Chapter 5 Marine accident and incident investigations

1 Marine accidents and incidents to be investigated

<Marine accidents to be investigated>

◎Paragraph 5, Article 2 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>

◎Item 2, paragraph 6, Article 2 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 3 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 item 2, paragraph 6, Article 2 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.

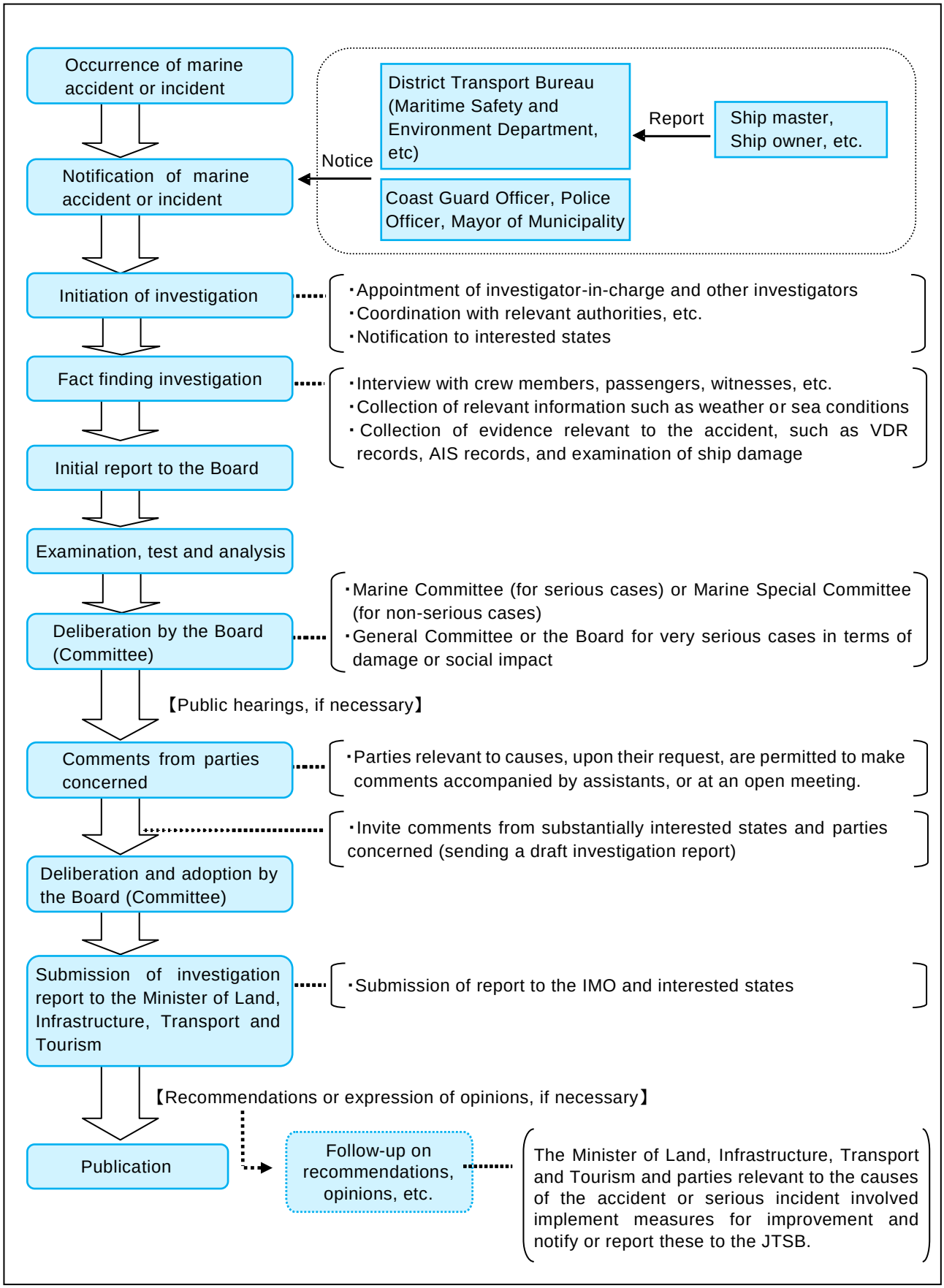
2 The situation where a ship grounded without any damage to the hull; and

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>

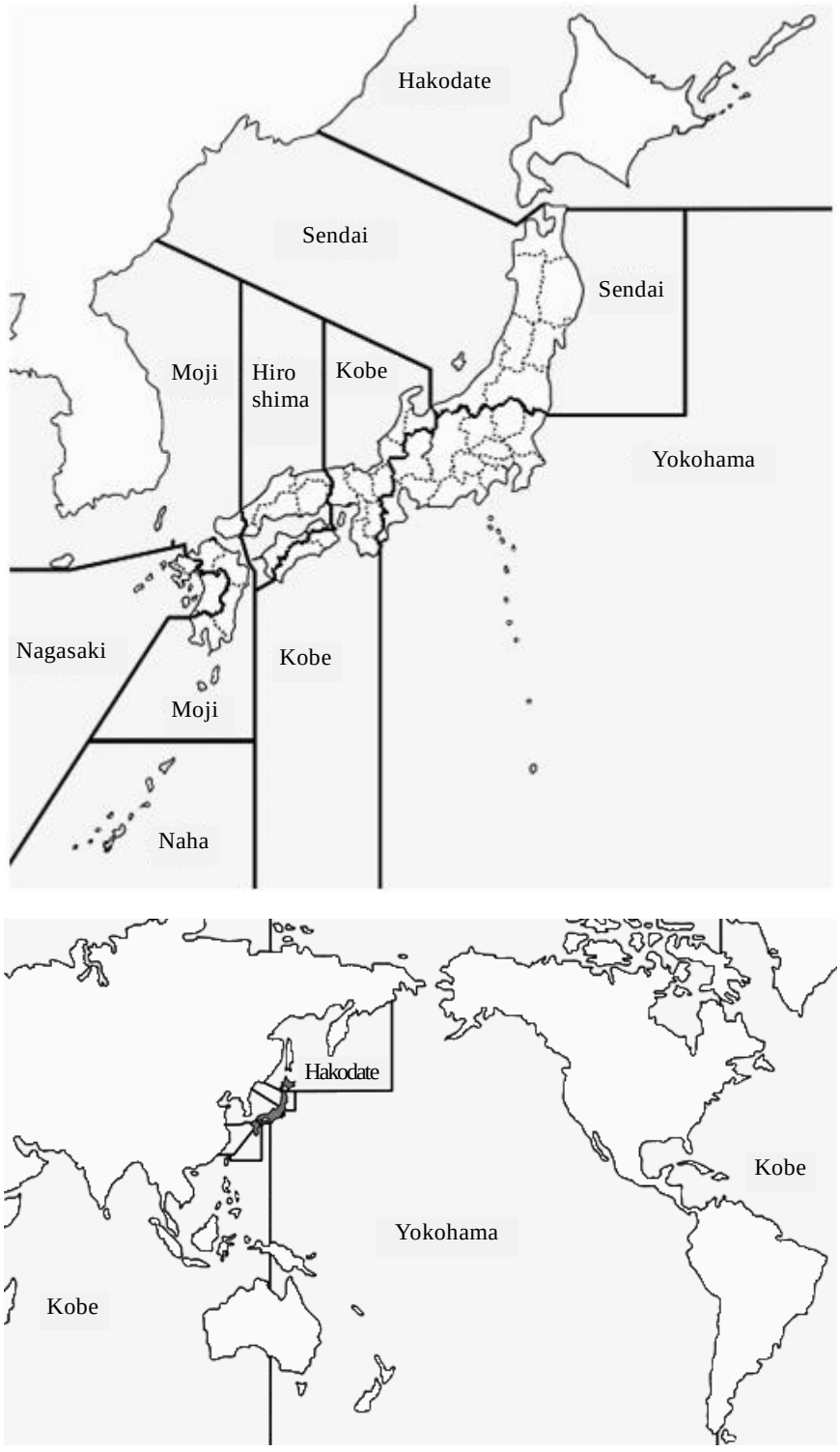
Marine accident and incident to be investigated		Type of marine accident and incident
Marine accident	Damage to ships or other facilities involved in ship operation	Collision, Grounding, Sinking, Flooding, Capsizing, Fire, Explosion, Missing, Damage to facilities
	Casualty related to ship structures, 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



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 2017)

The JTSB carried out investigations of marine accidents and incidents in 2016 as follows:

617 accident investigations had been carried over from 2015, and 738 accident investigations were newly launched in 2016. 778 investigation reports were published in 2016, and thereby 576 accident investigations were carried over to 2017.

62 incident investigations had been carried over from 2015, and 117 incident investigations were newly launched in 2016. 106 investigation reports were published in 2016, and thereby 72 incident investigations were carried over to 2017.

Investigations of marine accidents and incidents in 2016

(Cases)

Category	Carried over from 2015	Launched in 2016	Not applicable	Transferred to Tokyo Office	Total	Publication of investigation report	(Recommendations)	(Safety recommendations)	(Opinions)	Carried over to 2017	(Interim report)
Marine accident	617	738	△1	0	1,354	778	(0)	(2)	(0)	576	(1)
Tokyo Office (Serious cases)	15	15	0	1	31	14		(2)		17	(1)
Regional Offices (Non-serious cases)	602	723	△1	△1	1,323	764				559	
Marine incident	62	117	△1	0	178	106	(0)	(0)	(0)	72	(0)
Tokyo Office (Serious cases)	0	0	0	0	0	0				0	
Regional Offices (Non-serious cases)	62	117	△1	0	178	106				72	
Total	679	855	△2	0	1,532	884	(0)	(2)	(0)	648	(1)

Note 1. The figures for “Launched in 2016” includes cases which occurred in 2015 or earlier, and which the JTSB was notified of in 2016 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.

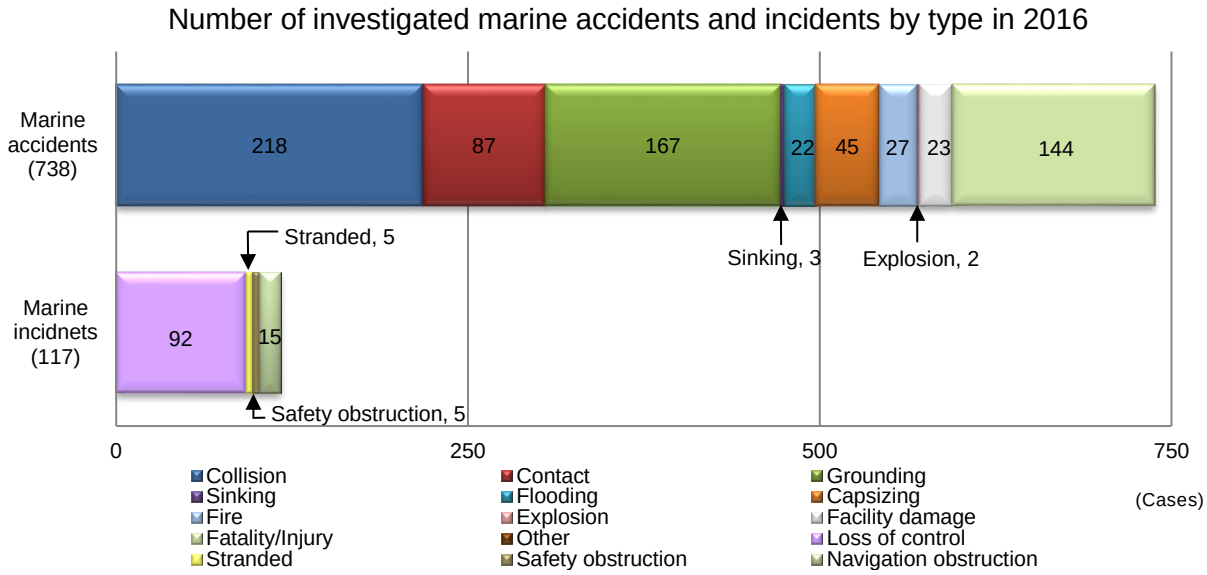
Note 3: The column “Transferred to Tokyo Office” shows the number of cases where the investigation found out that it was serious and the jurisdiction was transferred from the regional office to the Tokyo Office.

6 Statistics of investigations launched in 2016 (As of end of February 2017)

(1) Types of accidents and incidents

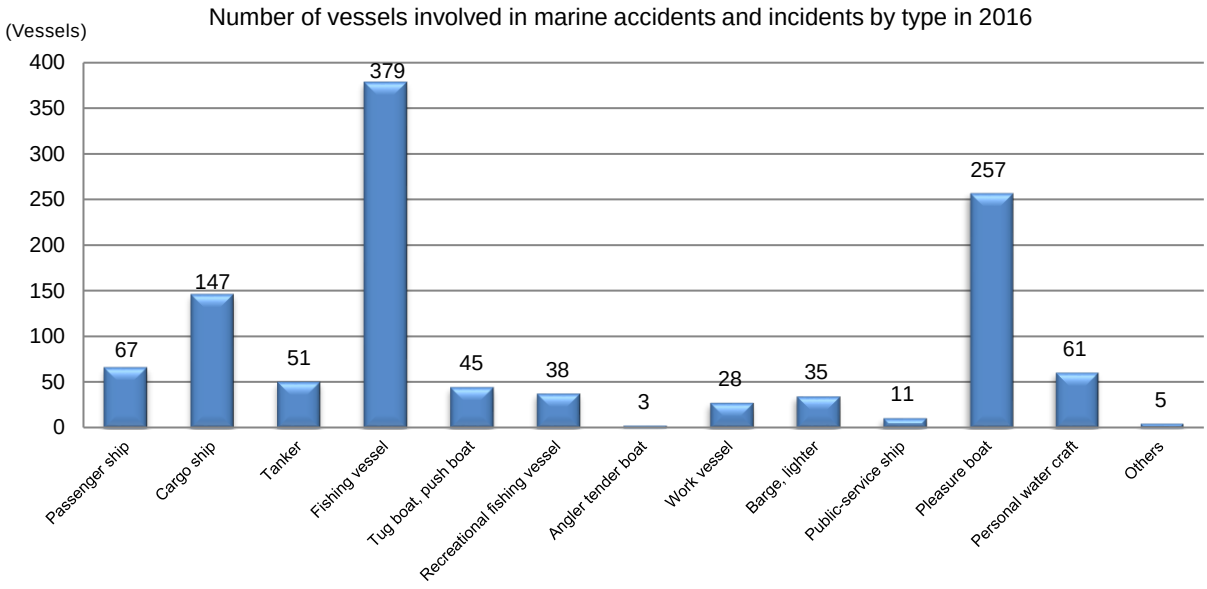
The breakdown of the 855 investigations launched in 2016 by type of accidents and incidents is as follows: The marine accidents included 218 cases of collision, 167 cases of grounding, 144 cases of fatality/injury (not involved in other types of accidents), and 87 cases of contact. The marine incidents included 92 cases of loss of control, 15 cases of navigation obstruction, five cases of stranded, and five safety obstruction. The objects of contact were breakwaters in 20 cases, quays in 10 cases,

and piers in 10 cases.



(2) Types of vessels

The number of vessels involved in marine accidents and incidents was 1,127. By type of vessel, they included 379 fishing vessels, 257 pleasure boats, 147 cargo ships, 67 passenger ships, 61 personal water crafts.



The number of foreign-registered vessels involved in marine accidents and incidents was 60, and they were classified by accident type as follows: 36 vessels in collision, 10 vessels in grounding, and six vessels in contact. As for the flag of vessels, 17 vessels were registered in South Korea, 15 vessels in Panama, three vessels in the Marshall Islands, three vessels in China. The number of vessels registered in Asian countries or regions was accounting for a half of the accidents and incidents.

Number of foreign-registered vessels by flag

(Vessels)

South Korea	17	Cambodia	2	Belize	2
Panama	15	Micronesia	2	Mongolia	2
Marshall Islands	3	Bahamas	2	Others	10
China	3	Thailand	2		

(3) Number of casualties

The number of casualties was 414, consisting of 84 deaths, 24 missing persons, and 306 injured persons. By type of vessel, 137 persons in fishing vessels and 98 persons in pleasure boats. By type of accident, 161 persons in fatality/injury, 100 persons in contact, 86 persons in collision, 31 persons in grounding, and 24 persons in capsizing.

With regard to dead or missing, 59 persons were involved in fishing vessel accidents, 18 persons in pleasure-boat accidents, indicating dead or missing cases occurred frequently in fishing vessels.

Number of casualties (marine accident)

(Persons)

2016										
Vessel type	Dead			Missing			Injured			Total
	Crew	Passengers	Others	Crew	Passengers	Others	Crew	Passengers	Others	
Passenger ship	1	0	0	0	0	0	9	25	1	36
Cargo ship	4	0	2	1	0	0	9	0	3	19
Tanker	5	0	0	2	0	0	5	0	1	13
Fishing vessel	41	0	1	17	0	0	77	0	1	137
Tug boat, push boat	1	0	0	0	0	0	1	0	1	3
Recreational fishing vessel	0	0	0	0	1	0	2	18	1	22
Angler tender boat	1	0	0	0	0	0	0	0	0	1
Work vessel	1	0	0	1	0	0	2	0	1	5
Barge, lighter	1	0	1	0	0	0	0	0	1	3
Public-service ship	0	0	0	1	0	0	17	0	0	18
Pleasure boat	9	0	8	1	0	0	26	0	54	98
Personal water craft	3	0	5	0	0	0	9	0	41	58
Others	0	0	0	0	0	0	0	0	1	1
Total	67	0	17	23	1	0	157	43	106	414
	84			24			306			

7 Summaries of serious marine accidents and incidents which occurred in 2016

The serious marine accidents which occurred in 2016 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 accident)

1	Date and location of accident	Vessel type and name, accident type
	January 8, 2016 Approximately 19 nautical miles off to the northwest of Tsushima, Tsushima City, Nagasaki Prefecture	Passenger ship BEETLE Collision (with marine creature)
	Summary	While the vessel was navigating from Busan Port in the Republic of Korea toward Hakata Port in Fukuoka Prefecture, it collided with what appeared to be a marine creature, as a result of which six passengers and two crew members suffered bruises and other injuries.
2	Date and location of accident	Vessel type and name, accident type
	January 10, 2016 Wave dissipating blocks near Sakata Port, Yamagata Prefecture	Cargo ship CITY (Panama) Grounding
	Summary	The vessel ran aground on a breakwater, and became submerged up to the bridge.
3	Date and location of accident	Vessel type and name, accident type
	February 19, 2016 Off to the southwest of Iwaishima, Kaminoseki Town, Yamaguchi Prefecture	Container ship SINOKOR INCHEON (Vessel A, South Korea) Fishing vessel TOSHI MARU (Vessel B) Collision
	Summary	Vessel A and Vessel B collided, Vessel B capsized and the skipper died.
4	Date and location of accident	Vessel type and name, accident type
	April 22, 2016 Near the quay wall of the Port of Bassens near Bordeaux, French Republic	Chemical tanker BUCCOO REEF Fatality of crew member
	Summary	While the vessel was engaged in berthing operation, an ordinary seaman who was trying to disengage the tug line of a tug boat became entangled in the messenger rope of the line, fell and died.
5	Date and location of accident	Vessel type and name, accident type
	May 10, 2016 Inside Omaezaki Port	Cargo ship CENTURY SHINE (Panama) Grounding
	Summary	The vessel ran aground in shallows while navigating, causing damage to the hull, but no one was injured.
6	Date and location of accident	Vessel type and name, accident type
	May 16, 2016 Off to the northwest of Heigunto Island, Yamaguchi Prefecture	Cargo ship HUNAN (Singapore) Missing of crew member
	Summary	While the vessel was navigating, one crew member fell into the sea and went missing.
7	Date and location of accident	Vessel type and name, accident type
	May 21, 2016 Off to the south of the Ashizuri Misaki Lighthouse, Kochi Prefecture	Chemical tanker FINE CHEMI (South Korea) Missing of crew member
	Summary	While Vessel A was navigating from China to Chiba Prefecture, one crew member went missing.
8	Date and location of accident	Vessel type and name, accident type
	June 7, 2016 Inside the central passage of Kobe Section, Hanshin Port	Container ship ESTELLE MAERSK (Vessel A, Denmark) Container ship JJ SKY (Vessel B, China) Collision

	Summary	Vessel A and Vessel B collided while both vessels were both navigating, Vessel A sustained scrape marks on its starboard bow and Vessel B suffered denting damage on it port stern, but no one was injured.
9	Date and location of accident	Vessel type and name, accident type
	August 1, 2016 In seas south of Hiroshima, Marugame City, Kagawa Prefecture (inside the Bisan Seto north passage)	Ferry KITAKYUSHU II (Vessel A) LPG vessel KAGOSHIMA MARU No.5 (Vessel B) Collision
	Summary	While navigating toward Shin-Moji Port in Fukuoka Prefecture, Vessel A collided with Vessel B as it navigated toward Niihama Port in Aichi Prefecture.
10	Date and location of accident	Vessel type and name, accident type
	August 7, 2016 Off Ogishima, Kawasaki City, Kanagawa Prefecture	Chemical tanker EASTERN PHOENIX (Vessel A, Panama) Oil tanker KEIHIN MARU No.8 (Vessel B) Collision
	Summary	Vessel A and Vessel B collided off Ogishima Island.
11	Date and location of accident	Vessel type and name, accident type
	August 12, 2016 Off Oshima fishing port, Oi Town, Fukui Prefecture	Recreational fishing vessel KEIAN MARU No.11 Missing of recreational angler
	Summary	While the vessel was returning to Oshima fishing port, one recreational angler went missing.
12	Date and location of accident	Vessel type and name, accident type
	September 9, 2016 Off Hidaka Port, Gobo City, Wakayama Prefecture	Chemical tanker EIWA MARU 3 (South Korea) Explosion
	Summary	While the vessel was navigating off Hidaka Port, it exploded, killing one crew member and injuring two others.
13	Date and location of accident	Vessel type and name, accident type
	September 23, 2016 About 2,900m at a true bearing of 249° from Tomogashima Lighthouse in Kada, Wakayama City, Wakayama Prefecture	Recreational fishing vessel TSURIBITOYA XI Injury of recreational angler
	Summary	While the vessel was navigating in order to change the fishing spot, the vessel shook under the impact of a ship wave from ahead, and three recreational anglers were injured.
14	Date and location of accident	Vessel type and name, accident type
	October 30, 2016 T Wharf, Shinko east pier, Kobe City, Hyogo Prefecture	Cargo ship BBC ASIA (Antigua and Barbuda) Fatality and injury of stevedores
	Summary	While the vessel was engaged in cargo handling work in the Kobe Section of Hanshin Port, two stevedores died and one was injured.
15	Date and location of accident	Vessel type and name, accident type
	December 14, 2016 About 2km north of Mihonoseki Lighthouse, Jizozaki, Mihonoseki Town, Shimane Prefecture	Fishing vessel DAIFUKU MARU Capsizing
	Summary	While Vessel A was being towed off Mihonoseki Lighthouse, it capsized, four crew members died and five went missing.

(Marine incident)

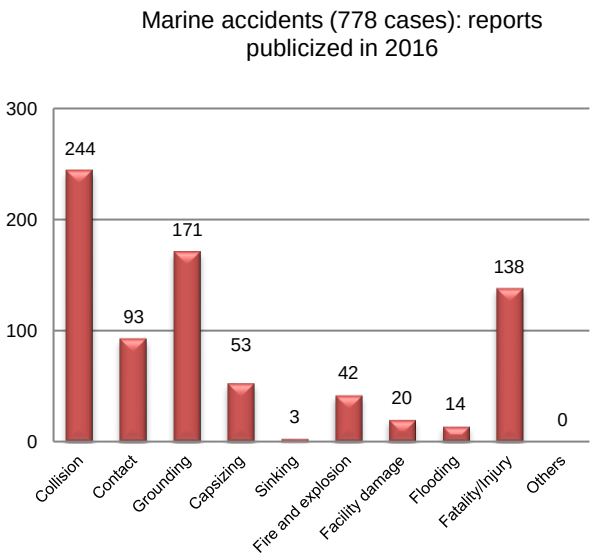
No serious marine incident occurred in 2016.

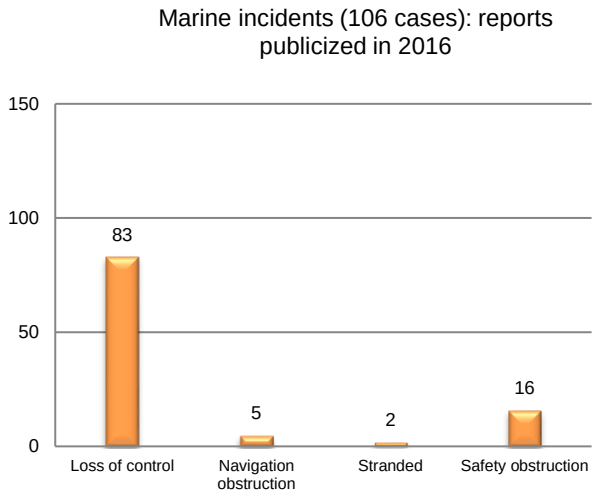
8 Publication of investigation reports

The number of investigation reports of marine accidents and incidents published in 2016 was 884, consisting of 778 marine accidents (among them, 14 were serious) and 106 marine incidents.

Breaking them down by type, the marine accidents included 244 cases of collision, 171 cases of grounding, 138 cases of fatality/injury, and 93 cases of contact. The marine incidents included 83 cases of losses of control, (81 cases of navigational equipment failure and two cases of out-of-fuel), 16 cases of safety obstruction, five cases of navigation obstruction, and two cases of stranded.

As for the objects of contact, 20 were quays, 16 were breakwaters, and 10 were light buoys.





The number of vessels involved in marine accidents and incidents was 1,184. Breaking them down by type, the marine accidents involved 342 fishing vessels, 246 pleasure boats, 160 cargo ships, and 60 personal water craft. The marine incidents involved 35 fishing vessels, 34 pleasure boats, 10 passenger ships, and seven cargo ships.

Number of vessels by type involved in marine accidents and incidents for which reports were publicized in 2016

(Vessels)

Classification	Passenger ship	Cargo ship	Tanker	Fishing vessel	Tug boat, push boat	Recreational fishing vessel	Angler tender boat	Work vessel	Barge, lighter	Public-service ship	Pleasure boat	Personal water craft	Others	Total
Marine accident	52	160	57	342	46	36	6	20	38	8	246	60	7	1,078
Marine incident	10	7	5	35	6	1	0	3	2	2	34	1	0	106
Total	62	167	62	377	52	37	6	23	40	10	280	61	7	1,184
%	5.2	14.1	5.2	31.8	4.4	3.1	0.5	2.0	3.4	0.9	23.6	5.2	0.6	100.0

The investigation reports for serious marine accidents and incidents published in 2016 can be found on JTSB website at:

http://www.mlit.go.jp/jtsb/marrep.html

9 Actions taken in response to recommendations in 2016

There were no actions taken in response to recommendations in 2016.

10 Provision of factual information in 2016

There were no cases of provision of factual information in 2016.

コラム

Research and Marine Accident Investigation

Marine Accident Investigator

On November 25th last year, Tokyo University of Marine Science and Technology hosted a "Symposium on Ships, Transportation and Marine Safety", with sponsorship from the Japan Institute of Navigation and others, and support from the Japan Transport Safety Board and others.

In the field of ship engineering, there is a traditional system whereby the causes of damage to hull compartments, hull breakage, fishing vessel capsizing and others are researched in engineering departments at universities and elsewhere, then safety regulations are drawn up by public authorities as measures to prevent a recurrence. As such, research and investigation on the causes of accidents have been undertaken as a single process (empirical engineering). The Symposium provided an opportunity to consider whether this sort of close relationship also exists between research and accident investigation on the topic of collisions, which account for 20% of all marine accidents.

For many years, the process of identifying the causes of collisions in Japan involved taking disciplinary action against seafarers as a system of inquiries on marine accidents. As a result, from the viewpoint of traffic rules (navigation law), the central thrust of investigation lay in assessing the actions of seafarers who were involved in handling vessels at the time of the accident. By assigning this process to employees with long experience as seafarers, conclusions with a sense of currency were drawn. I think a connection with the research field was not very necessary in this kind of situation.

Then, about eight years ago, the Japan Transport Safety Board was set up to investigate causes of accidents, with a view to preventing recurrence. Merely assessing the actions of seafarers who were involved in handling vessels does not lead to a radical prevention of recurrence; instead, discovering the interactions with organizations, environments, devices, etc., leads to identifying the cause. Rather than merely drawing conclusions with a sense of currency, this means also pointing out underlying factors that will help to prevent recurrence, and as such, knowledge in research fields related to collisions, such as human factors and human engineering, are now necessary for accident investigation. Under present circumstances, however, although efforts are being made to train investigators and cite literature, more attempts to collaborate with universities and academic societies, such as outsourcing analysis and personnel exchanges, have to be made.

Currently, marine accident investigators are focusing attention on three research areas in order to scientifically identify causes of collisions. These are (1) indicators that quantitatively show the risk of a collision, (2) methods of analyzing underlying factors (CREAM), and (3) ways of use and the usability of equipment such as electronic charts. On (1), there is already a large body of research on collision risk indicators; besides the traditional concepts of distance and time of closest point of approach, various indicators based on inputting the size, speed and other factors of ships are being studied with a view to improving warnings, for example. This approach may help to quantitatively evaluate how the expected enlargement of container ships from now on will impact the risk of collision. (2) CREAM appears to be a method of analysis that is already used in the field of power generation facilities and other land-based plant. Although there is still a lot to learn, I would like to try this in marine accident investigation as well. Finally, (3) focuses on whether there is any problem with the widespread use of electronic charts, such as the ways in which AIS, radar and other information overlaid on a screen, or their usability in operations and others that differ depending on the equipment manufacturer, or the precision of simplified charts. Linkage between research on collisions and accident investigation is now needed for analysis from this kind of perspective.

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

Cargo ship and container ship collide at entrance to Tokyo Bay, cargo ship sinks, seven fatalities

Collision between cargo ship BEAGLE III and container ship PEGASUS PRIME

Summary: **The cargo ship BEAGLE III (Vessel A, gross tonnage 12,630 tons)** with a master, second officer, and 18 crews proceeding in the south-southwest direction toward Kobe-ku Hanshin Port and **the container ship PEGASUS PRIME (Vessel B, gross tonnage 7,406 tons)** with a master, second officer, and 12 crews proceeding in the northeast direction toward Tokyo-ku Keihin Port collided with each other at the baymouth of Tokyo Bay, south-east offshore Tsurugizaki, Miura City, Kanagawa Prefecture, Japan at around 03:10, March 18, 2014.

Seven crews of Vessel A died, two are missing, and the ship sank due to a damage hole in side shell plating of the central port-side.

A crew of Vessel B was injured and the ship bow buckled.

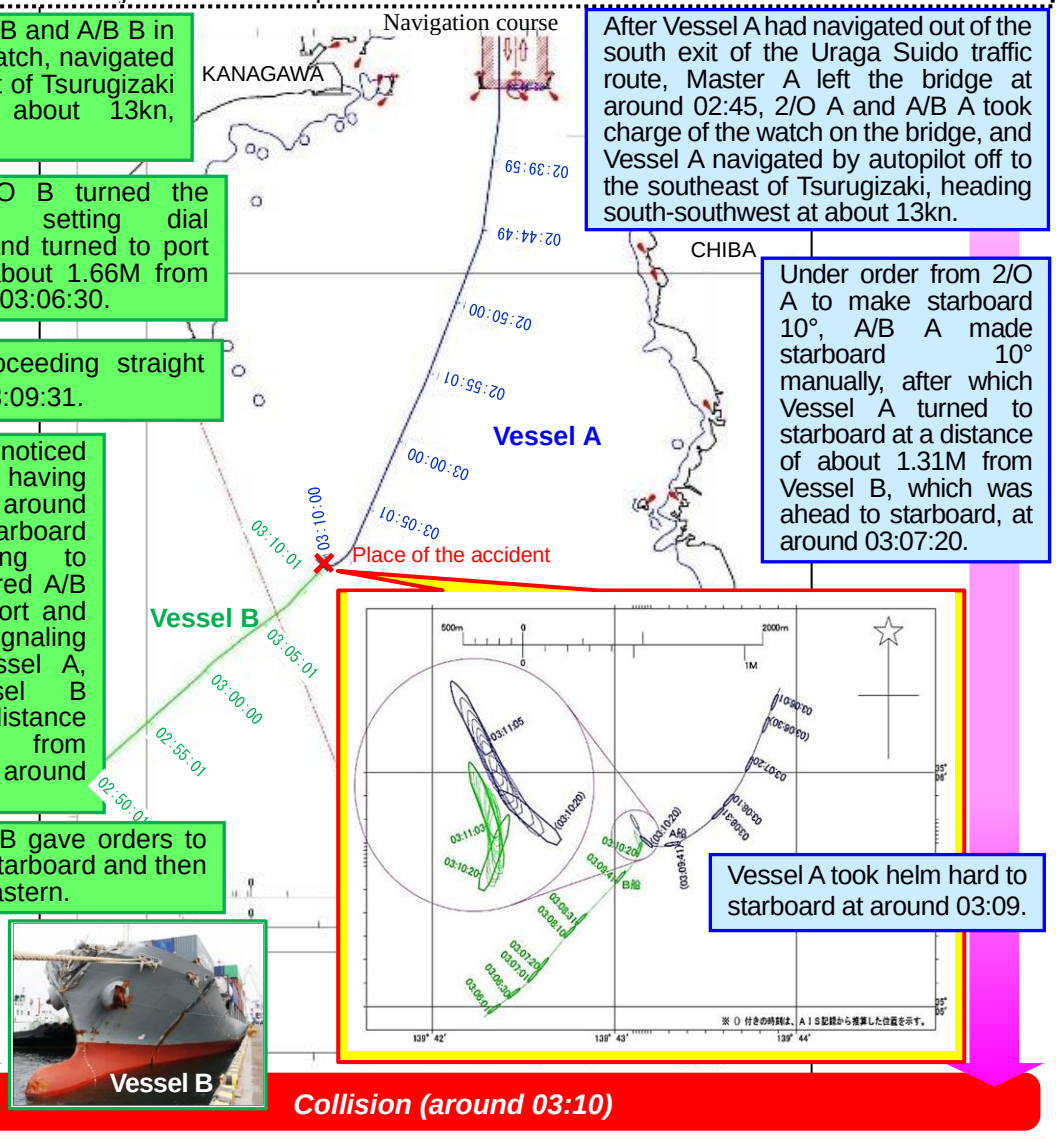
Vessel B, with 2/O B and A/B B in charge of bridge watch, navigated off to the southeast of Tsurugizaki by autopilot at about 13kn, heading northeast.

On Vessel B, 2/O B turned the autopilot course setting dial counterclockwise and turned to port at a distance of about 1.66M from Vessel A at around 03:06:30.

Vessel B was proceeding straight from 03:08:10 to 03:09:31.

On Vessel B, 2/O B noticed that Vessel A, having approached at around 0.5M on the starboard bow, was turning to starboard, so ordered A/B B to turn 20° to port and flashed a daylight signaling light twice to Vessel A, whereupon Vessel B turned to port at a distance of about 0.32M from Vessel A at around 03:09:41.

On Vessel B, 2/O B gave orders to take helm hard to starboard and then put the engine full astern.



After Vessel A had navigated out of the south exit of the Uraga Suido traffic route, Master A left the bridge at around 02:45, 2/O A and A/B A took charge of the watch on the bridge, and Vessel A navigated by autopilot off to the southeast of Tsurugizaki, heading south-southwest at about 13kn.

Under order from 2/O A to make starboard 10°, A/B A made starboard 10° manually, after which Vessel A turned to starboard at a distance of about 1.31M from Vessel B, which was ahead to starboard, at around 03:07:20.

Vessel A took helm hard to starboard at around 03:09.

Probable Causes: It is probable that the accident occurred because, when Vessel A was navigating in south-southwest direction and Vessel B was navigating in northeast direction at night and the both ships came closer to each other, Vessel A turned to starboard, Vessel B turned to port and kept proceeding straight, and the both ships collided with each other.

It is somewhat likely that Vessel A turned to starboard because 2/O A of Vessel A did not notice Vessel B in the starboard ahead.

It is probable that Vessel B kept proceeding straight because, after Vessel B turned to port for passing by Vessel A on the starboard side, 2/O B of Vessel B did not conduct look-out properly and hence could not notice that Vessel A in the starboard ahead turned to starboard.

For details, please refer to the accident investigation report. (Published on May 19, 2016)
http://www.mlit.go.jp/jtsb/eng-mar_report/2016/2014tk0009e.pdf

Fire breaks out in engine room and spreads, ship sinks, two fatalities

Fire on passenger ship FUNADA

Summary: **The passenger ship FUNADA (Vessel A, gross tonnage 19 tons)** was navigating inside Oge Port en route to Okamura Port in Imabari City, Ehime Prefecture with the skipper and four passengers on board, when fire broke out at around 21:27 on April 12, 2015.

After everyone on board Vessel A had escaped such as by jumping into the sea, two of the passengers died and the skipper was injured, while the vessel was consumed by fire and sank.

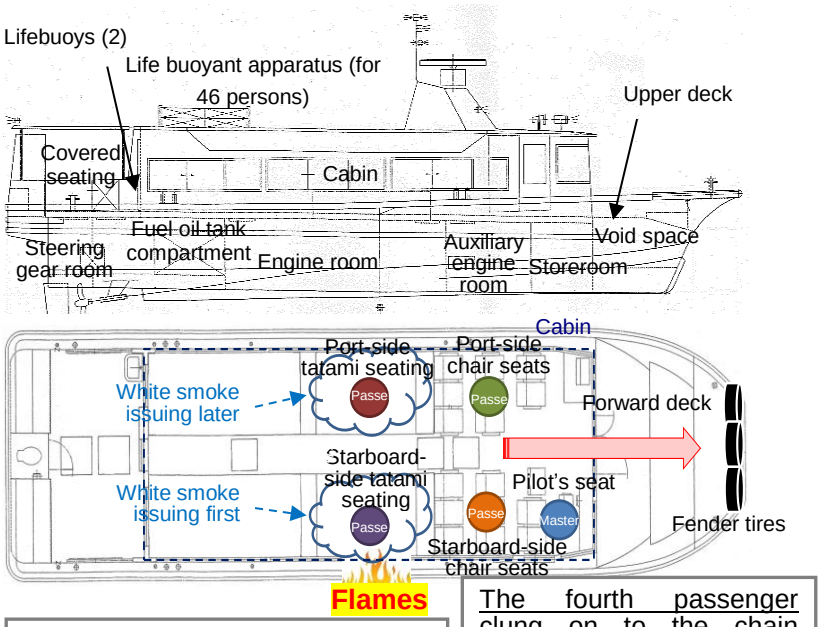
Vessel A set off from the pier of Oge Port at around 21:25 on April 12, 2015, and headed for Okamura Port using both main engines at about 500rpm ahead. While the vessel was proceeding northwest around 50m west-northwest of the southern end of Ichimonji Breakwater in Oge Port, white smoke started to issue from all four sides of the starboard-side tatami seating, and after the skipper had stopped both main engines, white smoke also started to issue from all four sides of the port-side tatami seating.

The cabin became filled with white smoke and flames rose up on the outside of the starboard central partition

Fire breaks out (around 21:27)

Vessel A in flames (photo: Japan Coast Guard)

Structures on the upper deck caught fire, and although a Japan Coast Guard patrol boat discharged firefighting water, the fire was not extinguished, and at around 23:55 the vessel sank in the sea off to the southwest of Oge Port.



The skipper and three passengers evacuated to the forward deck and jumped into the sea without putting on life jackets.

The fourth passenger clung on to the chain linking the fender tires at the front of the bow, and awaited rescue while immersed in seawater up to the knee.

Passenger → Found in the sea on May 17 **Confirmed dead**

Passenger → **Confirmed dead**

Passenger, Passenger, Skipper, Passenger → **Rescued by boats that came to their assistance**

It is somewhat likely that the fire started as a result of contact between gasoline or similar spurting from pressurized pipes and the exhaust system piping of the starboard main engine, which had grown hot, or of a short circuit, power leakage or other such problem in power cables of the power circuit that were hung near the ceiling of the starboard partition in the engine room. However, the source of the fire on the starboard side of the engine room could not be clarified.

It is somewhat likely that the fire that started in the engine room spread to the rest of the vessel because a ventilator fan was working and fresh air was continuously fed inside the engine room as a result.

Probable causes (excerpt): It is probable that this accident occurred because, while Vessel A was navigating inside Oge Port at night, fire broke out in the engine room and then spread throughout the rest of the vessel.

It is somewhat likely that the fire that started in the engine room spread to the rest of the vessel because a ventilator fan was working and fresh air was continuously fed inside the engine room as a result.

For details, please refer to the accident investigation report. (Published on June 30, 2016)
http://www.mlit.go.jp/jtsb/ship/rep-acci/2016/MA2016-6-1_2015tk0003.pdf

Vessel capsizes after increased listing due to simultaneous movement of fish shoal, etc.
Capsize of fishing vessel GENPUKU MARU No.1

Summary: The **fishing vessel Genpuku Maru No.1 (Vessel A, gross tonnage 135 tons)** was engaged in hauling a net off to the west-northwest of Hamada Port, Hamada City, Shimane Prefecture, with the master, the fishing chief and 18 other crew members on board, when it capsized and sank at around 04:30 on December 24, 2014.

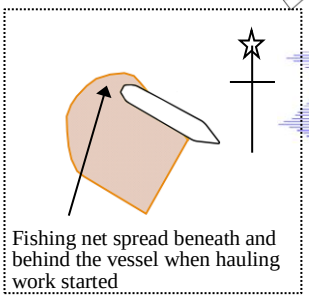
Of the 20 crew members, four died and one went missing but was subsequently certified dead.

Vessel A set off from Hamada Port together with Genpuku Maru No.13, Genpuku Maru No.17 and Genpuku Maru No.68 (hereinafter "No.13", "No.17" and "No.68") at around 14:20 on December 23, and started searching for fish shoals at around 15:00. Later, the vessels were joined by Genpuku Maru No.67 (hereinafter "No.67"), and after No.13 and No.17 had gathered fish, the net was cast between around 02:40-45 on the 24th.

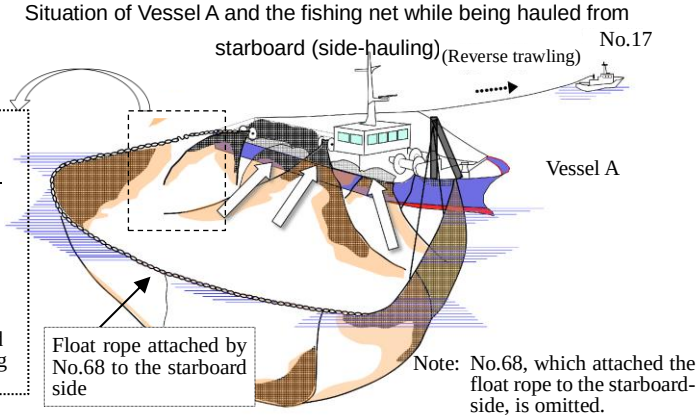
Vessel A started to haul the net at around 03:20, and at around 04:25, off to the west-northwest of Hamada Port, 19 crew members lined up on the starboard side and started the work of side-hauling.

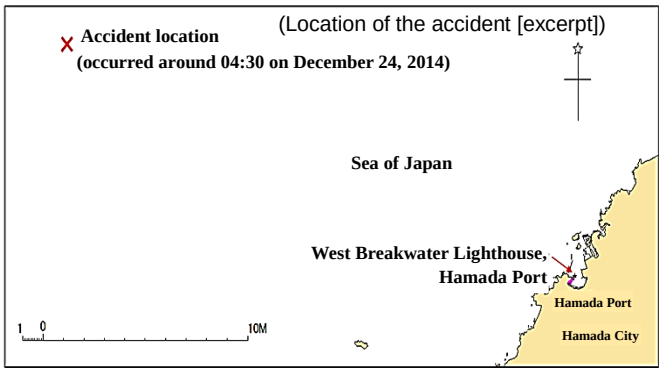
About five minutes after the hauling work started, the vessel listed to starboard, seawater washed onto the upper deck twice, and about one minute after the vessel started listing to starboard, it capsized.

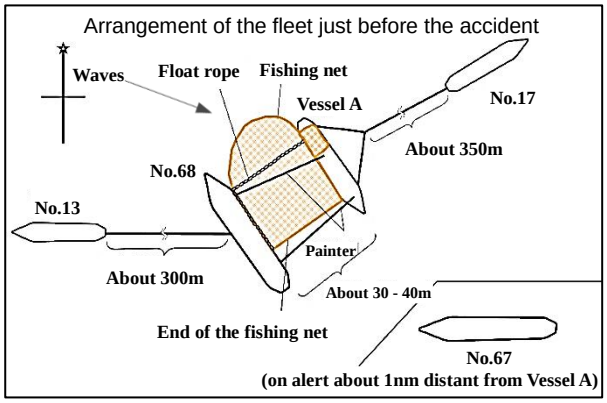
Capsized (around 04:30)



Situation of Vessel A and the fishing net while being hauled from starboard (side-hauling)







(Situation of capsizing)

- Without filling its port-side ballast tank with seawater, Vessel A took up a position in which it encountered waves from the stern, then started the work of side-hauling while being connected to No.68 by a painter rope on the starboard side with the fishing net in between, and pulled by a rope by No.17 on the port side.
- Vessel A swung its stern to port by reverse trawling under a wave height of about 2.0-2.5m, and took up a position in which it encountered waves from about 30°-40° starboard stern.
- A shoal of mackerel inside the fishing net on the starboard side of Vessel A simultaneously descended, and when the heel angle of the vessel reached about 4.9°, seawater started to flow onto the upper deck from the scuppers.
- When Vessel A had listed to a working deck submersion angle of up to about 9.5°, it was struck by the first wave from the starboard stern and seawater collected on the upper deck, after which more waves washed in, the starboard list increased and the vessel capsized.

Probable causes: It is probable that this accident occurred because, while Vessel A was engaged in the work of hauling in a purse seine fishing net from the starboard side off to the west-northwest of Hamada Port at night under a wave height of about 2.0-2.5m, while being pulled by a rope by a lighting ship on the port side, it fell into a state of diminished stability combined with impact from external heeling moment, causing the starboard list to increase and the vessel to capsize.

It is probable that it fell into a state of diminished stability combined with impact from external heeling moment as a result of the following.

(1) That the shoal of mackerel simultaneously descended and the starboard side was pulled downwards.

(2) That seawater washed onto the upper deck and collected there.

For details, please refer to the accident investigation report. (Published on July 28, 2016)
http://www.mlit.go.jp/jtsb/ship/rep-acci/2016/MA2016-7-1_2014tk0019.pdf

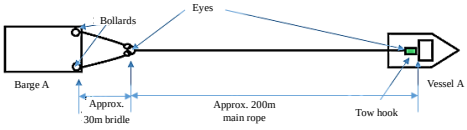
While towing a barge when a gale warning and other alerts had been issued, vessel capsized after being pulled sideways, etc.

Capsize of tugboat MEIYU No. 18 and barge SK-106

Summary: While the **tugboat MEIYU No. 18 (Vessel A, 19 tons)** was towing **barge SK-106 (Barge A, 65m)** and proceeding south to south-southwest off to the south-southeast of Obana Misaki in Hakodate City, Hokkaido, with the skipper and two other crew members on board accompanied by one instructor for the skipper, it capsized at around 14:26 on March 27, 2015. On Vessel A, the skipper and the instructor died and one deckhand went missing, while another deckhand was injured and the vessel was totally lost.

At around 12:30 on March 27, 2015, Vessel A informed the responsible person in Company A that it had departed Hakodate Port heading for Ishinomaki Port, and after stopping temporarily off the West Breakwater of Hakodate Port, extending its main rope to about 200m and forming a tug and tow, it continued to proceed.

Layout diagram of the tug and tow



At around 13:43, Vessel A was proceeding south about 1.4M to the northwest of Obana Misaki at a speed of about 2-3kn.

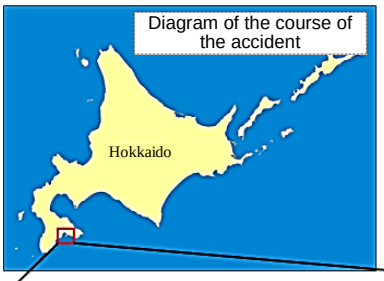
At around 14:18, the vessel was proceeding south to south-southwest about 1-3M south-southeast of Obana Misaki at a speed of about 4-5kn, under a southwest wind and while being struck from the bow by waves from the southwest.

At around 14:21, there was a call from the instructor (Instructor A) to the cellphone of the responsible person at Company A but the call was cut off, and although the responsible person in Company A returned the call to the ship's telephone and others no more than five minutes later, there was no connection.

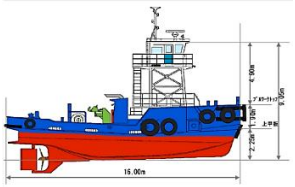
Capsized (around 14:26)

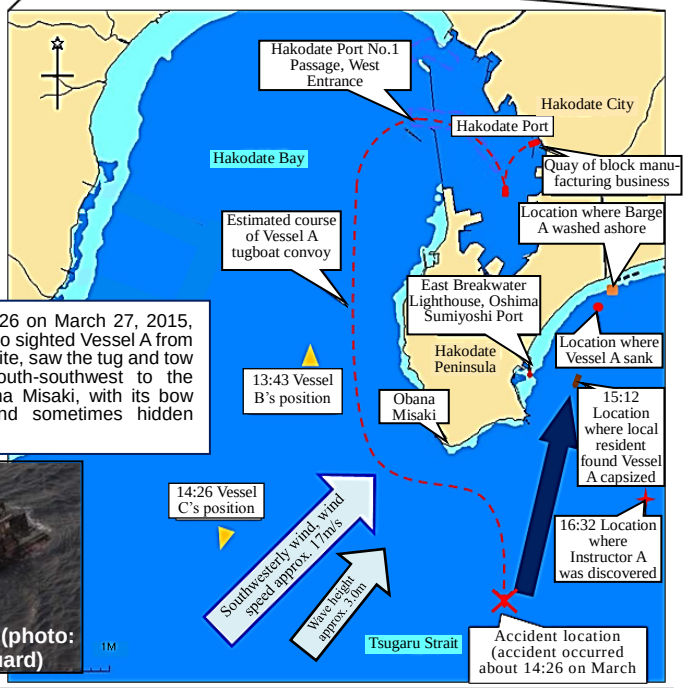
(Situation of capsizing [excerpt])

Diagram of the course of the accident



Vessel A





At around 14:18 and 14:26 on March 27, 2015, an officer of Vessel C, who sighted Vessel A from the west of the accident site, saw the tug and tow proceeding south to south-southwest to the south-southeast of Obana Misaki, with its bow covered with waves and sometimes hidden behind waves.

- It is probable that the positional relationship between Vessel A and Barge A would cause a situation of being pulled sideways when in a state of swinging around at ship speeds of 4kn and 5kn.
- In situations where a towed barge causes a swinging motion at a speed of 4kn and wave encounter angle of 20° or a speed of 5kn and an encounter angle of 30°, it is probable that, though not immediately leading to capsizing, the maximum angle of heel to port in Vessel A would be larger than the maximum angle of stability and would exceed the angle of bulwark top immersion of 17.3°, even when taking into account the steady heel angle due to towline tension and wind as well as rolling due to waves.
- It is somewhat likely that Vessel A was subjected to "waves, towline tension when the barge made a swinging motion, and wind pressure" (hereinafter "compound external force") and was pulled sideways, and that the port-side heel angle became larger than the maximum angle of stability, stability was reduced and the bulwark was submerged in the sea, as a result of which resistance from the bulwark made it difficult to stabilize, the vessel continued to be subjected to waves and capsized.

Probable causes: It is somewhat likely that this accident occurred because Vessel A departed from Hakodate Port under conditions in which a gale warning had been issued for the Tsugaru Strait and a gale and high waves advisory for Hakodate City, then formed the tug and tow and started navigating toward Ishinomaki Port, but while it was proceeding south to south-southwest about 1-3M to the south-southeast of Obana Misaki, Vessel A became subjected to compound external force and became pulled sideways, the port-side heel angle became larger than the maximum angle of stability, stability was reduced and the bulwark was submerged in the sea, as a result of which resistance from the bulwark made it difficult to stabilize, the vessel continued to be subjected to waves and capsized to port.

It is somewhat likely that the tug and tow left port under conditions in which a gale warning had been issued for the Tsugaru Strait and a gale and high waves advisory for Hakodate City because, although the responsible person at Company A had given verbal instructions on standards for halting port departures by small tugboats, Company A had not sufficiently familiarized crews with these standards and crews did not have sufficient knowledge of them.

For details, please refer to the accident investigation report. (Published on July 28, 2016)
http://www.mlit.go.jp/jtsb/ship/rep-acci/2016/MA2016-7-2_2015tk0002.pdf

Several fishing vessels capsize off to the east Tsushima, five fatalities

Capsize of fishing vessel KICHIEI MARU No.1 and others

Summary: When the **fishing vessel KICHIEI MARU No.1 (Vessel A , 18 tons)**, with the skipper and one deckhand on board, had dropped a parachute sea anchor and was drifting off to the east of Kamijima in Tsushima City, Nagasaki Prefecture, under conditions in which a gale advisory and thunderstorm advisory with the addition of tornadoes had been issued for the Kami-Tsushima and Shimo-Tsushima districts, it capsized at around 03:29 on September 1, 2015.

The skipper and deckhand on Vessel A were injured and the vessel was totally lost.

At around 15:00 on August 31, 2015, Vessel A departed from Chiromo fishing port heading for fishing grounds off to the east of Kamijima, arrived at the fishing grounds at around 16:00, dropped a parachute anchor with a diameter of about 20m from the bow, connected to a main rope with a length of about 40m and started fishing operations while drifting.

Since Skipper A hardly ever used weather information issued over the radio by the Tsushima fisheries radio station, he had not obtained the gale advisory and thunderstorm advisory with the addition of tornadoes issued for the Kami-Tsushima and Shimo-Tsushima districts, as the gale advisory issued by the Japan Meteorological Agency at 00:45 on September 1 was broadcast over the radio by the fisheries radio station at 04:55.

At around 03:00 on September 1, Vessel A stopped fishing and tried to return to port while subject to a south wind blowing at a speed of about 20-30m/s and waves from the east with a height of about 3m, but was unable to hoist the parachute anchor, so returned the hoisting cable to its original position and continued to drift.

Seawater washing in from the stern of Vessel A flowed in through the sliding door that had been left open for ventilation, pushed through the closed door to the engine room and flowed into the engine room, and at around 03:10 the main engine stopped. Seawater repeatedly washed in, the Vessel A slowly listed to port and the bulwark top was submerged at around 03:20, the stability could not be restored and the vessel capsized.

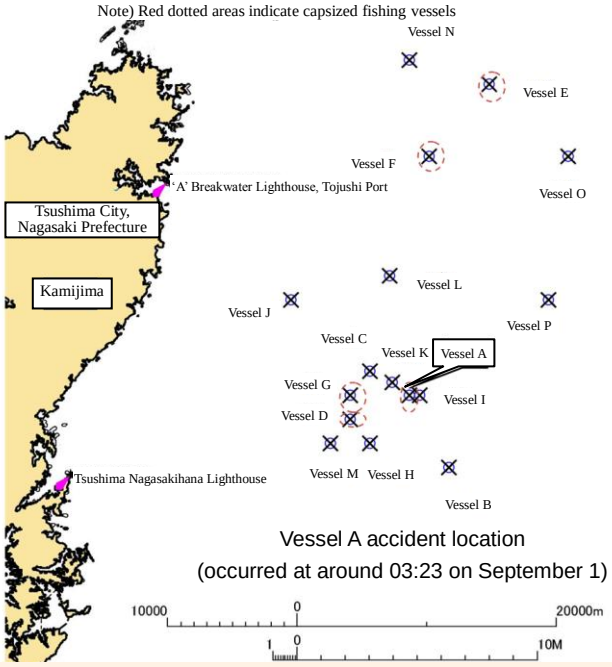
Capsized (around 03:29)

Vessel A in its capsized state

When this accident occurred, 15 other fishing vessels besides Vessel A (Vessels B-P) were engaged in fishing operations off to the east of Kamijima. Of these, five including Vessel A capsized and a total of five persons died.

Vessel D	Around 03:23 on September 1	2 on board	2 fatalities
Vessel E	Around 03:55 on September 1	1 on board	No injuries
Vessel F	Around 03:55 on September 1	2 on board	2 fatalities
Vessel G	Around 03:35 on September 1	1 on board	1 fatality

Location of the accident (near Tsushima)



Probable causes: It is probable that this accident occurred because, while Vessel A was drifting on a parachute sea anchor off to the east of Kamijima at night while subject to a south wind blowing at a speed of about 20-30m/s and waves from the east with a height of about 3m, under conditions in which a gale advisory and thunderstorm advisory with the addition of tornadoes had been issued for the Kami-Tsushima and Shimo-Tsushima districts, seawater washing in from the stern flowed into the engine room because the sliding door on the stern side of the galley that served as an entrance to the crew quarters had been left open, the vessel listed to port and the bulwark top was submerged, the vessel lost its stability and capsized.

It is probable that the sliding door on the stern side of the galley that served as an entrance to the crew quarters had been left open because the crew members did not think the weather would deteriorate and were ventilating the crew quarters as usual.

It is probable that the crew members could not predict the increased force of the wind because they had not obtained the gale advisory and thunderstorm advisory with the addition of tornadoes issued for the Kami-Tsushima and Shimo-Tsushima districts.

For details, please refer to the accident investigation report. (Published on March 31, 2016)
http://www.mlit.go.jp/jtsb/ship/rep-acci/2016/MA2016-3-38_2015mj0090.pdf

Capsize of Vessel D, fishing vessel KAIRYO MARU No.3 http://www.mlit.go.jp/jtsb/ship/rep-acci/2016/MA2016-3-37_2015mj0089.pdf
Capsize of Vessel E, fishing vessel EBISU MARU http://www.mlit.go.jp/jtsb/ship/rep-acci/2016/MA2016-3-40_2015mj0092.pdf
Capsize of Vessel F, fishing vessel KONPIRA MARU No.8 http://www.mlit.go.jp/jtsb/ship/rep-acci/2016/MA2016-3-41_2015mj0093.pdf
Capsize of Vessel G, fishing vessel SUMIYOSHI MARU No.5 http://www.mlit.go.jp/jtsb/ship/rep-acci/2016/MA2016-3-39_2015mj0091.pdf