Chapter 3 Marine accident and incident investigation

1. Summary of major investigation report

Summaries of five of the 1,165 investigation reports publicized in 2011 are presented below.

Marine 1 While a ship was proceeding in the North East Offing of Iriomote Shima, she pitched, and two passengers each suffered a compression fracture in the lumbar spine
(Passenger ship AN-EI GO No. 98, Casualties of passengers)
[investigated by Tokyo Office]

Full text of the investigation report (Japanese text only):
http://www.mlit.go.jp/jtsb/ship/rep-acci/2011/MA2011-3-3_2010tk0025.pdf

1. Summary of the accident

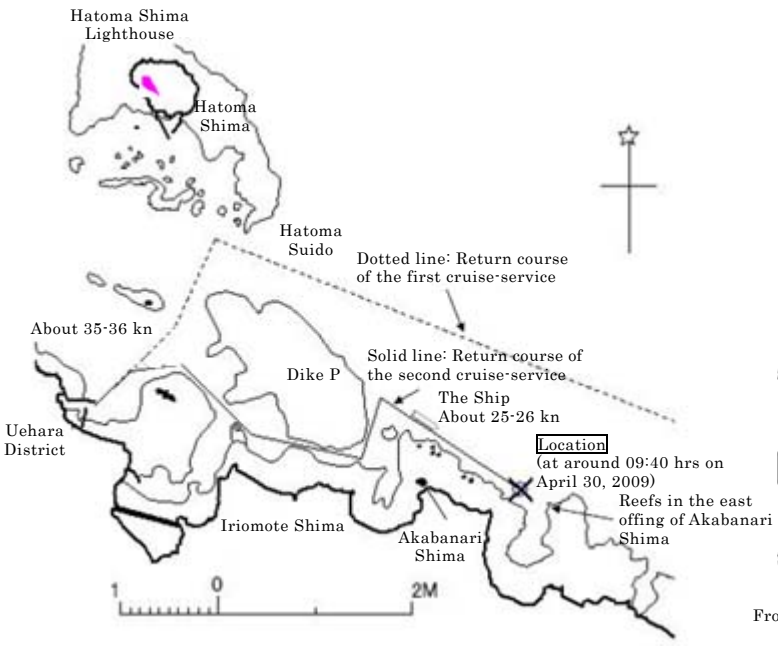
(1) Date and time: At around 09:40 hrs, April 30 (Thursday), 2009

(2) Location: North East Offing of Iriomote Shima, Taketomi Town, Okinawa Prefecture

(3) Outline of the accident:

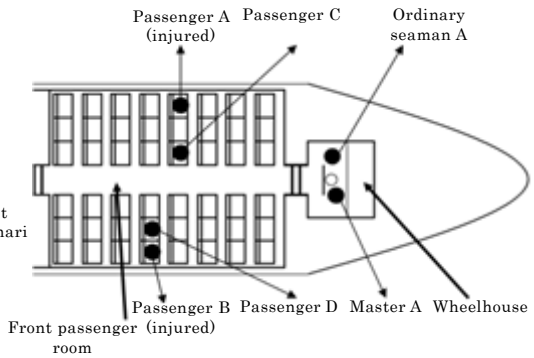
Passenger ship AN-EI GO No. 98 (the Ship), owned by limited private company An-ei Kanko (Company A), was boarded by the master with an ordinary seaman, and had 28 passengers on board. While the Ship was proceeding from Iriomote Shima (Iriomote Island), Taketomi Town, Okinawa Prefecture, to Ishigaki Shima (Ishigaki Island), Ishigaki City, two passengers (Passenger A and Passenger B) suffered injuries when the hull pitched at the north east offing of Iriomote Shima.

(4) Date of publication: March 25, 2011



Plots of estimated positions of the Ship

AN-EI GO No. 98



Seat positions in the front passenger room of the injured passengers, and other persons

2. Findings

(1) It is probable as follows:

The Ship was proceeding off the regular course east-southeast ward along the reefs in the north east offing of Iriomote Shima, and, near the east offing of Akabanari Shima (Akabanari Island), she was hit by consecutive waves about 1.5 to 2 meters high from east-northeast on the port bow. Just before the occurrence of the accident, the master recognized the high wave approaching; however, the master kept the Ship proceeding at the original speed, so the Ship's bow rode on the wave crest and then fell down onto the wave bottom; at that time, two passengers, sitting in the front passenger room, were lifted up off their seats and then dropped down onto the seats, causing each of them to suffer a compression fracture in the lumbar spine due to the free fall shock.

(2) It is probable that, although from Akabanari Shima to the reefs in the east of Akabanari Shima the master had reduced the speed or changed the course in order to reduce the pitch when a big wave approached, the master had proceeded after that at the original speed and with the original course.

(3) It is probable that the master, when approaching the point of turn near the reefs in the east of Akabanari Shima at the original speed, looking in the starboard bow direction in order to monitor the Ship's distance to the reefs in the bow and starboard side, failed to recognize the big wave approaching from the port bow direction.

(4) It is probable that the master had lost the chance to reduce the speed due to having failed to recognize the approaching wave until just before its arrival.

(5) It is somewhat likely that the master took the course for the following two reasons: the master, remembering a suggestion made by other masters of Company A that wave effects are cancelled by the reefs along the courses closer to the reefs in the north east offing of Iriomote Shima, thought that, along a course close to the reefs, the Ship would suffer smaller hull motions by waves than that experienced at the return course of the first cruise-service; the master, having no chance to look into the regular courses shown in the safety management regulations, wrongly thought that the round-trip course of the first cruise-service and the course was the regular course.

(6) It is somewhat likely that the following two facts contributed to the occurrence of the accident: the master and the ordinary seaman failed to provide directions or guidance by public address system to the passengers to sit in the rear passenger room because the hull motions would be smaller there; and the master failed to provide the passengers with guidance to wear seat belts.

(7) It is somewhat likely that the following fact contributed to the occurrence of the accident: Company A had not provided its crew with proper safety education in accordance with its safety management regulations concerning standard operations and so forth.

3. Probable causes

It is probable that the accident occurred when the two passengers, sitting in the front passenger room, were lifted up and then dropped onto their seats, each suffering a compression fracture in the lumbar spine due to the free fall shock when the Ship's bow rode on the big wave crest and fell down to the wave bottom, because the master, proceeding east-southeast ward along the reefs in the north east offing of Iriomote Shima while hitting consecutive waves of about 1.5 to 2 meter high from east-northeast on the port bow and failing to recognize the big wave approaching until just before its arrival, kept the Ship proceeding at the original speed.

It is probable that the reason why the Ship was proceeding at the original speed is that, although the master tried to reduce the pitch by reducing the speed and changing the course when a big wave was approaching, the master reverted to the original speed when the wave passed the Ship.

It is probable that the reason why the master failed to recognize the big wave approaching until just before its arrival is that the master was looking in the starboard bow direction in order to monitor the Ship's distance to the reefs in the bow and starboard side when approaching the point of turn near the reefs in the east of Akabanari Shima.

It is somewhat likely that the reason why the master navigated the Ship off the regular course along the reefs in the north east offing of Iriomote Shima is that, remembering a suggestion by other masters of Company A that, along a course closer to the reefs in the north east offing of Iriomote Shima, the reefs cancel wave effects, the master thought that navigating there would reduce the hull motions in comparison with those experienced in the first cruise-service, and that, having no chance to look into the regular courses shown in the safety management regulations, the master wrongly thought that the course was the regular course.

It is somewhat likely that the following facts contributed to the occurrence of the accident: the master and the ordinary seaman failed to provide passengers by public address system with directions or guidance to sit in the rear passenger room where hull motions are smaller; and the master failed to advise the passengers to wear seat belts.

It is somewhat likely that the following fact contributed to the occurrence of the accident: Company A failed to provide their crew with proper safety education in accordance with its safety management regulations concerning standard operations and so forth.

4. Recommendations, opinions, and remarks

The JTSB recommended Company A to provide safety education in accordance with their safety management regulations and so forth, prepare a safety operation manual in heavy weather applicable to the actual situation of their cruise services, and ensure compliance with the manual.

(For the details of the recommendations, refer to "Chapter 3 - 2. Summary of recommendations and opinions" (Page 97).)

The JTSB expressed its opinions to the Minister of Land, Infrastructure, Transport and Tourism with regard to the guidance of the high speed boat passenger transport business operators to prepare passenger-safety measures, such as ship handling in heavy weather.
(For the details of the opinions, refer to "Chapter 3 - 2. Summary of recommendations and opinions" (Page 98).)

The JTSB made its remarks to the Okinawa Passenger Boat Association to guide the passenger boat service operators in Yaeyama Retto (Yaeyama Islands) in order to firmly execute their safety management regulations.
(For the details of the remarks, refer to "Appendix 28　Remarks made in 2011" (Page 56 in Appendixes).)

Marine 2 A container ship, while proceeding eastward in Kanmon Passage and trying to overtake a cargo ship proceeding ahead, proceeded ahead of a JMSDF destroyer proceeding westward and collided with it; a fire broke out
(Collision of Container ship CARINA STAR and JMSDF Destroyer KURAMA)
[Investigated by the Tokyo Office]

Full text of the investigation report: http://www.mlit.go.jp/jtsb/eng-mar_report/Carina_Kurama.pdf

1. Summary of the accident

(1) Date and time: 19:56:09-12 hrs, October 27 (Tuesday), 2009

(2) Location: Vicinity of Moji Saki, Kanmon Passage, Kanmon Port

(3) Outline of the accident:

Container ship CARINA STAR (Ship A), boarded by a master (Master A) with 15 crew members, was proceeding eastward toward Hanshin Port through the Kanmon Passage in Kanmon Port. Destroyer of Japan Maritime Self-Defense Force (JMSDF) KURAMA (Ship B), boarded by a master (Master B) with 295 crew members, was proceeding westward through Kanmon Passage toward Sasebo Port, Sasebo City, Nagasaki Prefecture. The ships collided in the vicinity of Moji Saki, Kita-Kyushu City, Fukuoka Prefecture. Ship A sustained a fracture opening on the starboard bow outer-plate shell plate, and Ship B sustained substantial damage on the bow, which caused fire to break out on the damaged parts of both ships. Six crew members of Ship B suffered injuries during the fire-fighting operations; however, there were no injuries among the crew of Ship A.

Situation of Ship A

Situation of Ship B

(4) Date of publication: June 24, 2011

2. Findings

(1) Situations where Ship A, trying to overtake cargo ship QUEEN ORCHID (SHIP C), proceeded ahead of Ship B

a. It is probable that Ship A, while navigating eastward in Kanmon Passage, was approaching the starboard side of Ship C thinking that it would be possible to overtake Ship C at the west of Kanmon Bridge due to the speed difference between both ships.

b. Ship A received a message from the Kanmon-Kaikyo Vessel Traffic Service Center (Kanmon MARTIS), “Overtake on Ship C’s port side, Ship C is moving to the starboard side, but 1 mile (M) ahead of you, Ship B is coming. Pay attention. Over,” and replied

that they were going to overtake on the port side. However, a voice said "Do we have to overtake on her port side? A head-on vessel is getting closer to us," which suggests a possibility that they had doubts about the message from Kanmon MARTIS telling them to overtake Ship C on the port side.

c. It is somewhat likely that Master A took the message to have enforcement power instead of just provision of information. It is probable that Ship A decided to overtake Ship C on the port side in the situation where Ship A had approached the starboard side of Ship C; reduced the speed to slow ahead in the vicinity of Hayatomo Seto, west of Kanmon Bridge, put the helm 10° to port and then eventually hard to port because Ship A came close to Ship C, and passed about 70 m astern of Ship C.

d. It is probable that Ship A, due to the port-swinging inertia of the helm hard-a-port and the port-side rotational moment caused by the tidal stream, swung widely to port, advanced to the center of Kanmon Passage, and proceeded ahead of Ship B.

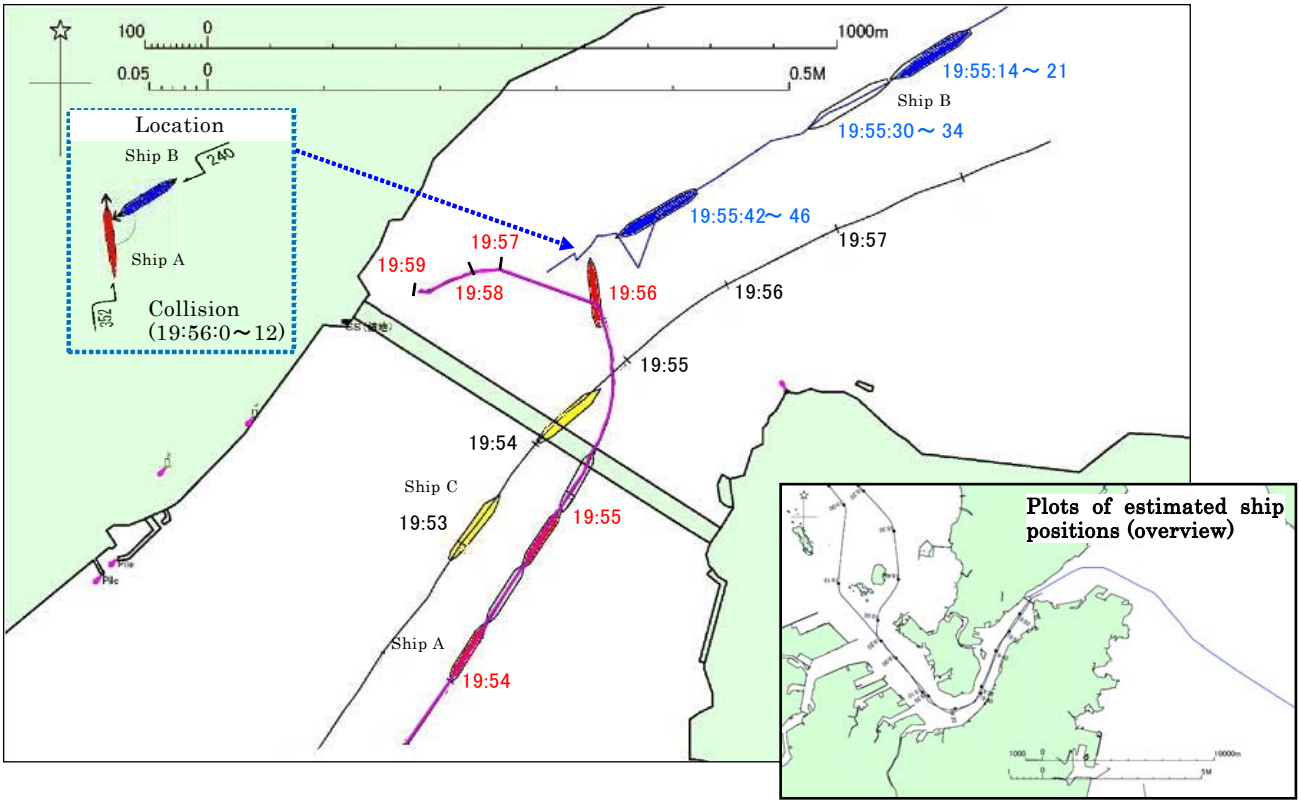
e. It is probable that Master A did not pay attention to the movement of Ship B because he was concentrating on clearing Ship C, and furthermore, Master A made no Overtaking Signals either.

f. It is probable that Ship A, which had tried to overtake Ship C in Kanmon Passage, overtook it even though it should not have according to Article 38, Paragraph 2 of the Ordinance for Enforcement of Act on Port Regulations, because the overtaking position was near Kanmon Bridge, the starboard-side clearance of Ship C would decrease as Ship C put the helm to starboard along Kanmon Passage, the port-side clearance would decrease as Ship B was coming on the opposite course, and as a conclusion, it was difficult to overtake Ship C on the starboard side and on the port side.

g. It is probable that the safety management of the owner/management company of Ship A (Company A) in navigating Ship A through the Kanmon Strait was improper because the check list for navigation through narrow channels included no specific descriptions of what to be noted, such as measures to follow the Overtaking Rule or to keep close communications with Kanmon MARTIS.

(2) Situations in Ship B proceeding at a speed of about 17 knots (kn) until just before the collision

a. It is probable that although Ship B's navigation plan for the Kanmon Strait had prescribed the speed through the water at about 12 kn, Ship B, while navigating westward by Kanmon Passage, was navigating at a speed of about 17 kn at the Tanoura Offing due to the effects of the tidal stream, faster than the full speed through the water of about 15 kn, which had been set before entering Kanmon Passage based on the judgment on the situations where there were no vessels on the same course ahead except for a small vessel and also due to the intention to pass through the Kanmon Strait quickly so as to have sufficient time for scheduled work.



Plots of estimated ship positions

b. It is probable as follows: Master B, having visual contact with Ship C, judged Ship C as a large vessel on the opposite course proceeding along the Kanmon Passage with its rudder to the starboard; then, having visual contact with Ship A, Master B judged Ship A as a large vessel similar to Ship C proceeding along the passage in a similar way to Ship C; in addition, Officer B thought that vessels would not try to overtake near the Kanmon Bridge.

c. It is probable that Master B's decision to maintain the full speed through the water at about 15 kn, which meant that Ship B was navigating at a speed of about 17 kn due to the effects of the tidal stream, was based on his judgment that Ship C would come close to Ship B but pass by it because Ship A was following close behind Ship C, and would also pass Ship B by putting the helm to starboard in a similar manner to Ship C.

d. It is probable that the higher commander of Ship B had not provided proper safety management for passing through the Kanmon Strait because the higher commander of Ship B had not provided Ship B with sufficient guidance, including obtaining movements of passing vessels with the Automatic Identification System (AIS), monitoring VHF communication, and using the service provided by Kanmon MARTIS or applying a safe speed in accordance with the situation.

(3) Collision avoidance maneuvers taken by Ship A and Ship B

a. It is probable that, although Master A had cleared the stern of Ship C, put the helm amidships, advanced Ship A to the center of Kanmon Passage, and put the helm hard to

starboard being aware of a risk of collision with Ship B, Ship A collided with Ship B before Ship A obtained a rudder effect.

b. It is probable that Master A sent no overtaking signal to Ship C when it overtook Ship C on Ship A's port side.

c. It is probable as follows: due to Ship A's starboard light that Master B saw and the aspect of Ship A's mast lights, Master B was afraid that Ship A was taking its rudder to port contrary to Master B's expectation that it would pass with its rudder to starboard; however, Master B kept proceeding at about 17kn and took no action of giving warning signals.

d. It is probable that the chief officer of Ship B (Officer B), because the attitude of Ship A had not shown changes, wondered why Ship A was not putting the helm to starboard, and upon being warned by Master B that Ship A might have put the helm to port, set both engines to stop and then to full astern.

e. It is probable that, although Master B put the helm hard to starboard while the rudder angle was changing to port due to the helm hard-a-port operation of Officer B, Ship B collided with Ship A.

(4) Guidance provided by the Kanmon MARTIS

a. It is probable that, according to the information obtained through the radar, the operator thought that Ship A proceeding eastward in Kanmon Passage would overtake Ship C in the east of the east side exit of Hayatomo Seto waterway.

Operation room of Kanmon MARTIS

b. It is probable that the operator, contacting Ship C, which was ahead of Ship A, and Ship A, which was overtaking Ship C, finally told Ship A as a provision of information to overtake Ship C on the port side and pay attention to Ship B coming 1 M ahead in addition to Ship C shifting to the starboard side, and received the reply from Ship A that Ship A would overtake Ship C on the port side.

It is somewhat likely that Master A took the messages from the Kanmon MARTIS as not simple information provisions but legally-enforced instructions because they were in an English imperative form and the IMO Standard Communication Phrases, which the Kanmon MARTIS had not regularly used, were not used

c. It is probable that the operator was required to guide Ship A in accordance with the Kanmon MARTIS Operation Manual in such a way that Ship A should not overtake Ship

C because, while Ship A and Ship C were approaching the Kanmon Bridge, Ship A would catch up with Ship C in the vicinity of Hayatomo Seto, where Ship B was proceeding on the opposite course, and because the operator received the message that Ship A would overtake Ship C.

It is probable that the operator did not give such guidance for the following reasons: the operator thought that, because of the tidal current influences on Ship A and Ship B, Ship B would complete passing before Ship A would overtake Ship C, and that the overtaking would occur in the east of the eastern side exit of Hayatomo Seto waterway; in addition, the operator thought that Ship A would never take improper actions before the completion of safety confirmations required for overtaking.

d. It is probable that the operator did not fully grasp the situation where Ship A would overtake Ship C or how Ship B would pass that position.

e. It is probable that Kanmon MARTIS did not give Ship B guidance to proceed under a speed limit of 15 kn imposed on a large ship or a ferry over a gross tonnage of 10,000 tons for protecting the safety of vessels moored at berths, because Ship B was not included in such category.

f. It is probable that the Kanmon MARTIS, for the following reasons, did not inform Ship B that Ship A would overtake Ship C on the port: the Kanmon MARTIS thought that Ship A would catch up with Ship C in the vicinity of Hayatomo Seto, that Ship B would complete passing before Ship A would overtake Ship C, and that the overtaking would occur in the east of the eastern side exit of Hayatomo Seto waterway; Ship A was not taking a course for initiating such overtaking; finally, Ship B was proceeding off-center of Kanmon Passage.

3. Probable causes

It is probable that the accident occurred in the vicinity of Hayatomo Seto in Kanmon Passage, at night and under the current condition of about 1.3 to 2.7 kn SW, by the collision of Ship A proceeding eastward and Ship B proceeding westward, in the following situations: Ship A approaching ahead of Ship B proceeding in the right lane of Kanmon Passage, when Ship A tired to overtake Ship C on the port in the situation where Ship A was approaching the starboard side of Ship C proceeding ahead of Ship A.

It is somewhat likely that Ship A tried to overtake Ship C on the port side in a situation where Ship A was approaching the starboard side of Ship C proceeding ahead of Ship A due to the following reason: Master A took the messages from Kanmon MARTIS for information provision as something legally-enforced, not as simple information provision.

It is probable that Master A, trying to overtake Ship C, proceeded ahead of Ship B, because, when Master A, reducing the speed, tried to overtake Ship C on the port side in a situation where Ship A was approaching Ship C's starboard side, Ship A turned to port excessively because of the port-swinging inertia caused by Ship A's steering of hard-a-port, and

the rotational moment caused by the tidal current.

It is somewhat likely that the following fact contributed to the occurrence of the accident: the operator in Kanmon MARTIS did not have precise knowledge on the position of Ship A's overtaking of Ship C or on the situations of Ship B approaching the overtake position.

It is somewhat likely that the following fact contributed to the occurrence of the accident: Ship B was proceeding at a speed of about 17 kn.

4. Opinions

The JTSB expressed its opinions to the Commandant of the Japan Coast Guard as follows: the operation manuals used by Kanmon MARTIS should be enhanced and revised; vessels passing Kanmon Straits should be firmly informed of overtaking navigation and speed; finally, the enhancement of the surveillance capability of Kanmon MARTIS should be considered.

In addition, the JTSB expressed its opinions to the Ministry of Defense as follows: the navigation manuals for passing Kanmon Straits should be enhanced; the MSDF ships navigating in narrow channels, including Kanmon Straits, should make sure to transmit their AIS information.

(For the details of the opinions, refer to "Chapter 3 - 2. Summary of recommendations and opinions" (Page 99).)

5. Safety recommendations

In view of the results of this accident investigation, the JTSB recommended Company A to take necessary actions to establish directions for practicing the overtaking navigation rule in the Kanmon Strait, keeping close communication with Kanmon MARTIS, and using AIS information appropriately, and then to train the crew members to be familiarized with them. Company A should also train the crew members in order for them to have accurate knowledge of message markers and the master's relationship with the VTS*1, taking into account the amendments of the Act on Port Regulation on July 1, 2010.

(For the details of the safety recommendations, refer to "Chapter 3 - 2. Summary of recommendations and opinions" (Page 103))

*1: VTS (Vessel Traffic Services, Annex V Regulation 12 to the SOLAS Convention)

Marine 3 A ferry heavily listed while proceeding south-westward in Kumanonada to starboard and grounded off Mihama Town.
(Listing of Ferry ARIAKE) [Investigated by the Tokyo office]

Full text of the investigation report (Japanese text only): http://www.mlit.go.jp/jtsb/ship/rep-acci/2011/MA2011-2-2_2009tk0012.pdf

1. Summary of the accident

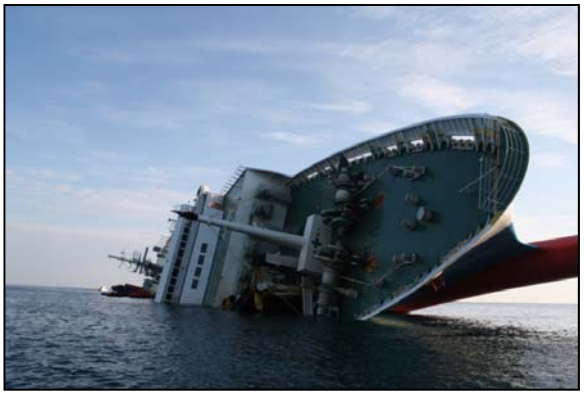
(1) Date and time: At around 05:06 hrs, November 13 (Friday), 2009

(2) Location: South-east off Kiho Town, Mie Prefecture (Kumanonada)

(3) Outline of the accident:

Ferry ARIAKE, operated by Maruei Ferry, Co. Ltd. (Company A), was boarded by a master with 20 crew members. It had 7 passengers, and was loaded with 150 containers and other items. At around 05:06 hrs, while proceeding south-westward in Kumanonada, ARIAKE heavily listed to starboard and grounded on its side off Mihama Town, Mie Prefecture.

Two of the passengers and one of the crew members were injured.



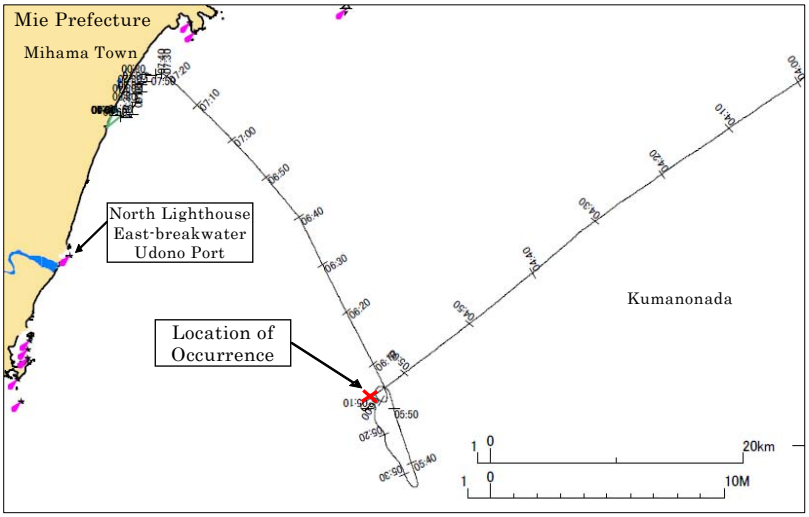
ARIAKE, listing and grounding on its side

(4) Date of publication: February 25, 2011

2. Findings

(1) Events leading to the occurrence of the accident

It is probable that: the ship, carrying 7 passengers, containers and trailers*1, was sailing south-westward in Kumanonada with the waves on the port quarter; the ship encountered a wave (the first wave) and listed to starboard by about 25°, which triggered the cargo shifting; the ship, when encountered by the second wave, listed further.



Plots of estimated ship positions

In addition, it is probable that: the listing, although once reduced by shifting ballast waters, grew larger while the ship was sailing north-westward toward the shore; the ship grounded and fell on its side near the shore of Mihama Town; before the grounding, the

passengers and crew members were rescued.

*1: A "trailer" refers to a vehicle towed by a truck to transport cargos.

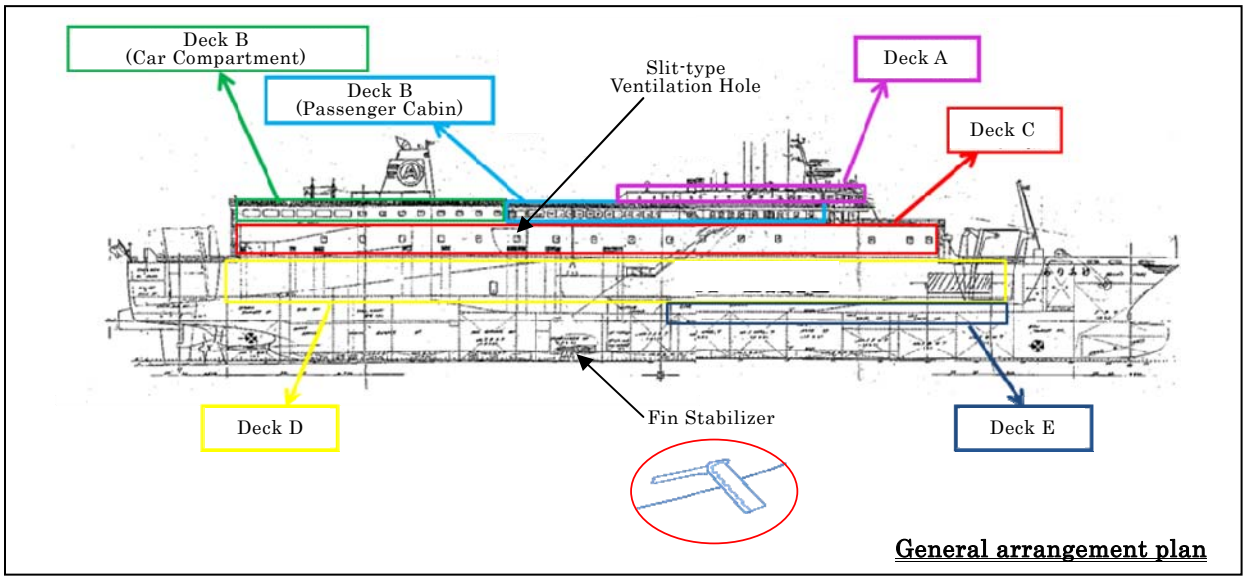
(2) Listing of about 25° caused by the first wave

It is probable that the ship, sailing in quartering sea with the waves with a length of about the ship's hull-length, a period of about 10 sec, and a significant height of about 4.6 m, listed to starboard by about 25° and rapidly turned to port when the ship encountered the first wave about 6.9 m high on the port stern from about 40° and was situated on the steep forefront of the wave, because the static balance point of the list angle was about 25° when the midship was on the forefront of a wave with the height of 1.5 times the significant wave height (about 6.9 m).

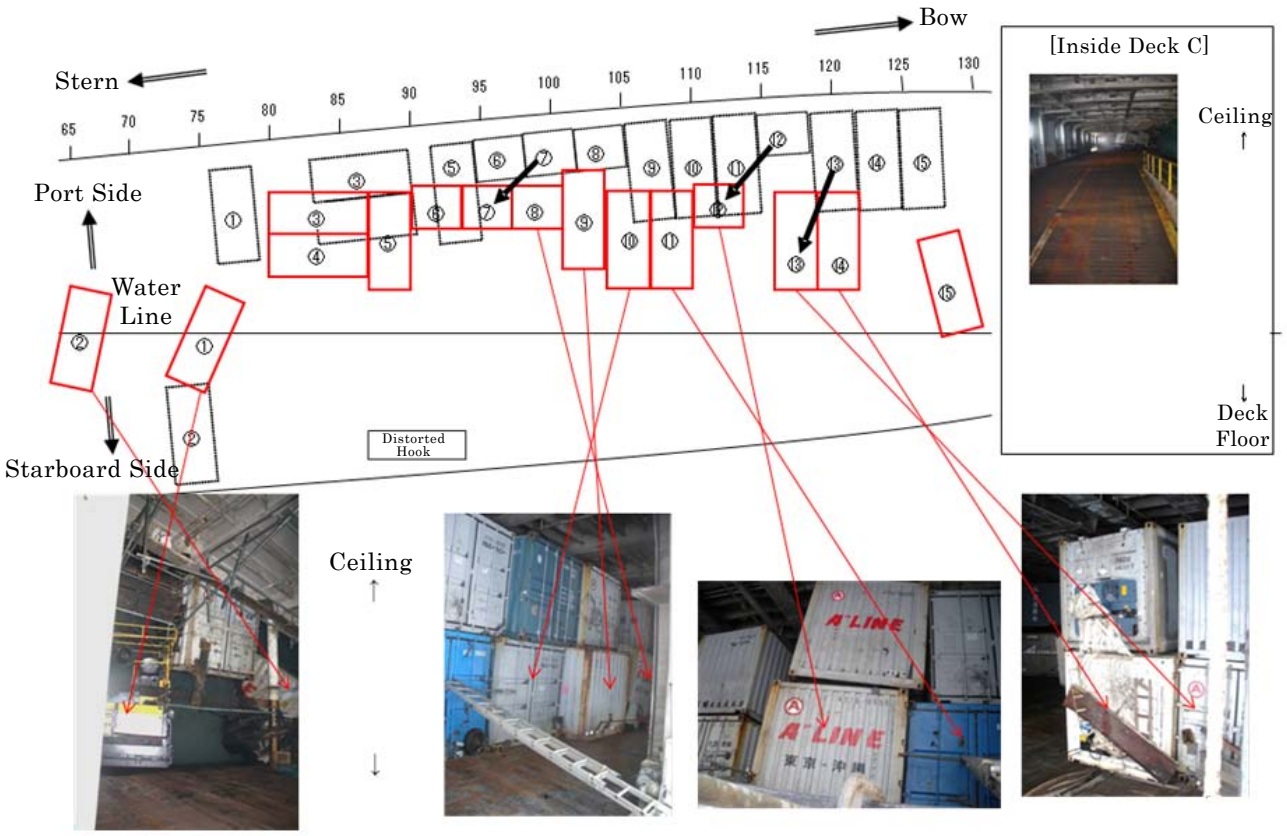
(3) Cargo shifting and the listing caused by the second wave

It is probable as follows:

a. Company A, although having installed lashing gear and equipment on the ship, had not considered specific lashing-procedures for containers or trailers, and had not prepared manuals for effective lashing procedures to prevent excessive shifting of cargo. In addition, the maximum coefficient of static friction between the deck and the containers, the supporting pads and the racks was approximately 0.4, corresponding to the coefficient of static friction between steel and steel, judging from the fact that: the car deck was not coated with paint compatible with the car ferry construction standards at the time of the accident; there was another incident of container shifting occurred prior to the accident; and the non-slip deck coating had abraded away.



General arrangement plan



Shifting of containers and trailers

b. Most of the containers were double-stacked and placed in rows in the across-the width direction and approximately one row of every three rows was lashed with lashing chains; the lashing chains were just about 0.4 m longer than the container-stack height, so those chains stood approximately straight from the floor; therefore, the way of lashing was not effective for preventing excessive shifting.

c. Most of the trailers were loaded on Deck C; the seven trailers in the front row and the three trailers in the back row were lashed with six-point-lashing (lashed with two additional lashing chains to the four regular chains); the other 34 trailers were lashed with four-point-lashing (the regular way of lashing with four lashing chains).

d. The containers began to slide when the ship listed to starboard by 25°.

e. A chain used for trailer lashing was broken down when the list angle reaches 27° because the tension exceeded the breaking load; therefore, when the chain was broken down, the other chains were consecutively broken down, causing the trailers to slide.

f. When the ship encountered the second wave about 4.6 m high in the port quartering sea by about 55° and was situated on the steep forefront of the wave, the ship listed to starboard by about 40° because of the shifting of cargo and the outward heeling*2 caused by the port turn.

*2: "Outward heel" refers to a phenomena whereby a turning ship heels due to centrifugal force in the direction opposite to the rotation center.

(4) Rescuing of passengers and crew

All the seven passengers on board and fourteen of the crew members were rescued by a Japan Coast Guard helicopter that came to assist; the master and the six crew members launched an inflatable life raft and abandoned the ship, and were rescued by a rescue craft.

3. Probable causes

It is probable that the ship listed to starboard by about 25° and the cargo shifting happened when the ship was encountered the wave with about 6.9m high at the port quarter by about 40° while sailing in Kumanonada at night as the ship was situated in the dangerous zone of successive high wave attack in quartering seas.

It is probable that the ship was sailing in the dangerous zone in the high quartering waves, because: neither the master nor the first officer had knowledge of the dangerous zone; and the master thought that the ship would not be greatly influenced by quartering waves because he had not experienced a significant pitch or roll on the ship even in quartering seas.

It is probable that the cargos slid because Company A had not taken measures to prevent an excessive shifting of cargo in accordance with the car ferry construction standards.

4. Remarks

The JTSB made its remarks urging the ship operators to describe, in their safety management manuals, the danger that would be posed by sailing in rough sea with quartering waves, and provide safety education to those who serve in navigation in order to ensure they recognize such danger.

(For the details of the remarks, refer to “Appendix 28　Remarks made in 2011” (Page 55 in Appendixes).)

Marine 4 Two workmen died from being hit by a mooring line broken and snapped-back while their mooring work.
(Fatality to workmen involved with container ship KUO CHANG)
[Investigated and processed by the Tokyo Office]

Full text of the investigation report : http://www.mlit.go.jp/jtsb/eng-mar_report/KuoChang.pdf

1. Summary of the accident

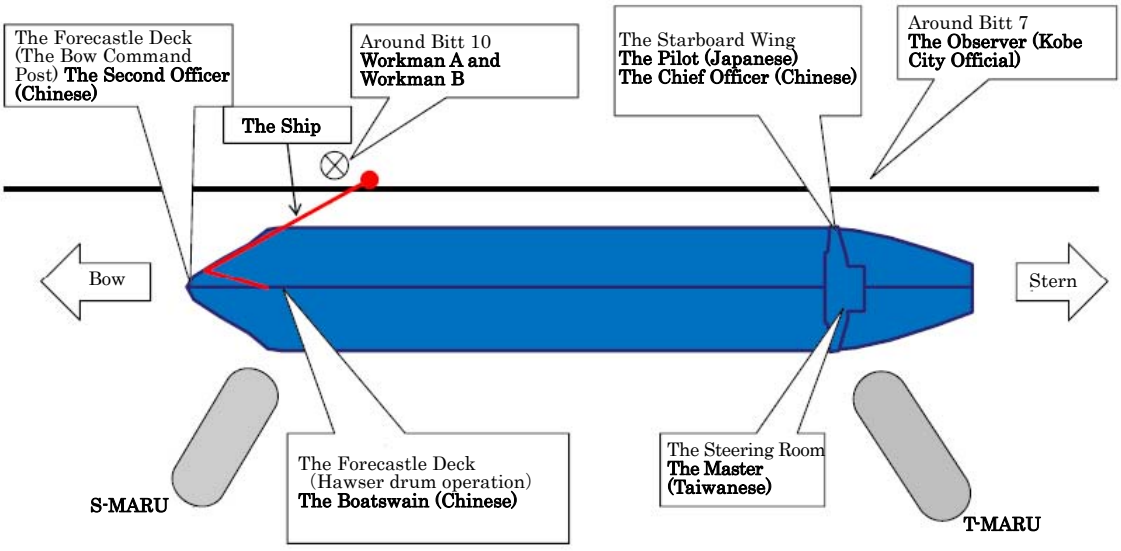
(1) Date and time: At about 07:36 hrs, March 20 (Sunday), 2009

(2) Location: Port Island Container Berth 18, Kobe District, Hanshin Port

(3) Outline of the accident:

At about 07:36 hrs, while the container ship KUO CHANG (the Ship) was docking at Port Island Container Berth 18 (the Berth), a mooring rope moored onto a bitt on the Berth broke, snapped back and hit two workmen (Workman A and Workman B) who were engaged in mooring work. Both of the workmen died.

(4) Date of publication: April 22, 2011



Positions of the parties concerned at the time of the accident

2. Findings

(1) It is probable that, on docking at the Berth, the pilot was actually in command of the vessel and the master and the chief officer at the bridge gave order to the second officer on the bow and the third officer on the stern under the pilot's advice.

Forward spring line of the Ship

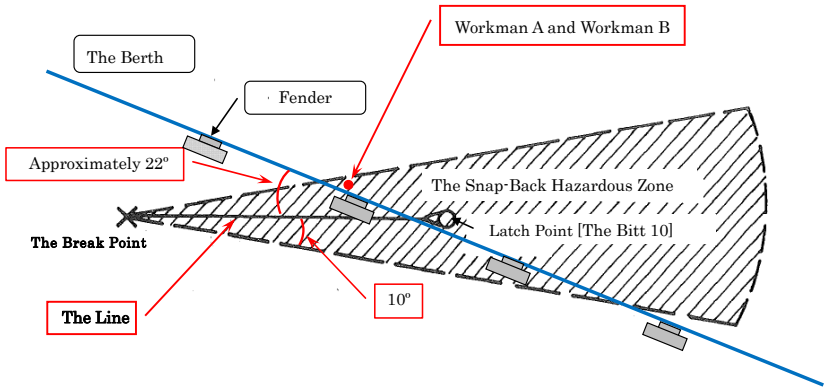
(2) It is probable that the broken mooring line (the Line) was a synthetic fiber rope used for less than a year, but it was worn due to repetitive use while touching a bend point where the sheer strake and outside plating

touched at almost a right angle (the Bend Point).

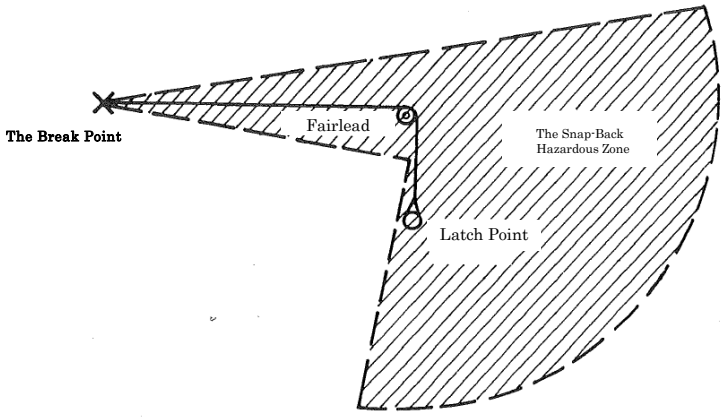
(3) It is probable that the master, in the situation where the Ship was running over the designated berthing point, ordered the second officer to heave the Line moored onto the bitt on the Berth in order to reduce the forward headway by using the Line.

(4) It is probable that the Second Officer gave order to heave the Line without knowing that the Line was touching the Bend Point, as he was commanding on the bow commanding post, from where the Bend Point was not visible.

(1) The Situation of the accident



(2) Snap-back hazardous zone in case of break of a mooring line bent at a fairlead



The Situation of the accident and the snap-back hazardous zone

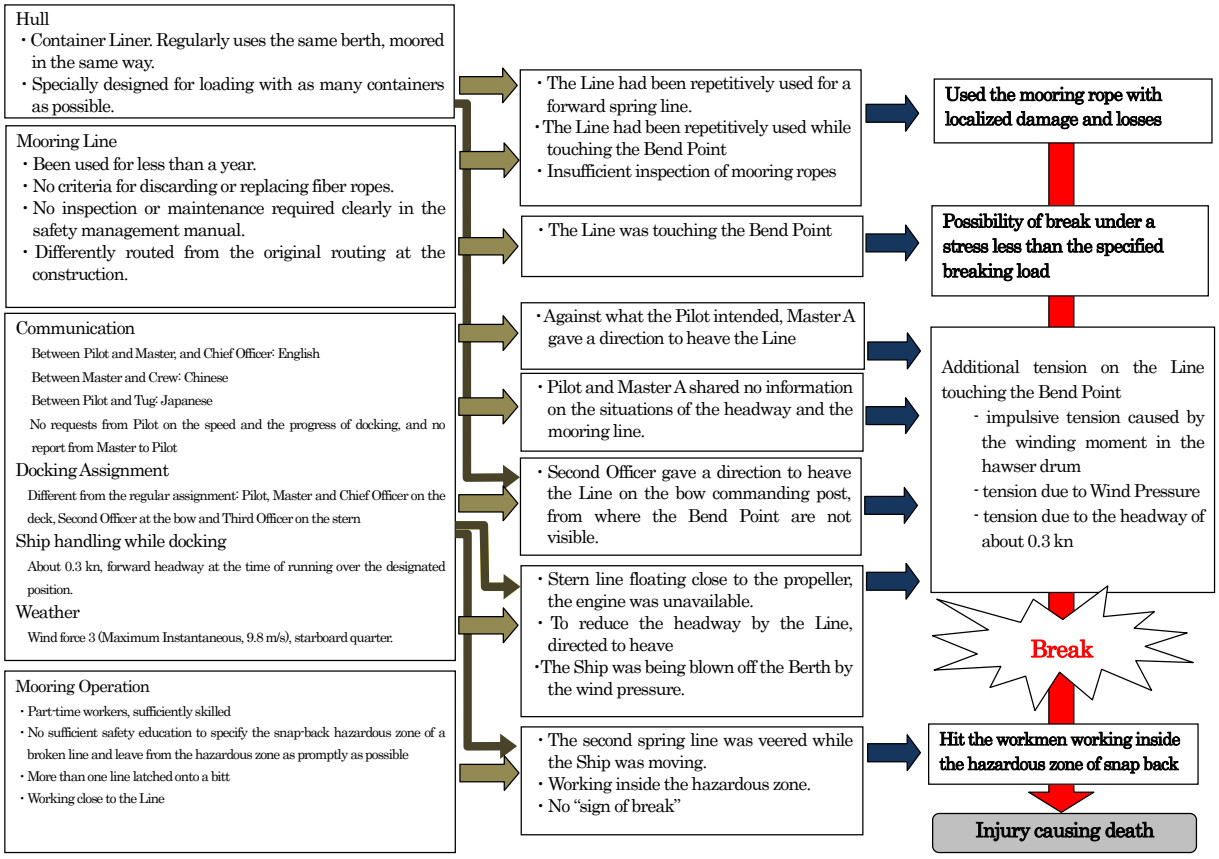
(5) It is probable that the Line, while touching the Bend Point, broke due to the combined tensions: an impulsive tension due to the winding moment in the hawser drum*1; tensions due to the forward headway of about 0.3 kn; the wind pressure.

The Broken part of the Line

(6) It is highly probable that Workman A and Workman B were hit by the Line which had snapped-back at the moment of breaking, as they were working inside the hazardous zone of snap back*2.

*1: A "hawser drum" is a rotating drum that can wind up a rope about 200 m in length, and is used for heaving or veering a mooring rope.

*2: "Snap back" is the sudden release of the static energy stored in the stretched synthetic line when it breaks



Cause and effect relationship of causal factors

(7) It is probable that the line handling service company had not provided the workman with safety instructions to complete the work swiftly and leave from the snap-back hazardous zone as promptly as possible in case of operations close to a mooring rope under tension, showing the extent of the snap-back hazardous zone of a broken rope under tension.

It is not found to what extent the fact described above related to the occurrence of the accident.

3. Probable causes

It is probable that the accident occurred because the Line broke, snapped back and hit Workman A and Workman B, who were working inside the hazardous zone of snap-back, while the Ship was docking at the Berth.

It is probable that the Line was broken due to the wear it had incurred and by the combined tensions on the Line touching the Bend Point: the impulsive tension due to the winding moment in the hawser drum; the tensions due to the forward headway of the Ship; the wind pressure.

4. Safety recommendations and remarks

The JTSB recommended the ship management company to make necessary revisions of their safety management manuals, and also recommended the Marine Department, the

Government of Hong Kong, People's Republic of China to supervise the company.
(For the details of the safety recommendations, refer to "Chapter 3 - 2. Summary of recommendations and opinions" (Page 102).)

The JTSB made its remarks to manufactures of mooring ropes regarding the need to establish guidelines in order to replace or discard their products by examining their appearance and provide users of the ropes with the guidelines, and also to line handling service providers regarding the need to provide their mooring workers with information on the extent of the snap-back hazardous zones of ropes when broken under tension, and give them instructions such as to avoid working inside the zone unless necessary.
(For the details of the remarks, refer to "Appendix 28　Remarks made in 2011" (Page 59 in Appendixes).)

Marine 5 A round-haul-net fishery boat capsized while drifting in a fishing area; 17 of the crew members died or went missing
(Capsize of fishing vessel SUWA MARU No. 58) [investigated by the Tokyo Office]

Full text of the investigation report (Japanese text only):
http://www.mlit.go.jp/jtsb/ship/rep-acci/2011/MA2011-4-2_2008tk0002.pdf

1. Summary of the accident

(1) Date and time: At about 13:50 hrs, June 23 (Monday), 2008

(2) Location: Around 350 km off the east of Inubo-saki, Choshi City, Chiba Prefecture

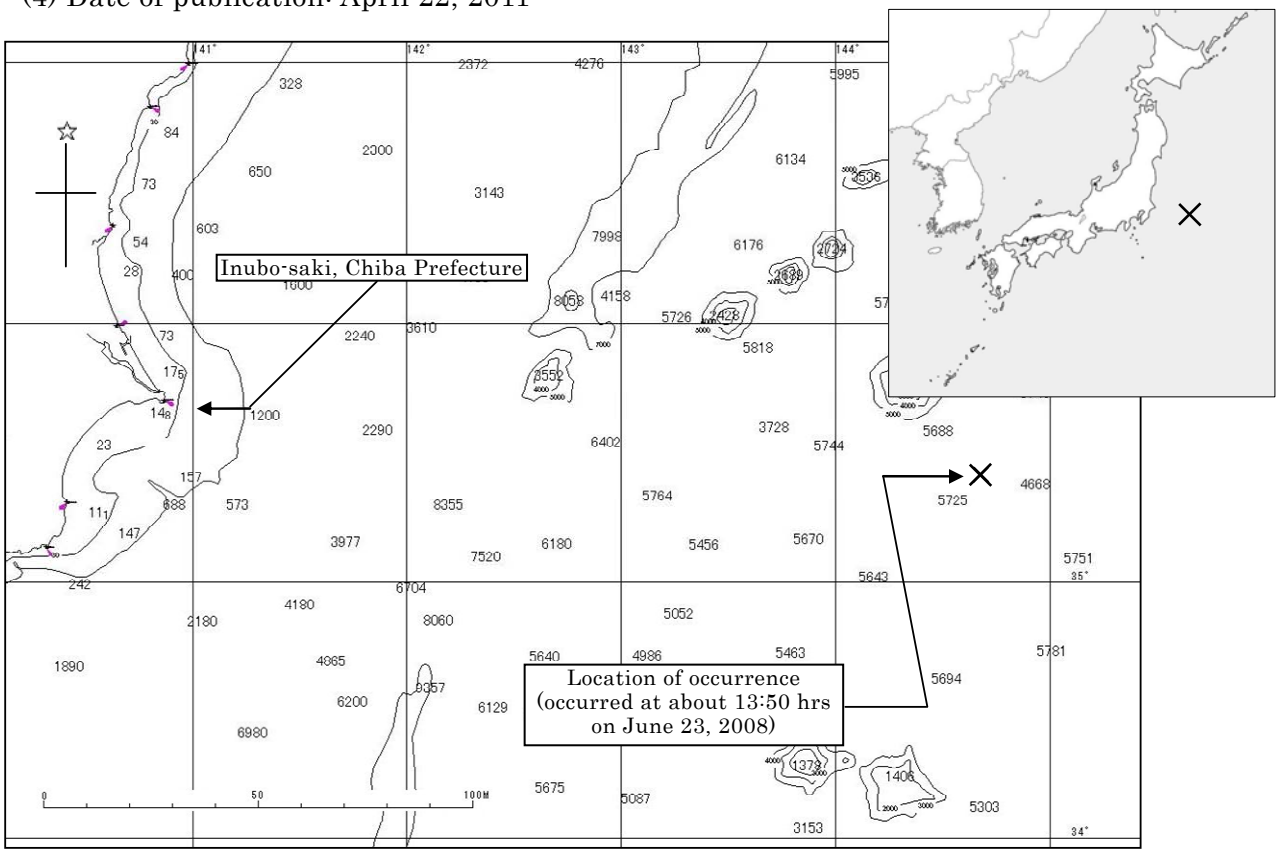
(3) Outline of the accident:

SUWA MARU No. 58 (the boat), a towing-net boat of a round-haul-net fishing fleet, was boarded by a skipper with a chief fisherman and 18 other crew members. While drifting in the fishing area off the east of Inubo-saki, Chiba Prefecture, the boat listed to starboard and turned over, sinking in the vicinity of 350 km off the east of Inubo-saki Lighthouse.

SUWA MARU No. 58

Out of the twenty crew members, four died and thirteen went missing.

(4) Date of publication: April 22, 2011



Location of occurrence

2. Findings

(1) Events leading to the occurrence of the accident

It is probable that the boat, a member of a fishing fleet consisting of eight boats in two groups, had an impact twice on the starboard bow section, turned over on the starboard side, wend down bow first, and then sank at about 13:50 hrs, while drifting by a parachute anchor (parachute drifting) at around 350 km off the east of Inubo-saki under a sea condition of southwest-to-south winds and southwest-to-south waves on June 23, 2008, when the fleet was off from fishing activities.

(2) Situations of capsizing and sinking

It is probable that the boat, while parachute drifting, had an impact twice on the starboard bow section, listed further to starboard as the starboard bow was sinking by seawater coming in, and turned over in about a minute after the second impact.

It is probable that the boat turned over with its bow to south-south-west, started foundering from its bow, and then sank bow first in about 40 minutes after turning over.

(3) Factors of the occurrence of the accident

a. It is somewhat likely that: the boat had higher center of gravity than that in the normal state and an initial list to starboard while parachute drifting; a big wave (a wave with a different height and a different length to those of waves that determine the rolls and pitches of the boat) hit the boat on its starboard bow section, and seawater flooded into the boat from the starboard mid section; the flooded water accumulated on the bow deck, causing the bow to drop down and the boat to list further to starboard; the starboard bow freeboard became so small that water flooded from the starboard side by consecutive waves; the list increased, and the top of the starboard side went under water; the boat turned over losing its stability.

b. It is somewhat likely that: the boat's total weight increased by the fishing nets which had been soaked with water and patched for repair; the boat's center of gravity shifted higher than that in the normal state because fishing gear, ropes and other items were loaded on the wheelhouse's canopy; the transverse weight distribution was imbalanced because heavy chains, fishing nets and floats were loaded in that order from the starboard side; and, the initial listing to starboard occurred due to the shift of the fishing nets toward the heavy chains as the boat rolled.

c. It is somewhat likely that the structure around the scupper hampered water drainage through the scupper, and that contributed to the water accumulation on the bow deck.

3. Probable causes

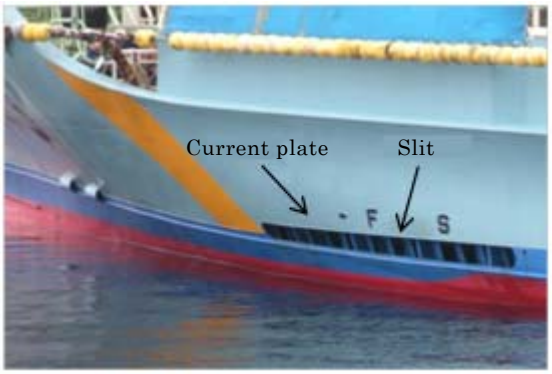
It is somewhat likely that the accident occurred as follows: the boat was parachute drifting at around 350 km off the east of Inubo-saki under a sea condition of southwest-to-south winds and southwest-to-south waves; the boat had higher center of gravity shifted than that in

the normal state and had an initial list to starboard; the boat was hit by the big waves at the starboard bow and seawater flooded in at the starboard mid section; the boat listed to starboard as the bow sank down due to the accumulation of water on the bow deck; the starboard bow's freeboard was so small that waves repeatedly came onboard from the starboard side and the boat listed further; and, the boat turned over losing its stability as the top of the starboard side went under water.

It is somewhat likely that the causes of the higher center of gravity than that in a normal state and the initial listing to starboard were as follows: the fishing nets gained weight because they had been soaked with water and been patched for repair; the fishing gear, ropes and other items were loaded on the wheelhouse's canopy; the imbalance in the transverse weight distribution was caused by the loading of the heavy chains, the fishing nets and the floats in that order from the starboard side; and, the fishing nets shifted toward the heavy chains as the boat rolled.

It is somewhat likely that the structure around the scupper contributed to hampering water drainage.

Loading situation of fishing nets



Structure of scupper
(photo of similar type of boat)

4. Remarks

The JTSB made its remarks on safety measures about fishing nets, scupper, and parachute drifting to the Fisheries Agency and other organizations concerned and owners of net-fishery boats.

(For the details of the remarks, refer to "Appendix 28　Remarks made in 2011" (Page 58 in Appendixes).)

2. Summary of recommendations and opinions

There were two recommendations, five opinions, and nine safety recommendations in 2011, which is summarized below:

(1) Recommendations (two cases)

1. In view of the results of the investigation on the passenger-injury accident on the passenger ship AN-EI GO No. 98, the JTSB, in order to ensure passengers' safety, made the following recommendations to the An-ei Kanko Co., Ltd. on March 25, 2011:
1. Safety education on safety management manual The company should regularly provide its crew with proper safety education on the company's operation standards, putting emphasis on measures for safe operation while underway on rough seas, and ensure their compliance with the standards. 2. Development of and compliance with safety manual for navigation on rough seas taking into account actual operation In order to ensure implementation of its safety management manual, the company should review its safety measures on rough seas in terms of route, speed, use of seatbelt, instruction for passengers to move to a place with less ship motion, and so forth, taking into account the size and the cabin arrangement of the ships in service, to develop a safety manual for navigation on rough seas, provide education to its crew about the manual, and ensure their compliance with it.

2. In view of the results of the investigation of the capsizing of recreational fishing vessel SHIBUSAKI No. 10, the JTSB, in order to ensure passengers' safety, made the following recommendations to Shibusaki Co., Ltd. on September 30, 2011:
The company should enhance the awareness throughout the company of ensuring the safety of passengers and vessels, maintain the seaworthiness of the vessels they own by properly having ship inspections, and take safety measures for passengers by instructing them to surely wear life jackets.

(2) Opinions (five cases)

1. In view of the results of the investigation of the capsizing of the motor boat NO FIGHT, the JTSB expressed its opinions to the Minister of Land, Infrastructure, Transport and Tourism on January 28, 2011 as follows:

Efforts have been made to disseminate information and raise awareness about what should be complied with in vessel operation and to what attention should be paid for safe operation for boat operators and owners on the occasions of issuing or revalidating a license. The Minister should continue the efforts of informing them of the following items and making sure of their compliance:

1. Collection and utilization of the latest information of weather and sea conditions, and characteristics of navigation areas

Boat operators should collect information of weather and sea conditions, and characteristics of navigation areas (such as presence or absence of breakwaters and off-limit areas) before departure. In addition, they should collect updated information of weather and sea conditions by mobile phone or other devices while underway and navigate in a proper way taking into account the specific conditions of navigation areas, such as high waves expected near breakwaters.

2. No overloading beyond the maximum number of persons onboard

No boat should be boarded with persons in excess of its capacity, because keeping sufficient freeboard is critical to safe navigation.

2. In view of the results of the investigation of the passenger-injury accident on passenger ship AN-EI GO No. 98, the JTSB expressed its opinions to the Minister of Land, Infrastructure, Transport and Tourism on March 25, 2011 as follows:

Since 2005, eight similar accidents have occurred on passenger ships or commuter boats, and twelve passengers have suffered from lumbar compression fractures. The causes of those accidents were as follows: while underway on rough seas where the vessel severely went up and down due to winds or waves, proper routes or courses were not taken or the speed was not reduced properly; measures for ensuring passengers' safety, such as guiding passengers on the stern section where vessel motion was relatively small and instructing passengers to wear seat belts, were not sufficient. Therefore, the Minister of Land, Infrastructure, Transport and Tourism should direct the concerned parties of

passenger ferry operators with high speed craft to develop safety measures for ensuring passengers' safety such as safe operation on rough seas (speed, course and so forth), inform their crew and other persons concerned of such measures, and make sure they are taken.

3. In view of the results of the investigation of the collision of container ship CARINA STAR and JMSDF destroyer KURAMA, the JTSB expressed its opinions to the Commandant of the Japan Coast Guard on June 24, 2011 as follows:

1. Revising the Kanmon MARTIS Operation Manual and others

It is desirable that the Kanmon MARTIS Operation Manuals should be revised according to the following items, and at the same time, that they should be practiced properly:

(1) Revising the Kanmon MARTIS Operation Manual

In order to ensure proper implementation of the Overtaking Rule in the Kanmon Strait in accordance with the Act on Port Regulations, criteria to decide which action should be taken, information provision, guidance or correction of navigation-rule violation, and messages to be delivered should be prescribed for Hayatomo Seto and its vicinity.

(2) Implementation of the Overtaking Rule

In order to ensure proper implementation of the Overtaking Rule in Kanmon Passage in accordance with the Act on Port Regulations, information should be provided to vessels in advance to inform that overtaking in Hayatomo Seto and its vicinity should be avoided because it is dangerous when there is a vessel on the opposite course.

(3) Public announcement of the use of the international standard communication procedures

The Kanmon MARTIS should inform vessels passing the Kanmon Strait that Kanmon MARTIS use message markers when giving information, advice or instruction based on the international standards.

2. Notification of the Overtaking Rule and Navigation Speed

It is desirable that Kanmon MARTIS should make public notifications on specific situations in which overtaking in the Kanmon Strait should be avoided, as well as the area where a speed of 15 knots or less is recommended in order to ensure the safety of ships moored at berths.

3. Reinforcement of Surveillance Arrangement

It is desirable that, in order to reinforce the surveillance arrangement, Kanmon MARTIS should consider the following:

(1) Establishment of qualification system for Operators

Kanmon MARTIS should establish a qualification system for Operators in order to ensure the supply of competent Operators, in addition to the training sessions for Operators that have been held.

(2) Monitoring by Operators

a. Reinforcement of monitoring

Monitoring should be reinforced, for example, by more than one Operator, when overtaking is going to take place while there is a vessel on the opposite course. In addition, handover operation should take place after the overtaking is completed and safety is secured.

b. Night vision systems

Night vision systems which enable the Operators to monitor vessels passing by at night time should be installed in addition to the cameras which have been installed for monitoring in day time.

4. In view of the results of the investigation of the collision of container ship CARINA STAR and JMSDF destroyer KURAMA, the JTSB expressed its opinions to the Minister of Defense on June 24, 2011 as follows:

1. Revising the Navigation Manual for passing through the Kanmon Strait

It is desirable that the related items in the Navigation Manual should be revised so as to include the following:

(1) Collection of information on the movements of other vessels through the AIS, monitoring ship VHF communication and use of the services provided by Kanmon MARTIS

(2) Safe speed for navigation in the Kanmon Strait

2. The application of the AIS

It is desirable that the JMSDF ships should make sure to transmit AIS information when navigating narrow channels, including the Kanmon Strait, because such information helps reception vessels.

5. In view of the results of the investigation of the passenger injury accident on the recreational fishing vessel HANABUSA, the JTSB expressed its opinions to the Director General of the Fisheries Agency on September 30, 2011 as follows:

The Fisheries Agency should advise the governors of prefectures to inform recreational-fishing-vessel service operators or recreational-fishing-vessel operation managers of the occurrence of the passenger-injury accident and to include the following items in the operation manuals developed by the recreational-fishing-vessel service operators to ensure passengers' safety:

1. Instruction of what passengers should comply with

As a recreational fishing vessel sometimes severely goes up and down due to waves while underway, passengers should be boarded on the stern section, where vessel motion would be relatively small.

2. Items which recreational-fishing-vessel service operators and their crew should comply with

(1) In a situation where a recreational fishing vessel is severely going up and down due to waves while underway, the crew should keep lookout properly on the waves and take measures to reduce the vessel motion by changing the relative course to the direction of waves or slowing the vessel down to a safe speed.

(2) In a situation where vessel motion due to waves may create a danger while underway, the crew should guide the passengers to board on the stern section, where vessel motion would be relatively small.

(2) Safety recommendations (nine cases)

1. In view of the results of the investigation of the fatality to workmen involved with container ship KUO CHANG, the JTSB made the following recommendations to CHENG LIE NAVIGATION Co., Ltd. and the Marine Department, the Government of Hong Kong, People's Republic of China on April 22, 2011:

The accident occurred when the mooring line with wear broke due to the additional tensions on the mooring line, which was touching the Bend Point, including the impulsive tension due to the winding moment in the hawser drum, the tension caused by the forward headway of the Ship and that caused by the wind pressure, and hit the two mooring workmen, causing them to die.

The safety management manual prepared by CHENG LIE NAVIGATION Co., Ltd. requires inspections on the mooring equipment at berthing to confirm that such equipment is in good condition. In the case of the accident, judging from the state of wear to the forward spring line, it is highly unlikely that the line was in a "good condition," as stated in the manual mentioned above.

Therefore, it is recommended to clearly state and require to pay attention to the route of mooring ropes and the bitts to moor the ropes onto in order to prevent mooring ropes from touching corners such as the Bend Point to the extent possible and obtain safe and effective mooring forces, and to place a person in charge to take command of operations in such a position from where the person can acquire the knowledge of the overall conditions of mooring ropes. At the same time, it is recommended to make all the ships under management comply with such requirements.

2. In view of the results of the investigation of the death and injury of workmen involving cargo ship RICKMERS JAKARTA and barge SHINEI-MARU No. 18, the JTSB, in order to prevent the recurrence of similar casualties, made the following recommendations to Crane manufacturers on June 24, 2011:

It is somewhat likely that this accident was caused in the following sequence. While Crane No.3 of RICKMERS JAKARTA was hoisting the Cargo, the rim of Main Sheave C at the extremity of the jib fractured, causing the Main Wire's precipitous drop into the gap caused by fracture. This caused a break in the Main Wire, and also, finally, the fall of the Cargo, Main Hook Block, and grommet onto SHIN EI- MARU No.18.

This accident occurred in spite of the fact that Crane No.3 passed a load test three weeks earlier, and later investigation revealed the occurrence of brittle fracture on the fractured surface of Main Sheave C and various sized cracks were observed on Main Sheave

E's surface. In the face of these findings, Crane manufacturers should, when they produce a rim that requires strong bending and shaping processes as a part of a weld construction sheave, perform proper control of manufacturing processes, including the selection of materials.

3. In view of the results of the investigation of the collision of container ship CARINA STAR and JMSDF destroyer KURAMA, the JTSB made the following recommendations to NAM SUNG SHIPPING CO., LTD. on June 24, 2011:

It is probable that the accident occurred at night in the vicinity of Hayatomo Seto in Kanmon Passage with a tidal stream of about 1.3–2.7 kn SW, while CARINA STAR (Ship A) was proceeding eastward and KURAMA (Ship B) was proceeding westward, and that the vessels collided with each other in the situation where Ship A had approached QUEEN ORCHID's (Ship C) starboard side and then tried to overtake Ship C on her port side, which, as a result, made Ship A proceed ahead of Ship B, which was proceeding on the right side of Kanmon Passage.

It is somewhat likely that the reason for Ship A's action of trying to overtake Ship C on her port side in the situation where Ship A had approached the starboard side of Ship C was that Master A had taken the message sent by the Kanmon-Kaikyo Vessel Traffic Service Center (Kanmon MARTIS) for just a provision of information as an enforcement power because they were in the imperative form in English without message markers on the message, which were not adopted by Kanmon MARTIS.

NAM SUNG SHIPPING CO., LTD. should establish directions for practicing the overtaking navigation rule in the Kanmon Strait, keeping close communication with Kanmon MARTIS, and using AIS information appropriately, and then should train the crewmembers to be familiarized with them. The company also should train the crewmembers in order for them to have accurate knowledge of message markers and the master's relationship with the VTS, taking into account the amendments of the Act on Port Regulation on July 1, 2010.

4. In view of the results of the investigation of the collision of cargo ship MARINE STAR and container ship TAKASAGO, the JTSB made the following recommendations to the Panama Maritime Authority, the ASIA SHIPPING NAVIGATION S.A. as the owner of MARINE STAR and the BLUE MARINE MANAGEMENT CORP. as the management company of the ship on October 28, 2011:

The Panama Maritime Authority should guide the ASIA SHIPPING NAVIGATION S.A. to have the BLUE MARINE MANAGEMENT CORP. execute proper ship management to secure safe operation.

The ASIA SHIPPING NAVIGATION S.A. should instruct the BLUE MARINE MANAGEMENT CORP. to follow the navigation rules of the state where vessel call, prepare a proper watchkeeping arrangement and ensure the safety of navigation.

The BLUE MARINE MANAGEMENT CORP. should provide clear and specific instructions on the rules that must be obeyed to the ships that navigate in this sea area, and at the same time guide the ships to ensure safety by reinforcing watchkeeping arrangements on the bridge through the measures including the increase of the number of crew on bridge watchkeeping duty.

5. In view of the results of the investigation of the collision of car carrier CYGNUS ACE and multi-purpose cargo ship ORCHID PIA, the JTSB made the following recommendations to the Panama Maritime Authority and RCL SHIP MANAGEMENT PTE LTD as the management company of CYGNUS ACE on November 25, 2011:

The accident was caused by the two vessels, CYGNUS ACE and ORCHID PIA, colliding with each other while proceeding on intersecting courses at eastward offshore Oshima at night. In this accident, CYGNUS ACE did not maintain proper lookout for ORCHID PIA and attempted to avoid collision with ORCHID PIA by successions of small alterations of course to port using the autopilot, which constituted the cause of the collision.

The Panama Maritime Authority should direct RCL SHIP MANAGEMENT PTE LTD to instruct the masters and crew members under its management to comply with the provisions of "the Safety Management Manual" established in accordance with the International Safety Management Code for the Safe Operation of Ships and for Pollution Prevention.

RCL SHIP MANAGEMENT PTE LTD should make sure to instruct the masters and crew members under its management to operate vessels strictly in accordance with "the Safety Management Manual."

3. Statistics of investigations of marine accidents and incidents

The JTSB carried out investigations of marine accidents and incidents in 2011 as follows:

Regarding accident, 825 cases were carried over from 2010, and there were 998 cases newly launched in 2011. Of the total number, investigation reports for 1,027 cases were published, an interim report for 1 case was published, and 790 investigations were carried over to 2012.

Regarding incident, 101 cases were carried over from 2010, and there were 142 cases newly launched in 2011. Of the total number, investigation reports for 138 cases were published, and 103 investigations were carried over to 2012.

Among the publicized reports of 1,165 cases, two included recommendations, nine included safety recommendations, five included opinions, and forty-six included remarks.

Investigations of marine accidents and incidents in 2011

(cases)

Category	Carried over from 2010	Launched in 2011	Not applicable	Transferred to Tokyo Office	Total	Publication of investigation report	Recommendations	Safety recommendations	Opinions	Remarks	Carried over to 2012	Interim report
Marine accident	825	998	-6	0	1,817	1,027	2	9	5	46	790	1
Tokyo Office (Serious cases)	27	12		28	67	43	2	9	5	39	24	1
Regional Offices (Non-serious cases)	798	986	-6	-28	1,750	984				7	766	
Marine incident	101	142	-2	0	241	138	0	0	0	0	103	0
Tokyo Office (Serious cases)	1	0			1	1					0	
Regional Offices (Non-serious cases)	100	142	-2		240	137					103	
Total	926	1,140	-8	0	2,058	1,165	2	9	5	46	893	1

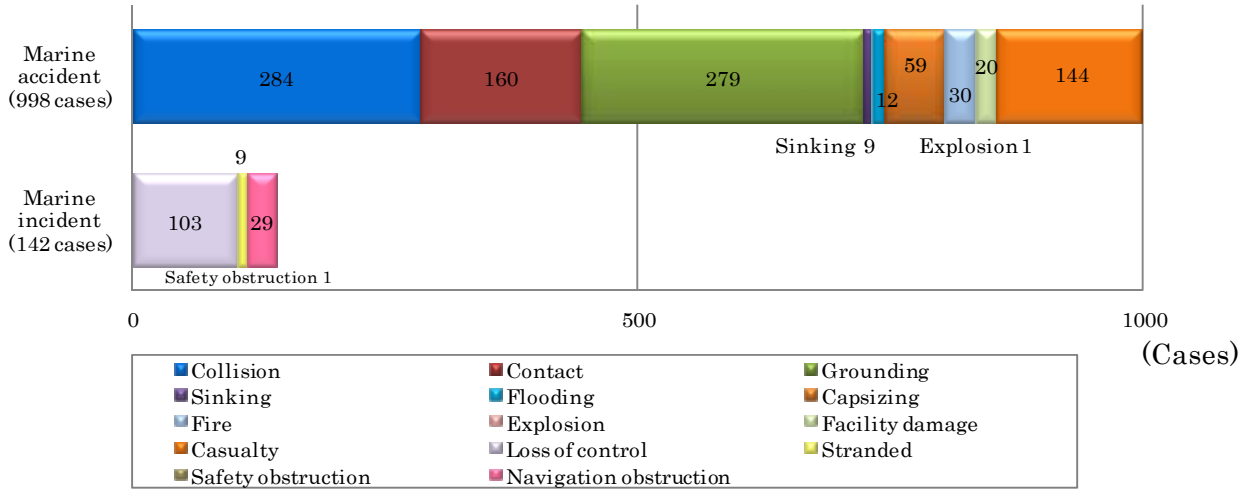
Note 1: The column “Not applicable” shows the number of cases which did not come under the category of accident or incident as defined in Article 2 of the Act for Establishment of the Japan Transport Safety Board.
Note 2: The column “Transferred to Tokyo Office” shows the number of cases where the investigation found out that it was serious and the jurisdiction was transferred from the regional office to the Tokyo Office.

4. Statistics of investigations launched in 2011

(1) Types of accidents and incidents

The 1,140 investigations launched in 2011 are classified by type as follows: With regard to marine accident cases, there were 284 cases of collision, 279 cases of grounding, 160 cases of contact, and 144 cases involving casualty. With regard to marine incidents, there were 103 cases of loss of control, including 61 cases of engine failure and 5 cases of out-of-fuel, 29 cases of navigation obstruction, and 9 cases of stranded. With regard to the objects of contact, they were quays in 41 cases, breakwaters in 24 cases, and piers in 15 cases.

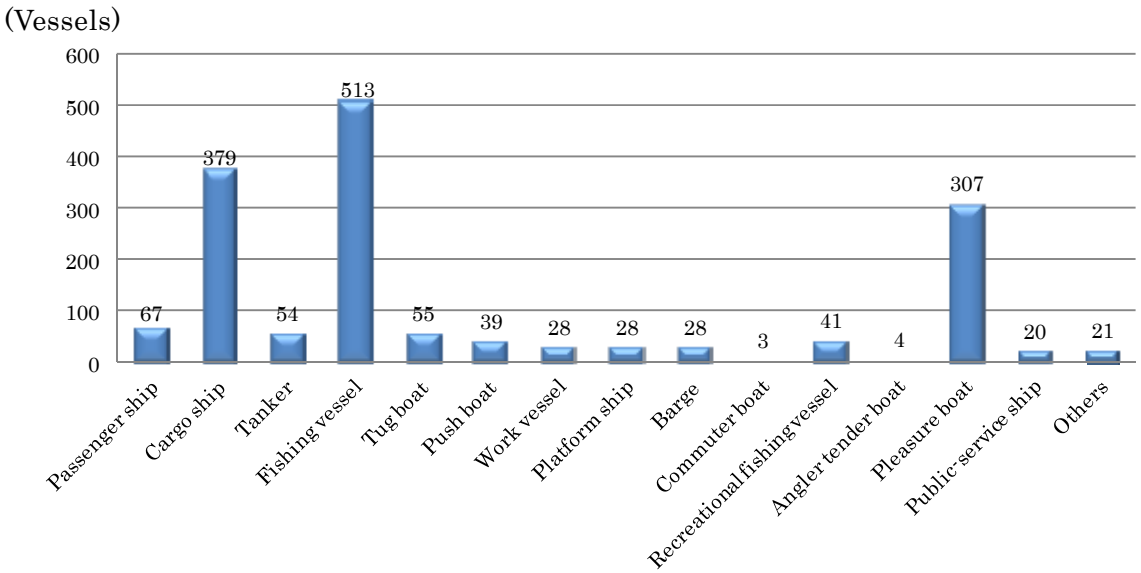
Number of marine accidents and incidents by type



(2) Types of vessels

The number of vessels involved in marine accidents and incidents is 1,587. Those vessels are classified by type as follows: 513 fishing vessels, 378 cargo ships, 307 pleasure boats, 67 passenger ships, and 55 tug boats. The total of the three categories of fishing vessels, cargo ships, and pleasure boats is 1,199, accounting for nearly 80 % of all the accidents and incidents.

Number of vessels involved in marine accidents and incidents by type



The number of foreign-registered vessels involved in marine accidents and incidents is 108, and they are classified by accident type as follows: 56 vessels in collisions, 21 vessels in contacts, and 17 vessels in groundings. As for the nationality of vessels, 34 vessels were registered in Panama, 16 vessels were in South Korea, 13 vessels were in Cambodia, and 6 vessels were in Singapore and Belize. The number of vessels registered in Asian countries or regions is 46, accounting for about 43 %.

Number of foreign-registered vessels by nationality

(Vessels)

Panama	34	Belize	6	Bahamas	3	Vietnam	2
South Korea	16	Hong Kong	5	Liberia	3	Netherlands	2
Cambodia	13	Malta	4	Antigua and Barbuda	3	Others	6
Singapore	6	China	3	Sierra Leone	2	Total	108

(3) Number of casualties

The number of casualties is 470, consisting of 137 deaths, 33 missing persons, and 300 injured persons. By type of vessel, 177 persons in fishing vessels and 171 persons in pleasure boats. By type of accident, 169 persons in casualties (not involved in other types of accidents), 143 persons in collision, 66 persons in sinking or capsizing, 52 persons in contact.

With regard to persons dead or missing, 97 persons were involved in fishing vessel accidents, 38 persons in pleasure-boat accidents, and 12 persons in cargo-ship accidents; it indicates that dead or missing cases have occurred more frequently in fishing vessel accidents.

Tragic accidents that occurred with loss of many human lives include: the disappearance of a fishing vessel off Hachinohe, Aomori Prefecture in April resulting in 3 deaths and 3 missing persons; the capsizing of a passenger boat on a river-cruise tour in Tenryu River in Hamamatsu City in August, resulting in 5 deaths; and a fire on a fishing vessel off Hachijo Shima (Hachijo Island), Tokyo, in November, resulting in 2 deaths and 2 missing persons.

Number of casualties (marine accident)

(Persons)

2011										
Vessel Type	Dead			Missing			Injured			Total
	Crew	Passenger	Others	Crew	Passenger	Others	Crew	Passenger	Others	
Passenger ship	4	3	0	0	0	0	6	17	0	30
Cargo ship	9	0	2	1	0	0	16	0	0	28
Tanker	2	0	0	0	0	0	3	0	0	5
Fishing vessel	69	0	0	28	0	0	79	0	1	177
Recreational fishing vessel	2	1	0	1	0	0	3	21	3	31
Pleasure boat	17	0	18	1	0	2	42	0	91	171
Others	9	1	0	0	0	0	12	5	1	28
Total	112	5	20	31	0	2	161	43	96	470
	137			33			300			

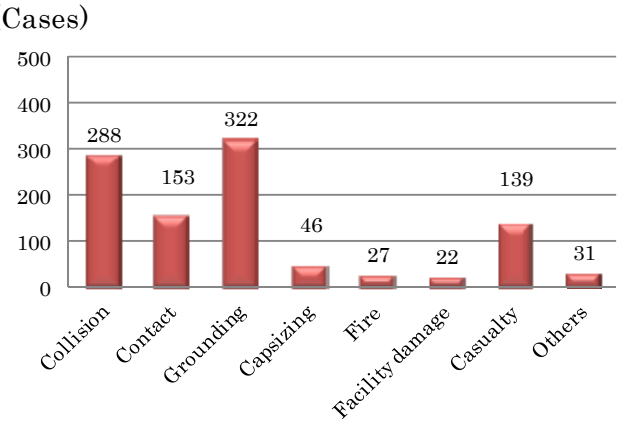
5. Publication of investigation reports

The number of investigation reports of marine accidents and incidents publicized in 2011 is 1,165 (the actual number of accidents and incidents is 1,166 because there is one report dealing with more than one accident): 1,028 marine accidents (among them, 43 are serious), and 138 marine incidents (among them, one is serious).

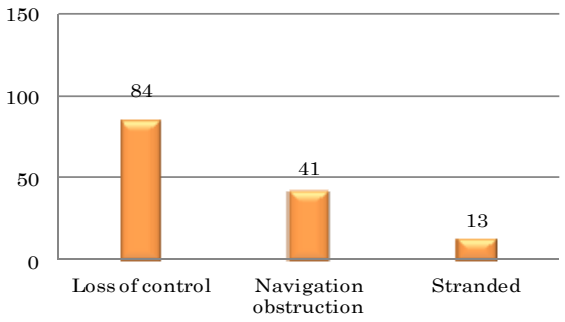
Looking those accidents and incidents by type, there were 322 cases of grounding, 288 cases of collision, 153 cases of contact, and 139 cases of casualty in marine accidents. Whereas in marine incidents, there were 84 cases of losses of control, including 60 cases of engine failure, 5 cases of rudder failure, and 3 cases of out-of-fuel, 41 cases of navigation obstruction, and 13 cases of stranded.

As for the objects of contact, 47 were quays, 20 were breakwaters, and 15 were piers.

Marine accidents (1,028 cases): reports publicized in 2011



Marine incidents (138 cases): reports publicized in 2011



The number of vessels involved in marine accidents and incidents is 1,570 vessels. Looking those vessels by type, the vessels involved in marine accidents were 429 fishing vessels, 344 cargo ships, 268 pleasure boats, 60 tug boats, and 56 passenger ships. The vessels involved in marine incidents were 49 fishing vessels, 39 pleasure boats, 19 cargo ships, and 18 passenger ships. The sum of fishing vessels, cargo ships, and pleasure ships involved in accidents or incidents is 1,148, accounting for over 70 % of all the vessels involved in accidents or incidents.

Number of vessels involved in marine accidents and incidents by type

(Vessels)

Type	Passenger ship	Cargo ship	Tanker	Fishing vessel	Tug boat	Push boat	Work vessel	Barge	Lighter	Commuter boat	Recreational fishing vessel	Angler tender boat	Pleasure boat	Public-service ship	Others	Total
Marine accident	56	344	47	429	60	29	31	28	32	4	48	5	268	24	18	1,423
Marine incident	18	19	2	49	5	3	1	1	4	0	1	0	39	1	4	147
Total	74	363	49	478	65	32	32	29	36	4	49	5	307	25	22	1,570
%	4.7 %	23. 1%	3.1 %	30. 5%	4.1 %	2.0 %	2.0 %	1.9 %	2.3 %	0.3 %	3.1 %	0.3 %	19. 6%	1.6 %	1.4 %	100.0 %

The serious marine accidents for which investigation reports were publicized in 2011 are listed in the table below.

List of publicized investigation reports on serious accidents (2011)

No.	Date of publication	Date of the accident	Vessel type and name accident type	Location	Deaths/Injuries
1	Jan. 28, 2011	Oct. 25, 2009	Recreational fishing vessel TAIKAI MARU Contact with a rock	West of Misumi Lighthouse, Kamiamakusa City, Kumamoto Prefecture Around 272° true, 480m from Misumi Lighthouse	1 fatality (Angler) 2 injured (1 skipper, 1 angler)
2	Jan. 28, 2011	Dec. 11, 2009	Motorboat NO FIGHT Capsizing	Vicinity of Break Water (B) in East Port Area, Tomakomai Port, Tomakomai City, Hokkaido Prefecture Around 001° true, 2,530m from Break Water Lighthouse, East Port Area, Tomakomai Port	6 fatalities (1 operator and 5 other occupants)
3	Jan. 28, 2011	May 29, 2010	Fishing vessel NIKKO MARU Grounding	North east coast of Tajiri Port, Iwami Town, Tottori Prefecture Around 232° true, 800m from Obaneo Lighthouse	1 injured (Deckhand)
4	Jan. 28, 2011	Jun. 7, 2010	Passenger ferry ORANGE 8 Fishing vessel HOSEI MARU Collision	Off southeast of Jizousaki, Shoudoshima Town, Kagawa Prefecture Around 176° true, 1.3 nautical mile from Jizousaki Lighthouse	1 injured (Skipper of HOSEI MARU)
5	Jan. 28, 2011	Jun. 25, 2010	Recreational fishing vessel SANKO MARU Capsizing	Motonuwa Port, Nuwajima Island, Matsuyama City, Ehime Prefecture Around 167° true, 1,300m from Okozeiwa Light Beacon	None
6	Feb. 25, 2011	Nov. 13, 2009	Ferry ARIAKE Listing	Off the southeast of Kiho Town, Mie Prefecture (Kumanonada) Around 115.5° true, 14.0 nautical miles from East Break Water North Lighthouse, Udono Port	3 injured (1 crewmember, 2 passengers)
7	Feb. 25, 2011	Jul. 28, 2010	Chemical tanker SANSHUN MARU Cargo ship SHIN KISSHO Collision	Bisan Seto North Passage Around 256° true, 2,000m from Ushijima Light Beacon, Marugame City, Kagawa Prefecture	None
8	Mar. 25, 2011	Apr. 30, 2009	Passenger ship AN-EI GO No.98 Injury to passengers	Off the northeast of the Iriomote Shima (Iriomote Island), Taketomi Town, Okinawa Prefecture Around 137° true, 5.6 nautical miles from Hatomajima Lighthouse	2 injured (Passengers)

No.	Date of publication	Date of the accident	Vessel type and name accident type	Location	Deaths/Injuries
9	Mar. 25, 2011	Aug. 11, 2009	Cement carrier FUYO MARU No.3 Fishing vessel SHOFUKU MARU No.18 Collision	Off the west of Esashi Port, Esashi Town, Hokkaido Prefecture Around 278° true, 13.7 nautical miles from Kamomejima Lighthouse	None
10	Mar. 25, 2011	Oct. 24, 2009	Fishing vessel KOFUKU MARU No.1 Capsizing	Off the south-southwest of Kozu Shima (Kozu Island), Izu Syoto (Izu Islands) Around 195° true, 39 nautical miles from Kozu Shima Island Lighthouse, Kozu Shima Village, Tokyo	1 fatality (Skipper) 4 missing (Crewmembers) 3 injured (Crewmembers)
11	Apr. 22, 2011	Jun. 23, 2008	Fishing vessel SUWA MARU No.58 Sinking	Around 350km east from Inubosaki, Choshi City, Chiba Prefecture	4 fatalities (1 boatswain, 3 crewmembers) 13 missing (1 master, 1 chief fisher, 1 chief engineer, 1 chief radio officer, 1 chief oiler, 8 crewmembers) 3 injured (Crewmembers)
12	Apr. 22, 2011	Mar. 20, 2009	Container ship KUO CHANG (Hong Kong) Fatality to mooring workmen	Container Berth 18, Kobe District, Hanshin Port Around 236° true, 1,150m from the Kobe No. 6 Break Water Lighthouse, Kobe City, Hyogo Prefecture	2 fatalities (Workmen)
13	Apr. 22, 2011	Jul. 16, 2010	Cargo ship SENEI MARU Fishing vessel TOSHI MARU No.2 Fishing vessel TOSHI MARU No.3 Collision (with Fishing net)	Off Kamegakubi, Kurahashi Shima (Kurahashi Island), Kure City, Hiroshima Prefecture Around 034° true, 3.3 nautical miles from Akisengai-iwa Light Beacon	None
14	Jun. 24, 2011	Sep. 1, 2008	Cargo ship RICKMERS JAKARTA (Republic of the Marshall Islands) Barge SHINEI MARU No.18 Fatality and injury to workers	No. 3 pier of Yamashita Wharf in Section 1 of Yokohama Quarter, Keihin Port Around 266° true, 1,400m from Yokohama Bay Bridge Light (P1), Yokohama City, Kanagawa Prefecture	1 fatality (Stevedore) 3 injured (Stevedores)
15	Jun. 24, 2011	Oct. 27, 2009	Container ship CARINA STAR (Republic of Korea) Destroyer KURAMA Collision	Vicinity of Moji Saki, Kanmon Passage, Kanmon Port Around 294° true, 330m from Moji Saki Lighthouse, Kitakyushu City, Fukuoka Prefecture	6 injured (Crew of KURAMA)

No.	Date of publication	Date of the accident	Vessel type and name accident type	Location	Deaths/Injuries
16	Jun. 24, 2011	Jul. 29, 2010	Container ship SKY LOVE (Republic of Korea) Cargo ship HAEJIN (Republic of Korea) Collision	Off the east-northeast of Okinoshima Island, Munakata City, Fukuoka Prefecture Around 069° true, 15.5 nautical miles from Okinoshima Lighthouse	None
17	Jul. 29, 2011	Nov. 16, 2009	Dive boat STYLE Fatality to a diver	Agonoura Port, Zamami Village, Okinawa Prefecture Around 290° true, 1,100m from Ushinoshima Lighthouse, Zamami Village	1 fatality (Instructor)
18	Jul. 29, 2011	Dec. 21, 2009	Tanker EISHIN MARU No.17 Chemical tanker COSMO BUSAN (Republic of Korea) Collision	Crossing of Bisan Seto North Passage and Mizushima Passage Around 262° true, 1.1 nautical miles from Nabeshima Lighthouse, Sakaide City, Kagawa Prefecture	None
19	Jul. 29, 2011	Sep. 8, 2010	Chemical tanker KINYO MARU Tugboat KAIRYU Barge MARUSEN 2 Collision	Bisan Seto East Passage in the north west of Ogi Shima (Ogi island), Takamatsu City, Kagawa Prefecture Around 303° true, 1,700m from Ogishima Lighthouse	None
20	Aug. 26, 2011	Oct. 11, 2010	Tugboat FUMI MARU No.28 Barge YAMAKA 57SD103 Fishing vessel NANKAI MARU Collision	West Entrance of Kurushima Strait Around 225° true, 1.8 nautical miles from Ogeshima Lighthouse, Imabari City, Ehime Prefecture	1 fatality (Skipper of NANKAI MARU)
21	Sep. 30, 2011	Nov. 1, 2009	Passenger ship RYUGUJO Fatality to a crew member	Toba Port, Toba City, Mie Prefecture Around 213° true, 300m from East Break Water Lighthouse, Toba Port	1 fatality (Engine-room rating)
22	Sep. 30, 2011	Nov. 28, 2009	Recreational fishing vessel SHIBUSAKI No.10 Sinking	Off the east coast of Suwa Lake, Suwa City, Nagano Prefecture Around 231° true, 460m from Nanatsugama Triangulation Point, Suwa City	3 injured (Anglers)
23	Sep. 30, 2011	Jul. 11, 2010	Recreational fishing vessel HANABUSA Injury to an angler	Off the southwest of Rukan Reef in the west of Itoman City, Okinawa Prefecture Around 221° true, 8 nautical miles from Rukan Reef Lighthouse, Itoman City	1 injured (Angler)

No.	Date of publication	Date of the accident	Vessel type and name accident type	Location	Deaths/Injuries
24	Sep. 30, 2011	Jul. 19, 2010	Motorboat KAISER Contact with a mooring dolphin	Tokushima Section 1 of Tokushima Komatsushima Port, Tokushima Prefecture Around 184° true, 740m from Tokushima Okinosu Training Wall Lighthouse, Tokushima City	6 injured (Occupants)
25	Sep. 30, 2011	Jul. 24, 2010	Fishing vessel WAKAEI MARU Small combined-use boat FUKUJU MARU Collision	Nagasu Port, Usa City, Oita Prefecture Around 203° true, 500m from Training Wall Lighthouse, Buzen-nagasu Port in Usa City	6 injured (Occupants of WAKAEI MARU)
26	Sep. 30, 2011	Jul. 30, 2010	Pleasure boat KAIKYO MARU Pleasure boat KOKURA MARU Collision	Vicinity of Tokomasari Reef, Kyan Port, Itoman City, Okinawa Prefecture Around 297° true, 970m from Tokomasari Reef Light Beacon	None
27	Sep. 30, 2011	Sep. 17, 2010	Recreational fishing vessel ICHIFUKU MARU Motorboat KANA MARU Collision	Off Ibusuki Port, Ibusuki City, Kagoshima Prefecture Around 071° true, 1,320m from East Break Water Lighthouse, Ibusuki Port	None
28	Oct. 28, 2011	Oct. 14, 2008	Car carrier PYXIS (Republic of Panama) Fire	Off the east of Kinkasan, Ishinomaki City, Miyagi Prefecture Around 089° true, 340 nautical miles from Kinkasan Lighthouse	1 fatality (Chief engineer)
29	Oct. 28, 2011	Feb. 20, 2009	Cargo ship MARINE STAR (Republic of Panama) Container ship TAKASAGO Collision	On the Bisan Seto East Traffic Route (off Sakaide Port, Sakaide City, Kagawa Prefecture) Around 062° true, 2,300m from Koseijima Lighthouse	None
30	Oct. 28, 2011	Mar. 21, 2010	Cargo ship DONG PHONG (Vietnam) Grounding	Northeast coast of Ishikari-Wan Port, Hokkaido Prefecture Around 101° true, 1.2 nautical miles from Ishikari-Wan Port North Break Water North Lighthouse	None
31	Oct. 28, 2011	Apr. 29, 2010	Oil tanker TAIYO MARU No.32 Gravel carrier KATSU MARU No.38 Collision	Irago Channel Traffic Route Around 183° true, 2,640m from Irago Cape Lighthouse, Tahara City, Aichi Prefecture	None
32	Oct. 28, 2011	Oct. 4, 2010	Motorboat NIKKO MARU No.2 Capsizing	Vicinity of Estuary of Omono River, Akita City, Akita Prefecture Around 167° true, 7.7km from Akita Old South Break Water Lighthouse	1 fatality (Operator) 1 injured (Occupant)

No.	Date of publication	Date of the accident	Vessel type and name accident type	Location	Deaths/Injuries
33	Nov. 25, 2011	Mar. 10, 2009	Car carrier CYGNUS ACE (Republic of Panama) Multi-purpose cargo ship ORCHID PIA (Republic of Korea) Collision	Off the east of Oshima Island, Oshima-cho, Tokyo 087° true, 7.6 nautical miles from Ryuosaki Lighthouse	16 missing (Crew of ORCHID PIA)
34	Nov. 25, 2011	Jan. 12, 2010	Fishing vessel YAMADA MARU No.2 Sinking	Off the west-northwest of Osezaki, Fukue Shima (Fukue Island), Goto City, Nagasaki Prefecture Around 301° true, 46 nautical miles from Osezaki Lighthouse	10 fatalities (1 master, 1 chief engineer, 1 boatswain, 7 deckhands)
35	Nov. 25, 2011	May 5, 2010	Personal watercraft RED PEARL Fatality and injury to riders	Near the Regulating Gate on Chiba Prefecture Side, Upper Stream Side of Estuary Barrage of Tone River, Tounosho Town, Chiba Prefecture Around 078° true, 1,875m from Kanoko Triangulation Point	3 fatalities (1 rider, 2 rescuers) 1 injured (Operator)
36	Nov. 25, 2011	May 6, 2010	Personal watercraft MINPA Fatality to a rider	Estuary of Sagami River, Hiratsuka City, Kanagawa Prefecture Around 076° true, 4,400m from West Break Water Lighthouse, Oiso Port, Oiso Town	1 fatality (Rider)
37	Nov. 25, 2011	May 10, 2010	Oil tanker SHINSUI MARU No.8 Fishing vessel SUMIYOSHI MARU No.8 Collision	West-southwest of Kanazawa Port, Kanazawa City, Ishikawa Prefecture Around 264° true, 15.3 nautical miles from West Break Water Lighthouse, Kanazawa Port	1 missing (Ordinary seaman of SUMIYOSHI MARU No.8) 1 injured (Master of SUMIYOSHI MARU No.8)
38	Nov. 25, 2011	May 23, 2010	Cargo ship KATSU MARU No.8 Grounding	Vicinity of the eastern end of Hososhimasaki, Hososhima Port, Hyuga City, Miyazaki Prefecture Around 323° true, 860m from Hososhima Lighthouse in Hyuga City	4 fatalities (1 master, 3 crew members)
39	Nov. 25, 2011	Jun. 24, 2010	Passenger ship EIKYU MARU No.8 Contact with a light buoy	Ofunase South Light Buoy in the south of Amakusakamishima Island, Amakusa City, Kumamoto Prefecture Around 233° true, 660m from Nishinohara South Break Water Lighthouse, Miyada Port in Amakusakamishima Island	1 injured (Ordinary seaman)

No.	Date of publication	Date of the accident	Vessel type and name accident type	Location	Deaths/Injuries
40	Nov. 25, 2011	Sep. 18, 2010	Dive boat SOUTHWARD PASSAGE II Grounding	Southeast end of Inanbise, off the south of Toya Port, Yomitan Village, Okinawa Prefecture Around 178° true, 1.2 nautical miles from Dai-ni Oki Break Water South Lighthouse, Toya Port	None
41	Nov. 25, 2011	Feb. 22, 2011	Angler tender boat SETO MARU Capsizing	Vicinity of Suzu Shima (Suzu Island), off the west of Azashi Port, Kushimoto Town, Wakayama Prefecture Around 302° true, 5.6 nautical miles from Shionomisaki Lighthouse	1 fatality (Skipper) 6 injured (1 crew member, 5 anglers)
42	Dec. 16, 2011	Apr. 27, 2010	Fishing vessel FUDO MARU No.3 Fatality to a crew member	Off the northeast of Choshi Port, Choshi City, Chiba Prefecture Around 034° true, 11.0 nautical miles from Inubosaki Lighthouse	1 fatality (Deckhand)
43	Dec. 16, 2011	Jul. 27, 2010	Cargo ship OCEAN SEAGULL (Republic of Panama) Cement carrier SUMISE MARU No.2 Collision	Yokohama District 5, Keihin Port Around 097° true, 1,180m from Light A at Yokohama Honmoku Fishing Piers, Yokohama City, Kanagawa Prefecture	None

List of publicized investigation reports on serious incidents (2011)

No.	Date of publication	Date of the incident	Name of the incident	Location	
1	Dec. 16, 2011	Aug. 11, 2010	Passenger ferry OSADO MARU Navigation obstruction	Approximately 13.5 nautical miles off the east of Sadogashima, Sado City, Niigata Prefecture Around 097° true, 13.5 nautical miles from North Break Water Lighthouse, Suizu Port in Sado City, Niigata Prefecture	