damage	Situation during accident	Summary	Measures against recurrence	Date of report publication
July 8, 2012	Marine taxi MERMAID V, weighing 3.6 tons	Lumbar compression fracture of two passengers	Navigation speed: 20 knots Wave height: 2.5 m	During the vessel's navigation with the captain, one crew member and nine passengers on board, the crew was late in noticing swelling waves and decelerating the vessel, so it was tossed vertically by the waves, which sent two passengers seated on a bench of the bow deck airborne and slammed them down onto the floor, causing lumbar compression fractures.	・When navigating in choppy conditions, a navigation speed capable of mitigating the oscillations of vessel must be ensured. ・Compliance with the navigation standard	September 2013
Sept. 25, 2012	Diver ship LUCKY, weighing 19 tons	Lumbar spine burst fracture of one passenger	Navigation speed: 8 knots Wave height: 2.0-3.0 m	The ship with the captain and 41 passengers on board, the captain neglected to guide the passengers to posterior seats with less rocking motion. When the ship encountered large waves, it decelerated but the waves shook it vertically, causing a passenger sitting on a seat without handrails or seatbelt, located at the starboard side of the cabin to go airborne, and to slam him back into his seat. The passenger suffered lumbar burst fracture.	・Necessity of guiding passengers to posterior seats less affected by rocking motions before departure	November 2013
Nov. 11, 2012	Passenger ship PHOENIX, weighing 68 tons	Thoracic compression fracture of one passenger	Navigation speed: 10 knots Wave height: 4.0 m	The ship with the captain, two crew members and 77 passengers on board was rocked by large waves from the right front side. The crew had not selected the standard course, and therefore when ship crested a large swell, it was shaken vertically. The impact caused a passenger who was seated on the deck in the left center passenger compartment (and without anything to hold onto) to go airborne and then slam back down onto the deck, resulting in a thoracic compression fracture.	・When a captain decides to depart even in the face of stormy weather, the shipowner should take appropriate measures to ensure the captain's compliance with the navigation standard, such as instructing the captain to select the standard route. ・When a captain has decided to depart in the face of stormy weather, the shipowner should instruct the crew to ask passengers sitting on seats in the posterior passenger compartment to offer their seats to elderly persons including tourists.	July 2013
June 5, 2014	Passenger ship HAMAKAZE, weighing 19 tons	One passenger: right rib fracture, thoracic compression fracture,	Navigation speed: 19 knots Wave height: 1.0-1.5 m	Despite a strong wind warning, high-seas warning and maritime strong wind warning, the ship with the captain, one crew member and nine passengers on board was navigating in a	・The shipowner should instruct captains to avoid the questionable areas, that are prone to high waves. If a ship	June 2016

		lumbar compression fracture, traumatic hemothorax and cervical contusion Two passengers: thoracic compression fractures		sea area wilder than the surrounding sea. The ship climbed successive high waves without decelerating, then dropped steeply between the waves. Three passengers seated anterior to the right center section of the passenger compartment went airborne and then fell heavily their seats, which resulted in lumbar compression fractures and other injuries.	should navigate through such an area, appropriate measures such as deceleration according to wave height must be taken. ・When navigating under stormy weather conditions and ship motion instability is anticipated, the captain should guide the passengers to posterior seats. ・When strong ship motion is expected due to stormy weather conditions or wind-borne waves, the safety manager should, before departure, instruct the crew to make all passengers appropriately fasten their seatbelts and to concretely explain to them how to mitigate impacts of ship motion such as recommended postures to prevent impacts to their buttocks after going airborne.	

Date	Vessel	Human damage	Situation during accident	Summary	Measures for preventing recurrence and others	Date of report publication
Aug. 29, 2014	Pleasure boat RAVEN 3, weighing less than 5 tons	Lumbar spine burst fracture and right radial head fracture of one passenger	Navigation speed: 15-20 knots Wave height: 0.3 m	The pleasure boat with the captain and three passengers on board, was almost directly struck by the wakes generated by another ship, the impact of which vertically shook the bow, causing a passenger seated on an anterior seat to go airborne and subsequently slammed back down into his seat. This resulted in a lumbar spine burst fracture and right radial head fracture.	・When navigating through ocean waves, it is necessary to decelerate and choose a route with a less vertical impact on the ship. When vertical motion of the bow is anticipated, passengers should be guided to the posterior section of the ship with less vertical motion.	October 2015
Dec. 16, 2014	Passenger ship SOUTHERN KING, weighing 19 tons	Lumber compression fracture of a passenger	Navigation speed: no data Wave height: 2.5 m	While navigating with the captain, one crew member and 56 passengers on board, the crew neglected to instruct the passengers to fasten their seatbelts, so when the ship climbed over successive high waves and dropped between them, it was vertically shaken. The ship's motion sent a passenger seated without his seatbelt fastened at the left front side of the anterior passenger compartment to airborne and slammed back onto his seat, resulting in a lumber compression fracture.	・Ensuring compliance with the manual for safe navigation under a stormy weather, that requires the fastening of seat belts	May 2016
Apr. 17, 2016	Diver ship HONOKA, weighing 3.5 tons	Chance fracture of lumbar spine of a passenger and damage to the intervertebral disc of lumbar vertebra of another passenger	Navigation speed: 6 knots or less Wave height: 1.5 m	The ship was navigating with the captain, eight crew members and 26 passengers on board. The crew neglected to ask the passengers to take seats at the center section of the anterior deck or posterior section where ship motion impact would be small, so when the ship climbed over oncoming waves, the ship was violently shaken vertically, causing two passengers at the right front side of the anterior deck to go airborne and then slamming them to the deck, resulting in chance fractures of the lumbar spine.	・In case there is a possibility of an impact due to waves, the crew should organize passengers' luggage and guide the passengers to the center section of the deck or the stern section. ・When a stormy weather is anticipated, departure from the port should be cancelled.	August 2017
Aug. 10, 2017	Traffic boat SKIPJACK II, weighing 0.9 tons	Thoracic spine burst fracture of a passenger	Navigation speed: 9-10 knots Wave height: 0.5-1.0 m	During navigation of the boat with the captain and seven passengers on board against oncoming rough waves, the crew neglected to adequately decelerate the boat, so when the ship climbed over the waves, it was vertically shaken at the bow and sending a passenger seated at the right front section of the ship	・Regarding cases in which a risk of ship being shaken by rough waves is present, captains shall endeavor to guide passengers to the posterior section of ship where ship motion is relatively small and minimize the	October 2019

				airborne and then slamming them back down onto their seat. The passenger suffered a thoracic spine burst fracture.	wave-induced ship motion, for example, by adequate deceleration.	

* The relevant information is posted on the JTSB website.
https://www.mlit.go.jp/jtsb/iken-teikyo/s-teikyo18_20200306.pdf (Japanese only)

Column

Serious accidents that occurred in other country's territorial water

Marine Accident Investigator

On July 25, 2020, a Panamanian-registered cargo ship operated by a Japanese shipping company ran aground southeast of the coast of the island Republic of Mauritius. On August 6, a fuel oil was released and reached the seashore of the southeast coast causing widespread oil pollution.

The accident amounted to a serious marine incident to be investigated by the country where the cargo ship is registered and is also related to Japan's merchant fleet and therefore based on international treaty, the country of the registration country Panama, and coastal nation Mauritius agreed that Japan would take charge of the accident investigation (also see Chapter 7, on page 171). According to the framework of the treaty, Japan for the first time dispatched five investigation team members to conduct the site investigation of the accident of a foreign-flag ship in foreign territorial waters. In this way, Japan has promoted the establishment of a cooperative international investigation system between affected countries.

Although the period of the investigation overlapped the COVID-19 pandemic and the investigation team encountered various difficulties, we were able to carry out hearings with concerned parties and an airborne investigation over the accident site in cooperation with local authorities.

Looking back on the dispatch of the team for accident investigation in Mauritius

Since the COVID-19 pandemic, the investigation team for the first time from Japan encountered various difficulties. Since the COVID-19 made it impossible for the team to obtain a flight to Mauritius, we first departed Japan on September 20, arrived to the Reunion Island, which is a French territory located about 230 km southwest of Mauritius, chartered a small propeller-driven aircraft and then traveled to Mauritius. Immediately after arriving, the team members took PCR tests and then quarantined in a hotel to the west of Mauritius. The quarantine lasted for two weeks, during which we were allowed to visit other team members' rooms, but our movement on the hotel premises was impossible under the control of special mobile police.

At the same time, government authorities of Mauritius were cooperative with Japan's accident investigation and allowed the team to hold hearings with concerned parties even during its quarantine. However, all team members had to wear a mask and PPE(Personal Protective

Equipment). Ministry of Foreign Affairs, Regional Integration and International Trade officials escorted us by car during our commutes between our hotel and the hearing sites. Hearings were attended by Ministry of Health and Wellness officials with contact between us and other than concerned parties strictly prohibited.

After the quarantine, we moved to a hotel in the capital Port Louis. Restrictions on their movements were lifted, making it easier for us to investigate the accident.

After successfully completing the first investigation in Mauritius, we returned to Japan on October 22. We were able to complete the investigation without any major problems. In addition to the cooperation of the Mauritius government, Japan's authorities, such as the Ministry of Foreign Affairs of Japan did their best to coordinate the smooth investigation by the team. On the basis of the factual information obtained from the accident investigation, the maritime accident investigators will proceed with analyses aimed at the clarification of the accident.

Investigation team members being encouraged by the minister

Minister of Land, Infrastructure, Transport and Tourism, Akaba encouraging the investigation team

An investigation team member receiving a PCR test

11 Summaries of major marine accident and incident investigation reports (case studies)

Collision after leaving the quay and while turning

Collision of passenger ship Nipponmaru with mooring equipment (a pile dolphin)

Summary: Passenger ship NIPPONMARU (gross tonnage: 22,472 tons) with the captain, 204 crew members and 419 passengers on board left Apra Harbor quay F-4 of Guam, an unincorporated and organized US territory. While reversing toward pier D on the opposite shore, the ship turned left south of the quay toward the port entrance and collided with the pile dolphin of pier D at around 21:13, December 30, 2018.
This accident caused breaches in the outer plates of the starboard and port quarters, damaged the pile dolphin of pier D but resulted in no casualties.

At around 21:04, the ship that was being docked to quay F-4 (hereinafter referred to as the "quay") to its portside with the bow directed toward the east when it started to leave the quay.

After leaving the quay, the ship reversed toward a sea area west from the quay.

After reaching an area west of the quay, it started a left turn at around 21:10.

The ship reversed toward the pier while turning leftward.

Collision (at around 21:13:27)

(Analysis of the accident)

(Difference between the captain's recognition of how he was handling the ship and how he was actually handling the ship)

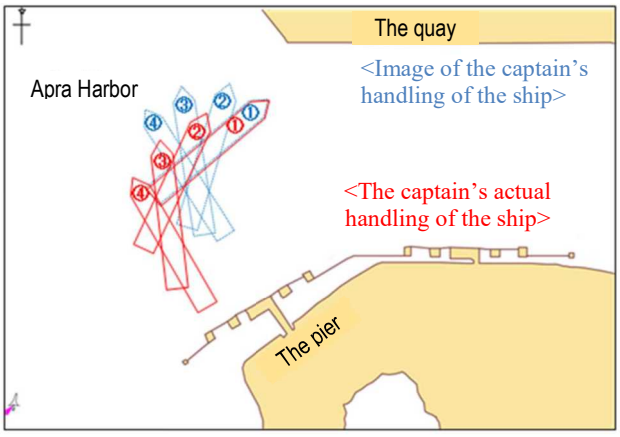
It is probable that the captain intended to tilt the joystick fully in the starboard direction but tilted it fully sternward. Although he was aware that tilting the joystick fully in the starboard direction requires tilting it fully toward the left side of his body while orienting his body toward the stern, he was in a standing position with his body positioned in a different direction from what he was used to. This resulted in him tilting the joystick fully toward the left side of his body while facing aport, and not sternward.

It is probable that the captain was unaware of his misdirection because he performed the operation without watching the way his hands controlled the joystick or watching outboard display. He probably did not think that what was reported to him by navigation officer B indicated the approach of the ship toward the pier, and he understand neither the proposals or advice by navigation officer C who was supporting ship's handling nor those by a pilot.

It is probable that the captain kept on steering the ship without watching his hands controlling the joystick and without thinking that what was reported by navigation officer B meant that the ship was on a collision course with the pier because he selectively collected information corroborating that what he was thinking was correct and was therefore convinced that his handling of the ship was right.

The reason the captain did not understand neither the proposals nor advice by the navigation officer C nor those by the pilot was probably because he ignored all information disproving his preconceived belief.

It is likely that the captain wanted to hold a leading position in the undocking and turning of the ship and recognized that navigation officer C was a newcomer in training. All these factors likely led to his prioritizing his own judgements over the suggestions advice by the pilot and navigation officer C, which likely caused his continuation of tilting the joystick fully sternward.



Difference between the captain's image of his handling and the actual movement of the ship

Probable cause: It is probable that, during the ship's left turn in an area west of the quay, the captain in an attempt to facilitate the turn tilted the joystick fully sternward although intending to tilt it fully in the starboard direction. He continued tilting the joystick fully sternward unaware of his mistake causing the ship to reverse with its bow rotating leftward when the stern collided with the pile dolphin of the pier.

For details, please refer to the accident investigation report. (Published August 27, 2020)
https://www.mlit.go.jp/jtsb/ship/rep-acci/2020/MA2020-7-2_2019tk0001.pdf

Many passengers injured due to the collision with floating objects during navigation

Passengers injured due to the collision of passenger ship GINGA with floating objects

Summary: Passenger ship GINGA (gross tonnage: 277.32 tons) with its captain, chief engineer and other two crew members as well as 121 passengers onboard was navigating westward on hydrofoils at a speed of about 41.7 knots (speed relative to the seabed) in an offshore area east from Himesaki, Sado City, Niigata Prefecture on the way to Ryotsu Port of the same city, when the ship collided with floating objects at around 12:16, March 9, 2019. This resulted in the injuries of 108 passengers and one crew member.
This accident breached the starboard quarter of the GINGA.

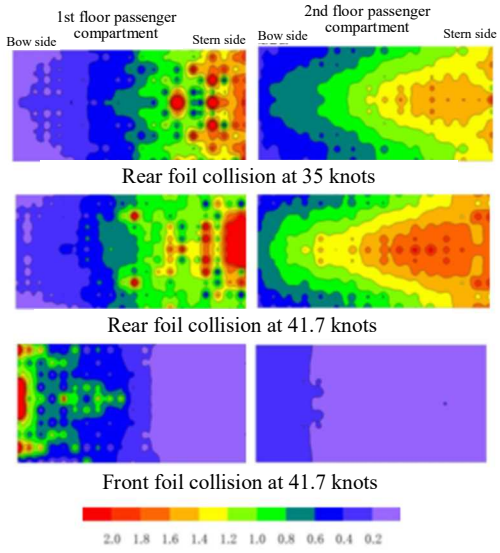
The ship departed Niigata Port in hull borne state at around 11:30 and started foilborne navigation at around 11:35.

At around 11:39, the ship was navigating west-northwest on autopilot, taking a course of 288° at a speed of about 40 knots.

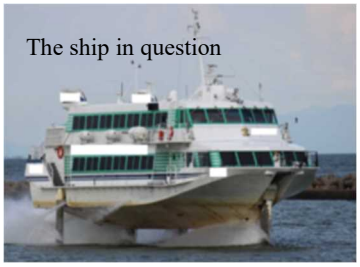
At around 11:48, the ship reduced its speed to about 37 kn and continued to navigate.

At around 12:15, when the ship was navigating westward while increasing its speed, the captain observed white floating objects in the water near the port bow, so he took immediate action to drop the ship's hull to surface and steered full starboard, while the chief engineer began throttling down toward full stop.

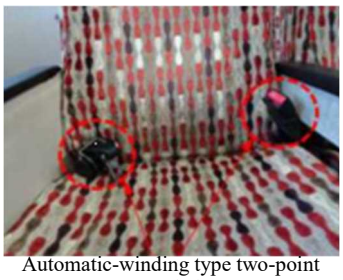
Impact on the ship at around 12:16



Speeds and upward acceleration for each collision point



Seat table



Automatic-winding type two-point seat belt

Seats of the ship (at the time of the accident)

(Analysis of upward acceleration and passenger injuries)

Due to the many lumbar fracture injuries that occurred in sections where upward acceleration was greatest, use of seats and seat cushions with adequate shock-absorbing functions was found to be an effective measure in reducing the number and degree of injuries in case of an accident.

(Analysis of backward acceleration and passenger injuries)

In this accident, the generation of backward acceleration due to the collision with the floating objects threw the passengers forward, which caused injuries such as upper jaw fractures and traumatic dental root fractures of 35 passengers. Therefore, installing shock absorbers to each seat head rest and seat back was found to be an effective measure in reducing the number and degree of injuries in case of an accident.

Probable causes: After the ship passed the slowdown zone located east off the coast of Himesaki, it accelerated and headed westward in a foilborne state. It is probable that the captain first observed the floating objects in the direction of the port bow (front left side) but they had already approached beyond avoidable distance, so he could not avoid them despite his collision avoidance maneuvering and the floating objects struck the rear hydrofoil wing, resulting in lumbar fractures among several passengers.

For details, please refer to the accident investigation report. (Published March 26, 2020)
https://www.mlit.go.jp/jtsb/ship/rep-acci/2020/MA2020-3-1_2019tk0008.pdf (Japanese only)

The Japan Transport Safety Board has stated recommendations to the Ministry of Land, Infrastructure, Transport and Tourism. For details, please refer to "Chapter 2: Summary of recommendations and opinions issued in 2020 (page 18).

Collision after passing an oncoming Vessel By "starboard to starboard" navigation instead of "port-side to port-side"

Collision between cargo ship JK III and marine sweeper NOTOJIMA

Summary: Cargo ship JK III (Vessel A, gross tonnage: 699 tons) bound for Fukuyama Port, Fukuyama City, Hiroshima Prefecture with the captain and four crew members on board was navigating north east, while marine sweeper NOTOJIMA (Vessel B, gross tonnage: 498 tons) bound for Kure Port, Kure City, Hiroshima Prefecture with the skipper and 40 crew members on board was navigating south-south west. At around 23:55, June 26, 2019, the two ships collided. The bow of the Vessel A was dented, and there was a breach in the outer plate of the starboard quarter of the Vessel B. There were no casualties in either ship.

At around 23:25, navigation officer A (of Vessel A) took over shift duty from captain A and was navigating in a northeast direction in Mihara-seto toward Aoki-seto at a speed of about 12 knots along the scheduled route by autopilot.

During the navigation in Aoki-seto, as navigtion officer A was monitoring the radar screen, he recognized AIS information indicating Vessel B navigating southward at about 3 M in toward the port bow.

Soon after passing the Koneshima (island) lighthouse, navigation officer A visually confirmed the starboard and mast lights of Vessel B behind Aokibana, Mihara City, Hiroshima Prefecture. in the port bow direction.

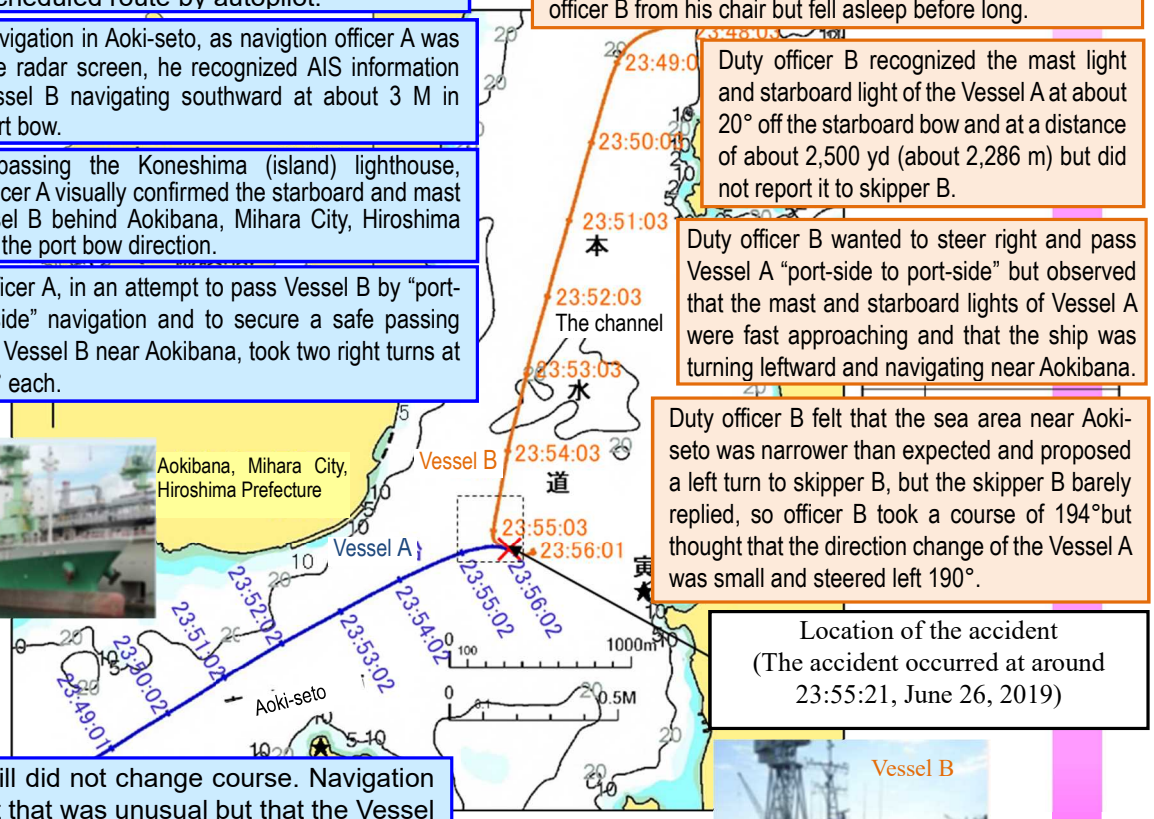
Navigation officer A, in an attempt to pass Vessel B by "port-side to port-side" navigation and to secure a safe passing distance from Vessel B near Aokibana, took two right turns at about 2° to 3° each.

Duty officer B in charge of navigation of Vessel B that was navigating along Bisan-seto sea area north route took over shift duty at around 20:45. On the other hand, skipper B of the Vessel B was in command of the ship and was instructing officer B from his chair but fell asleep before long.

Duty officer B recognized the mast light and starboard light of the Vessel A at about 20° off the starboard bow and at a distance of about 2,500 yd (about 2,286 m) but did not report it to skipper B.

Duty officer B wanted to steer right and pass Vessel A "port-side to port-side" but observed that the mast and starboard lights of Vessel A were fast approaching and that the ship was turning leftward and navigating near Aokibana.

Duty officer B felt that the sea area near Aoki-seto was narrower than expected and proposed a left turn to skipper B, but the skipper B barely replied, so officer B took a course of 194°but thought that the direction change of the Vessel A was small and steered left 190°.



Location of the accident
(The accident occurred at around 23:55:21, June 26, 2019)

Vessel B still did not change course. Navigation officer A felt that was unusual but that the Vessel B would maneuver right sooner or later.

Since Vessel B still did not change course and was now on a collision course with Vessel A, navigation officer A, recognizing the danger, activated the ship's searchlight (about 15 seconds from collision), switched to manual steering and turned the ship rightward by 30°to 40°.

Duty officer B felt that Vessel A was so near that he ordered reduced RPMs on both engines to navigate at a very low speed. He received an instruction from commander B, to stop both engines then ordered the immediate reversal of both engine to move slowly astern.

Collision (at around 23:55)

Probable cause: This accident occurred at night at an offshore area west from Sagishima, Mihara City, Hiroshima Prefecture on Vessel A's northeast route and Vessel B's the south-southwest route. It is probable that navigation officer A decided to pass Vessel B "port-side to port-side" and continued on near the center of Aoki-seto. Meanwhile, duty officer B felt unsafe about passing Vessel A "port-side to port-side," so he decided on a "starboard to starboard" maneuver and asked his skipper's permission for a left turn. He mistakenly thought that permission was granted and continued navigating near the center of the channel. As a result, the two ships collided.

For details, please refer to the accident investigation report. (Published December 17, 2020)
https://www.mlit.go.jp/jtsb/ship/rep-acci/2020/MA2020-11-2_2019tk0015.pdf (Japanese only)

Capsizing during navigation on a course and speed vulnerable to portside wind and waves

Capsizing of fishing vessel KEIEIMARU No. 65

Summary: Fishing vessel KEIEIMARU No.65 (gross tonnage: 29 tons) with the captain and seven crew members on board was returning to Hanasaki Port, Nemuro City, Hokkaido. At around 07:20, September 17, 2019, the ship capsized east of Cape Nosappu in the same city.
Among the eight crew members, one died and seven went missing.

On September 12, the ship departed Hanasaki Port dip net fishing for saury.

At around 17:16 on September 14, the crew began fishing east of Cape Nosappu, Nemuro City.

At around 04:08 on September 16, the ship started returning to the port.

On the way back to the port, the captain had a phone conversation with consort ship captain A, and in response to a question from captain A, explained that he was navigating with slightly reduced the engine rotation.

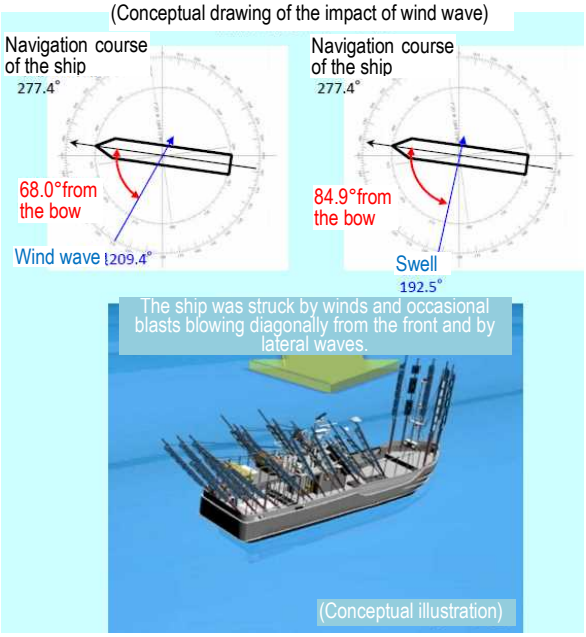
Under bad weather conditions with windblasts and high waves, consort ship captain B judged the navigation to no longer be possible. At 07:00, when consort ship captain B called the captain in question (KEIEIMARU No. 65), he was told that the captain was bailing* the seawater out of his ship which was struck by lateral waves.

* "Bail" means steering a ship to either a portside direction or a starboard direction to discharge seawater on the deck.

Consort ship captain B thought that the captain was busy steering the ship while bailing the seawater out of it, so he ended the call. Subsequently, at around 07:30, consort ship captain B called again but heard the recorded message "The mobile phone you have called is switched off."

Capsizing (at around 7:20)

(Conceptual drawing of the impact of wind wave)



(Situation of judgment on returning to the port)

- It is likely that this accident could have been avoided, had the captain decided to return to the port sooner, passing the sea area where the accident occurred before the growing atmospheric depression approached, this accident could have been avoided.
- Therefore, captains should appropriately judge meteorological and hydrographic conditions, and if necessary, decide to return to port early to avoid risk.

(Mechanism resulting in the capsizing)

In this case, it is highly probable that strong ocean waves caused a horizontal oscillation (269°) equivalent to a maximum expected value of 1/1000, a windblast struck the ship simultaneously with the maximal horizontal oscillation of the portside (windward) and the tilt moment rapidly increased (1.5 times higher than that in the case of a steady wind), which resulted in the rapid capsizing of the ship.

Probable cause: Under circumstances in which a high wind maritime alert was issued and a low-pressure system was approaching, the Vessel bound for Hanasaki Port was navigating westward east of Cape Nosappu in the face of winds and ocean waves. It is likely that the lateral waves hitting the port-side oscillated the vessel (causing a maximum expected value of 1/1000), a strong wind blast blew when its port-side (windward side) horizontally oscillated maximally, its tilt moment due to the winds rapidly increased and tilted in the starboard direction in excess of the bulwark submersion angle, causing the starboard bulwark to submerge, thereby capsizing the vessel.

For details, please refer to the accident investigation report. (Published August 27,2020)
https://www.mlit.go.jp/jtsb/ship/rep-acci/2020/MA2020-7-3_2019tk0022.pdf (Japanese only)

Passengers injured on ship due to a vertical thrusting them upward and slamming them back into their seats

Passengers injured on passenger ship NANKYU No. 10

Summary: Passenger ship NANKYU No. 10 (gross tonnage: 19 tons) with the captain, ordinary seamen and 55 passengers on board departed port taking a north-northwest course at about 12 knots. At around 16:24, on December 2, 2019, the ship was struck hard by incoming tidal waves, that lifted the bow caused seated passengers to become airborne then slammed down onto their seats. The impact injured 14 passengers.

The captain had checked the meteorological and hydrographic conditions at the waiting area of the Nejime Port ferry landing, and although the average wind speed was 10 m/s, he judged that navigation would be possible given the wave height.

All seats on the ship were occupied by passengers. The captain verbally called to their attention the risk of wild weather and ship motion before the ship departed Nejime Port toward Ibusuki Port.

The ship passed the breakwater and lighthouse located at the north of Nejime Port at a speed of about 12 knots. It was navigating north-northwest while being struck tossed upward by tidal waves (1.5 to 2.0 m in height) outside the port. When the ship climbed over an oncoming high wave, the bow lifted, tossing passengers seated in the anterior passenger compartment into the air. When the ship subsequently dropped between the waves, passengers were slammed violently down into their seats.

Impact (at around 16:24)

(Analysis of the accident)

- Although the wind speed at the port exceeded their departure cancellation standard, the wave height to port did not reach theirs, so the captain judged that departure would be possible.
- At the accident site outside the port, the captain steered the Vessel A as follows:
(1) To avoid collision with an aquaculture facility, the captain took a north-northwest course further north from the standard course.
(2) Although the ship was struck by oncoming winds and waves (1.5 to 2.0 m in height), it kept on at a speed of about 12 knots.

Situation of passenger injuries

Among 14 injured passengers, 9 suffered spinal fractures and 5 suffered minor injuries.

Those who suffered spinal fractures had been seated in the 1st to 3rd row seats of the passenger compartment.

The situation involving the passenger compartment and seats of Vessel A are as follows:

Situation of the passenger compartment

Situation of the chair seats

Probable cause: It is probable that the ship departed despite the bad weather and hydrographic (walrus) conditions exceeding the standards for departure and navigation cancellation conditions and continued navigating outside the port at about 12 knots while taking a north-northwest course, which deviated northward from the standard navigation route. Probably the ship crested a high wave, which lifted the bow and thrust the passengers seated in the passenger compartment up in the air and slammed them onto their seats, resulting in injuries.

For details, please refer to the accident investigation report. (Published November 26, 2020)
https://www.mlit.go.jp/jtsb/ship/rep-acci/2020/MA2020-10-2_2019tk0027.pdf (Japanese only)

The Japan Transport Safety Board has provided recommendations to the Ministry of Land, Infrastructure, Transport and Tourism. For details, please refer to “Chapter 2: Summary of recommendations and opinions issued in 2020 (page 22).

Column

Approaches toward investigations and accident prevention

Sendai Office, Secretariat

In response to a marine accident or incident, investigators are required to approach main investigation targets (e.g., persons and ship(s)) as soon as possible according to accident/incident type. A hearing of the accident parameters is conducted, written inquiries are sent to concerned parties and an on-site investigation is begun. The vessels involved in accidents are counted as physical evidence, subject to disposal. This necessitates on-site investigations as early as possible.

The following are the contents of our investigations, focusing on the examples of a fire accident and an engine failure.

Fire accident

Many accidents investigated by the Sendai Office involve fires on fishing vessels, which can be roughly classified into electrical fires (due to short circuits, degradation of wire insulation, etc.) and contact with combustible substances (such as fuel or lubricants) by a heat source (such as an exhaust pipe).

Fiber-reinforced plastic (FRP) is used for the bodies and structures of fishing vessels. FRPs, excluding flame-retardant plastics, pose a significant fire risk to vessels if they are overheated, catch fire and the subsequent fire spreads by chain reaction.

Among fire accidents, there are many cases in which a vessel is burned beyond recognition. They are often impossible to retrieve after sinking, and thus investigations are sometimes difficult.

Engine failure

Main engine failure is caused for example by long-term lack of maintenance of pistons or crank shafts and subsequent corrosion. While there are shipowners who keep their ships in perfect condition, there are cases in which engine manufacturer maintenance standards are not met.

While investigating various accidents, I sometimes feel that many engine troubles could have been avoided through pre-departure inspections, engine inspections and maintenance—all of which are important regular requirements.

JTSB investigations are intended to identify the causes of accidents and prevent their recurrence. During hearings with those related to navigation or maintenance, it is important not to make accusations, get angry or mentally back them into corners. Our basic stance is “80% listening and 20% talking.” Even though I am always trying to put this into practice I often fail to do so, which often causes regret later.