JAPAN TRANSPORT SAFETY BOARD
ANNUAL REPORT 2013

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JTSB Japan Transport Safety Board

JTSB Mission

We contribute to
-preventing the occurrence of accidents and
-mitigating the damage caused by them,
thus improving transport safety while raising public awareness, and thereby protecting the people's lives by
-accomplishing appropriate accident investigations which thoroughly unveil the causes of accidents and damages incidental to them, and
-urging the implementation of necessary policies and measures through the issuance of safety recommendations and opinions or provision of safety information.

JTSB Principles

1. Conduct of appropriate accident investigations

We conduct scientific and objective accident investigations separated from apportioning blame and liability, while deeply exploring into the background of the accidents, including the organizational factors, and produce reports with speed. At the same time, we ensure that the reports are clear and easy to understand and we make efforts to deliver information for better understanding.

2. Timely and appropriate feedback

In order to contribute to the prevention of accidents and mitigation of the damage caused by them, we send messages timely and proactively in the forms of recommendations, opinions or factual information notices nationally and internationally. At the same time, we make efforts towards disclosing information in view of ensuring the transparency of accident investigations.

3. Consideration for victims

We think of the feelings of victims and their families, or the bereaved appropriately, and provide them with information regarding the accident investigations in a timely and appropriate manner, and respond to their voices sincerely as well.

4. Strengthening the foundation of our organization

We take every opportunity to develop the skills of our staff, including their comprehensive understanding of investigation methods, and create an environment where we can exchange opinions freely and work as a team to invigorate our organization as a whole.

On the Fifth Anniversary of the JTSB

This October marks the fifth anniversary of the establishment of the Japan Transport Safety Board (JTSB) since it was inaugurated through the merger and reorganization of the Aircraft and Railway Accidents Investigation Commission and the cause finding part of the Japan Marine Accident Inquiry Agency on October 1, 2008.

Just after the establishment of the JTSB, the overall number of investigations substantially increased because marine accidents and incidents were included in its field. Therefore, we had to devise ideas to conduct investigations and deliberations efficiently. However, while maintaining our position as a specialized accident investigation agency, we endeavored to thoroughly clarify the causes of aircraft, railway and marine accidents and incidents and to make and publish investigation reports as quickly as possible. Based on the results of the investigations, we also made recommendations or stated opinions, as the occasion demanded, for administrative organizations and the parties relevant to the cause of the accidents and incidents, thus calling for efforts to prevent a recurrence of similar accidents and incidents in the future.

In carrying out our day-to-day investigation activities, we made efforts to enhance the knowledge and expertise necessary for accident investigations while exchanging views with foreign accident investigation organizations in order to improve our accident investigators' knowledge while keeping in step with the continuous development of new technologies and at the same time, actively taking part in seminars and other meetings involving experts.

In these circumstances, the alleged disclosure of information in the course of the investigation of the Train Derailment Accident between Tsukaguchi and Amagasaki Stations on the Fukuchiyama Line of the West Japan Railway Company came to light in 2009. Consequently, public confidence in the investigation report and our investigations was undermined.

After one and a half years of verification efforts by victims of the accident and their families, bereaved families and experts, it was confirmed that the information leakage had no influence on the investigation report. However, in order to deal with the problems revealed in the verification process, we launched the Advisory Meeting for Duty Improvement in July 2011 and, in line with recommendations from these experts, we also came up with the Duty Improvement Action Plan in March 2012 which specified the missions we must pursue as an organization and four action principles. In this way, we endeavored to improve our duties by combining all of our resources. In March 2013, we reviewed the contents of the Action Plan in light of the progress of efforts made under the initiative. At present, we are making further efforts to improve our activities.

In order to release information in an appropriate and timely manner, we established a regular press conference featuring the chairman starting in August 2011. Through this press conference, we provide a broad range of information mainly about the progress of accident and incident investigations, and the achievements of our duty improvement efforts. From the point of view of better dealing with the voices of accident victims and other related parties, we established the Victims and their Families Liaison Office in April 2012 in order to ensure effective two-way communication by providing victims and their families with information mainly about accident investigations whenever necessary.

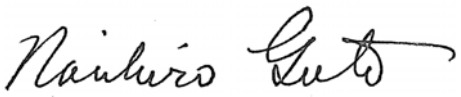
We have also made efforts to issue more detailed information about our investigation activities to help prevent the recurrence of accidents and incidents. For example, we started providing JTSB Digests and launched a web-based marine accident map on which users can easily search for investigation reports. We are also striving to make our website easier to read and use.

Now, after the first five years of the JTSB, the range of accidents and incidents we are required to investigate is expanding and at the same time, we have noted an increase in requests to and expectations of the JTSB. In response to these expectations, while keeping in mind the social responsibilities we shall fulfill from now on, we intend to strengthen our activities even more actively for the purpose of enhancing transport safety.

The JTSB Annual Report 2013 is designed to introduce our activities as broadly as possible and it includes summaries of our accident and incident investigation reports published in 2012 on each of the transport modes of aircraft, railway and marine, as well as summaries of accidents and incidents which occurred in 2012, with related statistics and materials and columns by our investigators.

We hope that this Annual Report will enable you, the readers, to have a better understanding of what the JTSB is and that it will also contribute to improving the safety of international transport.

Your understanding of, and cooperation with, our activities is deeply appreciated.



Norihiro Goto
Chairman
July 2013

A Message on the Fifth Anniversary of the JTSB

Seiji Abe
Chairman, Advisory Meeting for Duty Improvement of the JTSB
Professor, Kansai University

Herbert A. Simon, a political scientist and the winner of the 1978 Nobel Prize in Economics, came up with the "Bounded Rationality" concept to explain that there are boundaries in the rationality of the human being. According to Simon, because there are boundaries in the intelligent ability of the human being, he or she cannot foresee all unexpected situations in the future. (A. Simon, Administrative Behavior, Fourth Edition, S & S International, 1997.) Learning from problems and accidents which have actually occurred in the past in order to broaden the outlook and scope of understanding is useful in compensating for these human boundaries. In other words, we must learn from our failures. Herein lies the importance of accident investigation activities for the purpose of preventing a recurrence of similar accidents and incidents.

In modern society, the role of transport is decisively important. It may be considered to be a fundamental condition for the existence of modern society. Paul Virilio, a French cultural theorist, pinpointed two characteristics which decisively differentiate modern civilization from past civilizations. The first is "speed" and the second is "accidents" resulting from speed. (Paul Virilio, L' accident originel, Editions Galilée, 2005.) Speed and accidents are accompaniments to transport in today's society, and it is the Japan Transport Safety Board that endeavors to reduce the number of accidents, which are a negative side of the convenience the speed, through accident investigations.

Incidentally, so that accident investigation by a third-party organization is fruitful and that its investigation results may be broadly accepted by society, conditions such as those mentioned below must be fulfilled. First of all, investigations must be carried out in a fair and impartial manner. Secondly, a professional high-level investigation must be conducted. Thirdly, even if an investigation report has a high level of technical content, its form and descriptive style must be easy to read and understand for those affected by the accident and the general public. Finally, the parties relevant to the cause of the accident and the investigative organization should not have the relationship of questioner and the questioned, but rather, they should have a relationship which, while being strained, enables both sides to work together to discover the causes of the accident.

In September 2009, the information disclosure incident involving a member of the former Aircraft and Railway Accidents Investigation Commission, the predecessor to the JTSB, which took part in the investigation of the derailment accident on the Fukuchiyama Line of the West Japan Railway Company, came to light. This person allegedly leaked information about the progress of the investigation and a draft of the report before its release to parties relevant to the cause of the accident, thereby significantly damaging the impartiality, neutrality and reliability of the Commission as an accident investigation organization. The incident occurred when the JTSB's predecessor was in operation, but the JTSB understood the case as a serious problem posing a question as to the nature of an accident investigation organization, and it tried to recover the confidence of the public which had been damaged by this incident by making efforts to reform.

Therefore, the JTSB started a review to improve its duties and a reform of the accident investigation system throughout its organization in FY2011.

When the Aircraft Accident Investigation Commission was reorganized as the Aircraft and Railway Accidents Investigation Commission in 2001, I made the comment below upon request from the press.

> "Now, one small, red fish is in the tank. Will this small fish grow up to be a golden red carp in the future or will it end up as an ordinary goldfish? This latest move only means the addition of the railway division to the new investigation organization, and no evaluation can be made at the present time."

Ten years have passed since then. The JTSB is growing strongly with continuous efforts made to reform its structure. I believe it may become a fine golden red carp in the not too distant future.

The National Transportation Safety Board of the United States is known internationally as an accident investigation organization which is similar to the JTSB. The NTSB marked its 40th anniversary in 2007. On that occasion, the then NTSB Chairman Mark V. Rosenker made the following comment in his commemorative message:

> "I have often said that the NTSB is one of the best bargains in government. With fewer than 400 employees, the Safety Board is responsible for investigating more than two thousand transportation accidents a year. In our 40 years, our independent investigations have played an important part in improving the safety of every mode of transportation. As a result of the efforts of the Safety Board and other government agencies, manufacturers, operators and stakeholders, the United States enjoys a safe transportation system that is the envy of the world."

The JTSB will mark the tenth anniversary of its establishment in 2018. I do hope that a similar commemorative message will be made on that occasion by the JTSB Chairman, with continuous efforts to be made for reforming JTSB organization and beefing up its accident investigation activities.

Japan Transport Safety Board
Annual Report 2013

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Chapter 1 Summary of investigation activities in 2012

1. Accident investigation activities

When aircraft, railway or marine accidents/incidents occur, the JTSB designates an investigator-in-charge and accident investigators to conduct investigations to determine the cause of the accident or incident. When and where accidents or incidents will occur is unpredictable. Therefore, we are ready at all times to undertake investigation activities quickly when accidents or incidents occur.

Various accidents and incidents occurred in 2012. 18 accidents occurred in the aircraft field. One of these was in January when a privately owned Max Enterprise Axis R503 was running on the runway after landing and the aircraft hit the ground because its aft fuselage was lifted up by a gust of wind from behind on the left. Another was in March, when a Boeing 777-200 operated by Japan Airlines performed a go-around and the lower part of its aft fuselage made a tail strike with the surface of the runway. We investigated a total of 39 aircraft accidents in 2012, including 21 cases carried over from 2011. We also investigated 23 serious aircraft incidents in 2012, of which ten cases newly occurred in 2012 and the remaining 13 cases had been carried over from 2011.

We completed investigations into 15 aircraft accidents and seven serious aircraft incidents, and published investigation reports on these cases.

Of the investigation reports published in 2012, we stated our opinion to the Minister of Land, Infrastructure, Transport and Tourism concerning a serious incident involving a Boeing 737-800, operated by Air Nippon Co., Ltd., on January 27, 2012. On September 28, we made recommendations to the Minister of Land, Infrastructure, Transport and Tourism concerning an accident involving a privately owned Piper PA-46-350P.

In addition, on June 29, we made safety recommendations to the Federal Aviation Administration of the United States of America concerning a serious incident involving a McDonnell Douglas MD-90-30, operated by Japan Airlines International.

20 accidents occurred in the railway field in 2012. One of these accidents was a fire breaking out from under the floor of a train car during a stop at Tateyama Station on Tateyama Line of the Toyama Chihou Tetsudou Inc. in January, and another was a train derailment in which the train ran into earth and sand accumulated on the tracks between Oppama Station and Keikyu-Taura Station on Main Line of Keikyu Corporation in September. We investigated a total of 36 railway accidents, including 16 cases carried over from 2011. We also investigated seven serious railway incidents in 2012, of which five cases newly occurred in 2012 and the remaining two cases had been carried over from 2011.

We completed investigations into 13 railway accidents and one serious railway incident, and published investigation reports on these cases.

In the investigation reports published in 2012, we made recommendations to the Hokkaido Railway Company on November 30, 2012 concerning a serious incident which occurred on its Sekisho Line.

We launched investigations into 981 accidents in the maritime field in 2012. One of these accidents was when a crew member died of dyspnea in February when he inhaled a harmful gas in the cargo tank of the chemical tanker KYOKUHO MARU No. 2 and another was in September when the 25,074-gross-ton, Panamanian registered cargo ship NIKKEI TIGER collided with the fishing vessel HORIEI MARU. We investigated a total of 1,771 marine accidents in 2012, including 790 cases carried over from 2011. We also investigated 268 marine incidents in 2012, of which investigations of 165 cases were launched in 2012 and the remaining 103 cases had been carried over from 2011.

We completed investigations into 978 marine accidents and 158 marine incidents, and published investigation reports on these cases.

In the investigation reports published in 2012, we made recommendations to Shogakukan-Shueisha Productions Co., Ltd. and the Shizuoka Prefectural Board of Education on January 27, 2012 concerning an accident in which a cutter (unnamed) capsized. On August 31, 2012, we made safety recommendations to the owner and the operator of the pure car carrier VEGA LEADER concerning an accident in which its longshoremen sustained injuries. In total, we issued recommendations in six cases, opinions in four cases and safety recommendations in two cases.

Accident investigators must have diversified knowledge because they are responsible for investigating accidents and incidents and at the same time drafting proposals as well as recommendations and opinions concerning the measures to be taken to prevent the recurrence of accidents and incidents and to mitigate damage caused by such accidents and incidents, inviting comments from the parties related to the causes. Therefore, they actively participate in seminars at home and abroad in an effort to improve their professional knowledge and attend international conferences to share relevant information on accident investigations with foreign countries.

We will continue to conduct thorough investigations to determine the causes of aircraft, railway and marine accidents and incidents and publish investigation reports as quickly as possible, and then, based on the results of the investigations, we will make recommendations or state opinions, as necessary, to relevant administrative organizations and the parties related to the causes, thereby striving to prevent a recurrence of such accidents and incidents.

Chapter 2 Aircraft accident and serious incident investigations

1. Aircraft accidents and serious incidents to be investigated

<Aircraft accidents to be investigated>

◎ **Paragraph 1, Article 2 of the Act for Establishment of the Japan Transport Safety Board** (Definition of aircraft accident)

The term "Aircraft Accident" as used in this Act shall mean the accident listed in each of the items in paragraph 1 of Article 76 of the Civil Aeronautics Act.

◎ Paragraph 1, Article 76 of the Civil Aeronautics Act (Obligation to report)

1. Crash, collision or fire of aircraft;
2. Injury or death of any person, or destruction of any object caused by aircraft;
3. Death (except those specified in Ordinances of the Ministry of Land, Infrastructure, Transport and Tourism) or disappearance of any person on board the aircraft;
4. Contact with other aircraft; and
5. Other accidents relating to aircraft specified in Ordinances of the Ministry of Land, Infrastructure, Transport and Tourism.

◎ Article 165-3 of the Ordinance for Enforcement of the Civil Aeronautics Act

(Accidents related to aircraft prescribed in the Ordinances of the Ministry of Land, Infrastructure, Transport and Tourism under item 5 of the paragraph1 of the Article 76 of the Act)

The cases (excluding cases where the repair of a subject aircraft does not correspond to the major repair work) where navigating aircraft is damaged (except the sole damage of engine, cowling, engine accessory, propeller, wing tip, antenna, tire, brake or fairing).

<Aircraft serious incidents to be investigated>

◎ **Item 2, Paragraph 2, Article 2 of the Act for Establishment of the Japan Transport Safety Board** (Definition of aircraft serious incident)

A situation where a pilot in command of an aircraft during flight recognized a risk of collision or contact with any other aircraft, or any other situations prescribed by the Ordinances of Ministry of Land, Infrastructure, Transport and Tourism under Article 76-2 of the Civil Aeronautics Act.

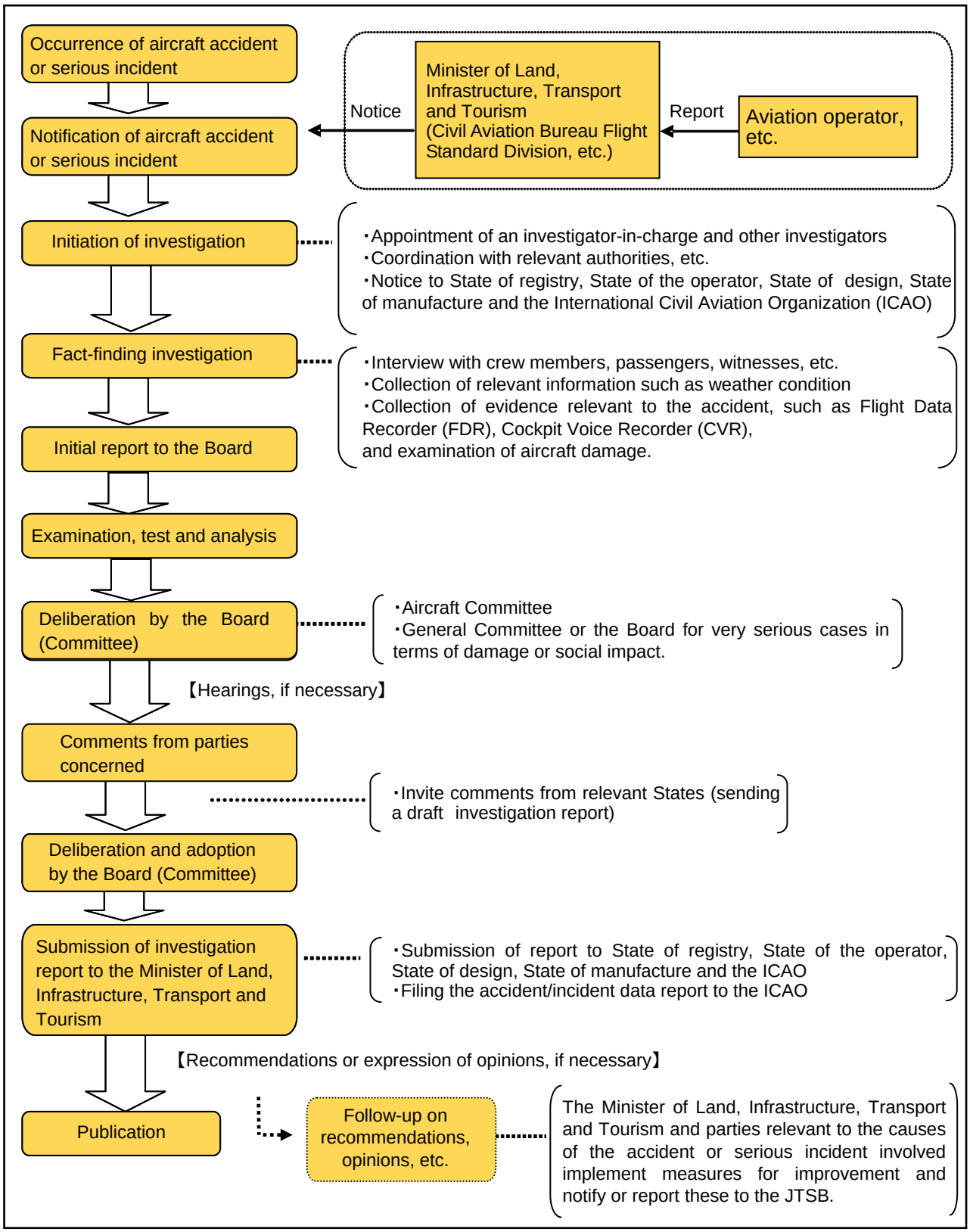
◎ Article 76-2 of the Civil Aeronautics Act

- When the pilot in command has recognized during flight that there was a danger of collision or contact with any other aircraft.
- When the pilot in command has recognized during flight that there is a danger of causing any of accidents listed in each item of paragraph 1, article 76 of the Civil Aeronautics Act, specified by Ordinances of the Ministry of Land, Infrastructure, Transport and Tourism.

◎ Article 166-4 of the Ordinance for Enforcement of the Civil Aeronautics Act (The case prescribed in the Ordinances of the Ministry of Land, Infrastructure, Transport and Tourism under Article 76-2 of the Civil Aeronautics Act)

1. Take-off from a closed runway or a runway being used by other aircraft or aborted take-off
2. Landing on a closed runway or a runway being used by other aircraft or attempt of landing
3. Overrun, undershoot and deviation from a runway (limited to when an aircraft is disabled to perform taxiing)
4. Case where emergency evacuation was conducted with the use for emergency evacuation slide
5. Case where aircraft crew executed an emergency operation during navigation in order to avoid crash into water or contact on the ground
6. Damage of engine (limited to such a case where fragments penetrated the casing of subject engine or a major damage occurred inside the engine)
7. Continued halt or loss of power or thrust (except when the engine(s) are stopped with an attempt of assuming the engine(s) of a motor glider) of engines (in the case of multiple engines, 2 or more engines) in flight
8. Case where any of aircraft propeller, rotary wing, landing gear, rudder, elevator, aileron or flap is damaged and thus flight of the subject aircraft could be continued
9. Multiple malfunctions in one or more systems equipped on aircraft impeding the safe flight of aircraft
10. Occurrence of fire or smoke inside an aircraft and occurrence of fire within an engine fire-prevention area
11. Abnormal decompression inside an aircraft
12. Shortage of fuel requiring urgent measures
13. Case where aircraft operation is impeded by an encounter with air disturbance or other abnormal weather conditions, failure in aircraft equipment, or a flight at a speed exceeding the airspeed limit, limited payload factor limit operating altitude limit
14. Case where aircraft crew became unable to perform services normally due to injury or disease
15. Case where parts dropped from aircraft collided with one or more persons
16. Case equivalent to those listed in the preceding items

2. Procedure of aircraft accident/incident investigation



3. Statistics of investigations of aircraft accidents and serious incidents

The JTSB carried out investigations of aircraft accidents and serious incidents in 2012 as follows:

Twenty-one accident investigations had been carried over from 2011, and 18 accident investigations newly launched in 2012. Fifteen investigation reports were published in 2012, and thereby 24 accident investigations were carried over to 2013.

Thirteen serious incident investigations had been carried over from 2011, and 10 serious incident investigations newly launched in 2012. Seven investigation reports and one interim report were published in 2012, and thereby 16 serious incident investigations were carried over to 2013.

Among the 22 reports published in 2012, one was issued with recommendations, one with safety recommendations, one with opinions, and two with remarks.

Investigations of aircraft accidents and serious incidents in 2012

(Cases)

Category	Carried over from 2011	Launched in 2012	Total	Published investigation report	(Recommendations)	(Safety recommendations)	(Opinions)	(Remarks)	Carried over to 2013	(Interim report)
Aircraft Accident	21	18	39	15	(1)	(0)	(0)	(0)	24	(0)
Aircraft serious incident	13	10	23	7	(0)	(1)	(1)	(2)	16	(1)

4. Statistics of investigations launched in 2012

The investigations launched in 2012 included 18 accidents, up four cases from 14 cases for the previous year, and 10 serious incidents, up four cases from six cases for the previous year.

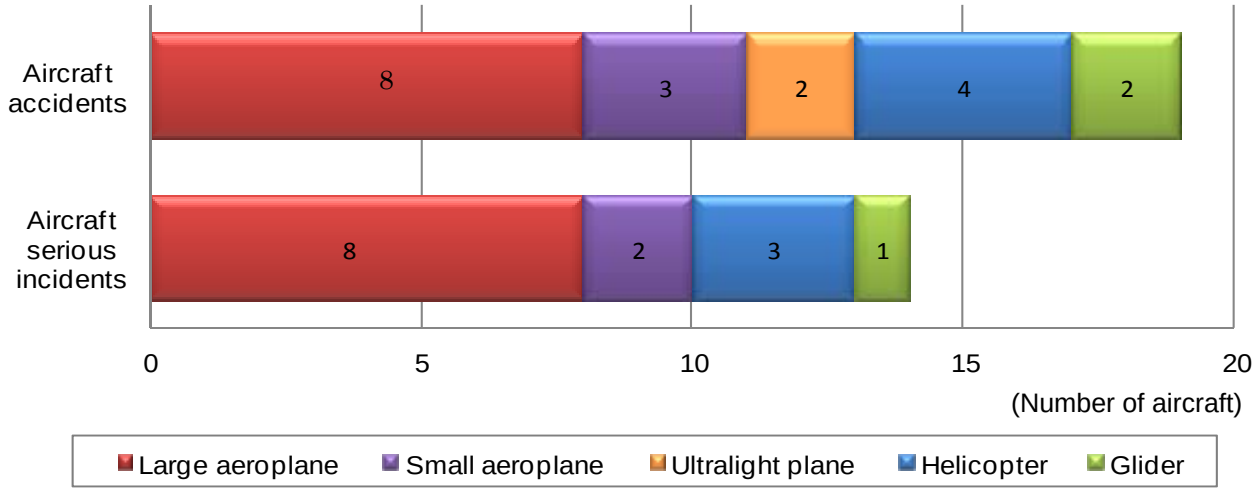
By aircraft category, eight of the accidents involved large aeroplanes*1 and three other cases concerned small aeroplanes*2, while two ultralight planes, four helicopters and two gliders were involved in the remaining cases. The serious incidents included eight cases involving large aeroplanes, two cases involving small aeroplanes, three cases involving helicopters and one case involving a glider.

*1 Large aeroplanes are aircraft with a maximum take-off weight of more than 5,700kg.

*2 Small aeroplanes are aircraft with a maximum take-off weight of 5,700kg or less, excluding ultralight planes.

Note: In aircraft accidents and serious incidents, two or more aircraft are sometimes involved in a single case. See details on Pages 8-11.

Number of aircraft accidents and serious incidents by aircraft category



In the 18 aircraft accidents, the number of casualties was 26, consisting of one death and 25 injured persons. In July 2012, four flight attendants sustained injuries due to the shaking of a large aeroplane. In August, a small aeroplane veered off the runway during landing and hit a worker on the ground, causing fatal injuries to the worker.

Number of casualties (aircraft accident)

(Persons)

2012							
Aircraft category	Dead		Missing		Injured		Total
	Crew	Passengers and others	Crew	Passengers and others	Crew	Passengers and others	
Large aeroplane	0	0	0	0	8	10	18
Small aeroplane	0	1	0	0	0	0	1
Ultralight plane	0	0	0	0	2	0	2
Helicopter	0	0	0	0	4	1	5
Glider	0	0	0	0	0	0	0
Total	0	1	0	0	14	11	26
	1		0		25		

5. Summaries of aircraft accidents and serious incidents which occurred in 2012

The aircraft accidents and serious incidents which occurred in 2012 are summarized as follows: The summaries are based on information available at the start of the investigations and therefore, may change depending on the course of investigations and deliberations.

(Aircraft accidents)

No.	Date and location	Operator	Aircraft registration number and aircraft type	Summary
1	January 4, 2012 Morito Town, Mito City, Ibaraki Prefecture	Private	JR7327 Max Enterprise Axis R503 (ultralight plane)	Refer to the No. 5 column on Page 13 of Section 6 “Publication of investigation reports.”
2	January 18, 2012 At about 1,000 ft high near Kitakojima Island, Ishigaki City, Okinawa Prefecture	Japan Coast Guard	JA720A Bombardier DHC-8-315 (large aeroplane)	The aircraft took off from Naha Airport for Ishigaki Airport for patrolling flight over the East China Sea. Just after making a left turn near Kitakojima Island, the aircraft had a collision with a bird and sustained substantial damage.
3	February 5, 2012 On runway of Sendai Airport	Air Nippon Co., Ltd.	JA8384 Airbus Industrie A320-200 (large aeroplane)	The aircraft took off from Osaka International Airport and approached Runway 27 of Sendai Airport under visual approach rules. When it performed a go-around over the runway, the aircraft had the lower side of its aft section hit the runway. The aircraft sustained substantial damage.
4	February 19, 2012 Karifuridake Temporary Helipad, Minami-Furano Town, Sorachi-gun, Hokkaido	HELL-SYS japan, Inc.	JA710H Eurocopter EC120B (rotorcraft)	The aircraft rolled over during taking off from Karifuridake Temporary Helipad and sustained damage. A pilot on board the aircraft suffered no injury. The aircraft sustained substantial damage.
5	March 31, 2012 On Runway A of Tokyo International Airport	Japan Airlines	JA701J Boeing 777-200 (large aeroplane)	The aircraft took off from Shanghai Airport and performed a go-around at Tokyo International Airport. At that time, the aircraft had the lower side of its aft section hit the runway. The aircraft sustained substantial damage.
6	April 28, 2012 On Yoshii River adjacent to Oku Gliding Field, Setouchi City, Okayama Prefecture	Private (Aircraft A)	JA21KA Sheibe SF25C (glider)	The Aircraft A, with a pilot in the left seat, took off from Oku Gliding Field in Setouchi City, Okayama Prefecture, while towing the Aircraft B with a trainee pilot on board. But both gliders dipped in Yoshii River adjacent to the gliding field just after the take-off and sustained substantial damage.
		Private (Aircraft B)	JA2376 Shempp-Hirth Discus b (glider)	
7	May 13, 2012 On dry riverbed of Tone River, Tamamura Town, Saba-gun, Gunma Prefecture	Private	Sorrell SNS8 Hiperlight R277L (ultralight plane)	Refer to the No. 15 column on Page 15 of Section 6 “Publication of investigation reports.”
8	June 18, 2012 At about 200 ft, above Ryugasaki Airfield, Ryugasaki City, Ibaraki Prefecture	IBEX Aviation Co., Ltd.	JA4135 Cessna 172P (small aeroplane)	When the aircraft was conducting consecutive touch-and-go training on Runway 08 of Ryugasaki Airfield after taking off from Chofu Airport, it had a collision with a bird during climbing and sustained substantial damage.

No.	Date and location	Operator	Aircraft registration number and aircraft type	Summary
9	June 20, 2012 On Runway A of Narita International Airport	All Nippon Airways	JA610A Boeing 767-300 (large aeroplane)	When the aircraft landed at Narita International Airport after taking off from Beijing Airport, it made a hard landing. In an after-arrival check, part of the fuselage was found deformed. Five passengers and four flight attendants sustained injuries.
10	June 29, 2012 Kawanehon-cho, Haibara-gun, Shizuoka Prefecture	Chubu Regional Bureau, Ministry of Land, Infrastructure, Transport and Tourism	JA6817 Bell 412EP (rotorcraft)	When the aircraft landed on a temporary helipad in Kawanehon-cho, Haibara-gun, Shizuoka Prefecture, it sustained substantial damage. The pilot and one passenger were injured.
11	July 5, 2012 At approximately 23,000 ft high about 150 km north of Narita International Airport	United Airlines	N224UA Boeing 777-200 (large aeroplane)	When the aircraft was flying toward Narita International Airport after taking off from Incheon International Airport (Republic of Korea), shakes occurred near the place mentioned in the “Date and location” column. One flight attendant was seriously injured, and three other FAs suffered slight injuries. There was no damage to the aircraft.
12	July 5, 2012 At approximately 11,300 m high about 160 km north-northwest of Tokyo International Airport	Korean Air	HL7473 Boeing 747-400 (large aeroplane)	While flying after taking off from Seoul (Gimpo) Airport, the aircraft was shaken near the place mentioned in the “Date and location” column. One passenger sustained injuries.
13	August 18, 2012 Otone temporary operation site Kawachi Town, Inashiki-gun, Ibaraki Prefecture	Private	JA3814 Cessna 172N Ram (small aeroplane)	When landing on Otone temporary operation site the aircraft veered off the runway to the left (to the south) and its right wing hit a person who was there for weeding work. The person sustained fatal injuries.
14	August 21, 2012 At approximately 12,200 m high about 26 km northwest of Izumo Airport	Asiana Airlines	HL8258 Airbus Industrie A330-300 (large aeroplane)	While flying after taking off from Honolulu Airport, the aircraft was shaken near the place mentioned in the “Date and location” column. Three passengers sustained injuries.
15	September 15, 2012 Temporary helipad, Kujukuri Town, Sanbu-gun, Chiba Prefecture	Private	JA120H Eurocopter EC120B (rotorcraft)	When the aircraft started hovering to move to the takeoff-landing area from the apron, its skid got caught on the ground and the aircraft fell on its side. Two persons on board the aircraft sustained injuries.
16	October 16, 2012 Above runway at Aguni Airport, Okinawa Prefecture	First Flying Co., Ltd.	JA5324 Britten Norman BN-2B-20 (small aeroplane)	After taking off from Aguni Airport for Naha Airport, the aircraft had a collision with a bird and sustained substantial damage.
17	November 19, 2012 Hirachinai, Otsu City, Shiga Prefecture	Nakanihon Air Service Co. Ltd.	JA9965 Aerospatiale AS332L1 (rotorcraft)	While the aircraft was hoisting up supplies near the place mentioned in the “Date and location” column” after taking off from Hira Temporary Helipad, a worker on the ground mistakenly touched the supplies. The worker stumbled and fell, and sustained injuries in the left wrist.
18	November 26, 2012 At approximately 10,900 m high over Shizuoka City, Shizuoka Prefecture	Japan Airlines	JA610J Boeing 767-300 (large aeroplane)	While flying after taking off from Narita International Airport, the aircraft was shaken near the place mentioned in the “Date and location” column. One passenger sustained injuries.

(Aircraft serious incidents)

No.	Date and location	Operator	Aircraft registration number and aircraft type	Summary
1	April 7, 2012 Fujigawa Gliding Field, Shizuoka City, Shizuoka Prefecture	Private	JA109B Globe G109B (glider)	The aircraft took off from the gliding field mentioned in the "Date and location" column for consecutive touch-and-go training, but when it made the first landing, the aircraft veered off the runway and stopped on grassy land.
2	July 5, 2012 About 5.6 km north of Naha Airport	China Eastern (Aircraft A)	B2332 Airbus Industrie A319-112 (large aeroplane)	The Aircraft A entered a runway despite earlier instructions by an air traffic controller to stand by before the runway. Therefore, the Aircraft B, which had obtained a landing clearance, performed a go-around on instructions from the air traffic controller.
		AirAsia Japan (Aircraft B)	JA01AJ Airbus Industrie A320-214 (large aeroplane)	
3	July 8, 2012 Temporary helipad at Asahikawa Red Cross Hospital, Hokkaido	Aero Asahi Corp.	JA6911 McDonnell MD900 (rotorcraft)	Just after the aircraft took off from the helipad mentioned in the "Date and location" column, its No. 1 engine stopped. As a result, the aircraft changed its destination to Asahikawa Airport and landed there.
4	July 8, 2012 On Runway 34 of Fukuoka Airport	Private (Aircraft A)	JA4178 Cessna 172RG (small aeroplane)	When the Aircraft A was approaching Runway 34 of Fukuoka Airport after receiving a landing clearance from an air traffic controller, the Aircraft B, which was to depart from the runway, entered there after it was instructed by the controller to stand by on the runway. The controller then instructed the Aircraft A to perform a go-around.
		Japan Air Commuter Co., Ltd. (Aircraft B)	JA847C Bombardier DHC-8-402 (large aeroplane)	
5	October 10, 2012 About 8.5 miles (about 16 km) southwest of Nagoya VORTAC	Diamond Air Service Inc. (Aircraft A)	JA30DA Mitsubishi MU-300 (large aeroplane)	The Aircraft A took off from Nagaya Airfield and conducted training in a training airspace over the Pacific. After finishing the training, the aircraft flew toward Manba-ohashi Bridge via Nagoya Port under VFR in order to return to Nagoya Airfield. When the aircraft made a left turn at about 2,000 ft over the bridge, the aircraft came close to the Aircraft B flying southwestwardly from behind. (A near miss report)
		Nakanihon Air Service Co., Ltd. (Aircraft B)	JA9745 Bell 206B (rotorcraft)	
6	October 20, 2012 At approximately 4,050 m high about 25 km west of Tokyo International Airport	JAL Express	JA342J Boeing 737-800 (large aeroplane)	While the aircraft was climbing after taking off from the airport mentioned in the "Date and location" column, its instruments showed a decrease in the revolution of the No. 1 engine and an increase in the exhaust gas temperature near the place mentioned in the "Date and location" column. The engine was then disengaged, and requested priority in air traffic control, the aircraft turned back and landed on the airport.

No.	Date and location	Operator	Aircraft registration number and aircraft type	Summary
7	October 31, 2012 On runway of Yakushima Airport	Private (Aircraft A)	JA35BB Eurocopter AS350B3 (rotorcraft)	The Aircraft B landed at the airport mentioned in the "Date and location" column and then, started taxiing back to the apron after turning around at the runway end on the northwestern side. But the Aircraft A, which had entered the same runway to stand by, took off before the Aircraft B's exit from the runway.
		Japan Air Commuter Co., Ltd. (Aircraft B)	JA849C Bombardier DHC-8-402 (large aeroplane)	
8	November 25, 2012 Satsuma-Iwojima Airfield, Mishima Village, Kagoshima-gun, Kagoshima Prefecture	Private	JA3689 Fuji Heavy Industries FA-200-180 (small aeroplane)	When the brakes were applied upon landing on the airfield mentioned in the "Date and location" column, the aircraft turned to the right and skidded out to grassy land east of the runway, and fell on its side.
9	December 8, 2012 On eastern runway end of Shonai Airport	All Nippon Airways	JA57AN Boeing 737-800 (large aeroplane)	When the aircraft landed on the airport mentioned in the "Date and location" column, it overran and stopped on grassy land.
10	December 25, 2012 On runway of Hanamaki Airport	J-Air Corp.	JA202J Bombardier CL-600-2B19 (large aeroplane)	When the aircraft landed on the airport mentioned in the "Date and location" column, the aircraft veered off the runway to the left (to the east), and stopped with its nose landing gear out on grassy land.

6. Publication of investigation reports

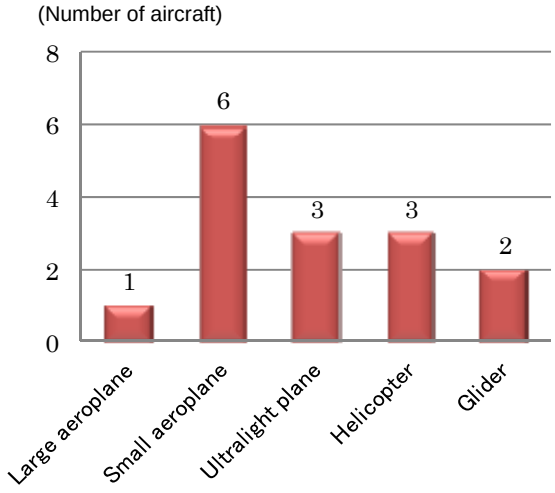
The number of investigation reports of aircraft accidents and serious incidents published in 2012 was 22, consisting of 15 aircraft accidents and seven serious incidents.

Looking those accidents and serious incidents by aircraft category, the accidents involved one large aeroplane, six small aeroplanes, three ultralight planes, three helicopters and two gliders. The serious incidents involved eight large aeroplanes and one small aeroplane.

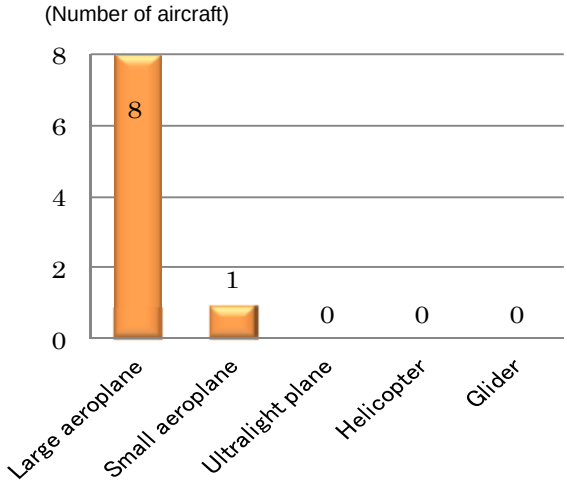
Note: In aircraft accidents and serious incidents, two or more aircraft are sometimes involved in a single case. See details on Pages 12-17.

In the 15 accidents, the number of casualties was 28, consisting of 14 deaths and 14 injured persons.

Aircraft accident reports (15 cases) published in 2012



Aircraft serious incident reports (seven cases) published in 2012



The investigation reports for aircraft accidents and serious incidents published in 2012 are summarized as follows:

List of published investigation reports on aircraft accidents (2012)

No.	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type	Summary
1	January 27, 2012	February 18, 2011 On runway of Yao Airport	Showa Aviation Co., Ltd.	JA8828 Fairchild Swearingen SA226-AT (small aeroplane)	When the aircraft landed at Yao Airport, its airframe was damaged. The aircraft sustained substantial damage.
2	February 24, 2012	October 11, 2009 In the mountains about 6 km east of Mt. Biei, Hokkaido	Private	JA2503 Valentine/FFT KIWI (glider, single-seater)	The aircraft took off from Biei Gliding Field by being towed by another airplane, but it made an emergency landing in the mountains about 6 km east of Mt. Biei, Hokkaido. The pilot was slightly injured. The aircraft sustained substantial damage.

No.	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type	Summary
3	February 24, 2012	July 25, 2010 In the mountains in Otaki, Chichibu City, Saitama Prefecture	Saitama Prefectural Government (Operated by contracted Honda Airways Co., Ltd.)	JA31TM Eurocopter AS365N3 (rotorcraft)	The aircraft took off from a temporary helipad in Otaki, Chichibu City, Saitama Prefecture, for a rescue operation, but it crashed while hoisting down two rescuers (one from Saitama Disaster Prevention Aviation Unit and a firefighter from Chichibu Fire Brigade) to a ravine upstream of Takigawa. The pilot in command, a pilot, and two rescuers from Saitama Disaster Prevention Aviation Unit and a firefighter from Chichibu Fire Brigade sustained fatal injuries. The aircraft was destroyed.
4	March 30, 2012	August 18, 2010 Near Sanagijima Island, Tadotsu-cho, Nakatado-gun, Kagawa Prefecture	Japan Coast Guard	JA6796 Bell 412EP (rotorcraft)	The aircraft took off from Hiroshima Airport for patrolling flight in the eastern part of the Seto Inland Sea. While flying near Sanagijima, Tadotsu-cho, Nakatado-gun, Kagawa Prefecture, the aircraft hit overhead wires extended between Sanagijima and Oshima and crashed into the sea. The pilot in command and four other persons aboard the aircraft suffered fatal injuries. The aircraft was destroyed.
5	March 30, 2012	January 4, 2012 Morito Town, Mito City, Ibaraki Prefecture	Private	JR7327 Max Enterprise Axis R503 (ultralight plane)	The aircraft took off from Oarai temporary operation site in Mito City, Ibaraki Prefecture. While running on the runway after landing on the operation site, the aircraft sustained damage. The pilot was seriously injured.
6	April 27, 2012	June 12, 2011 At Shinshinotsu Gliding Field, Shinshinotsu-mura, Ishikari-gun, Hokkaido	Private	JA2168 Sportavia SF25C (motor glider, two-seater)	The aircraft sustained damage to its airframe upon landing at Shinshinotsu Gliding Field in Shinshinotsu-mura, Ishikari-gun, Hokkaido, after finishing a familiarization flight. The captain was seriously injured and one passenger suffered a slight injury. The aircraft sustained substantial damage.
7	April 27, 2012	August 31, 2011 Irrigation canal in Takahama, Ishioka City, Ibaraki Prefecture	Private	JR1417 Sport Aviation Aircraft Avenger R447L (ultralight plane, single-seater)	When the aircraft was flying toward Kasumigaura after taking off from Chiyoda temporary operation site, its engine thrust went down and the aircraft struck an overhead wire. Then, the aircraft crashed in an irrigation canal in Takahama, Ishioka City, Ibaraki Prefecture. The pilot was slightly injured. The aircraft was destroyed.

No.	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type	Summary
8	June 29, 2012	November 5, 2010 On runway of Miyazaki Airport	Civil Aviation College	JA4167 Beechcraft A36 (small aeroplane)	The aircraft took off from Miyazaki Airport for solo flight training and when it landed at the airport, it became immobile on the runway. No one was injured in the accident. The aircraft sustained substantial damage.
9	June 29, 2012	April 27, 2011 At approximately 25,000 ft high about 27 nm east-southeast of Kushimoto, Wakayama Prefecture	All Nippon Airways	JA8569 Boeing 767-300 (large aeroplane)	While flying for Tokyo International Airport after taking off from Miyazaki Airport, the aircraft was shaken at an altitude of approximately 25,000 ft about 27 nm east-southeast of Kushimoto. One flight attendant was seriously injured and two passengers and two FAs sustained slight injuries. There was no damage to the aircraft.
10	June 29, 2012	July 10, 2011 At about 11,000 ft high above Honda Airport	Tokyo Skydiving Club	JA55DZ Cessna 208B (small aeroplane)	The aircraft took off from Honda Airport and 18 skydivers exited from the aircraft into the airspace over the airport. After the aircraft returned to the airport, damage to the aircraft was found. One skydiver was injured. The aircraft sustained substantial damage.
11	June 29, 2012	July 14, 2011 Sabaekoizumi Temporary Helipad, Koizumi, Sabae City, Fukui Prefecture	Private	JA007J Robinson R22 Beta (rotorcraft)	The aircraft made a roll-over and sustained damage when it landed at Sabaekoizumi Temporary Helipad after finishing a familiarization flight. The pilot in command was seriously injured and a passenger suffered slight injuries. The aircraft sustained substantial damage.
12	July 27, 2012	July 28, 2010 In the mountains east of Mt. Iwabe-dake, Fukushima Town, Matsumae-gun, Hokkaido Prefecture	Nakanihon Air Service Co., Ltd.	JA3902 Cessna TU206G (small aeroplane)	The aircraft took off from Niigata Airport for Sapporo Airfield, but it did not arrive there even after the estimated arrival time and went missing. The aircraft was found crashed in the mountains east of Mt. Iwabe-dake in Fukushima Town, Matsumae-gun, Hokkaido, two days later. The pilot in command and one passenger suffered fatal injuries. The aircraft was destroyed.

No.	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type	Summary
13	September 28, 2012	January 3, 2011 On the south-southeastern slope of Mt. Yago, approximately 14 km northeast of Kumamoto Airport	Private	JA701M Piper PA-46-350P (small aeroplane)	The aircraft went missing after taking off from Kumamoto Airport for a leisure flight to Kitakyushu Airport. On the following day, the aircraft was found on the south-southeastern slope of Mt. Yago, about 14 km northeast of Kumamoto Airport apparently after colliding with the mountain slope. The pilot in command and a passenger suffered fatal injuries. The aircraft was destroyed. *** The report included Recommendations**
14	September 28, 2012	March 24, 2011 On runway of Kumamoto Airport	Honda Airways Co., Ltd.	JA33UK Cessna 172S (small aeroplane)	The aircraft took off from Kumamoto Airport for solo flight training. The aircraft was damaged when it bounced during landing at the airport. No one was injured. The aircraft sustained substantial damage.
15	December 21, 2012	May 13, 2012 On dry riverbed of Tone River in Tamamura Town, Sawa-gun, Gunma Prefecture	Private	No registration number Sorrell SNS8 Hiperlight R277L (ultralight plane)	When the aircraft was flying along a traffic pattern after taking off from a temporary operation site adjacent to Tone River in Shiba Town, Isezaki City, Gunma Prefecture, its engine came to a halt. The aircraft made an emergency landing on the dry riverbed on the other side of the river in Tamamura Town, Sawa-gun, Gunma Prefecture, and the aircraft was damaged. The pilot was slightly injured. The aircraft was destroyed.

List of published investigation reports on aircraft serious incidents (2012)

No.	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type	Summary
1	January 27, 2012	July 28, 2010 At approximately 11,700 ft high about 46 km east-southeast of Narita International Airport	United Airlines	N219UA Boeing 777-200 (large aeroplane)	While the aircraft was climbing after taking off from Narita International Airport for San Francisco International Airport, its right engine came to a halt above the sea about 46 km east-southeast of Narita International Airport. The aircraft then flew back to Narita International Airport and landed there.

No.	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type	Summary
2	January 27, 2012	October 26, 2010 At approximately 6,800 ft high about 30 km east of Asahikawa City, Hokkaido	Air Nippon Co., Ltd.	JA55AN Boeing 737-800 (large aeroplane)	The aircraft took off from Chubu Centrair International Airport for Asahikawa Airport. When the aircraft was descending toward Asahikawa Airport following an air traffic controller's instructions near the destination aerodrome, its ground proximity warning system issued a warning at about 6,800 ft about 50 km east of Asahikawa City, Hokkaido. Its flight crew took an emergency maneuver and landed at Asahikawa Airport. *** The report included Opinions**
3	March 30, 2012	October 23, 2010 At approximately 2,000 ft high over city area about 2 km southeast of Yokota Airfield	Kawasaki Air Co., Ltd.	JA3818 Cessna TU206G (small aeroplane)	The aircraft took off from Chofu Airfield for an aerial survey. After completing its work near the mouth of Kurobe River in Toyama Prefecture, the aircraft changed its destination to Chofu Airfield from Niigata Airport and when it was flying back to Chofu Airfield, it declared a state of emergency due to fuel starvation and landed at Yokota Airfield.
4	April 27, 2012	May 10, 2011 About 3 km northwest of Fukuoka Airport	Japan Air Commuter Co. Ltd. (Aircraft A) All Nippon Airways (Aircraft B)	JA844C Bombardier DHC-8-402 (large aeroplane) JA602A Boeing 767-300 (large aeroplane)	The Aircraft A was approaching Fukuoka Airport after receiving a landing clearance from an air traffic controller, while the Aircraft B entered the runway 16 via the taxiway E2 after receiving a take-off clearance. The Aircraft A requested the air traffic controller to confirm the landing clearance, and the controller instructed it to perform a go-around.
5	May 25, 2012	November 28, 2010 About 4 nm southwest of Chubu Centrair International Airport	Evergreen International Airlines, Inc.	N482EV Boeing 747-200 (converted freighter model) (large aeroplane)	When the aircraft was climbing after taking off from Runway 36 of Chubu Centrair International Airport for Anchorage International Airport, the No. 2 engine thrust indication dropped with strong aircraft vibrations. After shutting down the engine and jettisoning its fuel, the aircraft turned back and landed at Chubu Centrair International Airport.
6	June 29, 2012	August 15, 2010 At approximately 5,500 ft high about 11 km west of Sendai Airport	Japan Airlines International Co., Ltd.	JA002D McDonnell Douglas MD-90-30 (large aeroplane)	The aircraft took off from Sendai Airport for Fukuoka Airport, but during its take-off climb, the aircraft declared a state of emergency upon the activation of the right engine fire warning alarm at about 5,500 ft. The right engine was shut down while the fire-extinguishing system was activated. The aircraft then flew back to Sendai Airport and landed there. After landing, heat damage was confirmed inside the cowling of the right engine. *** The report included Safety recommendations**

No.	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type	Summary
7	August 31, 2012	December 26, 2010 On Runway 34 at Fukuoka Airport	Air Busan Co., Ltd. (Aircraft A)	HL7517 Boeing 737-400 (large aeroplane)	The Aircraft A was taxiing toward Runway 34 at Fukuoka Airport for take-off to Gimhae International Airport (Busan). Meanwhile, the Aircraft B was approaching Fukuoka Airport upon receiving a landing clearance on Runway 34. Because the Aircraft A entered the runway, the Aircraft B performed a go-around under an air traffic controller's instructions.
			JAL Express Co., Ltd. (Aircraft B)	JA8998 Boeing 737-400 (large aeroplane)	

7. Summaries of recommendations and opinions

There were one safety recommendations, one recommendations and one opinions in 2012, which are summarized below:

(1) Safety recommendations (one case)

○ In view of the results of the investigation of the serious incident involving McDonnell Douglas MD-90-30 (large aeroplane), registered JA002D, operated by Japan Airlines International, the JTSB made safety recommendations to the Federal Aviation Administration of the United States on June 29, 2012 as follows:

In view of the result of this serious incident investigation, the JTSB recommends that the FAA urge the engine manufacturer to take the following measures:

In the serious incident, it is highly probable that the fatigue crack originating from the outer diameter of the No.4 Bearing Scavenge Tube progressed into the fracture, whereas the Tube is covered with the heat shield, making it impossible to have a direct inspection of the relevant spot during a regular maintenance work. Therefore, it is recommended that the manufacturer review the tube design and overhaul inspection method thereof in order to prevent the recurrence of similar cases.

(2) Recommendations (one case)

○ In view of the results of the investigation of the accident involving a privately owned Piper PA-46-350P (small aeroplane), registered JA701M, the JTSB made recommendations to the Minister of Land, Infrastructure, Transport and Tourism on September 28, 2012 as follows:

It is highly probable that the aircraft collided with the mountain slope during its in-cloud post-takeoff climb with a low climb rate under VFR. It is probable that the PIC might have acquired the latest weather information over the radio; however, it is highly probable that he took off without acquiring a necessary weather briefing from the weather station at Kumamoto Airport.

In the past five years there were four cases where VFR flights of small aircraft (helicopters inclusive) ended up with accidents. The four cases are as follows:

· A Cessna TU206GU, JA3902, crashed into the mountain slope east of Mt. Iwabe, Fukushima-town, Matsumae-gun, Hokkaido Prefecture in July 2010.

· A Robinson R44II, JA32CT, crashed about 15 km southeast of Tajima Airport, Hyogo Prefecture in July 2009.
· An Aerospatiale AS350B, JA9755, crashed off Cape Omasaki, Oma-cho, Shimokita-gun, Aomori Prefecture in July 2008.
· A Cessna 404, JA5257, crashed into the mountain slope near the top of Mt. Ena, Nakatsugawa City, Gifu Prefecture in November 2007.

The highly probable causes of these accidents are insufficient collection of weather information and non-execution of return to the departure airport upon an encounter with devastating weather conditions.

The Civil Aviation Bureau, MLIT issued the directive of the Operations Director titled as "Measures to be taken for safe VFR flights (Kokukuko No. 86, dated April 30, 2002)", to the All Japan Air Transport and Service Association and the Japan Aircraft Pilot Association. The contents of the directive are believed to be appropriate, but as mentioned above, accidents in which aircraft flew in clouds under VFR have occurred despite the issuance of the directive.

In light of this accident and similar accidents mentioned above, the JTSB, in accordance with Paragraph 1, Article 26, the Act for Establishment of the Japan Transport Safety Board, recommends the Minister, MLIT as follows:

In order to prevent the accidents in in-cloud flight under VFR, the Civil Aviation Bureau publishes again the following contents to the pilot associations and also make them known to individual pilots using the opportunities of the newly introduced system "Review System on Specific Pilot Competence" (2012 MLIT Ordinance No. 22).

(1) Commence flying only when VMC is maintained all across the enroute based on the latest weather information.
(2) Prepare an alternative plan in case of deteriorating weather while collecting weather information on enroute.
(3) Decide well in advance on returning to the departure airport or landing at a proper place.

(3) Opinions (one case)

○ In view of the results of the investigation of the serious incident involving a Boeing 737-800 (large aeroplane), registered JA55AN, operated by Air Nippon Co., Ltd., JTSB stated opinions to the Minister of Land, Infrastructure, Transport and Tourism on January 27, 2012 as follows:

It is highly probable that the serious incident occurred because an aircraft which belongs to Air Nippon Co., Ltd., experienced a ground proximity and its flight crew took an emergency maneuver responding to its EGPWS warnings during its descent toward its destination aerodrome, Asahikawa Airport, under the ATC instructions. It is probable that the ground proximity occurred because: an air traffic controller instructed the aircraft to descend below the MVA without confirming it; its flight crew did not question the Radar Controller on the descent instructions in spite of awareness of being vectored to the east toward the mountainous area.

In view of the investigation results of the serious incident, the Japan Transport Safety Board states the following opinion to the Minister of Land, Infrastructure, Transport and Tourism pursuant to Article 28 of the Act for Establishment of the Japan Transport Safety Board in

order to secure the safety of air traffic:

Efforts must be made to expedite the introduction of a system to better support air traffic controllers so that they can have situation awareness more easily when ATC instructions were issued for an aircraft to descend below the MVA, or when an aircraft descended below the MVA.

8. Remarks

The JTSB made remarks on the following two aircraft accidents in 2012.
Refer to the investigation reports for details of the remarks.

(1) A rotorcraft, registered JA31TM, owned by Saitama Prefectural Government and operated by contracted Honda Airways Co., Ltd., crashed during a rescue operation

(Published on February 24, 2012)

http://www.mlit.go.jp/jtsb/eng-air_report/JA31TM.pdf

(2) A Beechcraft A36, registered JA4167, operated by Civil Aviation College, became immobile on the runway.

(Published on June 29, 2012)

http://www.mlit.go.jp/jtsb/eng-air_report/JA4167.pdf

9. Information dissemination in the process of investigations

The JTSB disseminated information on the following two aircraft serious incidents in 2012.
The information is summarized below.

(1) Aircraft serious incident involving a privately owned Globe G109B

(Disseminated on April 19, 2012)

The JTSB provided information regarding the aircraft serious incident (runway deviation) involving Globe G109B, which occurred on April 7, 2012, as follows to the Civil Aviation Bureau, the Ministry of Land, Infrastructure, Transport and Tourism:

As a result of the investigation up until now, the following point has been clarified with regard to the area where a main landing gear is connected to the fuselage:

・The bolt and nut with which the right main landing gear was connected to the fuselage had fallen off, while the screw threads had been worn out. The nuts used in the area where both main landing gears had been connected to the fuselage were not those designated by the manufacturer.

(2) Aircraft serious incident involving Bell 206B, operated by Nakanihon Air Service Co., Ltd.

(Disseminated on October 19, 2012)

The JTSB provided information regarding the aircraft serious incident (near miss) involving

Bell 206B, operated by Nakanihon Air Service Co., Ltd., which occurred on October 10, 2012, as follows to the Civil Aviation Bureau, the Ministry of Land, Infrastructure, Transport and Tourism:

The JTSB is working on the investigation of the near miss incident reported by the captain of a Bell 206B, registered JA9745, which occurred on October 10, 2012. Our investigation up until now identified other aircraft involved in the near miss, and we provide the information concerned as follows:

The investigation is still under way on specifically how the near miss occurred and the causes for the incident.

1. Registration number
   JA30DA（Mitsubishi MU-300）

2. Operator
   Diamond Air Service Inc.

3. Persons on board
   Seven persons（the PIC, the first officer, five others）

4. Summary of the history of the flight
   JA30DA took off from Nagaya Airfield at 9:39 Japan Standard Time and conducted training in a training airspace over the Pacific. After finishing the training, the aircraft flew toward Manba-ohashi Bridge via Nagoya Port under VFR in order to return to Nagoya Airfield. When the aircraft made a left turn at about 2,000 ft over the bridge, the aircraft came close to JA9745 flying southwestwardly from its left behind.

Column

Operational training for small aeroplanes (fixed wing)

Investigations of aircraft accidents require a broad range of knowledge and a high level of professionalism. Therefore, we continuously provide various kinds of lectures and training.

This column takes up operational training for a small aeroplane (Cessna 172) as part of these lectures and training.

In fiscal 2012, two investigators with no experience in aircraft operations received this training. (They previously served as an air traffic controller and an aircraft inspector.) This training is aimed at deepening trainees' knowledge about aircraft operations in order to facilitate their jobs as investigators, rather than having them obtain licenses. The training has curriculums which enable participants to obtain a broad range of experience in a short period of time.

First of all, trainees receive class training, which include curriculums not only about aircraft operations and how to handle the Cessna aircraft but also about aeronautical weather, air traffic control, aeronautical engineering and others.

The class training is followed by actual training for aircraft operations. Initially, trainees take off from Chofu Airfield in suburban Tokyo and perform such training as basic airworks, low-speed flying, and stall and recovery in a training airspace established over Saitama Prefecture, and then, they return to Chofu Airfield. These practices are repeated for several days.

When trainees have almost learned the basic airworks, take-off and landing training starts. Because there is no airfield in Tokyo where take-off and landing training can be performed, trainees take off from Chofu Airfield and then, usually move to a temporary operation site in Ibaraki Prefecture while performing mainly basic airworks. They perform take-off and landing training there four to eight times. Various kinds of training are also performed enroute back to Chofu Airfield. This kind of training is continuously performed for two weeks. Eventually, trainees obtain about 20 hours of flight experience and practice take-off and landing about 45 times.

During this training, trainees sometimes experience surprise situations, such as big aircraft bounces after an unsuccessful landing, failure to catch words in air traffic communication while excessively concentrating on aircraft maneuvering, and an insufficient watch-out of the situation around the aircraft. Of course, because the trainee is accompanied with a veteran instructor on board the plane, a dangerous situation actually does not occur.

However, having experience in these surprise situations and understanding the psychological state of pilots and trainees contribute to facilitating the investigations of causes for aircraft accidents and incidents.

"I've understood things like the gyroscopic precession, propeller slipstream and air currents by myself by reading documents. However, the feeling I physically experienced in the actual training was quite different from what I had imagined before," one participant recalled after finishing the training. This indicates the training can be a good incentive for investigators who tend to be inclined toward knowledge from books.

Column

Importance of PR activities and encouragement

Our Duty Improvement Action Plan, fully enforced from FY 2012, calls for providing information about our activities more actively.

The serious incident involving a Boeing 787 which occurred in January 2013 turned out to be an extremely good opportunity for implementing the initiative sought in the Action Plan.

Lithium-ion battery installed on the Boeing 787 which had been bound from Yamaguchi-Ube Airport to Haneda Airport on January 16, 2013 generated heat and got greatly damaged. As a result, the aircraft landed on Takamatsu Airport as the nearest aerodrome.

In the preceding week, a fire broke out of lithium-ion battery installed on the same type of aircraft when it was being checked after passengers disembarked from the aircraft upon its landing on Boston's Logan International Airport of the United States. The fire was put out by firefighters. This type of aircraft had been closely watched as an ultramodern airplane equipped with many state-of-the-art technologies since the development stage. Therefore, these incidents drew strong attention from various quarters.

On the night of the day when the incident occurred at Takamatsu Airport, five designated investigators arrived at the scene. They started an investigation in front of rows of cameras set by media organizations. Our staff there had opportunities to speak to the press almost every day before and after the investigation and explained the progress of their investigation.

Meanwhile, in Tokyo, we also had lectures for the press about the incident many times, because there were a lot of requests for providing information about the findings and the progress of the investigation. These lectures were organized every day in the first month and later twice a week for about three months.

This was truly unusual for us, and to be honest, we were not so experienced in this kind of lecture. We realized how difficult it is to accurately convey what we mean to others and to answer to their points of interest appropriately

We paid attention particularly to the following points during these lectures:

(1) Convey facts accurately

(2) Separate facts and thoughts (consideration)

(3) Explain unknown things as unknown.

(4) Carefully handle information based on statements and voice recorder data

It is quite rare that causes for aircraft accidents and incidents are found quickly at the investigation site. This is the case not only for this incident but also for other cases. The causes are usually clarified step by step through steady efforts. The whole picture of each case can be revealed only while checking whether the hypothesis may not be biased or erroneous from the point of view of the Board.

This process is time-consuming and we believe that public confidence in our activities can be improved by providing factual information, such as about what happened, to the people even during the investigation.

Since the occurrence of the incident up until now, we have received a lot of encouraging words and technical advices from many people, apparently in a feedback to our activities. These messages came from such persons as those who were engaged in the initial stage of development for lithium-ion battery and very active electric and electronic engineers, and they equally hoped to use their knowledge to help clarify the causes. Their messages also told us their great expectations for our activities. Please allow us to express our thanks to these people here.

Finally, we would like to refer to a magazine article which took up the Boeing 787 case. The article said, “The JTSB disclosed materials about the progress of their investigation in a timely manner. Their way of disclosure was very much improved compared to the previous style.” This made us feel that we have been rewarded for our efforts for better information disclosure.

10. Summaries of major aircraft accident and serious incident investigation reports

The aircraft crashed while hoisting down rescuers in a ravine upstream

Eurocopter AS365N3, registered JA31TM, owned by Saitama Prefectural Government

Summary of the accident: A Eurocopter AS365N3, registered JA31TM, owned by Saitama Prefectural Government, took off from a temporary helipad in Otaki, Chichibu City, Saitama Prefecture, at 10:48 Japan Standard Time on July 25 (Sunday), 2010 for a rescue operation. The aircraft, while hoisting down two rescuers (one from the Saitama Disaster Prevention Aviation Unit and a firefighter from the Chichibu Fire Brigade) to a ravine upstream of Takigawa, crashed around 11:03.

Of seven persons on board, two hoisted-down persons survived; however, five persons (a pilot in command, a pilot, two rescuers from the Saitama Disaster Prevention Aviation Unit and a firefighter from the Chichibu Fire Brigade) sustained fatal injuries.

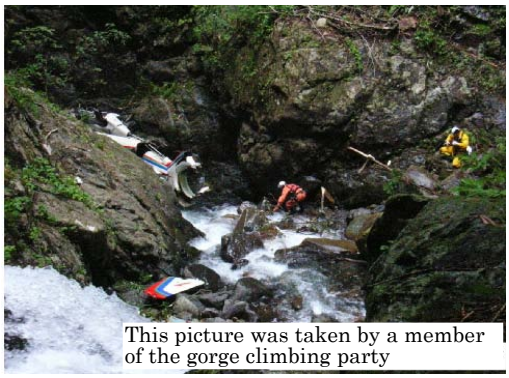
The aircraft was destroyed; however, no fire broke out.

Findings

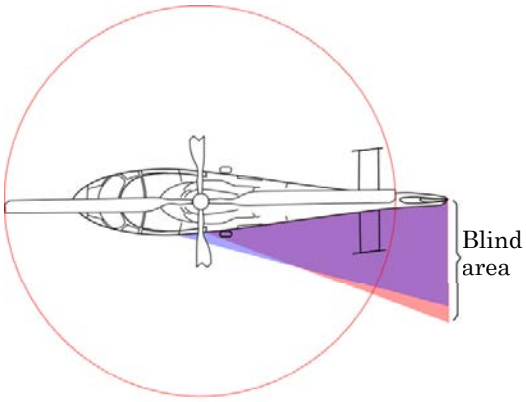
(1) Many scratch marks seemingly caused by induced foreign objects were observed in the inside of the Fenestron, while pieces of wood were found trapped in the tail rotor assy. Based on these findings, it is very likely that the first abnormal phenomenon occurred when the tail rotor hit trees.

(2) Several trees on the right bank of the accident site had been broken, while a fragment of the black blade was found at the root of the tree on the right bank about 23 m above the rescuers' landing point. Further, broken trees with scratch marks were found in the plunge pool, and there were trees with branches chopped on the right bank. Based on the findings, it is very likely that the Aircraft had its main rotor hit against trees while spinning.

(3) It is not certain whether the pilot in command took actions for confirming or made instructions for confirming obstacles in the aft on the left side before having the aircraft hover to the left to adjust its position, but it is very likely that the looking out toward the left aft was not appropriate.

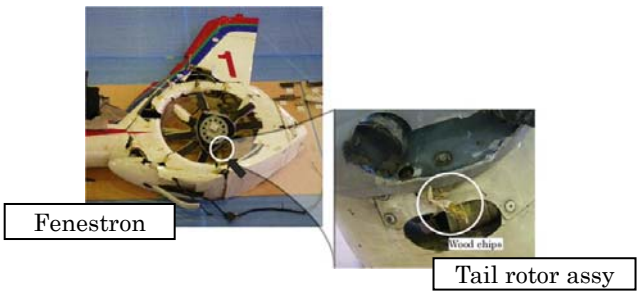


Just after Occurrence of Accident



Blind Area in Aft Left Section of the Aircraft

Legend:
Blue part denotes Blind area from the left pilot station seen through the cabin window.
Red part denotes Blind area from the cabin rear seat.



Probable causes: It is very likely that the aircraft crashed when it hovered to the left to adjust the hoist descent position without appropriate looking out, the Fenestron's tree contact developed into a loss of yaw control followed by main rotor tree strike.

The fact that the aircraft, without taking full advantage of long hoist cable, lowered its AGL (Above Ground Level) altitude very likely contributed to the Fenestron's tree contact.

For details, please refer to the investigation report. (published on February 24, 2012)
http://www.mlit.go.jp/jtsb/eng-air_report/JA31TM.pdf

The aircraft became immobile on runway after landing after solo flight training

Beechcraft A36, registered JA4167, operated by Civil Aviation College

Summary of the accident: A Beechcraft A36, registered JA4167, operated by the Civil Aviation College, took off from Miyazaki Airport for solo flight training at 13:09 Japan Standard Time on November 5 (Friday), 2010. The aircraft landed at Miyazaki Airport and then became immobile on the runway around 13:49.

There was one trainee pilot on board, who did not sustain any injuries.

The aircraft sustained substantial damage, but there was no outbreak of fire.

Findings

When performing a landing, it is important to keep the aircraft in the proper landing attitude on touchdown. To achieve this, it is important to properly adjust the approach speed and perform a flare*1 as the aircraft sinks. In this accident, given the insufficient deceleration and incorrect approach with the flare too moderate relative to the sinking of the aircraft, it is probable that the aircraft did not touchdown with a proper landing attitude.

Accident Aircraft

As a result, it is probable that the aircraft bounced at touchdown due to the improper reduction in airspeed and rate of descent, thus touched down with residual lift and the impact of the landing gear as it hit the runway.

It is probable that, after touchdown, the aircraft bounced in a near level attitude and touched down again on the nose gear first, followed immediately by the main gear, and that, with the impact of the second touchdown, the aircraft bounced again in porpoising*2 with the nose up steeply.

It is probable that in the following touchdown, the aircraft touched down on the nose gear in the steep nose down attitude, which caused the nose gear to sustain damage, and the aircraft then skidded about 292 m on the runway with the nose pushed against the runway surface before becoming immobile.

*1 A "flare" maneuver is made immediately before touchdown in which the aircraft's nose is pulled up to reduce the airspeed and the rate of descent to help minimize landing impact.

*2 In "porpoising," the aircraft repeats a cycle of touchdown and lifting similar to bounce.

Probable causes: It is highly probable that the accident occurred as follows: the aircraft bounced at touchdown, and subsequently fell into a state of porpoising without performing a go-around, eventually touched down with the nose gear severely hitting the runway first, sustained damage to the airframe and then became immobile on the runway.

Regarding the reason why the aircraft bounced at touchdown, it is probable that, with the airspeed still slightly faster than it should have been, after reducing the engine power to idle on passing the runway threshold, the trainee judged that performing a flare in an ordinary manner under the circumstances would cause the aircraft to fly over the intended touchdown point and therefore he eased up on the flare. As a result, it is probable that neither airspeed nor rate of descent was reduced and the aircraft touched down with residual lift, which resulted in bouncing at touchdown due to the impact of the landing gear as it hit the runway.

As for the reason that the trainee did not perform a go-around even after the aircraft bounced, it is probable that he did not have the knowledge and skills that would have enabled him to perform a go-around without hesitation upon bounce.

For details, please refer to the investigation report. (published on June 29, 2012)
http://www.mlit.go.jp/jtsb/eng-air_report/JA4167.pdf

Aircraft damaged on bouncing when landing on airport in solo flight training

Cessna 172S, registered JA33UK, operated by Honda Airways Co., Ltd.

Summary of the accident : A Cessna 172S, registered JA33UK, operated by Honda Airways Co. Ltd., took off from Kumamoto Airport for solo flight training on March 24 (Thursday), 2011. The aircraft was damaged when it bounced during the landing at the airport.

A student pilot on board the aircraft suffered no injury.

The aircraft was damaged; however, no fire broke out.

Findings

First touchdown

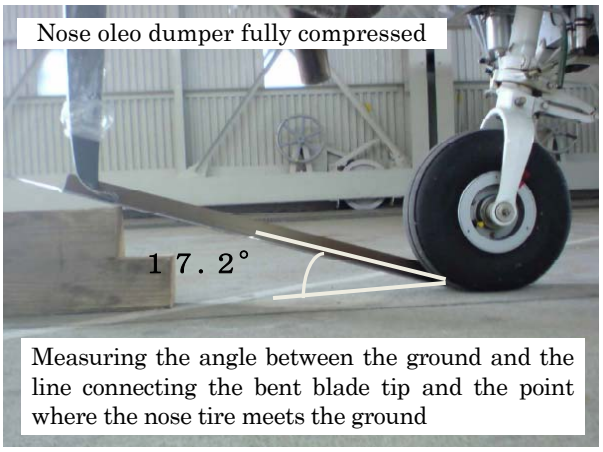
It is probable that the aircraft touched down beyond the target marking due to the left crosswind and tailwind effects. Without a proper landing attitude established, it is somewhat likely that the aircraft bounced with a relatively large sink rate and a larger touchdown speed amid effects of winds.

Second touchdown

As 70 mm inward bending of the blade tip needs at least 17.2° of pitch-down attitude, the student pilot had possibly pushed the control wheel or failed to apply back elevator pressure to hold the pitch-down attitude, resulting in the nose-low contact with the runway.

Accident Aircraft

Damaged Propeller Blade



Measuring the angle between the ground and the line connecting the bent blade tip and the point where the nose tire meets the ground

Probable causes: It is very likely that the aircraft bounced upon landing, followed by a nose-low hard contact with the runway, resulting in damage of propeller blades and fuselage structure.

The student pilot's possible pushing of the control wheel or failure to apply back elevator pressure resulted in the nose-low contact with the runway upon the second settling.

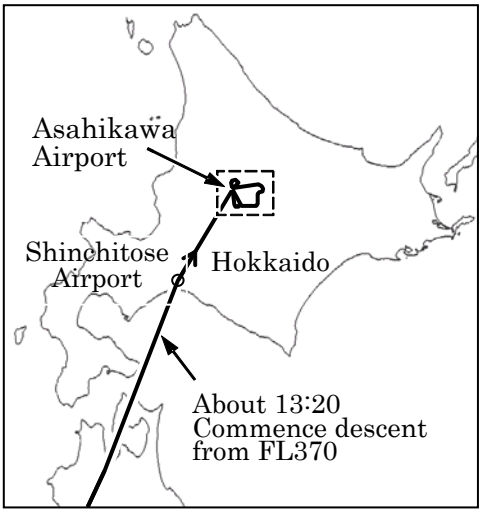
For details, please refer to the investigation report. (published on September 28, 2012)
http://www.mlit.go.jp/jtsb/eng-air_report/JA33UK.pdf

Incident involving emergency maneuver executed by aircraft crew to avoid contact with ground during flight

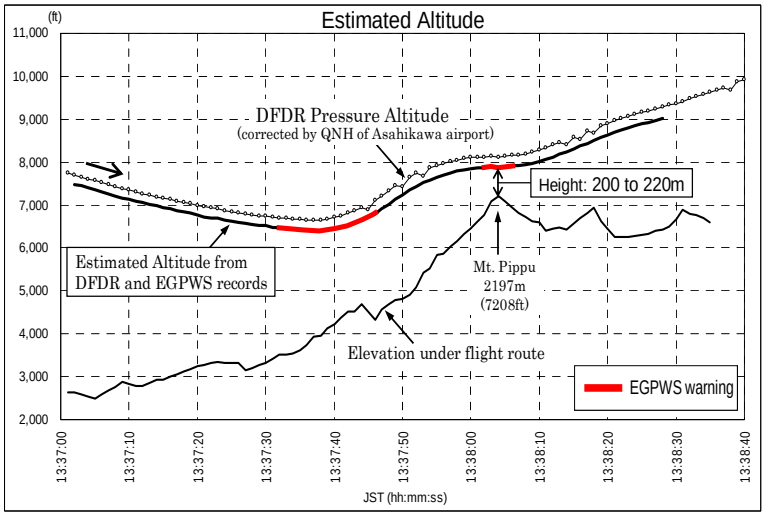
Boeing 737-800, registered JA55AN, operated by Air Nippon Co., Ltd.

Summary of the serious incident: A Boeing 737-800, registered JA55AN, operated by Air Nippon Co., Ltd., took off from Chubu Centrair International Airport for Asahikawa Airport as the scheduled flight 325 of All Nippon Airways Co., Ltd., under the wet lease agreement with All Nippon Airways Co., Ltd. on October 26 (Tuesday), 2010. When the aircraft was descending toward Asahikawa Airport following an air traffic controller's instructions near the destination aerodrome, its ground proximity warning system issued a warning at about 6,800 ft about 30 km east of Asahikawa City, Hokkaido Prefecture. The aircraft took an emergency maneuver and landed at Asahikawa Airport at 14:05 Japan Standard Time.

There were 57 persons on board, consisting of the pilot in command, five crewmembers and 51 passengers, but no one was injured.



Estimated Flight Route



Estimated Flying Altitude

Probable causes: It is highly probable that this serious incident occurred because the aircraft experienced a ground proximity and its flight crew took an emergency maneuver responding to its EGPWS*1 warnings during its descent toward its destination aerodrome, Asahikawa Airport, under the ATC instructions.

It is probable that the ground proximity occurred because the radar controller instructed the aircraft to descend below the MVA*2 without confirming it; its flight crew did not question the radar controller on the descent instructions in spite of their awareness of being vectored to the east toward a mountainous area.

It is probable that the radar controller forgot to confirm the MVA because his attention was focused on securing a separation with another aircraft waiting for a clearance.

It is probable that the flight crew did not question the air traffic controller about the instructions because: the PIC believed the controller was applying the MVA; the first officer gave no advice to the PIC in spite of his use of the VSD*3 based recognition of the approach to the mountainous area.

*1 EGPWS, the enhanced ground proximity warning system, is an airborne safety system which shows a ground proximity to the pilot mainly by analyzing the distance with the ground as measured by a radio altimeter and comparing the geographical feature database and the location of the aircraft.

*2 MVA, the minimum vectoring altitude, means a minimum altitude which an air traffic controller can designate for a radar-vectored aircraft.

*3 VSD, the vertical situation display, is a window which depicts the estimated and actual flight routes and issues a warning whenever a danger of a ground contact exists, by showing the cross section of the estimated flight route and its situation from the present location.

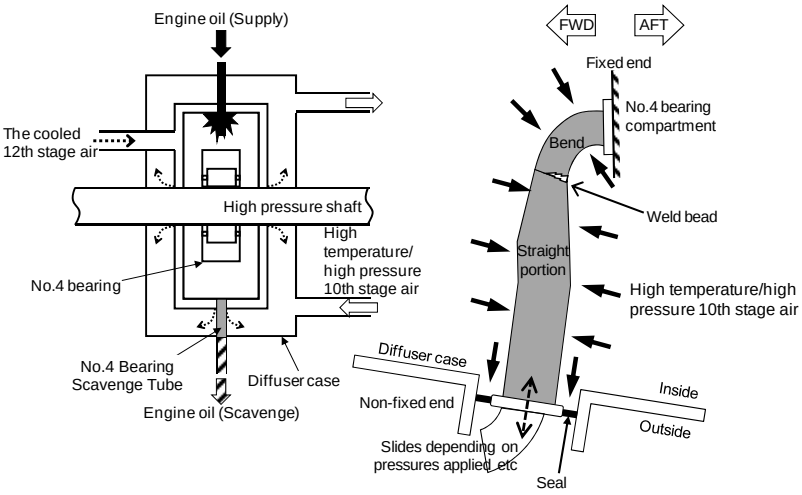
For details, please refer to the investigation report. (published on January 27, 2012)
http://www.mlit.go.jp/jtsb/eng-air_report/JA55AN.pdf

Engine fire during take-off climb
McDonnell Douglas MD-90-30, registered JA002D, operated by Japan Airlines International Co., Ltd.

Summary of the serious incident: A McDonnell Douglas MD-90-30, registered JA002D, operated by Japan Airlines International Co., Ltd. took off from Sendai Airport for Fukuoka Airport as the scheduled flight 3538 at 16:08 Japan Standard Time on August 15 (Sunday), 2010. While climbing around 16:10, the aircraft declared a state of emergency upon the activation of the right engine fire warning alarm at about 5,500 ft. The right engine was shut down, while the fire-extinguishing system was activated; consequently, the aircraft returned to Sendai Airport and landed there at 16:23. Heat damage inside the cowling of the right engine was confirmed after landing.

There were 111 persons on board, consisting of the pilot in command, four other crewmembers and 106 passengers, but no one was injured.

Right Engine Exterior



No.4 Bearing Scavenge Tube

Findings

It is highly probable that the rergion around the bend of the No. 4 bearing scavenge tube gets repeated stress associated with engine operations when the sealed end is pushed outwards as the pressure and the temperature inside the diffuser case rise in proportion to the engine thrust. It is highly probable that the repeated stress generated the fracture origins, from which further repeated stress caused the progress of the fatigue crack followed by the final fracture.

It is probable that because the tube fractured at the bend, the straight portion lost its support; broke loose from the case to make an opening, and from which the engine oil blew out into the high temperature section of the engine to get ignited.

Probable causes: It is probable that this serious incident occurred as follows: the aircraft No. 4 bearing scavenge tube of the right engine fractured during take-off, resulted in the tube breaking loose from the diffuser case letting the engine oil blow out through an opening where it broke loose, and subsequently the oil contact with the engine high temperature section developed into an engine fire.

It is highly probable that the repeated stress associated with engine operations generated the crack origins in the No.4 bearing scavenge tube and the fatigue crack grew into the fracture of the tube.

For details, please refer to the investigation report. (published on June 29, 2012)
http://www.mlit.go.jp/jtsb/eng-air_report/JA002D.pdf

Chapter 3 Railway accident and serious incident investigation

1. Railway accidents and serious incidents to be investigated

<Railway accidents to be investigated>

◎ **Paragraph 3, Article 2 of the Act for Establishment of the Japan Transport Safety Board** (Definition of railway accident)

The term "Railway Accident" as used in this Act shall mean a serious accident prescribed by the Ordinance of Ministry of Land, Infrastructure, Transport and Tourism among those of the following kinds of accidents; an accident that occurs during the operation of trains or vehicles as provided in Article 19 of the Railway Business Act, collision or fire involving trains or any other accidents that occur during the operation of trains or vehicles on a dedicated railway, collision or fire involving vehicles or any other accidents that occur during the operation of vehicles on a tramway.

◎ **Article 1 of Ordinance for Enforcement of the Act for Establishment of the Japan Transport Safety Board** (Serious accidents prescribed by the Ordinance of Ministry of Land, Infrastructure, Transport and Tourism, stipulated in paragraph 3, Article 2 of the Act for Establishment of the Japan Transport Safety Board)

1. The accidents specified in items 1 to 3 inclusive of paragraph 1 of Article 3 of the Ordinance on Report on Railway Accidents, etc. (the Ordinance);
2. From among the accidents specified in items 4 to 6 inclusive of paragraph 1 of Article 3 of the Ordinance, that which falls under any of the following sub-items:
   (a) an accident involving any passenger, crew, etc. killed;
   (b) an accident involving five or more persons killed or injured;
   (c) an accident found to be likely to have been caused owing to a railway officer's error in handling or owing to malfunction, injury, destruction, etc. of the vehicles or railway facilities, which resulted in the death of any person;
3. The accidents specified in items 4 to 7 inclusive of paragraph 1, Article 3 of the Ordinance which are found to be particularly rare and exceptional;
4. The accidents equivalent to those specified in items 1 to 7 inclusive of paragraph 1, Article 3 of the Ordinance which have occurred relevant to dedicated railways and which are found to be particularly rare and exceptional; and
5. The accidents equivalent to those specified in items 1 to 3 inclusive which have occurred relevant to a tramway, as specified by a public notice issued by the Japan Transport Safety Board.

[Reference] The accidents listed in each of the items of paragraph 1, Article 3 of the Ordinance on Reporting on Railway Accidents, etc.

Item 1: Train collision

Item 2: Train derailment

Item 3: Train fire

Item 4: Level crossing accident

Item 5: Accident against road traffic

Item 6: Other accidents with casualties

Item 7: Heavy property loss without casualties

◎ **Article 1 of the Public Notice of the Japan Transport Safety Board** (Accidents specified by the public notice stipulated in item 5, Article 1 of the Ordinance for Enforcement of the Act for Establishment of the Japan Transport Safety Board)

1. From among the accidents specified in items 1 to 6 inclusive of paragraph 1 of Article 1 of the Ordinance on Reporting on Tramway Accidents, etc. (the Ordinance), that which falls under any of the following sub-items:

   (a) an accident that causes the death of a passenger, crewmember, etc.;

   (b) an accident that causes five or more casualties;

2. The accidents specified in items 1 to 7 inclusive of paragraph 1 Article 1 of the Ordinance which are found to be particularly rare and exceptional; and

3. From among the accidents occurring on a tramway operated under the application of the Ministerial Ordinances to Provide Technical Regulatory Standards Railways mutatis mutandis as specified in paragraph 1 of Article 3 of the Ordinance on Tramway Operations, the accidents equivalent to those specified in items 1 to 3 of Article 1 of the Ordinance for Enforcement of the Act for Establishment of the Japan Transport Safety Board.

[Reference] The accidents specified in the items of paragraph 1, Article 1 of the Ordinance on Reporting on Tramway Accidents, etc.

Item 1: Vehicle collision

Item 2: Vehicle derailment

Item 3: Vehicle fire

Item 4: Level crossing accident

Item 5: Accidents against road traffic

Item 6: Other accidents with casualties

Item 7: Heavy property loss without casualties

Railway accidents to be investigated

<table>
<tr><th>Category</th><th>Train collision</th><th>Train derailment</th><th>Train fire</th><th>Level crossing accident</th><th>Accident against road traffic</th><th>Other accidents with casualties</th><th>Heavy property loss without casualties</th></tr>
<tr><td rowspan="2">Railway (including tramway operated as equivalent to railway)

[Notice 1-3]</td><td colspan="3" rowspan="2">All accidents (These refer to train accidents and do not include vehicle accidents on railways.*1)
[Ordinance 1-1]</td><td colspan="4">・Accidents involving the death of a passenger, crew member, etc.
・Accidents involving five or more casualties
・Accidents found to have likely been caused by a railway worker's error in procedure or due to the malfunction, damage, destruction, etc., of vehicles or railway facilities, which resulted in the death of a person
[Ordinance 1-2]</td><td></td></tr>
<tr><td colspan="5">Accidents that are particularly rare and exceptional [Ordinance 1-3]</td></tr>
<tr><td>Dedicated railway</td><td colspan="8">Accidents that are particularly rare and exceptional [Ordinance 1-4]</td></tr>
<tr><td rowspan="2">Tramway [Ordinance 1-5]</td><td colspan="7">Accidents involving the death of a passenger, crewmember, etc., and accidents involving five or more casualties
[Notice 1-1]</td><td></td></tr>
<tr><td colspan="8">Accidents that are particularly rare and exceptional [Notice 1-2]</td></tr>
</table>

*1: Among vehicle collisions, derailments, and fires on railways, accidents that fall under the category of level crossing accident, accidents against road traffics , or other accidents with casualties and which involve the death of a passenger, crewmember, etc. [Ordinance 1-2] or which are particularly rare and exceptional [Ordinance 1-3] are to be investigated.

(Note) "Ordinance" refers to the Ordinance for Enforcement of the Act for Establishment of the Japan Transport Safety Board; "Notice" refers to the Public Notice by the Japan Transport Safety Board; and the numbers refer to the Article and paragraph numbers.

< Railway serious incidents to be investigated>

◎ **Item 2, paragraph 4, Article 2 of the Act for Establishment of the Japan Transport Safety Board** (Definition of railway serious incident)

A situation, prescribed by the Ordinance of the Ministry of Land, Infrastructure, Transport and Tourism (Ordinance for Enforcement of the Act for Establishment of the Japan Transport Safety Board), deemed to bear a risk of accident occurrence.

◎ **Article 2 of the Ordinance for Enforcement of the Act for Establishment of the Japan Transport Safety Board** (A situation prescribed by the Ordinance of the Ministry of Land, Infrastructure, Transport and Tourism, stipulated in item 2, paragraph 4, Article 2 of the Act for Establishment of the Japan Transport Safety Board)

1. The situation specified in item 1 of paragraph 1 of Article 4 of the Ordinance on Reporting on Tramway Accidents, etc. (the Ordinance), wherein another train or vehicle had existed in the zone specified in said item;
   [A situation where a train starts moving for the purpose of operating in the relevant block section before completion of the block procedure: Referred to as "Incorrect management of safety block."]
2. The situation specified in item 2 of paragraph 1 of Article 4 of the Ordinance, wherein a train had entered into the route as specified in said item;
   [A situation where a signal indicates that a train should proceed even though there is an obstacle in the route of the train, or the route of the train is obstructed while the signal indicates that the train should proceed: Referred to as "Incorrect indication of signal."]
3. The situation specified in item 3 of paragraph 1 of Article 4 of the Ordinance, wherein another train or vehicle had entered into the protected area of the signal which protects the zone of the route as specified in said item;
   [A situation where a train proceeds regardless of a stop signal, thereby obstructing the route of another train or vehicle: Referred to as "Violating red signal."]
4. The situation specified in item 7 of paragraph 1 of Article 4 of the Ordinance, which caused malfunction, injury, destruction, etc. bearing particularly serious risk of collision or derailment of or fire in a train;
   [A situation that causes a malfunction, etc., of facilities: Referred to as "Dangerous damage in facilities."]
5. The situation specified in item 8 of paragraph 1 of Article 4 the Ordinance, which caused malfunction, injury, destruction, etc. bearing particularly serious risk of collision or derailment of or fire in a train;
   [A situation that causes a malfunction, etc., of a vehicle: Referred to as "Dangerous trouble in vehicle."]
6. The situation specified in items 1 to 10 inclusive of paragraph 1 of Article 4 of the Ordinance which is found to be particularly rare and exceptional; and
   [These are referred to as: item 4 "Main track overrun"; item 5 "Violating closure section for construction"; item 6 "vehicle derailment"; item 9 "Heavy leakage of

dangerous object"; and item 10 "others," respectively.]

7. The situations occurred relevant to the tramway as specified by a public notice of the Japan Transport Safety Board as being equivalent to the situations specified in the in preceding items.

◎ **Article 2 of the Public Notice of the Japan Transport Safety Board** (A situation prescribed by the public notice stipulated in item 7, Article 2 of the Ordinance for Enforcement of the Act for Establishment of the Japan Transport Safety Board (Serious incident on a tramway))

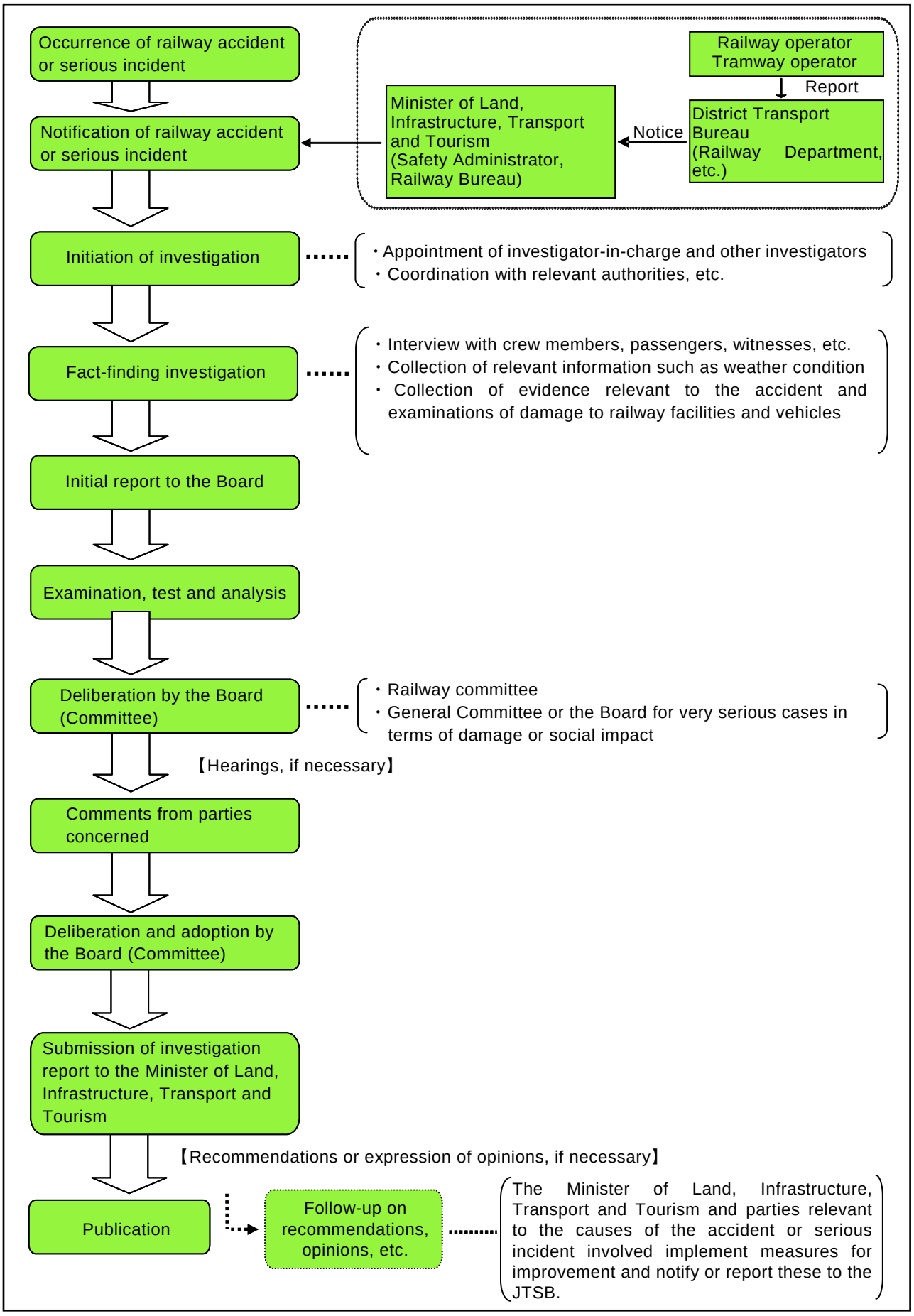
1. The situation specified in item 1 of Article 2 of the Ordinance on Reporting on Tramway Accidents, etc. (the Ordinance), wherein another vehicle operating on the main track had existed in the zone specified in said item;
   [A situation where a vehicle is operating on the main track for the purpose of operating in the relevant safety zone before the completion of safety system procedures: Referred to as "Incorrect management of safety block."]
2. The situation specified in item 4 of Article 2 of the Ordinance, which caused malfunction, injury, destruction, etc., bearing a particularly serious risk of collision, derailment of or fire in a vehicle operating on the main track;
   [A situation that causes a malfunction, etc., of facilities: Referred to as "Dangerous damage in facilities."]
3. The situation specified in item 5 of Article 2 of the Ordinance, which caused malfunction, injury, destruction, etc., bearing a particularly serious risk of collision, derailment of or fire in a vehicle operating on the main track;
   [A situation that causes a malfunction, etc., of a vehicle: Referred to as "Dangerous trouble in vehicle."]
4. The situation specified in items 1 to 7 inclusive of Article 2 of the Ordinance which is found to be particularly rare and exceptional; and
   [These are referred to as: item 2 "Violating red signal;" item 3 "Main track overrun;" item 6 "Heavy leakage of dangerous object;" and item 7 "others," respectively.]
5. From among the situations occurring on a tramway operated under the application of the Ministerial Ordinances to Provide Technical Regulatory Standards Railways mutatis mutandis as specified in paragraph 1 of Article 3 of the Ordinance on Tramway Operations, the situations equivalent to those specified in items 1 to 6 of Article 2 of the Ordinance for Enforcement of the Act for Establishment of the Japan Transport Safety Board.

Serious incidents to be investigated

<table>
<tr><td>Category</td><td>・Incorrect management of safety block (Railway)
・Incorrect management of safety block (Tramway)</td><td>・Incorrect indication of signal (Railway)
・Violating red signal</td><td>Dangerous damage in facilities</td><td>Dangerous trouble in vehicle</td><td>・Main track overrun
・Violating closure section for construction (Railway)
・Vehicle derailment (Railway)
・Heavy leakage of dangerous object
・Others</td></tr>
<tr><td rowspan="2">Railway (including tramway operated as equivalent to railway) [Notice 2-5]</td><td colspan="2">Certain conditions such as the presence of another train [Ordinances 2-1, 2-2, and 2-3]</td><td colspan="2">Risk of collision, derailment or fire [Ordinances 2-4/ 2-5]</td><td></td></tr>
<tr><td colspan="5">Incidents that are particularly rare and exceptional [Ordinance 2-6]</td></tr>
<tr><td rowspan="2">Tramway [Ordinance 2-7]</td><td>Certain conditions such as the presence of a vehicle [Notice 2-1]</td><td></td><td colspan="2">Risk of collision, derailment or fire [Notices 2-2 and 2-3]</td><td></td></tr>
<tr><td colspan="5">Incidents that are particularly rare and exceptional [Notice 2-4]</td></tr>
</table>

(Note) “Ordinance” refers to the Ordinance for Enforcement of the Act for Establishment of the Japan Transport Safety Board; “Notice” refers to the Public Notice by the Japan Transport Safety Board, and the numbers refer to the Article and paragraph numbers.

2. Procedure of railway accident/incident investigation



3. Statistics of investigations of railway accidents and serious incidents

The JTSB carried out investigations of railway accidents and serious incidents in 2012 as follows:

Sixteen accident investigatons had been carried over from 2011, and 20 accident investigatons newly launched in 2012. Thirteen investigation reports were published in 2012, and thereby 23 accident investigations were carried over to 2013.

Two serious incident investigatons had been carried over from 2011, and five serious incident investigatons newly launched in 2012. One investigation report was published in 2012, and thereby six serious incident investigatons were carried over to 2013.

Among the 14 reports published in 2012, one was issued with recommendations and two with remarks.

Investigations of railway accidents and serious incidents in 2012

(Cases)

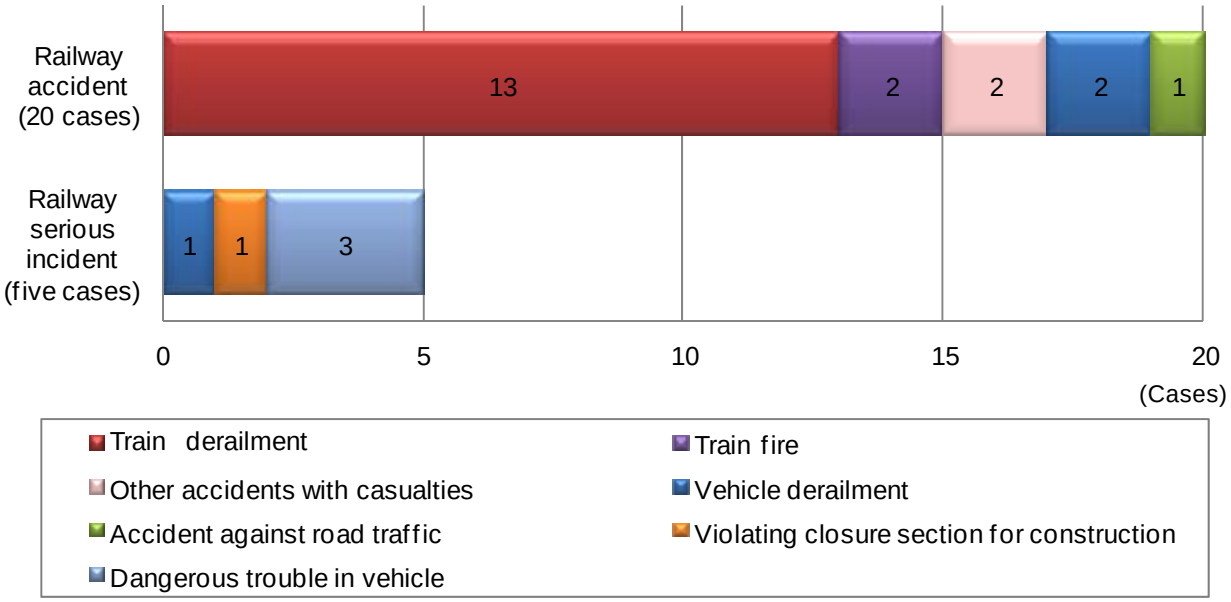
Category	Carried over from 2011	Launched in 2012	Total	Published investigation report	(Recommendations)	(Opinions)	(Remarks)	Carried over to 2013	(Interim report)
Railway accident	16	20	36	13	(0)	(0)	(2)	23	(1)
Railway serious incident	2	5	7	1	(1)	(0)	(0)	6	(0)

4. Statistics of investigations launched in 2012

The investigations launched in 2012 included 20 accidents, up six cases from 14 cases for the previous year, and five serious incidents, up three cases from two cases for the previous year.

With regard to railway accident cases, there were 13 cases of train derailment, two cases of train fire, two cases of other accidents with casualties, two cases of vehicle derailment and one case of accident against road traffic. With regard to railway serious incidents, there were one case of vehicle derailment, one case of violating closure section for construction and three cases of dangerous trouble in vehicle.

Number of railway accidents and serious incidents by type



In the 20 railway accidents, the number of casualties was 82, consisting of one death and 81 injured persons. These accidents included an accident in July 2012 in which a train watchman was hit to death by a limited express train entering the platform, and another accident in September in which a train ran onto the pile of earth and sand, and the front three cars of the train were derailed and the front four cars came to a halt in a tunnel, and 53 persons were injured (nine seriously injured and 44 slightly injured).

Number of casualties (railway accidents)

(Persons)

2012							
Category	Dead			Injured			Total
	Crew	Passenger	Others	Crew	Passenger	Others	
Casualties	0	0	1	2	72	7	82
Total	1			81			

5. Summaries of railway accidents and serious incidents which occurred in 2012

Railway accidents and serious incidents which occurred in 2012 are summarized as follows. The summaries are based on the information available at the start of the investigations, and therefore may change depending on the course of investigations and deliberations.

(Railway accidents)

No.	Date and accident type	Operator and line section (location)	Summary
1	Jan. 04, 2012 Train fire	Toyama Chihou Tetsudou, Inc. On the premises of Tateyama station, Tateyama Line (Toyama Prefecture)	After the passengers got off the train which arrived at Tateyama station, the driver of the train noticed smoke emitting from under the floor. The fire was extinguished after spreading to the inside of the car.
2	Feb. 04, 2012 Accident against road traffic	Nagasaki Electric Tramway Co., Ltd. Between Oura Kaigan-dori and Shimin Byoin Mae stops, Oura Branch Line (Nagasaki Prefecture)	Refer to "6. Publication of investigation reports" (No.11 on page 45).
3	Feb. 16, 2012 Train derailment	Japan Freight Railway Company On the premises of Higashi-Oiwake station, Sekisho Line (Hokkaido Prefecture)	Although the driver of the train applied the brake to stop the train at Higashi-Oiwake station, the train ran into the safety siding without slowing down, and ran over the car stop. The train was derailed and penetrated the snow shelter.
4	Feb. 17, 2012 Other accidents with casualties	West Japan Railway Company On the premises of Nishi-Akashi station, San-yo Line (Hyogo Prefecture)	The train collided with a truck entering the level crossing on the service road in the premises of Nishi-Akashi station. Nine passengers and the truck driver were injured.
5	Feb. 29, 2012 Train derailment	Hokkaido Railway Company On the premises of Yakumo station, Hakodate Line (Hokkaido Prefecture)	After leaving Yakumo station, both axles of the front bogie were derailed near the turnout.
6	Mar. 07, 2012 Train derailment	Hokkaido Railway Company Between Hashibetsu and Mashike stations, Rumoi Line (Hokkaido Prefecture)	While coasting at about 55 km/h, the train ran onto the pile of earth and sand which had flown onto the railway track, and both axles of the front bogie were derailed.
7	Mar. 30, 2012 Train derailment	Toyama Chihou Tetsudou, Inc. On the premises of Uchiyama station, Main Line (Toyama Prefecture)	Hearing an abnormal sound when the train was running along a down and rightward curved track before the turnout, the driver stopped the train near the turnout. It was found that the front axle was derailed to the left.
8	Apr. 04, 2012 Train fire	East Japan Railway Company On the premises of Kujira-nami station, Shin-etsu Line (Niigata Prefecture)	When entering Kujira-nami station, the train driver noticed an abnormal value of the trolley voltage indicator in the driver's cab. After arriving at the station, the driver noticed smoke emitting from around the pantograph of the second car from the front, and evacuated about fifty passengers from the train. It was found that the roof of the car was burning.

No.	Date and accident type	Operator and line section (location)	Summary
9	Apr. 26, 2012 Train derailment	Japan Freight Railway Company Between Izumisawa and Kamaya stations, Esashi Line (Hokkaido Prefecture)	After the train arrived at Goryokaku station, the assistant master of the station noticed smoke emitting from the bogie of the third freight car from the rear, and used a fire extinguisher. On the other hand, it was found that a turnout could not be switched at Kamaya station. Furthermore, it was found that there were continuous marks along the track in the direction to Izumisawa station which indicated that a train ran with derailed cars.
10	Jun. 11, 2012 Vehicle derailment	Okayama Electric Tramway Co., Ltd Between Kencho-dori and Saidaiji-cho stops, Higashiyama Main Line (Okayama Prefecture)	A tram passing through the intersection collided with a passenger car which was turning right in the intersection from the opposite direction. All of the four axles of the tram were derailed.
11	Jun. 19, 2012 Train derailment	Hakone Tozan Railway Co., Ltd. Between Deyama Signal station and Ohiradai station, Train Line (Kanagawa Prefecture)	The train running at about 20 km/h with powering ran onto a chunk of rock, and the first axle of the first car's front bogie was derailed.
12	Jun. 25, 2012 Train derailment	Shikoku Railway Company Between Konokawa and Iyo-Kaminada stations, Yosan Line (Ehime Prefecture)	The train ran onto the pile of earth and sand caused by the landslide on the railway track, and all of the four axles were derailed.
13	Jul. 24, 2012 Other accidents with casualties	Central Japan Railway Company On the premises of Higashi-Shizuoka station, Tokaido Line (Shizuoka Prefecture)	A train watchman walking along the railway track on his way to the designated lookout place was hit by the train. The train watchman was killed in the accident.
14	Jul. 28, 2012 Train derailment	Toyama Chihou Tetsudou, Inc. On the premises of Kamihori station, Kamidaki Line (Toyama Prefecture)	While entering Kamihori station, the train driver noticed abnormal sound and shock. He immediately operated the emergency brake. It was found that all of the eight axles of the 2-car train were derailed.
15	Sep. 11, 2012 Train derailment	Japan Freight Railway Company Between Kamaya and Izumisawa stations, Esashi Line (Hokkaido Prefecture)	While running through the premises of Izumisawa station at about 60 km/h, the emergency brake of the train was activated at a location near the up starting signal and the train came to a halt. When the driver reported the situation to the train dispatcher and checked the condition of the cars, it was found that the brake hose joining the 8th and 9th freight cars was disconnected, and the two cars were derailed.
16	Sep. 15, 2012 Vehicle derailment	Tosa Electric Railway Co., Ltd Between Nagasaki and Kogome-dori stops, Gomen Line (Kochi Prefecture)	A tram passing through the intersection collided with a truck which entered the intersection from the left. Both axles of the tram's front bogie were derailed. Eight persons (six passengers, the tram driver and the truck driver) were injured.

No.	Date and accident type	Operator and line section (location)	Summary
17	Sep. 24, 2012 Train derailment	Keikyu Corporation Between Oppama and Keikyu-Taura stations, Main Line (Kanagawa Prefecture)	While the train was coasting at about 75 km/h, the train driver noticed earth and sand piled up on the railway track 30 to 40 meters ahead, and applied the emergency brake. However, the train ran onto the earth and sand, and the front three cars were derailed to the right. The earth and sand contained a concrete block and fallen trees. The front four cars halted inside the tunnel, and the front three cars were derailed to the right. Nine persons were seriously injured (passengers), while forty-four persons were slightly injured (forty-three passengers and one driver).
18	Oct. 14, 2012 Train derailment	Kyushu Railway Company On the premises of Kagoshima Central station, Kagoshima Line (Kagoshima Prefecture)	After departing from Kagoshima Central station on schedule, the driver of the local train (2-car train set) noticed something abnormal with the passengers, and stopped the train by applying the service brake. It was found that both axles of the second car's rear bogie were derailed (both axles of the front bogie got back on the rails after derailment). 156 passengers and the driver on board were not injured.
19	Nov. 08, 2012 Train derailment	Sangi Railway Co., Ltd On the premises of Misato station, Sangi Line (Mie Prefecture)	The local train (3-car train set) ran into the safety siding of Misato station, and all of the four axles of the first car were derailed. Two passengers and one driver were on board the train, but they were not injured.
20	Dec. 15, 2012 Train derailment	Kyushu Railway Company Between Setoishi and Kaiji stations, Hisatsu Line (Kumamoto Prefecture)	While running at about 65 km/h, the driver of the limited express train (2-car train set) found a fallen rock about 30 meters ahead, and applied the emergency brake. However, it was too late, and the train collided with the fallen rock. The second axle of the second car's front bogie was derailed. Forty-five passengers and two crew members were on board the train, but they were not injured.

(Railway serious incidents)

No.	Date and incident type	Operator and line section (location)	Summary
1	Jun. 04, 2012 Dangerous trouble in vehicle	East Japan Railway Company Between Koriyama and Mougi stations, Ban-etsu East Line (Fukushima Prefecture)	When the door-pilot lamp in the driver's cab was extinguished while running the train, the driver immediately stopped the train by applying the emergency brake. After stopping the train, it was found that the right rear door of the third car was open.
2	Jun. 19, 2012 Dangerous trouble in vehicle	Fukui Railway Co., Ltd On the premises of Sanju-Hassha station, Fukubu Line (Fukui Prefecture)	When the train slowed down to the station, it was found that the right rear door of the first car was open.

No.	Date and incident type	Operator and line section (location)	Summary
3	Jun. 27, 2012 Vehicle derailment	Sangi Railway Co., Ltd On the premises of Higashi-Fujiwara station, Sangi Line (Mie Prefecture)	While the freight train was passing the turnout, the first axle of the second locomotive derailed near the turnout.
4	Jul. 13, 2012 H24.7.13 Violating closure section for construction	East Japan Railway Company On the premises of Takasaki station, Shin-etsu Line (Gunma Prefecture)	The train entered the section where preparation work for replacing the turnout parts was going on. Recognizing a worker inside the railway track, the driver stopped the train before the working site.
5	Nov. 26, 2012 Dangerous trouble in vehicle	Kyushu Railway Company Between Sue and Sue Central stations, Kashii Line (Fukuoka Prefecture)	When the door-pilot lamp in the driver's cab was extinguished while running the train, the driver immediately stopped the train by applying the emergency brake. It was found that the right front door of the first car was opened by about 30 cm.

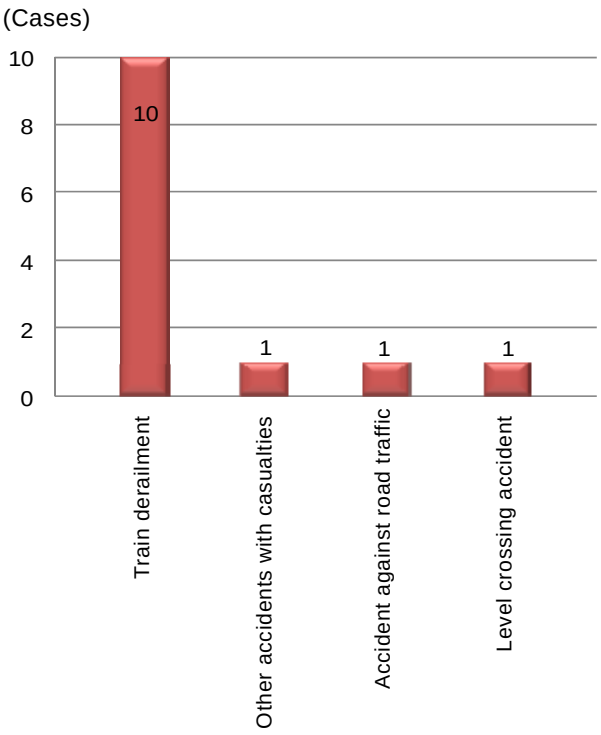
6. Publication of investigation reports

The number of investigation reports of railway accidents and serious incidents published in 2012 was 14, consisting of 13 railway accidents and one serious incident.

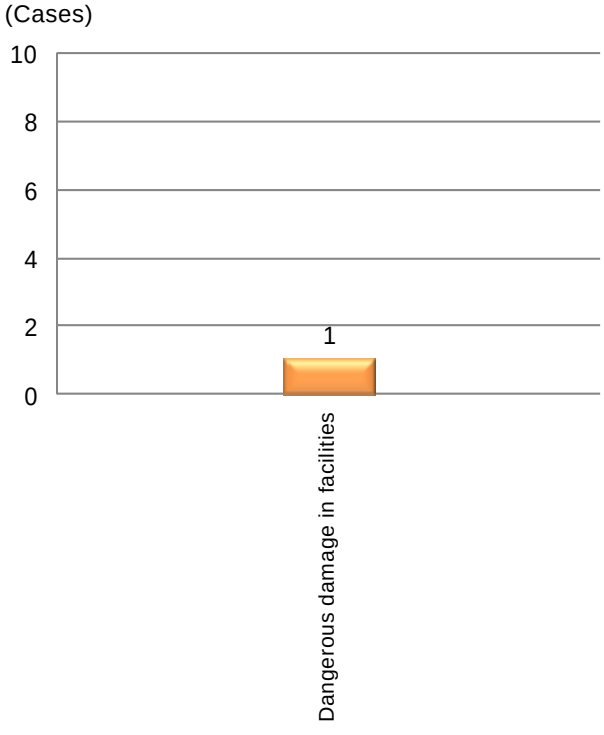
Looking those accidents and serious incident by type, the accidents involved 10 cases of train derailment (including three cases due to level crossing accident), one case of other accidents with casualties, one case of accident against road traffic and one case of level crossing accident. The serious incident was a case of dangerous damage in facilities.

In the 13 accidents, the number of casualties was 21, consisting of two deaths and 19 injured persons.

Railway accident reports (13 cases) published in 2012



Railway serious incident reports (one case) published in 2012



The investigation reports for railway accidents and serious incidents published in 2012 are summarized as follows:

List of published investigation reports on railway accidents (2012)

No.	Date of publication	Date and accident type	Operator and line section (location)	Summary
1	Jan.27, 2012	Dec.17, 2010 Train derailment (due to level crossing accident)	Konan Railway Co., Ltd Between Ishikawa-Pool-mae and Ishikawa stations, Owani Line (Aomori Prefecture)	The westbound train (2-car train set) left Ishikawa-Pool-mae station on schedule. While the train was coasting over Hirakawa bridge at 40 to 45 km/h, the driver of the train noticed a mini passenger car entering Ishikawa-Yagishi level crossing from the right. The driver immediately blew the horn and applied the emergency brake, but it was too late. The train collided with the mini passenger car and came to a halt at about 72 meters past the level crossing. The first axle of the first car's front bogie was derailed to the right. Among the 26 passengers and two crew members (a driver and a conductor) on board the train, one passenger and the conductor were injured. The driver who was the only person in the mini passenger car was injured. The train suffered damage to the front and side surface of the first car. The mini passenger car was severely damaged, but no fire occurred.
2	Jan.27, 2012	Dec.17, 2010 Other accidents with casualties	West Japan Railway Company On the premises of Maiko station, San-yo Line (Hyogo Prefecture)	The eastbound rapid train (12-car train set) left Maiko station on schedule. After leaving the station, the conductor of the train noticed a man waving something white on the platform at a location near the stop position for the train's 5th or 6th car. The conductor operated an emergency switch in the conductor's cabin to bring the train to a halt. The train came to a halt after running about 76 meters from the departure position. It was found that a woman had fallen on the railway track, who was later confirmed dead. A woman who got off the train with the dead woman and was on the platform tried to save the fallen woman. She had her leg injured at that time. About 600 passengers, one driver and one conductor were on board the train, but there were no deaths or injuries. *** The report included remarks**

No.	Date of publication	Date and accident type	Operator and line section (location)	Summary
3	Feb.24, 2012	Feb.01, 2011 Level crossing accident	East Japan Railway Company Between Morimiyanohara and Ashidaki stations, Iiyama Line (Niigata Prefecture)	The eastbound train (1-car train set) left Morimiyanohara station behind schedule. While the train was coasting at about 60 km/h, the driver of the train noticed a compact truck (station wagon) entering Daikonbara level crossing ahead from the left. The train driver immediately applied the emergency brake and blew the horn, but it was too late. The train collided with the compact truck, and came to a halt about 75 meters past the level crossing. Seven passengers, one driver and two track maintenance workers were on board the train, but there were no deaths or injuries. The truck driver who was the only person in the truck was killed in the accident. The train suffered damage to the lower cover plate, but it was not derailed. The truck was severely damaged, but no fire occurred. *** The report included remarks**
4	Apr.27, 2012	Jan.01, 2011 Train derailment	West Japan Railway Company Between Higashiyama-Koen and Houki-Daisen stations, San-in Line (Tottori Prefecture)	The eastbound snow-plow train (1-car train set) left Yonago station behind schedule in order to rescue a limited express train which had stopped due to fallen trees between Shimoichi and Mikuriya stations. While powering the snow-plow train at about 10 km/h between Higashiyama-Koen and Houki-Daisen stations, the driver noticed a stop signal indicated on the obstruction warning signal at a level crossing, and stopped the train before the signal. Then, the driver tried to advance the train closer to the level crossing in order to confirm the safety at the level crossing, but the train did not move. When the snow removal crew who were on board the train to rescue the limited express train removed the snow from around the plow head, it was found that the first axle of the plow head was derailed to the left. The driver and four snow removal crew members were on board the train, but there were no deaths or injuries.

No.	Date of publication	Date and accident type	Operator and line section (location)	Summary
5	May 25, 2012	Jan.27, 2011 Train derailment	West Japan Railway Company On the premises of Nagahara station, Kosei Line (Shiga Prefecture)	The northbound train (8-car train set) arrived at Nagahara station almost on schedule. When the train arrived, the driver found a snow bank on the track at the stop sign, and the driver stopped the train before the sign. When the driver started up the train to depart on schedule as a turn back operation, the train did not move. He reported the situation to the train dispatcher. When workers sent by the train dispatcher arrived and removed the snow, it was found that both axles of the 8th (rearmost) car's rear bogie were derailed to the left. Four passengers and two crew members were on board the train, but there were no deaths or injuries.
6	Jun.29, 2012	Mar.10, 2011 Train derailment	Japan Freight Railway Company Between Kuzumi and Namegawa stations, Narita Line (Chiba Prefecture)	The northbound high-speed freight train (10-car train set) passed Kuzumi station on schedule. When entering the premises of Namegawa station while coasting, the emergency brake of the train was activated, and the train stopped in the premises of the station. As the emergency brake could not be released after the train stopped, the driver inspected the train by order of the train dispatcher. It was found that the 8th and 9th freight cars of the train were separated from each other, the 9th freight car was derailed and overturned to the right, and the 10th freight car was derailed to the right. The train was scheduled to pass by a southbound passenger train at that station. There were marks on the sleepers, etc., indicating that the train was running with derailed cars before entering the station. One driver was on board the train, but the driver was not injured.
7	Jun.29, 2012	Mar.11, 2011 Train derailment	Japan Freight Railway Company On the premises of Nagamachi station, Tohoku Line (Miyagi Prefecture)	The southbound high-speed freight train (21-car train set) left Miyagino station on schedule. When passing Nagamachi station at about 45 km/h, the driver of the train received a train protection radio and an emergency stop radio, and at the same time, felt a shake. The driver applied the service brake to stop the train. When the driver inspected the train by order of the train dispatcher after the train stopped, it was found that the second axle of the 14th freight car's front bogie was derailed to the right. One driver was on board the train, but the driver was not injured.

No.	Date of publication	Date and accident type	Operator and line section (location)	Summary
8	Jun.29, 2012	Jul.14, 2011 Train derailment	East Japan Railway Company On the premises of Tokusawa station, Ban-etsu West Line (Fukushima Prefecture	The eastbound local train (3-car train set) left Kanose station on schedule. When the train was coasting in the Nishikawa tunnel on the premises of Tokusawa station at about 35 km/h, the driver of the train noticed a chunk of rock between the rails at about 27 meters ahead of the tunnel's exit. The driver immediately applied the emergency brake, but it was too late, and the train ran onto the rock. Both axles of the first car's front bogie were derailed to the right while both axles of the rear bogie were derailed to the left. Twelve passengers and two crew members (a driver and a conductor) were on board the train, but there were no injuries.
9	Aug.31, 2012	Nov.01, 2011 Train derailment (due to level crossing accident)	Chichibu Railway Co., Ltd Between Higuchi and Nogami stations, Chichibu Main Line (Saitama Prefecture)	The eastbound one-man-operated local train (3-car train set) left Nogami station a minute behind schedule. While the train was coasting at about 78 km/h, the driver of the train noticed a large truck standing inside Higuchi No.3 level crossing when the train came about 200 meters before the crossing. The driver blew the horn and applied the emergency brake, but it was too late. The train collided with the large truck. While both axles of the first car's front bogie were derailed to the right and both axles of the rear bogie were derailed to the left, the train came to a halt about 30 meters past the crossing. About forty passengers and the driver were on board the train, and four passengers and the driver were injured. Having got off before the accident occurred, the driver of the large truck was not injured. The train suffered damage to the front surface and underfloor equipment of the first car. The large truck was severely damaged, but no fire occurred.

No.	Date of publication	Date and accident type	Operator and line section (location)	Summary
10	Aug.31, 2012	Dec.27, 2011 Train derailment	Japan Freight Railway Company On the premises of Gifu Freight Terminal station, Tokaido Line (Gifu Prefecture)	The westbound high-speed freight train (27-car train set) departed from Track No.1 at Gifu Freight Terminal station. After passing the switches at about 35 km/h while keeping the master controller at powering notch, the driver of the train noticed that the trouble indication lamp in the driver's cab was lighted, and at the same time the emergency brake was activated. A duty station master in the station office heard a large sound and found a train running while raising a cloud of dust. The duty station master immediately set the simultaneous stop signal mode on, reported the derailment to the train dispatcher and requested train protection. After stopping the train, the driver of the train was informed by the train dispatcher that the train was derailed. The driver found that the 12th and 13th freight cars of the train were separated from each other, and both axles of the 12th freight car's rear bogie as well as both axles of the 13th freight car's front bogie were derailed. One driver was on board the train, but the driver was not killed or injured.
11	Aug.31, 2012	Feb.04, 2012 Accident against road traffic	Nagasaki Electric Tramway Co., Ltd. Between Oura Kaigan-dori and Shimin Byoin Mae stops, Oura Branch Line (Nagasaki Prefecture)	While powering the single-car tram at about 33km/h, the driver noticed a compact passenger car standing while leaving the rear right side of the body inside the tramway on the left side of the direction of travel inside the intersection between Oura Kaigan-dori and Shimin Byoin Mae stops. The driver blew the horn and applied the emergency brake, but the tram collided with the passenger car, and came to a halt about 16.7 meters past the collision point. The passenger car was pushed out forward by the collision, and was made to collide with a compact passenger car which was standing ahead. About thirty-five passengers and one driver were on board the tram, and five passengers were injured. There were two persons in the compact passenger car which collided with the tram, and three persons in the other compact passenger car which was standing ahead. All of the five persons were injured. The tram suffered damage to the front left side of the body, and both of the compact passenger cars were damaged.

No.	Date of publication	Date and accident type	Operator and line section (location)	Summary
12	Sep.28, 2012	Mar.11, 2011 Train derailment	Japan Freight Railway Company Between Hamayoshida and Yamashita stations, Joban Line (Miyagi Prefecture)	The southbound high-speed freight train (21-car train set) was powering at about 80 km/h after passing Hamayoshida station behind schedule, and the driver of the train received a train protection radio, and stopped the train by applying the emergency brake. The driver felt large shaking during the time before the train came to a halt after applying the emergency brake. Just before the train stopped, the driver received a message by radio informing that an earthquake occurred. A tsunami attacked the train about 20 to 25 minutes after the train stopped. When the driver checked the hauling container wagons, it was found that 20 container wagons except the locomotive were derailed and washed away to the right. One driver was on board the train, but the driver was not injured.
13	Nov.30, 2012	Nov.29, 2011 Train derailment (due to level crossing accident)	West Japan Railway Company Between Kaga-Onsen and Daishoji stations, Hokuriku Line (Ishikawa Prefecture)	The westbound limited express train (9-car train set) passed Kaga-Onsen station on schedule. While decelerating the train speed along the straight line section, the driver of the train noticed a compact passenger car at Shinsuganami level crossing, and immediately applied the emergency brake and blew the horn, but it was too late. The train collided with the passenger car, and came to a halt about 300 meters past the level crossing. The train suffered damage to the lower front section of the first car, and the front bogie's first axle was derailed to the left. The compact passenger car was severely damaged, but no fire occurred. About ninety passengers, one driver, two conductors and one cabin attendant were on board the train, but there were no deaths or injuries. The driver who was the only person in the compact passenger car was safe as the driver left the car before the accident.

List of published investigation reports on railway serious incidents (2012)

No.	Date of publication	Date and inccident type	Operator and line section (location)	Summary
1	Nov.30, 2012	Jun.14 to 16, 2011 Dangerous damage in facilities	Hokkaido Railway Company On the premises of Oiwake station, Sekisho Line (Hokkaido Prefecture)	・The first case occurred on June 14, 2011 The westbound local train (1-car train set) departed from Track No.1 at Oiwake station on schedule. A signaller at the station's signal cabin noticed that although the train departed from Track No.1, the indication lamp of the track's starting signal on the indication panel kept lighting green without being extinguished to give a stop signal indication. According to the sequence recorder of the interlocking device, the starting signal did not indicate a red stop signal at that time. ・The second case occurred on June 14, 2011 The westbound limited express train (4-car train set) departed from Track No.1 at Oiwake station on schedule. The same signaller in the first incident noticed that although the train departed from Track No.1, the indication lamp of the track's starting signal on the indication panel kept lighting green without being extinguished to give a stop signal indication. According to the sequence recorder of the interlocking device, the starting signal did not indicate a red stop signal at that time. ・The third case occurred on June 15, 2011 The westbound limited express train (5-car train set) departed from Track No.1 at Oiwake station on schedule. A signaler, different from the signaller in the first and second incidents, noticed that although the train departed from Track No.1, the indication lamp of the track's starting signal on the indication panel kept lighting green without being extinguished to give a stop signal indication. An employee in charge of work confirmed that the starting signal did not indicate a red stop signal at that time. ・The fourth case occurred on June 16, 2011 The westbound local train (1-car train set) departed from Track No.4 at Oiwake station behind schedule. A signaler, different from the signallers in the first to third incidents, noticed that although the train departed from Track No.4, the indication lamp of the track's starting signal on the indication panel kept lighting green without being extinguished to give a stop signal indication. According to the sequence recorder of the interlocking device, the starting signal did not indicate a red stop signal at that time. *** The report included recommendations**

7. Summary of recommendations and opinions

There was one case of recommendations in 2012, which is summarized below:

○ In view of the results of the investigation of an railway serious incident which occurred on the premises of Oiwake station on the Sekisho Line of Hokkaido Railway Company, the Japan Transport Safety Board made the following recommendations to Hokkaido Railway Company on November 30, 2012.

1. In order to prevent occurrence of a similar accident, Hokkaido Railway Company (the "Company") indicated its intention to establish construction work procedures, such as requiring prior checking of a change-over plug's insertion position and various drawings, which would not influence the existing signalling systems, and to specify in its operation manual a method to be adopted by signallers when they confirmed a situation in which a signal indication lamp which should have given a stop signal indication was not extinguished to give a stop signal indication. While these measures are considered to be effective in preventing a similar accident, it is necessary for the Company to continue providing its employees with proper education and training so that they can understand the meaning of these measures correctly to take proper measures in case of emergency.
2. In view of the fact that the serious incident occurred although preventive measures were implemented after the occurrence of a serious incident on Hakodate Line on January 15, 2009 in which a block signal which should have given a stop signal indication failed to do so, it is necessary for the Company to reexamine the implementation and management system for the construction and maintenance of the signalling systems, make all the workers including those from outside the Company master the basic operation procedures, and adopt additional safety measures as necessary for preventing a similar incident.

8. Remarks

The JTSB made remarks on the following two railway accidents in 2012.

(I) Railway accident on the premises of Maiko station on the San-yo Line of West Japan Railway Company (Accident with casualties)

(Published on January 27, 2012)

1. Improvement in the safety awareness of the railway users and their familiarization with the emergency button usage

This is an accident caused by the falling from the platform of a passenger who got off from the train. It is somewhat likely that alcohol drinking was involved in the falling.

In order to decrease the number of similar accidents, it is considered important that the railway users and operators should pay attention to the following;

(1) Each of the railway users should recognize the danger involved when falling on a railway track, and raise their awareness for protecting their own safety so that their behavior may not put themselves in a dangerous situation.

(2) The railway operators should pay special care so that passengers on the platform equipped with emergency buttons can press them without hesitation when noticing any passenger fallen on the railway track and finding it necessary to stop the train, and should obtain the understanding and cooperation of the railway users in this regard.

For this reason, it is considered also important that the railway operators should not only raise the safety awareness of the railway users but also familiarize them with the purpose of emergency buttons installed on the platform and their operation method. It is desirable that such a safety activity should be implemented in the form of a simultaneous campaign by railway operators' associations, rather than by a single operator, or even in the form of awareness-raising activities beyond the scope of the railway operators, so that such a movement will gain further understanding among the entire society, let alone the railway users.

2. Effective utilization of emergency buttons when a train is standing at a station or departing from a station

While unrelated to the occurrence of the accident, it has become clear in the process of investigating the accident that a crew on board a train may not be made aware of the occurrence of an emergency according to which of the emergency buttons installed in the station has been pressed when the train is standing at the station or departing from the station.

It is probable that installation of emergency buttons by the Company after the notice was issued from Railway Bureau, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) as a result of an accident with casualties at Shin-Okubo station was intended to notify a crew on board a train approaching to a station of the falling of a passenger, etc., and not necessarily to notify a crew on board a train standing at a station or departing from a station. It is also probable that the Company installed a rotating lamp and a buzzer close to each emergency button to make it easy to identify the location of the pressed emergency button, although the notice did not require installation of such devices.

However, a similar accident may occur at any station during the time between the arrival and departure of a train, and in such a case it is probable that installation of emergency buttons will be all the more effective if operating emergency buttons can make the crew on board the train aware that an abnormal event has occurred.

The railway operators have been promoting the railway users for these several years to press emergency buttons without hesitation when it is necessary to stop the train, and it is probable that the railway users expect, by pressing emergency buttons, a crew on board a train standing or beginning to move will be made aware of the occurrence of an abnormal event, and the train will be stopped. For this reason, with respect to those stations equipped with emergency buttons, it is recommended that some alerting device should be installed at a location where a crew of a departing train can easily be made aware of the occurrence of an abnormal event, according to the circumstances of each station like the platform is unstaffed or trains made up of a lot of cars make a stop.

In this connection, in a notice of "Safety measures to prevent falling accidents from the platform (supplement)" dated November 21, 2011 issued on the basis of the information from the JTSB, the Railway Bureau, MLIT requested the stations equipped with emergency buttons to adopt effective safety measures while taking account of "when a train is departing from the station" according to the type of operation. Therefore, it is recommended that the railway operators should give consideration to the arrangement of such facilities and their functions in accordance with the notice.

(II) Railway accident between Morimiyanohara and Ashidaki stations on the Iiyama Line of East Japan Railway Company (Level crossing accident)

(Published on February 24, 2012)

The accident occurred at a level crossing, a railway facility which is important to not only the railway operators but also the passersby and requires the utmost attention while being crossed.

It is necessary for the Company to strengthen its efforts for preventing occurrence of a similar accident on the basis of the following views.

(1) Bearing in mind that safety awareness should only be acquired by receiving education on a daily basis and getting through practical field work, it is necessary for the Company to ensure that the maintenance workers should fully master the safety procedures by making them practice the applicable procedures repeatedly at their education or training course and on the occasion of regular meetings, as well as by making use of training facilities and giving them on-the job-training from time to time. At the same time, it is necessary for the Company to consider introducing a safety mechanism like a human error prevention system which will enable a pair of level crossing guards to mutually confirm that they have checked the existence of any oncoming train.

(2) Considering that the level crossing is a type of safety equipment which needs prompt countermeasures when it should fail, it is desirable that the Company should consider adopting such measures as reducing disturbance to the passersby by means of shortening the time for the maintenance workers to arrive at the site and ensuring a rapid recovery from the failure.

9. Actions taken in response to recommendations in 2012

Actions taken in response to recommendations were reported with regard to one railway serious incident in 2012. The summary of this report is as follows:

(I) Railway serious incident between Oura Kaigan-dori and Oura Tenshudo-shita tram stops on the Oura Branch Line of Nagasaki Electric Tramway Co., Ltd (Incorrect management of safety block)

(Recommended on September 30, 2011)

As a result of the investigation of a railway serious incident which occurred between Oura Kaigan-dori and Oura Tenshudo-shita tram stops on the Oura Branch Line of Nagasaki Electric Tramway Co., Ltd. on October 21, 2010, the Japan Transport Safety Board published an investigation report and made recommendations to the Company as one of the parties relevant to the cause of the accident, on September 30, 2011. The Board received the following completion report on the implementation of measures in response to the recommendations.

<Summary of accident>

On October 21 (Thursday), 2010, at about 14:15, when the tablet and ticket system was in place in a single track section between Oura Kaigan-dori and Oura Tenshudo-shita tram stops, the driver of tram No. 1505 started the tram from Oura Kaigan-dori tram stop after confirming that tram No. 503 had come out of the single track section. When the driver stopped the tram at the stop line for the track leading to Ishibashi at the Matsugaebashi intersection, he saw that a 1-car tram, No. 1203 from Ishibashi stop bound for Hotarujaya tram stop, was stopped at No.1 stop line at the Matsugaebashi intersection.

At this time, the distance between tram No. 1505 and tram No. 1203 was about 46 m.

Subsequently, upon orders from a staff dispatched to Oura Kaigan-dori tram stop for operating the tablet and ticket system, tram No. 1203 backed up to Ishibashi tram stop, and then tram No. 1505 continued to Ishibashi tram stop.

<Recommendations made by the JTSB and the status of measures taken in response to the recommendations>

(1) Recommendations made by the JTSB

Based on the results of the investigation into this serious incident, the JTSB issues the following recommendations to Nagasaki Electric Tramway Co., Ltd. pursuant to paragraph 1, Article 27 of the Act for Establishment of the Japan Transport Safety Board in order to ensure transportation safety:

1. Concerning the education on regulations, standards, etc.

1) Examine whether the work standards, etc., related to the operation of the safety system (safety blocks) are appropriate and check the actual state of the operators including their response capability, etc.

2) Conduct appropriate education and training for the relevant employees, and periodically and continuously check the achieved level to ensure that the education

and training are put into practice.

3) Ensure that the relevant employees thoroughly understand and comply with the regulations, internal standards, etc.

2. Concerning the enhancement of the safety management system and the promotion of effective measures

1) Verify the effectiveness of current measures for safety management, and abolish or review systems and/or measures that are no longer effective.

2) Review the safety management system driven by the head office, and implement measures to establish an organization where field personnel are motivated to learn and make improvements on their own without ignoring problems.

(2) The content of the completion report by Nagasaki Electric Tramway Co., Ltd. for actions taken in response to the recommendations by the Board (December 26, 2012)

1. Concerning the education on regulations, standards, etc.

1) Examine whether the work standards, etc., related to the implementation of the safety system (safety blocks) are appropriate and check the actual state of the operators including their response capability, etc.

[Concrete actions taken on the basis of the implementation plan]

(a) Implementation of the safety system (safety blocks) education at training workshops. (Reported in December 2012)

(b) Review of the tablet and ticket system operation manual, followed by dissemination of the related information to all the operation staff. (Reported in May 2012)

(c) Creation of a pilot system operation manual, followed by provision of training workshops based on the new manual. (Reported in May 2012)

2) Conduct appropriate education and training for the relevant employees, and periodically and continuously check the achieved level to ensure that the contents of the education and training are put into practice.

[Concrete actions taken on the basis of the implementation plan]

(a) Holding training workshops by creating an annual training plan. (Reported in December 2012)

(b) Implementation of written tests at training workshops to check the level of understanding, and review the contents of the training as necessary. (Reported in December 2012)

(c) Implementation of demonstrations and individual interviews to check the achieved level at training workshops. (Reported in December 2012)

(d) Implementation of on-board inspection twice a year for each crew member to check the performance of the basic operation procedures. (Reported in December 2012)

(e) Review of the on-board inspection check sheet to make sure that basic operation procedures are consistently and correctly performed. (Reported in May 2012)

3) Ensure that the relevant employees thoroughly understand and comply with the regulations, internal standards, etc.

[Concrete actions taken on the basis of the implementation plan]

(a) Implementation of customer surveys by installing a customer survey box in each tramcar. (Reported in December 2012)

(b) Implementation of education and training to learn lessons from past accident cases by analyzing them and working out preventive measures. (Reported in December 2012)

(c) Implementation of an individual-based education method to check the level of understanding with regard to changes in operation procedures to be made for improving safety measures. (Reported in May 2012)

2. Concerning the enhancement of the safety management system and the promotion of effective measures

1) Verify the effectiveness of current measures for safety management, and abolish or review systems and/or measures that are no longer effective.

[Concrete actions taken on the basis of the implementation plan]

(a) Participation of field personnel and crew members in the near-accident review committee and accident prevention committee to hear opinions from the field personnel. (Reported in December 2012)

(b) Improvement of safety awareness by newly establishing an accident prevention study workshop on the basis of reviewing the activities of the accident eradication committee which are no longer effective. (Reported in December 2012)

(c) Installation of a monitoring system at Oura Kaigan-dori tram stop in order to check the presence of a tram in the safety block. (Reported in May 2012)

2) Review the safety management system driven by the head office, and implement measures to establish an organization where field personnel are motivated to learn and make improvements on their own without ignoring problems.

[Concrete actions taken on the basis of the implementation plan]

(a) Implementation of a safety meeting every two months. (Reported in December 2012)

Implementation of an annual emergency drill. (Reported in December 2012)

10. Information dissemination in the process of investigations

There was no case of information dissemination in 2012.

Column

Making a solitary decision in a cold rain

Railway transportation is part of the public transportation system which is indispensable for the daily life of the general public. As the railway users will be seriously affected once a railway accident occurs and several trains are made to stop operating for many hours, we should always keep in mind the necessity of resuming the train service as fast as possible after the initial stage of the investigation is over. For this reason, a railway accident investigator-in-charge who is responsible for the investigation will be put in a situation where he has to make a solitary decision on many occasions. The following is an example of such cases.

In the evening of a winter day, a train derailment accident occurred in which a train collided with an automobile at a level crossing. For implementing the initial investigation of the accident, a team of the three investigators headed by the investigator-in-charge took the Shinkansen, a conventional train and a taxi cab to get to the accident site after leaving their office. They arrived at the site after 21:30 on that day. It had started raining from the evening at the accident site. As the spring was still far away, it was very cold with a cold rain.

In the case of a derailment accident, it is necessary to check the condition of the railway track and other ground facilities by moving the affected cars after checking the condition of the accident site. Therefore, checking the condition of the accident site precisely, promptly and efficiently is very important. For that reason, accident investigators always try to plan their investigation procedures on the basis of relatively limited information available within a limited period of time moving to the accident site, so that they can undertake their investigation immediately after arriving at the site. At this stage, the investigator-in-charge is put in a critical situation where he has to decide on the investigation procedures and instruct the parties concerned accordingly. This is a moment when the investigator-in-charge keenly feels the weight of his responsibility, as the decision for settling the investigation procedures determines the course of the investigation.

For this particular accident in which the affected cars of the train were derailed largely and damaged, giving an indication that it would take many hours for the restoration work, the investigator-in-charge decided to keep checking the condition of the accident site all night in order to undertake the restoration work smoothly. During the rainy and cold night, the investigators continued checking the condition of the accident site while keeping records in their notebooks drenched with the cold rain, with a pen in their numb hands. It was past 2 o'clock around midnight when it became possible to remove the derailed cars. As it was unable to check the condition of ground facilities while removing the derailed cars, the investigator-in-charge decided to resume the investigation the next morning. It was past 3 o'clock when they left the site. They took an hour-long nap after that, and returned to the site at 6 o'clock in the morning to resume the investigation.

As it was relatively convenient to get to the accident site this time, it was not so burdensome to move to the site or make lodging arrangements. However, they had to continue with their investigation work virtually all night keeping in mind the necessity of resuming the train service. As a result, they could complete the initial stage of the investigation safely without catching a cold, but they keenly felt it necessary again to keep in good shape to be ready for any possibility.

11. Summaries of major railway accident and serious incident investigation reports

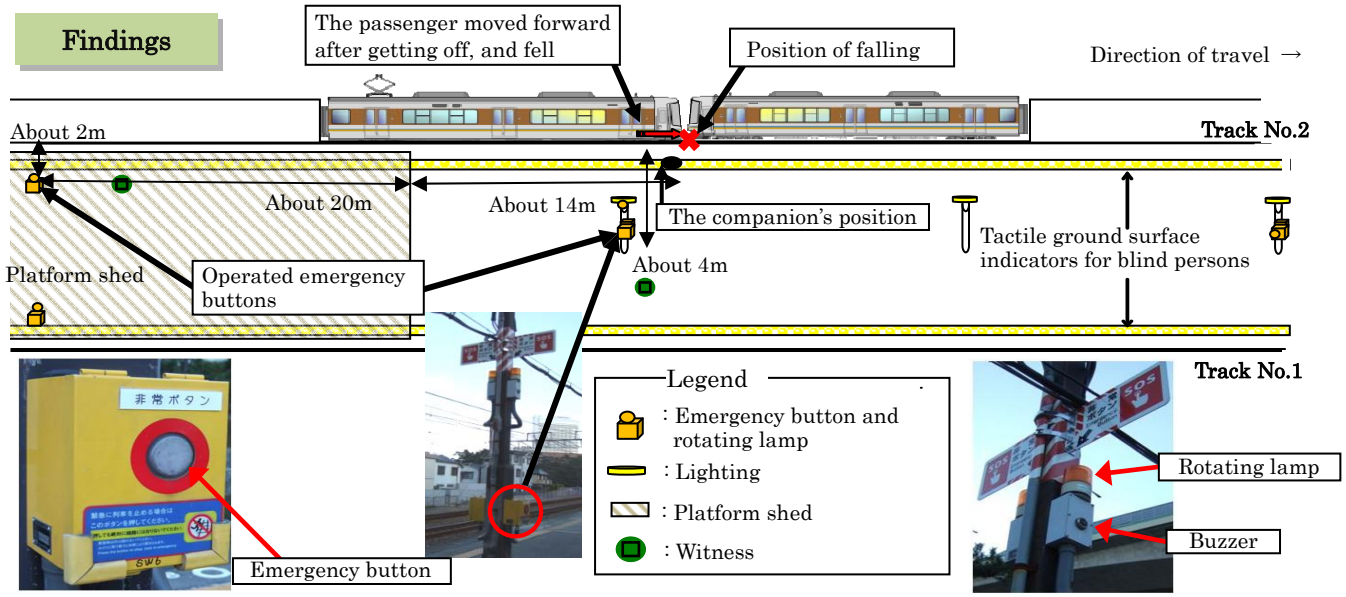
A passenger on the platform fell down into the space between the cars without a vestibule diaphragm

Other accidents with casualties on the premises of Maiko station, San-yo Line, West Japan Railway Company

Summary: On December 17, Friday, 2010, the eastbound rapid train (12-car train set) left Maiko station at 21:44 on schedule. After leaving the station, the conductor of the train noticed a man waving something white on the platform at a location near the stop position for the train's 5th or 6th car. The conductor operated an emergency switch in the conductor's cabin to bring the train to a halt. The train came to a halt after running about 76 meters from the departure position. It was found that a passenger had fallen on the railway track, who was later confirmed dead. The companion who got off the train with the dead passenger and was on the platform had her leg injured when trying to save the fallen passenger.

About 600 passengers, one driver and one conductor were on board the train.

Findings



Schematic drawing of the accident site

It is highly probable that the passenger walked along the train in the direction of travel after getting off the train, and fell from the platform into the space between the 4th and 5th cars (without a vestibule diaphragm for falling protection). It is somewhat likely that alcohol drinking was involved in the falling from the platform.

There is a possibility that the passenger fell from the platform four to six seconds after getting off. However, it is somewhat likely that it was before the conductor of the train got down on the platform (it took about five to six seconds) to check the situation.

It is somewhat likely that although the companion shouted for help on the platform while looking downward after the passenger fell, her voice did not reach the conductor because of the distance between them and the traveling sound of the train.

It is probable that although the witness on the platform pressed the emergency button about two seconds after the train departed, the conductor did not notice the rotating lamp lighted and the buzzer ringing as the conductor had not stopped the train by that time by operating the emergency switch.

It is somewhat likely that it is difficult for the crew on board a train standing at a designated position of the station to recognize that the station's "Platform Support Warning System" has been activated, depending on the location of the pressed emergency button.

Probable causes: It is highly probable that the accident occurred because the passenger walked along the train in the direction of travel after getting off the train, the train departed after the passenger fell from the platform at a position between the 4th and 5th cars, and the head of the passenger who was standing with the upper body straight got caught between the train and the platform.

For details, please refer to the investigation report. (Published in Japanese on January 27, 2012)
http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2012-1-2.pdf

A train collided with an automobile entering a failed level crossing following guidance of track maintenance workers

Level crossing accident at Daikonbara level crossing, Iiyama Line, East Japan Railway Company

Summary: On February 1, Tuesday, 2011, while the eastbound local train (1-car train set) left Morimiyanohara station about 10 minutes behind the scheduled time of 12:00 and was coasting at a speed of about 60 km/h, the driver of the train noticed a small truck entering Daikonbara level crossing ahead from the left. The train driver immediately applied the emergency brake and blew the horn, but it was too late. The train collided with the truck and came to a halt about 75 meters past the level crossing.

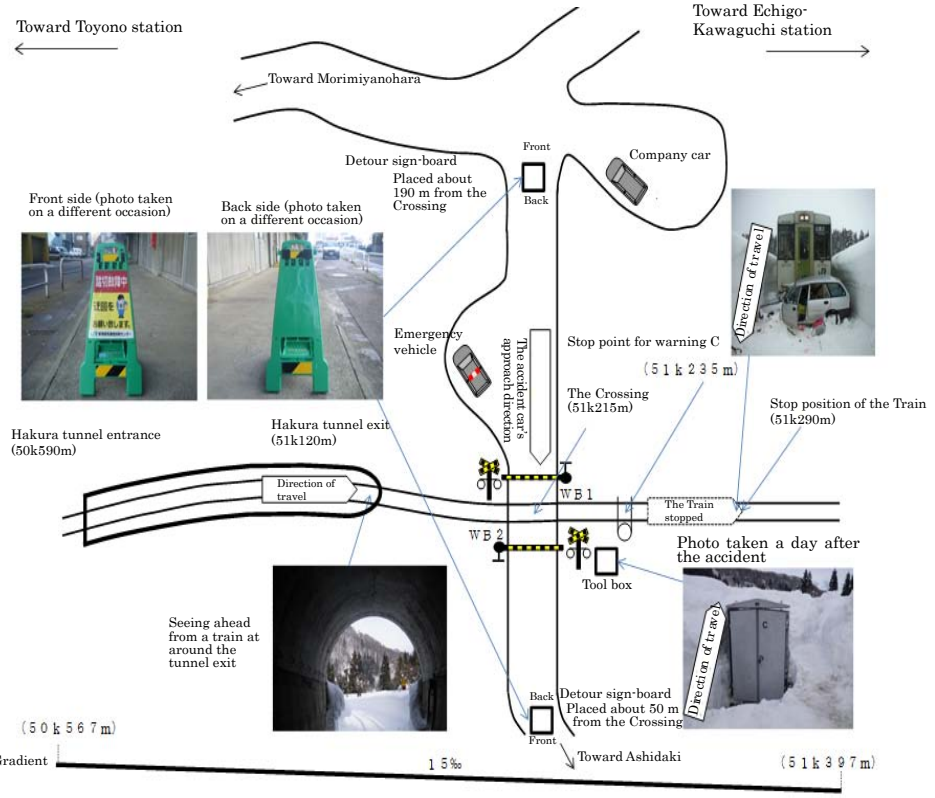
Seven passengers, one driver and two railway track maintenance workers were on board the train, but there were no deaths or injuries. The driver who was the only person in the truck was killed in the accident.

Findings

It is highly probable that because level crossing guard A raised the crossing rod immediately before the train came to the crossing, the truck entered the crossing and collided with the train.

It is highly probable that the existence of any oncoming train was not checked before the crossing rod was raised.

It is probable that the existence of any oncoming train was not checked because (i) level crossing guard A assumed that there would be an interval of more than 10 minutes in the operation schedule between westbound and eastbound trains, and (ii) level crossing guard B assumed from the work schedule given by A that the train would come at about 12:30.



Schematic drawing of the accident site

It is probable that the tall heaped snow around the level crossing obstructed the visibility for noticing a train approaching and absorbed the traveling sound of a train.

It is highly probable that the driver of the train was not informed of the failure of the level crossing because of the decision made by the train dispatcher not to warn against the failure of the crossing.

The Company did not provide for a regulation about cancelling a level crossing failure warning, and when two or more level crossing guards were assigned at a level crossing, the practice of cancelling such a failure warning was followed unless asked by the field staff to continue the warning. It is probable that such a practice followed by the Company is not appropriate from the viewpoint that a level crossing failure warning will be cancelled even when the field staff has missed asking for the continuation of the warning.

Probable causes: It is highly probable that the accident occurred because when the level crossing guards, without checking the existence of any oncoming train, raised the crossing rods which had been at closing position due to failure, the truck entered the crossing and collided with the train.

For details, please refer to the investigation report. (Published in Japanese on February 24, 2012)
http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2012-2-1.pdf

Derailed by flange climbing while running along a circular curved track due to a decrease of the wheel load

Train derailment accident between Kuzumi and Namegawa stations, Narita Line, Japan Freight Railway Company

Summary: On March 10, Thursday, 2011, when the northbound freight train (10-car train set) passed Kuzumi station at the scheduled time of 12:19 and entered the premises of Namegawa station while coasting, the emergency brake of the train was activated, and the train stopped on the premises of the station. When the driver inspected the train as the emergency brake was not released after the train stopped, it was found that the 8th and 9th freight cars of the train were separated from each other, the 9th freight car was derailed and overturned to the right, and the 10th freight car was derailed to the right. One driver was on board the train, but the driver was not injured.

Findings

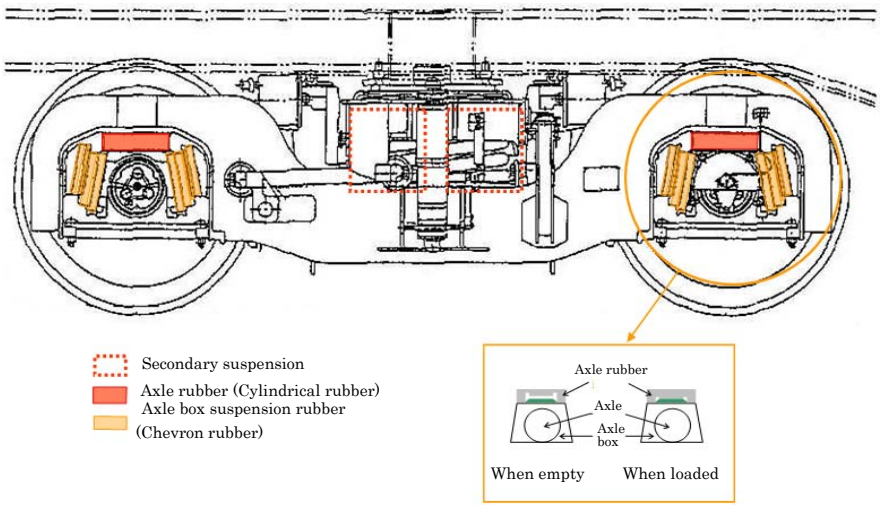
It is somewhat likely that the twist* at the derailment point (at around 9k560m) was larger than other points, according to the findings that 5.0 m twist at around the derailment point was 22.9 mm (loaded value) at the regular inspection immediately before the accident, a 6.5 mm increase from a year before, 5.0 mm out of which increased during the three months before February 11, 2011.

* "Twist" is the difference in cross level between two longitudinally separate points on a rail, and indicates the torsion of the track relative to a plane.

Although the combination of alignment and cross levels* at around 9k553m was relatively small with -5.9 mm for the outside rail and -5.4 mm for the inside rail, it was large at around the derailment point which was 5.0 m ahead (at around 9k558m), with 22.9 mm and 23.0 mm, respectively. It is somewhat likely that the relatively large combination of alignment and cross levels was involved in the decreased load of the outside wheel of the first axle in the rear bogie of the derailed freight car.

* "Combination of alignment and cross levels" is one of the parameters of track irregularity maintenance, taking account of a possible influence on the rolling and hunting motion of a freight car, which tends to occur easily as the combination of alignment and cross levels increases.

It is somewhat likely that due to aged deterioration for having been used since it was newly made, the spring of the axle suspension (axle rubber and axle box suspension rubber) for the freight cars became stiffened and the track followability was decreased. On the other hand, it is somewhat likely that the cars of the train were shaking at the curbed section at around the derailment point where a large track irregularity was observed. It is probable that the large track irregularity observed between 9k553m and 9k558m had largely changed the load and lateral force of the outside wheel of the first axle in the rear bogie of the derailed freight car, and contributed to the occurrence of derailment by making the derailment coefficient larger at around a point with a relatively large track irregularity.



Axle box suspension of the derailed freight cars

Probable cause: It is probable that the accident occurred because after running along a 406-m-radius left circular curved track, the outside (right) wheel of the first axle in the rear bogie of the 9th freight car of the train ran on the rail and was derailed to the right due to the decreased wheel load at first, and the second axle also ran on the outside (right) rail and was derailed. It is highly probable that the reason for the overturning of the 9th freight car which entered the premises of Namegawa station in a state of being derailed was that the front bogie and the derailed rear bogie of the 9th freight car ran on different tracks after passing the turnout, and the car body became unbearable to running. It is probable that the front bogie of the 10th freight car was derailed after running into wrong track because it was pulled by the rear bogie of the 9th freight car which ran into wrong track.

For details, please refer to the investigation report. (Published in Japanese on June 29, 2012)
http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2012-5-3.pdf

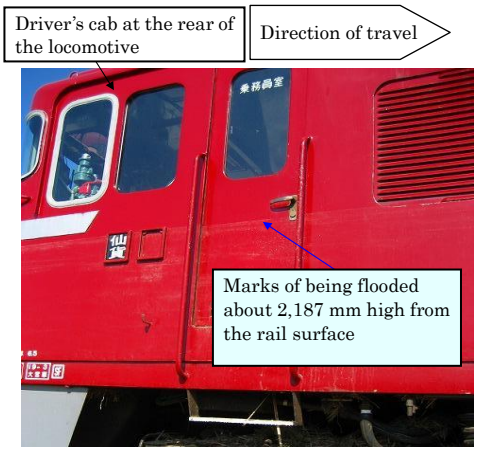
Train derailment by a tsunami caused by a huge earthquake

Train derailment accident between Hamayoshida and Yamashita stations, Joban Line, Japan Freight Railway Company

Summary: On March 11, Friday, 2011, after passing Hamayoshida station about 40 minutes behind the scheduled time of 14:06, the driver of the southbound freight train (21-car train set) received a train protection radio while powering the train, and the driver stopped the train by applying the emergency brake. The driver felt large shaking during the time before the train came to a halt after applying the emergency brake. Immediately before the train stopped, the driver received a message by radio informing that an earthquake occurred. A tsunami (tidal wave) attacked the train about 20 to 25 minutes after the train stopped. When the driver checked the condition of the train afterward, it was found that 20 freight cars except the locomotive were derailed and washed away. One driver was on board the train, but the driver was not injured.

Findings

According to the findings that the train hit by the tsunami had marks of being flooded on the surface of the locomotive at a position about 2,187 mm from the rail surface, it is somewhat likely that the freight cars were flooded to the level almost half as high as the height of the loaded containers. It is probable that for that reason, 20 freight cars (all container cars) were derailed by the force of the tsunami and buoyancy, and were scattered around while some of the freight cars were disconnected as their couplers became disengaged, and others were washed away to the right (mountain side).



Marks of being flooded left on the locomotive

The 4th freight car and the track as seen from around the right rear of the locomotive

The locomotive and the railway track as seen from Hamayoshida station

It is probable that the reason for the locomotive not being derailed was that the mass of the locomotive was larger than that of the freight car when fully loaded, that there were houses on the left of the locomotive (seaward), and that the disconnected freight cars weakened the force to derail the locomotive.

In the absence of bylaws for evacuating the crew on the basis of assuming that an extraordinary disaster has occurred in which freight cars of a train are carried away by a tsunami caused by a large earthquake like the Great East Japan Earthquake, it is desirable to provide for bylaws for evacuation procedures to ensure the safety of the crew when struck by an extraordinary disaster. In view of the statement by the driver of the train that it was unable to contact the train dispatcher by using the train radio or business cellular phone, it is also desirable to establish procedures for making the crew carry with them equipment which will enable access to information related to the occurrence of an earthquake or tsunami, as well as operation procedures for the crew when it is unable to contact the train dispatcher.

Probable cause: It is probable that the accident occurred because after the driver stopped the train by applying the emergency brake upon receiving a train protection radio, the train was hit from the left (seaward) by the tsunami caused by the earthquake, and all of the freight cars were washed away and derailed to the right (mountain side) by the force of the tsunami and buoyancy.

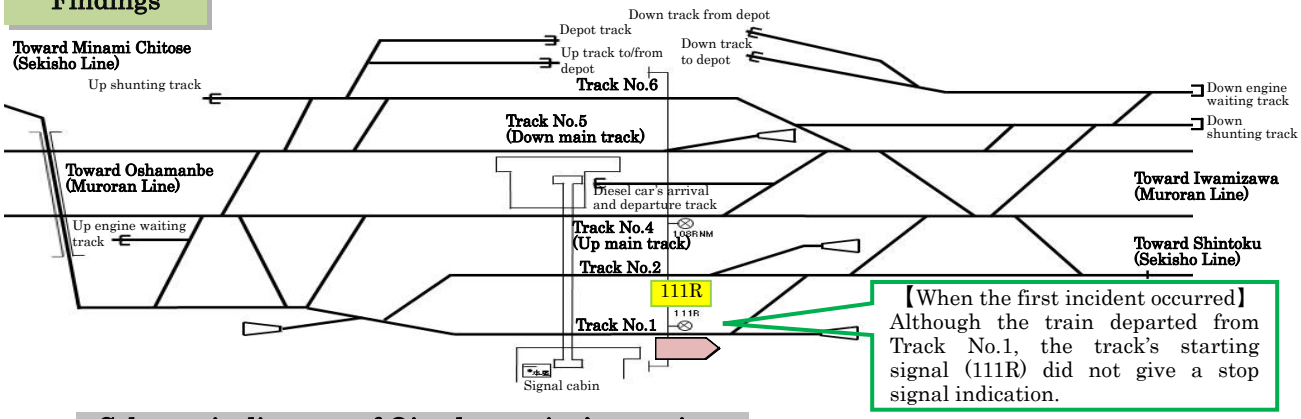
For details, please refer to the investigation report. (Published in Japanese on September 28, 2012)
http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2012-7-1.pdf

Plural events occurred in which a start signal's indication did not change after a train departed

Serious incident (Dangerous damage in facilities), Sekisho Line, Hokkaido Railway Company

Summary: On June 14, Tuesday, 2011, the eastbound local train (1-car train set) departed from Track No.1 at Oiwake station at 20:50 on schedule. Although the train departed from Track No.1, the indication lamp of the starting signal on the indication panel in the station's signal cabin kept lighting green without being extinguished to give a stop signal indication. A similar event occurred three more times before June 16.

Findings



Schematic diagram of Oiwake station's premises

All of the four incidents were caused by the work to improve signal facilities, and from the aspect of signal facilities, they all have an almost identical occurrence mechanism. To be precise, with respect to the wiring work for adding a new relay circuit to the existing signal facility, adoption of an improper work method created a circuit which allowed the electric current to flow to the signal control relay of the starting signal when setting a route for Sekisho Line and Muroran Line at the same time, which then created a situation in which the starting signal did not give a stop signal indication even when the train entered the track circuit in the protection area of the signal.

The adopted work method was improper because (i) minus side terminals of each cradle of the newly added relays were connected with each other by the wiring, (ii) each of the newly added relay devices was inserted into cradles, and (iii) a change-over plug was not inserted during the wiring work in the signal relay room to connect a plus side of each of the newly added relays to the plus side of the power source for the existing facility, which resulted in keeping the circuit always connected.

It is probable that it was not appropriate to implement the wiring work for the existing facility without ensuring a supervisor's attendance or without taking measures not to use the interlocking device temporarily during the hours when trains were in service, based on the judgment that the wiring work for the existing facility would not influence the operation of trains. It is probable that such types of wiring work as may influence the existing facility should be implemented only after getting approval for the wiring diagram as there may be a safety problem to the operation of trains.

It is probable that the reason for the occurrence of an almost identical incident for several times was that the event in which the indication lamp of the starting signal on the indication panel was not extinguished was considered to be due to a temporary failure of the indication panel, that the indication lamp was extinguished when operating the control console, that necessary measures were not taken immediately because the relevant persons were not informed of the event on the understanding that the wiring work would not involve much danger as the next train would not come until the next morning, and that the work transfer between the signallers was not properly done.

Probable cause: It is probable that the serious incident occurred because during the improvement work for Centralized Traffic Control system (CTC) and Programmed Route Control system (PRC), a new circuit was created so that the electric current could flow the signal control relay of the starting signal for eastbound trains when setting a route for Sekisho Line and Muroran Line at the same time, which caused the indication of the starting signal not to change from proceed to stop even when the train entered the protection area of the starting signal for eastbound trains on Sekisho Line.

For details, please refer to the investigation report. (Published in Japanese on November 30, 2012)
http://www.mlit.go.jp/jtsb/railway/rep-inci/RI2012-1-1.pdf

Chapter 4 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

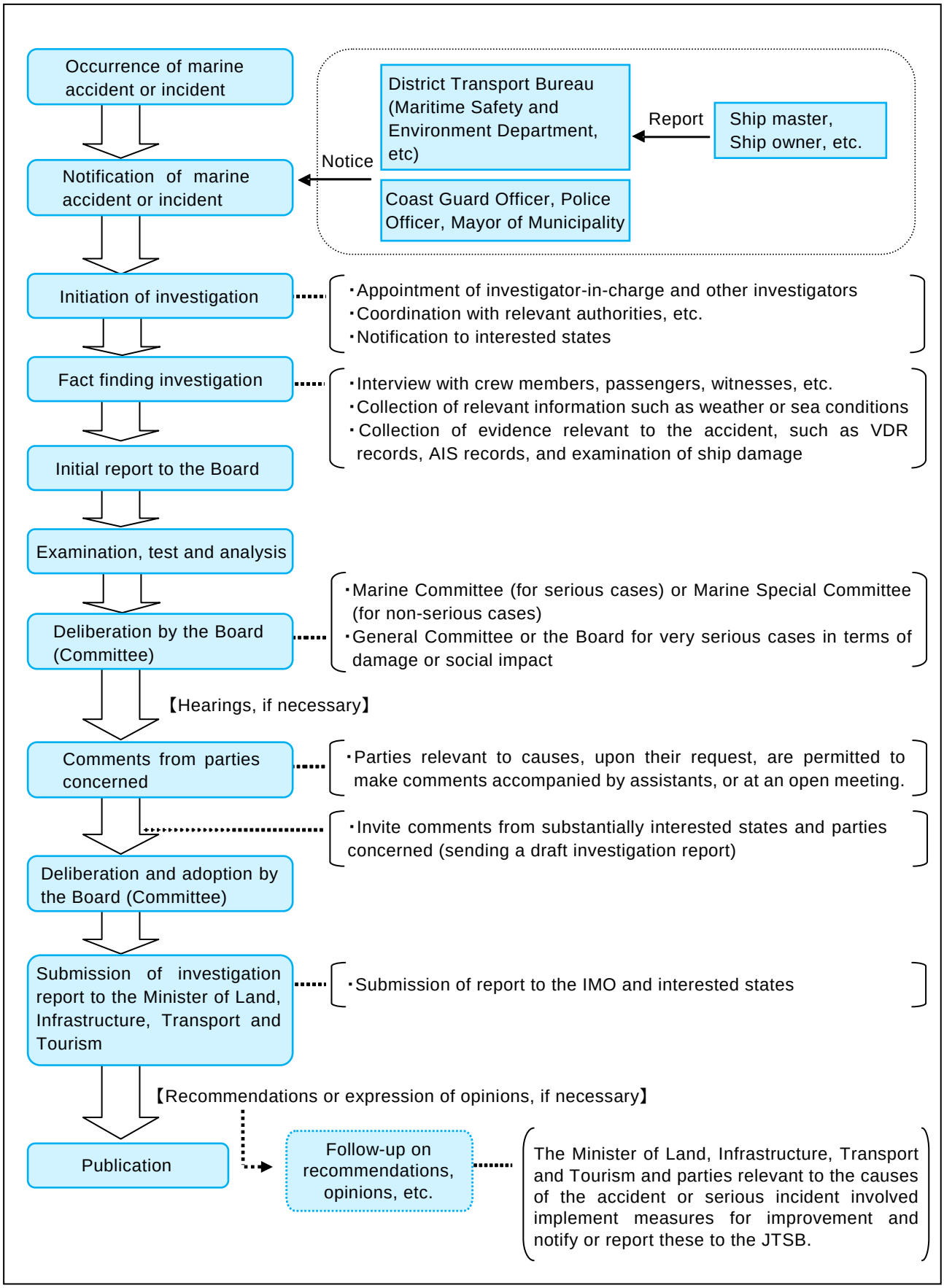
(A situation, prescribed by Ordinance of the Ministry of Land, Infrastructure, Transport and Tourism, stipulated in item 2, paragraph 6, Article 2 of the Act for Establishment of the Japan Transport Safety Board)

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>

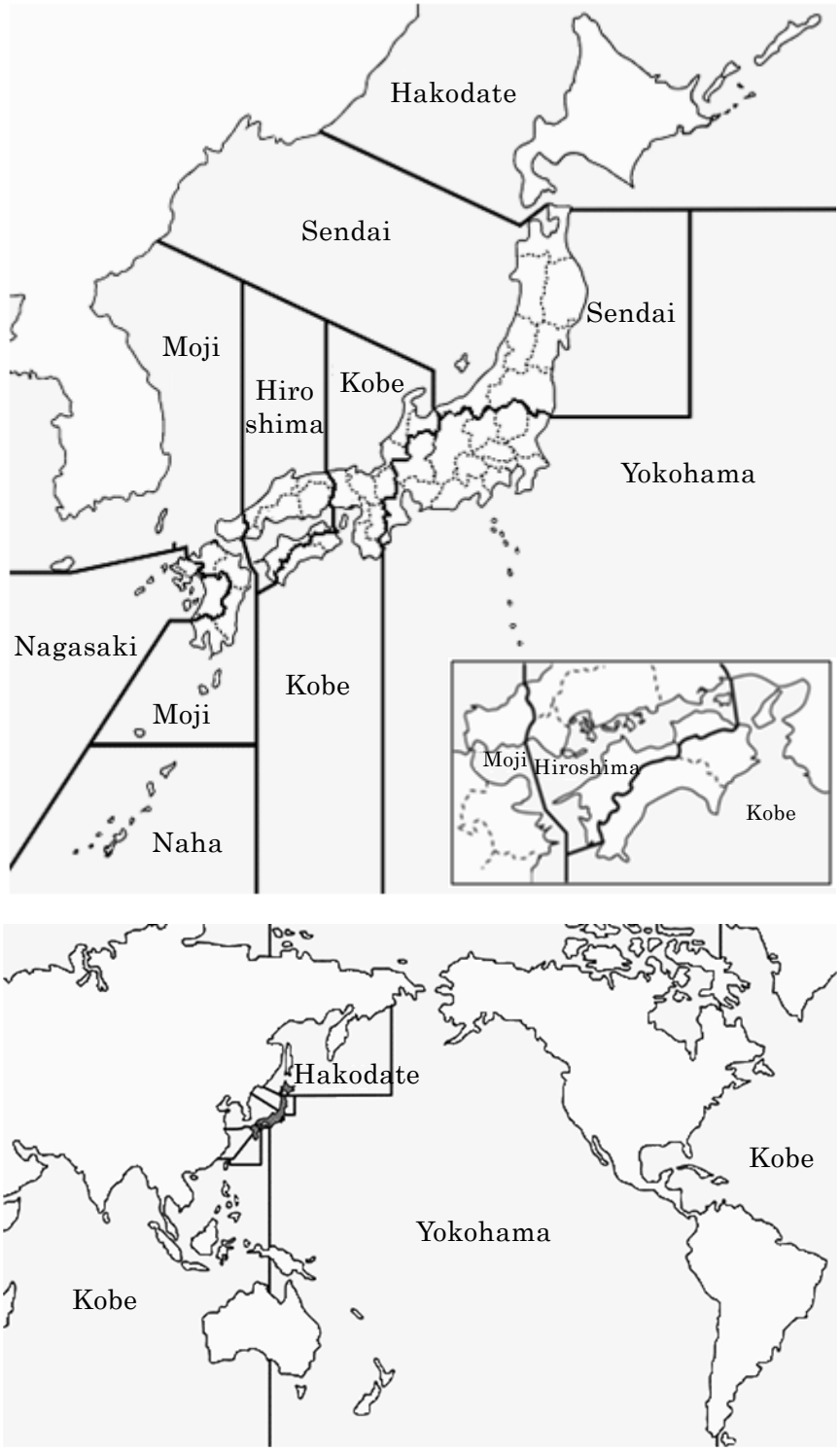
Marine accident and incident to be investigated		Type of marine accident and incident
Marine accident	Damage to ships or other facilities involved in ship operation	Collision, Grounding, Sinking, Flooding, Capsizing, Fire, Explosion, Missing, Damage to facilities
	Casualty related to ship structures,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

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

<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

The JTSB carried out investigations of marine accidents and incidents in 2012 as follows:

Investigations into 790 accidents had been carried over from 2011, and 981 accident investigations newly launched in 2012. Investigation reports on 978 accidents and four interim reports were published in 2012, and thereby 789 accident investigations were carried over to 2013.

Investigations into 103 incidents had been carried over from 2011, and 165 incident investigations newly launched in 2012. Investigation reports on 158 incidents were published, and thereby 109 incident investigations were carried over to 2013.

Among the 1,136 reports published in 2012, six were issued with recommendations, two with safety recommendations, four with opinions, and 33 with remarks.

Investigations of marine accidents and incidents in 2012

(cases)

Category	Carried over from 2011	Launched in 2012	Not applicable	Transferred to Tokyo Office	Total	Publication of investigation report	Recommendations	Safety recommendations	Opinions	Remarks	Carried over to 2013	Interim report
Marine accident	790	981	-4	0	1767	978	6	2	4	33	789	4
Tokyo Office (Serious cases)	24	22		28	74	42	6	2	4	32	32	4
Regional Offices (Non-serious cases)	766	959	-4	-28	1693	936				1	757	
Marine incident	103	165	-1	0	267	158	0	0	0	0	109	0
Tokyo Office (Serious cases)	0	0			0	0					0	
Regional Offices (Non-serious cases)	103	165	-1		267	158					109	
Total	893	1146	-5	0	2034	1136	6	2	4	33	898	4

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.

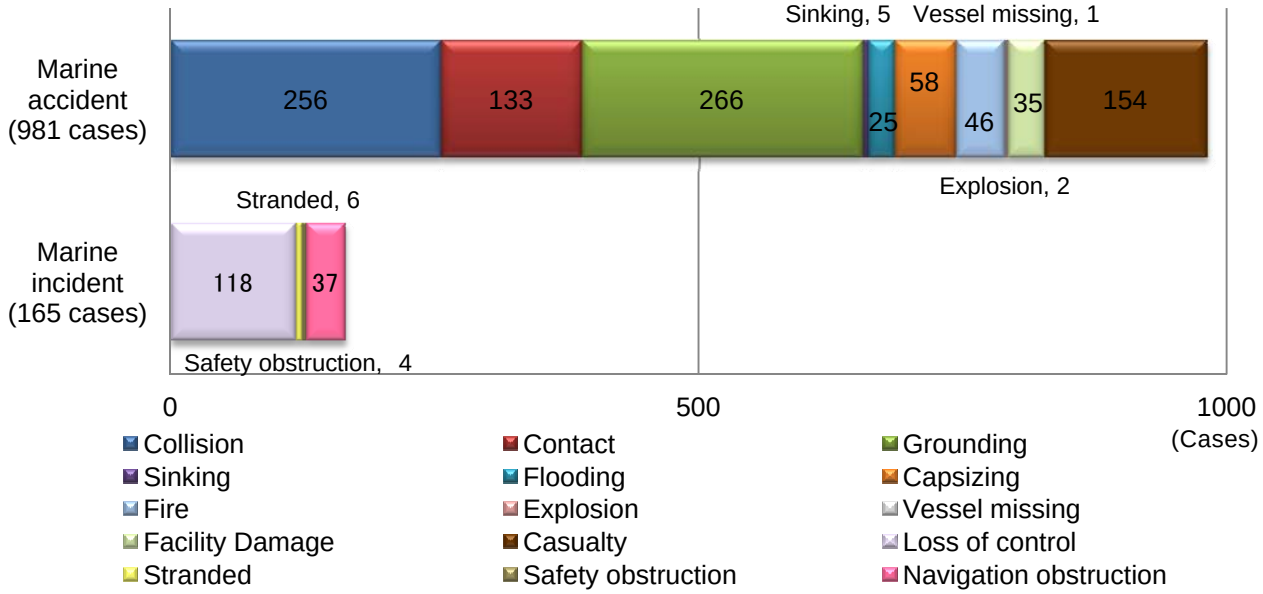
6. Statistics of investigations launched in 2012

(As of the end of April, 2013)

(1) Types of accidents and incidents

The 1,146 investigations launched in 2012 are classified by types as follows: With regard to marine accidents, there were 266 cases of grounding, 256 cases of collision, 154 cases of casualty, and 133 cases of contact. With regard to marine incidents, there were 118 cases of loss of control (including 76 cases of machinery failure, 10 cases of rope entangling, etc.), 37 cases of navigation obstruction, and 6 cases of stranded. The objects of contact were quays in 44 cases, breakwaters and breakwater blocks in 15 cases.

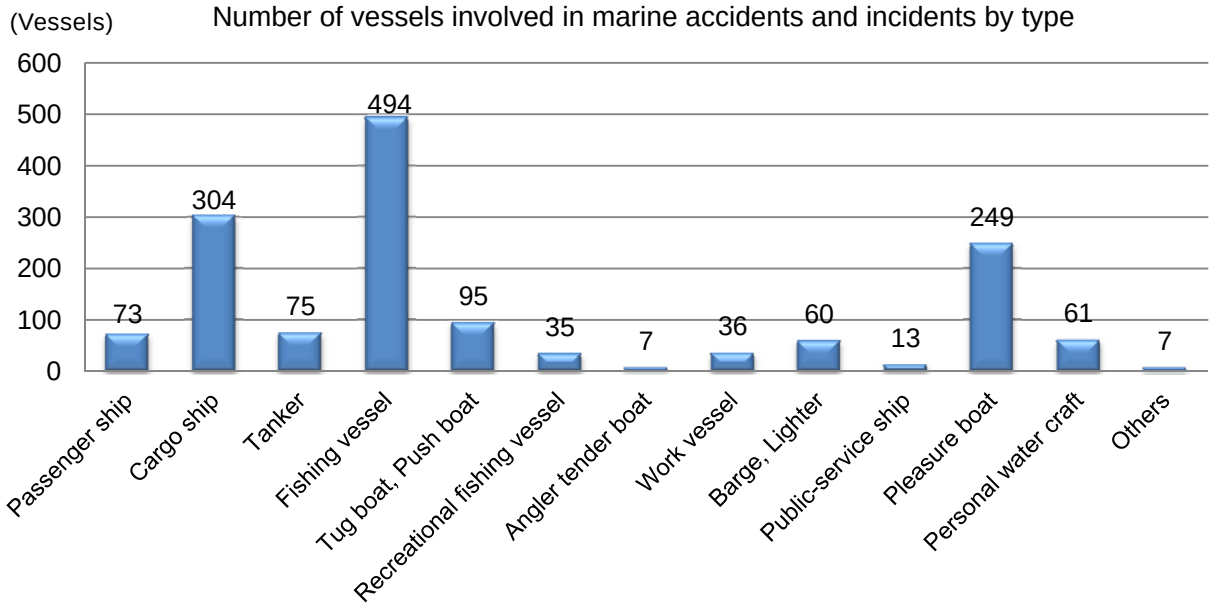
Number of marine accidents and incidents by type



(2) Types of vessels

The number of vessels involved in marine accidents and incidents is 1,509. Those vessels are classified by type as follows: 494 fishing vessels, 304 cargo ships, 249 pleasure boats, 95 tug boats, push boats, 75 tankers, and 73 passenger ships. The total of the three categories of fishing vessels, cargo ships, and pleasure boats is 1,047, accounting for nearly 70 % 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 was 121, and they were classified by accident type as follows: 64 vessels in collision, 19 vessels in grounding, and 10 vessels in contact. As for the nationality of vessels, 30 vessels were registered in Panama, 19 vessels in Cambodia, 18 vessels in South Korea. The number of vessels registered in Asian countries or regions was accounting for about 50% of the accidents and incidents.

Number of foreign-registered vessels by nationality

(Vessels)

Panama	30	Singapore	6	Cyprus	3	Kiribati	2
Cambodia	19	Russia	4	Philippines	3	Mongolia	2
South Korea	18	Liberia	4	China	3	Bahamas	2
Belize	6	Marshall Islands	3	United States of America	3	Others	13

(3) Number of casualties

The number of casualties was 429, consisting of 112 deaths, 29 missing persons, and 288 injured persons. By type of vessel, 173 persons in fishing vessels and 101 persons in pleasure boats. By type of accident, 175 persons in casualties (not involved in other types of accidents), 112 persons in collision, 65 persons in contact, and 34 persons in sinking or capsizing.

With regard to persons dead or missing, 88 persons were involved in fishing vessel accidents, 30 persons in pleasure-boat accidents, indicating dead or missing cases occurred frequently in fishing vessels.

In September 2012, a foreign-registered cargo ship collided with a bonito pole-and-line fishing boat on the high seas at the east offshore of Kinkazan, Miyagi Prefecture, causing 13 fishing boat crew members to go missing.

Number of casualties (marine accident)

(Persons)

2012										
Vessel Type	Dead			Missing			Injured			Total
	Crew	Passenger	Others	Crew	Passenger	Others	Crew	Passenger	Others	
Passenger ship	2	1	1	0	0	0	6	16	1	27
Cargo ship	6	0	1	0	0	0	7	0	1	15
Tanker	3	0	0	0	0	0	6	0	0	9
Fishing vessel	58	0	2	27	0	1	79	0	6	173
Tug boat, push boat	2	0	0	0	0	0	7	0	0	9
Recreational fishing vessel	1	0	0	0	0	0	1	17	0	19
Angler tender boat	0	1	0	0	0	0	2	10	0	13
Work vessel	1	0	0	0	0	0	1	0	1	3
Barge, Lighter	0	0	1	0	0	0	0	0	0	1
Public-service ship	1	0	0	0	0	0	0	0	0	1
Pleasure boat	20	0	9	0	0	1	29	0	42	101
Personal water craft	1	0	1	0	0	0	11	0	40	53
Others	0	0	0	0	0	0	1	0	4	5
Total	95	2	15	27	0	2	150	43	95	429
	112			29			288			

7. Summaries of serious marine accidents and incidents which occurred in 2012

The serious marine accidents which occurred in 2012 are summarized as follows: The summaries are based on information available at the start of the investigations and therefore, may change depending on the course of investigations and deliberations.

(Marine accident)

No.	Date and Location	Vessel type and name Accident type	Summary
1	Jan. 11, 2012 Keiyo Foods Complex South Berth, Funabashi City, Chiba Prefecture	Cargo ship GUANG DA (Panama) Fatality to a crew member	While mooring the ship at the berth referenced in the left column, a stand roller to secure a mooring line on the bow deck was broken and blown. One Chinese crew member working in the vicinity of the stand roller was found unconscious and confirmed dead later on.
2	Jan. 24, 2012 Around 229.4° true, 3.73 nautical miles from the lighthouse on Zenigame South Breakwater in Shinori Port, Hakodate City, Hokkaido Prefecture	Cargo ship RYUEI Facility damage	The starboard anchor of the ship leaving Tomakomai Port for Hakodate Port was dropped while underway, damaging the submarine cable.
3	Feb. 7, 2012 East Section of Niigata Port, Niigata City, Niigata Prefecture	Container ship KOTA DUTA (Singapore) Cargo ship TANYA KARPINSKAYA (Vladivostok) Collision	In East Section of Niigata Port, the container ship, KOTA DUTA collided with the cargo ship, TANYA KARPINSKAYA causing the TANYA KARPINSKAYA sunken.
4	Feb. 7, 2012 Sakai Semboku Section 7 of Hanshin Port	Chemical tanker KYOKUHO MARU No. 2 Fatality to a crew member	While the tanker having the master, second officer, and other 3 members onboard was navigating northward for Umemachi Terminal in Osaka Section 1 of Hanshin Port after she departed from Komatsu Wharf of Izumiotsu Port, Izumiotsu City, Osaka Prefecture, the chief engineer found the second officer fallen in the port side No. 1 cargo tank. The second officer was rescued. Being unable to breathe air due to inhaling of chloroform gas, the officer was confirmed dead due to lack of oxygen.
5	Mar. 4, 2012 Around 4 km northwest of Sunosaki, Tateyama City, Chiba Prefecture	Fishing vessel OURA MARU Recreational fishing vessel IKU MARU No. 5 Collision	The fishing vessel, OURA MARU, while underway, collided with the recreational fishing vessel, IKU MARU No. 5 having 6 passengers onboard and anchoring. One of the passengers onboard the IKU MARU No. 5 was killed and the skipper got injured. The structure of the IKU MARU No. 5 from its bow to stern was severely damaged.

No.	Date and Location	Vessel type and name Accident type	Summary
6	Mar. 8, 2012 In the vicinity of the No. 1 light beacon in Iyonada Traffic Route offshore of Iwaishima Island, Kaminoseki Town, Yamaguchi Prefecture	Cargo ship JNS-2 (South Korea) Fishing vessel CHOHO MARU Collision (with fishing gear)	The fishing vessel CHOHO MARU while in operation collided with the cargo ship JNS-2 navigating from Fukuyama to South Korea and the fishing vessel was capsized. The skipper of the fishing vessel fell into the sea. He was lifted and recovered but died.
7	Mar. 23, 2012 On East China Sea at about 120 km west-northwest of Naze Port, Naze City, Kagoshima Prefecture (Found at this location)	Fishing vessel KASUGA MARU Capsizing	The vessel navigating from Ibusuki Port to the fishing ground in Okinawa Prefecture was found capsized. 4 fishermen were rescued and 2 fishermen went missing.
8	Mar. 25, 2012 About 10 km southeast of Shiraoi Port, Shiraoi Town, Hokkaido Prefecture	Pleasure boat MIHO VII Capsizing	The boat having the skipper and 4 persons onboard was capsized while she was returning to port after fishing. Two persons were dead and one went missing.
9	Mar. 27, 2012 Rokko Island RC-5 Wharf, Kobe Section of Hanshin Port	Container ship ANNA MAERSK (Denmark) Fatality and injury to crew members	In running the periodical inspection of such riggings as life boats of the container ship while she was mooring and loading at the Rokko Island, Kobe Section of Hanshin Port, a life boat overhung outboard fell, causing one able seaman and the chief officer, both on the life boat, fatally and seriously injured, respectively.
10	Apr. 15, 2012 Around 031.5° true, 3.5 nm from Rokkosaki Lighthouse located in Suzu City, Ishikawa Prefecture	Container ship YONG CAI (Saint Vincent and Grenadines) Fishing vessel SHINYO MARU No. 2 Collision	The container ship YONG CAI navigating west-northwestward off the north of Noto Peninsula, Ishikawa Prefecture collided with the fishing vessel SHINYO MARU No. 2 navigating southwestward. The skipper of the vessel died and a crew member went missing. The YONG CAI sustained scratches on her starboard, and the bow section of SHINYO MARU No. 2 was crushed by pressure.
11	Apr. 20, 2012 Around 038° true, 1,360m from the lighthouse on the south breakwater of Osaka North Port located Osaka City, Osaka Prefecture	Container ship EVER UNISON (Singapore) Contact (with berth)	The container ship, while her mooring operation, contacted with the berth, which resulted in a dent on her hull and damage to parking stoppers on the berth.
12	May 15, 2012 Bandai Jima Wharf of Niigata West Port, Niigata City, Niigata Prefecture	Passenger ferry OSADO MARU Fatality to a passenger	On the ferry mooring at the wharf referenced in the left column, one passenger was found wounded on the head and dead on the car deck.
13	May 23, 2012 In the vicinity of the north end of West Breakwater, Section 4 of Rumoi Port, Rumoi City, Hokkaido Prefecture	Angler tender boat ARAKAZE Contact (with breakwater)	The boat having three anglers onboard contacted with the vicinity of the tip of West Breakwater of Rumoi Port while she was taking them from Rumoi Port to the West Breakwater. The skipper and one of the anglers were injured and the bow section of the boat was damaged.

No.	Date and Location	Vessel type and name Accident type	Summary
14	June 7, 2012 In the ship navigating in the vicinity of No.7 light beacon at JFE Steel Fukuyama Port, Fukuyama City, Hiroshima Prefecture	Cargo ship JUNIPER PIA (South Korea) Fatality to a crew member	While the ship navigating from Incheon Port, South Korea to JFE Steel No. 2 Export Berth in JFE Steel West Japan Works, one of crew members fell into a cargo hold and was confirmed dead.
15	June 24, 2012 Off the south of Nakama Port, Taketomi Island, Okinawa Prefecture	Passenger ship ANEI GO No. 3 Injury to a passenger	The ship, navigating from Nakama Port of Iriomote Island, Taketomi Town to Hateruma Fishery Harbor of Taketomi Town, was shaken up and down at the area referenced in the left column and one passenger was injured.
16	June 26, 2012 Off the south-southwest of Nakama Port, Taketomi Island, Okinawa Prefecture	Passenger ship ANEI GO No. 38 Injury to a passenger	The ship navigating from Ishigaki Port of Ishigaki City to Hateruma Fishery Harbor of Taketomi Town was shaken up and down at the area referenced in the left column and one passenger was injured.
17	July 3. 2012 In Mizushima Port, Kurashiki City, Okayama Prefecture	Container ship TIAN FU (China) Chemical tanker SENTAI MARU Collision	The container ship TIAN FU navigating from Komatsu Jima Port in Tokushima Prefecture to Mizushima Port collided with the chemical tanker SENTAI MARU navigating from Sodegaura Port in Chiba Prefecture to Mizushima Port. The port side of TIAN FU collided with the bow section of SENTAI MARU.
18	July 3. 2012 Off the north of Heigun Island, Yanai City, Yamaguchi Prefecture	Chemical tanker CHEM HANA (South Korea) Fatality to crew members	Two crew members of the tanker navigating the area referenced in the left column inhaled gas and were in the critical condition. These members were transported to the hospital by the patrol craft of the Japan Coast Guard and ambulance dispatched in response to the emergency call but they were confirmed dead.
19	Sep. 24, 2012 About 900 km east of Kinkasan Island, Miyagi Prefecture	Cargo ship NIKKEI TIGER (Panama) Fishing vessel HORIEI MARU Collision	In the area referenced in the left column, the cargo ship NIKKEI TIGER navigating from Shibushi Bay of Kagoshima Prefecture to Vancouver (Canada) collided with the fishing vessel HORIEI MARU navigating south to evade from the low pressure and 13 crew members of the vessel went missing.
20	Oct. 6, 2012 Tokuyama-Kudamatsu Port, Yamaguchi Prefecture	Cargo ship SAGE SAGITTARIUS (Panama) Fatality to a superintendent	While unloading the cargo on the ship moored at Kudamatsu Coal Relay Station of Tokuyama-Kudamatsu Port, a superintendent was found caught in the loading/unloading belt conveyor and confirmed dead by the rescue team.

No.	Date and Location	Vessel type and name Accident type	Summary
21	Oct. 10, 2012 Around 2.5 nm east of Kawage, Tsu City, Mie Prefecture	Passenger ship PHENIX Fire	The ship leaving Tsu and navigating to the Central Japan International Airport Station was on fire from her port engine when the said engine stopped running due to its failure. The fire was extinguished by the crew and 18 passengers changed to another ship operated by the Tsu Airport Line, and the ship entered in the Tsu Airport Line Terminal.
22	Oct. 12, 2012 Shore west of Hirose, Hirado Seto, Nagasaki Prefecture	Angler tender boat SHOEI MARU No. 18 Grounding	The boat drifted due to her engine failure and grounded on the shore. One of passengers fell in the sea and was drowned when the passenger was transferring to land.
23	Nov. 14, 2012 Shallowly submerged reef off the southeast of Suo-oshimacho Islands, Yamaguchi Prefecture	Passenger ship GINGA Grounding	The ship having passengers onboard including high school students on their school trip and navigating from Matsuyama Port of Ehime Prefecture to Ihota Port of Suo-oshimacho, Yamaguchi Prefecture, grounded on the hidden reef referenced in the left column.
24	Dec. 3, 2012 Off the southeast of Toden Ogishima LNG Berth, Kawasaki Section 2 of Keihin Port	LNG tanker LNG ARIES (Marshall Islands) Loss of control (Machinery failure)	The electric power in the tanker having the master, chief engineer and other 32 crew members onboard was lost when she was approaching the location referenced in the left column to unload her cargo after loading the LNG at the State of Qatar.
25	Dec. 11, 2012 In the carrier mooring at the ship mooring facilities on the right bank of Okawa River at 3-2, Nagara-higashi, Kita Ward, Osaka City	Gravel carrier SEIWA MARU Explosion	An explosion occurred within the boatswain's store while the carrier was mooring at the facilities referenced in the left column. One of the crew members died, another one in the boatswain's store was seriously injured and the master and one crew member of other ship who were in the facilities were slightly injured. The explosion damaged the bow deck seriously, scattered the shipping goods and part of hull, and damaged the ships mooring in the vicinity, buildings and cars in the neighborhood.
26	Dec. 26, 2012 Kurobe River, Tohnosho Town, Chiba Prefecture	Racing boat (unnamed) Capsizing	While training for the time trial race of the single scull (i.e., a rowing boat rowed by single person), 18 of 34 boats capsized making the rowers (high school students) fallen in the water. All of them were rescued but 6 of them were taken to the hospital due to their symptom of hypothermia.

Column Voice Analysis of VDR Data (Encounter with Tagalog)

The Voyage Data Recorder (VDR), the installation of which has been enforced since July 2002 in pursuant with the International Convention for Safety of Life at Sea (SOLAS), is equipment similar to the cockpit voice recorder on the aircraft. It records such voice data as communications among the crew members in the bridge and is now the major tool to help clearing up the causes of the marine accidents.

Today, it is alleged that one or more of five crew members onboard the merchant vessels worldwide are the Pilipino (300 thousands or more). Speaking of the Pilipino crew members on Japanese ocean-going merchant fleet, it is accounting for 70% of the entire crew members, and it is not unusual that all the members on the bridge are Pilipino. In some occasions the voices (communications in the bridge) recorded in the VDR before and after an accident are almost all in Tagalog.

An investigation of an accident turns out to be a painstaking job if we have to understand the communications carried out with unfamiliar, rare-to-hear language. In the first and urgent task of an investigator in charge of the accident is to find an interpreter. As can be understood easily, the language is more rarely spoken the interpreter of that language is harder to find. On the top of this, there are a lot of other languages spoken in Philippine than its official language (Tagalog), and crew members may sometimes speak their own individual dialect, which make us to find an interpreter widely acknowledgeable to languages spoken in Philippine as well as Tagalog.

The voice data can be analyzed only after the reliable interpreter becomes available, and in most of the cases the investigator together with the interpreter keep investigating the accident by carefully listening to the voice communications and by trying to catch the real meanings conveyed with the communications, because communications among the bridge team members can be heard intermittently more often (in spite of the noise elimination to the maximum level of efforts). This difficulty of comprehending the communications is because that the microphone mounted on the ceiling of the bridge will pick up such noises as winds and rains outside in the case of the bad weather conditions (under which the marine accidents are susceptible to happen) in addition to a variety of voices and noises inside of the bridge, and because that there will be a lot of terms and wordings inherent to marine and shipping industries, to which the interpreter will be unfamiliar.

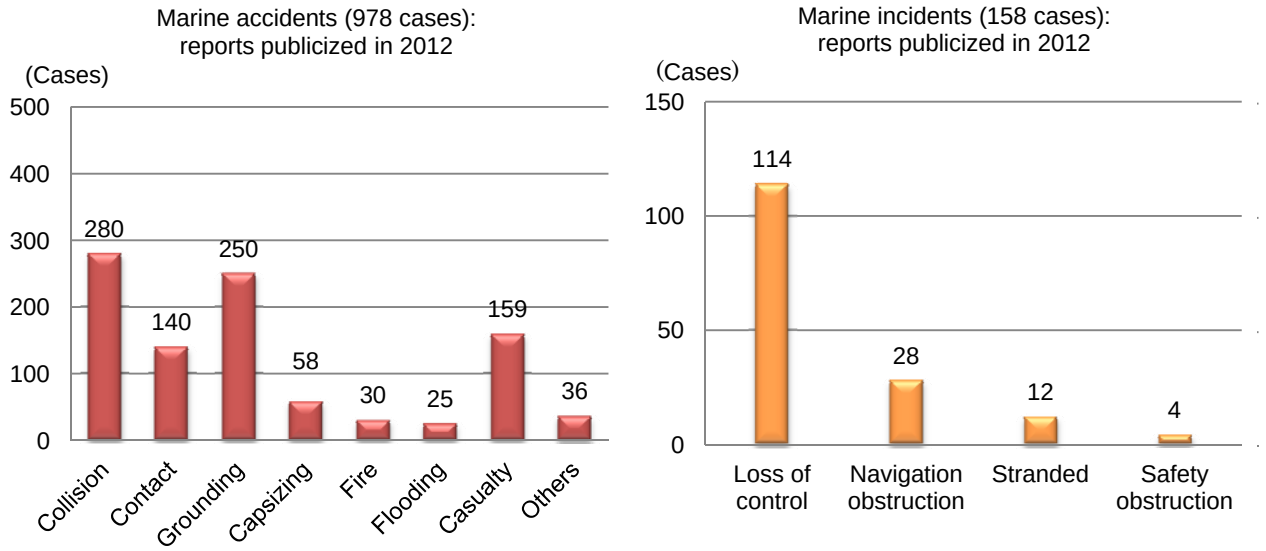
English will remain as the lingua franca of the sea in the world. On the other hand, the advent of the VDR in the investigation of causes of the marine accidents revealed the importance of understanding the mother tongue of individual crew member. We are going to encounter, in the course of our carrier of the marine accident investigations, a variety of languages worldwide since the crew on the vessels, coming from worldwide and navigating around Japan, have such nationalities as Turkey, Russia, and countries in the Eastern European needless to address such Asian countries as Philippine, China, South Korea, and Myanmar.

8. Publication of investigation reports

The number of investigation reports of marine accidents and incidents published in 2012 was 1,136 composed of 978 marine accidents (among them, 42 were serious) and 158 marine incidents.

Looking those accidents and incidents by type, there were 280 cases of collision, 250 cases of grounding, 159 cases of casualty, and 140 cases of contact in marine accidents. Whereas in marine incidents, there were 114 cases of losses of control, (including 59 cases of machinery failure, seven cases of propeller failure, and six cases of out-of-fuel), 28 cases of navigation obstruction, and 12 cases of stranded.

As for the objects of contact, 40 were quays, 22 were breakwaters, nine were light beacons, and so forth.



The number of vessels involved in marine accidents and incidents was 1,509. Looking those vessels by type, the vessels involved in marine accidents were 446 fishing vessels, 261 cargo ships, 231 pleasure boats, 84 tankers, and 77 tug boats, push boats. The vessels involved in marine incidents were 57 fishing vessels, 28 pleasure boats, 20 cargo ships, and 19 passenger ships. The sum of the number of fishing vessels, cargo ships, and pleasure boats involved in accidents or incidents is 1,043, accounting for about 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	Recreational fishing vessel	Angler tender boat	Work vessel	Barge, Lighter	Public-service ship	Pleasure boat	Personal water craft	Others	Total
Marine accident	47	261	84	446	77	35	6	32	47	16	231	49	16	1,347
Marine incident	19	20	17	57	7	4	0	2	3	0	28	4	1	162
Total	66	281	101	503	84	39	6	34	50	16	259	53	17	1,509
%	4.4 %	18.6 %	6.7 %	33.3 %	5.6 %	2.6 %	0.4 %	2.3 %	3.3 %	1.0 %	17.2 %	3.5 %	1.1 %	100.0 %

List of published investigation reports on serious marine accidents (2012)

No.	Date of publication	Date and Location	Name of Accident	Summary
1	Jan. 27, 2012	Dec. 31, 2009 Off the southwest of Kajitori-no-Hana , Imabari City, Ehime Prefecture	1st accident: Chemical tanker SAMHO HERON (Malta) Cargo ship GOLDEN WING (South Korea) Collision 2nd accident: Chemical tanker SAMHO HERON (Malta) Cargo ship CHIZURU MARU Collision	1st accident The chemical tanker SAMHO HERON was navigating northeastward off the southwest of Kajitori-no-Hana and the cargo ship GOLDEN WING was navigating southeastward in the same area. Two vessels collided with each other. The port bow of the SAMHO HERON was breached and port stern was dented. The bow of the GOLDEN WING was cracked and dented and the starboard stern was dented. But no fatality or injury was caused on both vessels. *** The report included Remarks** 2nd accident The SAMHO HERON was navigating southeastward after colliding with the GOLDEN WING around the location of the 1st accident and the cargo ship CHIZURU MARU was navigating southwestward behind the port side of the GOLDEN WING. Two vessels collided with each other. The SAMHO HERON sustained damage in the bow, and the CHIZURU MARU sustained the dent damage in her starboard mid-section. But no fatality or injury was caused on both vessels.

No.	Date of publication	Date and Location	Name of Accident	Summary
2	Jan. 27, 2012	Feb. 13, 2010 Kanmon Passage of Kanmon Port, off west of Mojisaki, Moji Ward, Kitakyushu City, Fukuoka Prefecture	Cargo ship TY EVER (South Korea) Cargo ship LOFTY HOPE (Cambodia) Collision	The cargo ship TY EVER was navigating eastward in the Kanmon Passage of Kanmon Port and the cargo ship LOFTY HOPE was navigating westward in the same Passage. Two ships collided with each other. The bow of the TY EVER was breached, and the port stern of the hull of the LOFTY HOPE was breached. But no fatality or injury was caused on both ships. *** The report included Remarks**
3	Jan. 27, 2012	Mar. 23, 2010 Kanmon Passage of Kanmon Port, off Mojisaki, Kitakyushu City, Fukuoka Prefecture	Cargo ship WIEBKE (Antigua and Barbuda) Cargo ship MARINE PEACE (Belize) Collision	The cargo ship WIEBKE leaving Masan Port of South Korea for Kobe Section of Hanshin Port was navigating eastward in the Kanmon Passage of Kanmon Port, and the cargo ship MARINE PEACE leaving Pohang Port of South Korea for Imabari Port, Imabari City, Ehime Prefecture was navigating eastward in the Kanmon Passage. The starboard mid-section of the WIEBKE collided with the port bow of the MARINE PEACE off the Mojisaki, Kanmon Passage. The WIEBKE sustained scratches on her starboard side mid-section and stern, and the MARINE PEACE sustained scratches on her port bow and stern. But no fatality or injury was caused on both ships. *** The report included Remarks**
4	Jan. 27, 2012	May 17, 2010 Off the northwest of Otate Island, Saikai City, Nagasaki Prefecture	Cargo ship MIHARU MARU Grounding	The ship navigating eastward off the northwest of Otate Island grounded on the Irose Reef located off the northwest of the Island. The chief engineer sustained minor injury on his fingers on the right hand and the hull of the ship's bottom sustained scratches and dent damage. *** The report included Remarks**
5	Jan. 27, 2012	June 2, 2010 Kawasaki Section 1 of Keihin Port	Motor boat QUEEN III Contact (with revetment)	The boat contacted with the revetment of the construction area in the Kawasaki Section 1 when she was turning to starboard to enter the Kawasaki Passage in the Kawasaki Section 1 of Keihin Port after navigating southwestward off the southeast of the Tokyo International Airport. All of four passengers onboard the boat sustained injuries and the boat sustained breaches on her bow and the hull of starboard bow. *** The report included Remarks**

No.	Date of publication	Date and Location	Name of Accident	Summary
6	Jan. 27, 2012	June 18, 2010 Northern part of Lake Hamana, Hamamatsu City, Shizuoka Prefecture	Cutter (unnamed) Capsizing	During the rowing training of the cutter carried out as the outdoor activity of the junior high school students at Mikkabi Youth Center in Shizuoka Prefecture, the winds and waves became too rough to keep training and the cutter was towed by the motor boat of the Mikkabi Youth Center. The cutter being towed southwestward off the south of Sakume of Lake Hamana capsized portside. One of students confined within the capsized cutter was killed. One of oars was broken but the hull sustained no damage. *** The report included Recommendations and Remarks**
7	Jan. 27, 2012	Sept. 19, 2010 Around the pier of the inner harbor inside of Hojo Port, Matsuyama City, Ehime Prefecture	Passenger ship KASHIMA Flooding	The flooding in the engine room was found while the ship was moored to the floating pier in the Hojo Port. In addition to the bilge water within the reverse and reduction gear box attached to the main engine of the ship, the generator, cell motor for the main engine, bilge pump, etc. were gotten wet and damaged. *** The report included Remarks**
8	Jan. 27, 2012	Nov. 17, 2010 Breakwater off the Naze Port, Amami City, Kagoshima Prefecture	Cargo ferry NANKAI MARU No. 3 Contact (with breakwater)	The ferry navigating southward in the Naze Port contacted with the breakwater referenced in the left column. One of the passengers and one of the crew members were slightly injured, the bow was severely damaged, and the breakwater off the Naze Port was damaged. *** The report included Remarks**
9	Feb. 24, 2012	May 21, 2010 Off the north of Himeshima Island, Himeshima Village, Oita Prefecture	Cargo ship HARMONY WISH (Cambodia) Cargo ship SHINKAZURYU Collision	The cargo ship HARMONY WISH was navigating westward towards Ningbo in the People's Republic of China and the cargo ship SHINKAZURYU was navigating eastward towards Fukuyama Port of Fukuyama City in Hiroshima Prefecture. Both ships were collided with each other in the area referenced in the left column, in which the visibility was restricted due to fog. The HARMONY WISH sustained a breach and a dent on her hull of starboard bow and the SHINKAZURYU sustained a bent-damage on the bulwark at her port bow and a dent on her hull. But no fatality or injury was caused on both ships. *** The report included Remarks**

No.	Date of publication	Date and Location	Name of Accident	Summary
10	Feb. 24, 2012	July 24, 2010 Shikama Section 1 of Himeji Port, Himeji City, Hyogo Prefecture	Motor boat CAPRICORN Contact (with breakwater)	The boat running in the Shikama Section 1 of Himeji Port contacted with the Shikama East Breakwater. The master was injured and the bow was crushed. *** The report included Remarks**
11	Feb. 24, 2012	Aug. 18, 2010 Hattaro P Pier of Hachinohe Port, Hachinohe City, Aomori Prefecture	Cargo ship STAR KVARVEN (Norway) Fatality of a stevedore	While the ship mooring at the pier referenced in the left column was discharging its cargo, a stevedore fell from either a hatch cover on the cargo hold or the maintenance ladder at the foot of the gantry crane. The stevedore was taken to the hospital, but was later pronounced dead. *** The report included Remarks**
12	Mar. 30, 2012	Aug. 15, 2010 Kusuhama Seashore of Mitoyo City, Kagawa Prefecture	Personal water craft (unnamed) Injury to swimmers	An operator who did not have license for personal watercraft was wandering off the Kusuhama seashore on the watercraft, and the operator fell in the water but kept running the watercraft only with the left hand, resulting in the contact with two swimmers who were walking back to the sandy beach. They were injured. *** The report included Remarks**
13	Mar. 30, 2012	Aug. 28, 2010 Kanazawa Port, Kanazawa City, Ishikawa Prefecture	Motor boat SAN Contact (with sediment control groin)	The boat returning to her marina in Kanazawa Port contacted with the sediment control groin in the Port. The skipper and two co-passengers were injured and the starboard bow was breached. *** The report included Remarks**
14	Mar. 30, 2012	Apr. 5, 2011 Off the west-southwest of Hinomisaki, Mihama Town, Wakayama Prefecture	Recreational fishing vessel KAIRIN MARU Fatality to a crew member and a passenger	The skipper, while adjusting the anchoring position in the fishing spot in the area referenced in the left column, was caught on his right ankle by the anchor rope and fell in the sea. One passenger trying to prevent the skipper from falling also fell in the sea. Both of them were killed. *** The report included Remarks**
15	Apr. 27, 2012	June 13, 2009 Raw Material Acceptance Wharf (Hiroura A wharf), Nikko Smelting & Refining Co., Ltd., Saganoseki Smelter and Refinery, wharf of port of Saganoseki, Oita City, Oita Prefecture	Cargo ship SINGAPORE GRACE (Hong Kong) Fatality of workers	While the ship was berthed at the wharf referenced in the left column, one of the workers fell while descending a ladder in No. 3 cargo hold for cargo work. Two of the three other workers who went to rescue him also collapsed in the cargo hold. The all three workers were rescued from No. 3 cargo hold, but later they were confirmed dead. *** The report included Recommendations, Opinions, Safety Recommendations and Remarks**

No.	Date of publication	Date and Location	Name of Accident	Summary
16	May 25, 2012	Nov. 15, 2010 Traffic Route in Kurushima Strait	Passenger ferry FERRY KITAKYUSHU Chemical Tanker KOKI MARU No. 78 Collision	The passenger ferry FERRY KITAKYUSHU and chemical Tanker KOKI MARU No. 78, both of which were navigating southeastward on the Traffic Route in the Kurushima Strait, collided with each other around the north exit of the West Suido Channel of the Route. The FERRY KITAKYUSHU sustained a dent on the starboard stern, and KOKI MARU No. 78 did on the port bow, but no fatality or injury was caused on both vessels. *** The report included Remarks**
17	May 25, 2012	June 12, 2011 Northwest of Oshima Island, Oshima Town, Tokyo	Cargo ship DAISENZAN MARU Recreational fishing vessel HISA MARU Collision	The cargo ship DAISENZAN MARU navigating southwestward from Keihin Port and the recreational fishing vessel HISA MARU drifting and angling in the area referenced in the left column collided with each other. One of the passengers on the HISA MARU was injured and her starboard was cracked. The DAISENZAN MARU sustained scratches on the bow. *** The report included Remarks**
18	May 25, 2012	July 2, 2011 East breakwater outside of Nakaminato Port located in Hitachinaka City, Ibaraki Prefecture	Recreational fishing vessel KAMOME MARU Contact (with breakwater)	While navigating toward Nakaminato Port under the restricted visibility condition due to dense fog, the vessel contacted with the breakwater referenced in the left column. Twelve passengers were injured and the bow and bulbous were damaged. *** The report included Remarks**
19	June 29, 2012	June 9, 2010 Uose Reef, off the northwest of Enoshima Island, Saikai City, Nagasaki Prefecture	Commuter boat FRESH ARIKAWA Grounding	The boat grounded on the Uose Reef northwest of Enoshima Island when she was navigating westward off the north of Kanagashirase Reef in Saikai City after leaving the Sasebo Port of Sasebo City for Arikawa Port of Shinkamigoto Town, both ports in Nagasaki Prefecture. The passenger and master of the boat were injured, she sustained a breach and a dent on her bottom and propeller shaft and blades were bent. *** The report included Remarks**

No.	Date of publication	Date and Location	Name of Accident	Summary
20	June 29, 2012	July 1, 2010 Off the north of Naruto Strait	Cargo ship SHINKENWA MARU Cargo ship SHOWA MARU No. 8 Collision	The cargo ship SHINKENWA MARU was navigating south-southeastward towards the Naruto Strait and the cargo ship SHOWA MARU No. 8 was navigating north-northwestward after passing through the Naruto Strait. Both ships collided with each other in the area referenced in the left column. One of crew members of the SHOWA MARU No. 8 was injured and the bow was breached and dented causing the flooding in the cargo hold. The bow of the SHINKENWA MARU was cracked and dented causing the flooding in the forepeak tank but no one was injured. *** The report included Remarks**
21	June 29, 2012	Aug. 28, 2010 Naruto Strait	Motor boat SUZU Injuries to co-passengers	The five co-passengers onboard the boat were injured when the boat navigating southward in the vicinity of the Onarutokyo Bridge of the Naruto Strait was shaken up and down. The boat sustained cracks on the stern bulkhead and windshield. *** The report included Remarks**
22	June 29, 2012	Oct. 16, 2010 Seashore, Northeast of Kuji Port, Kuji City, Iwate Prefecture	Cargo ship DAIKO MARU Grounding	The ship grounded on the rock reef of the seashore referenced in the left column, when she was navigating northwestward off the Kuji Port. The entire hull of her bottom was breached and cracked causing the flooding but no leakage of fuel oil and others was observed. There was no casualty to her crew. *** The report included Remarks**
23	June 29, 2012	Oct. 27, 2010 Off the southeast of Sensuijima Island, Fukuyama City, Hiroshima Prefecture	Fishing vessel DAIKO MARU Fishing vessel MIYAJIMA MARU Collision	The fishing vessel DAIKO MARU leaving Tomo Port of Fukuyama City in Hiroshima Prefecture for Hashirijima Port of the same city was navigating southeastward and the fishing vessel MIYAJIMA MARU was drifting. The both vessels collided with each other in the area referenced in the left column. One of crew members onboard the MIYAJIMA MARU fell in the sea and was drowned. The vessel sunk due to the damage on the port mid-section. The bow paint on the DAIKO MARU was scaled off but no one was injured. *** The report included Remarks**
24	July 27, 2012	Mar. 21, 2010 Off the Ichikawa Passage, Chiba Port, Chiba Prefecture	Cargo ship TSURUYOSHI MARU No. 3 Injury to a crew member	When weighing the anchor of the ship in the area referenced in the left column, the chief officer on the forecastle deck was hit, fell down and injured by the green water. *** The report included Remarks**

No.	Date of publication	Date and Location	Name of Accident	Summary
25	July 27, 2012	June 20, 2010 Off the east of Aijima Island, Matsuyama City, Ehime Prefecture	Cargo ship SEIREI MARU Cargo ship GYOREN 1 Collision	The cargo ship SEIREI MARU was navigating southwestward in the Akinada from the west entrance of the Kurushima Strait Traffic Route to the Kudako Channel west of Nakajima in Matsuyama City and the cargo ship GYOREN 1 was navigating northeastward from the Kudako Channel to the west entrance of the Kurushima Strait Traffic Route. Both ships collided with each other in the area referenced in the left column. The SEIREI MARU sustained the dent damage in her port bow and the GYOREN 1 did the damages on the hull and handrails on the port mid-section. But no fatality or injury was caused on both ships. *** The report included Remarks**
26	July 27, 2012	Jan. 11, 2011 Around South Berth A, Funabashi Chuo Wharf, Katsunan District, Chiba Port, Chiba Prefecture	Cargo ship EN KAI (China) Fatality to crew members	While the ship was berthing at the berth referenced in the left column, a tensed mooring rope suddenly bounced and struck on the chest of a boatswain working on the forecastle deck. The boatswain, taken into the hospital, died despite medical treatment.
27	July 27, 2012	Mar. 18, 2011 Katakami Port, Bizen City, Okayama Prefecture	Motor boat YOSHIOKA MARU Racing boat (unnamed) Collision	The motor boat YOSHIOKA MARU was running eastward from the Katakami Port to the fishing spot and the racing boat (unnamed) was being rowed westward. Tow boats were collided with each other in the Katakami Port. One of the oarsmen was injured and the boat was -broken on her stern and capsized. The YOSHIOKA MARU sustained scratches on the port bow and other places but no fatality or injury was caused on her. *** The report included Remarks**
28	Aug. 31, 2012	Jan. 4, 2011 Nakanose Traffic Route Light Beacon No. 1, Nakanose Traffic Route of Tokyo Bay	LNG bulk carrier RYOAN MARU Contact (with a light beacon)	The carrier navigating northward in the Nakanose Traffic Route toward the Chiba Port in Chiba Prefecture, collided with No. 1 light beacon on the Traffic Route. The carrier sustained the dent and other damages on the hull of her starboard bow but no fatality or injury was caused. The No. 1 light beacon on the Nakanose Traffic Route was crushed on its platform. *** The report included Remarks**

No.	Date of publication	Date and Location	Name of Accident	Summary
29	Aug. 31, 2012	Dec. 1, 2010 Nissan Motor Honmoku Wharf, Yokohama Section 5 of Keihin Port	Pure car carrier VEGA LEADER (Panama) Injuries to longshoremen	While car carrier loading cars at the wharf referenced in the left column, a deck panel of car deck No. 7 fell down onto car deck No. 6. Six stevedores in cargo operation on the deck panel and four stevedores on car deck No. 6 immediately below the panel, ten persons in total, were injured. *** The report included Safety Recommendations and Remarks**
30	Aug. 31, 2012	Nov. 24, 2010 Upstream side of Sumidagawa Bridge on Sumidagawa River, Toubu-Isesaki Line, Sumida Ward, Tokyo	Passenger ship RYOMA Injury to a passenger	One of passengers on the upper deck passenger room were injured when the windows of the room were remotely opened while the ship was moving down the river in the vicinity of the bridge referenced in the left column. *** The report included Remarks**
31	Sept. 28, 2012	Mar. 18, 2010 Off the South Mouth of East Channel, Nagoya Port, Aichi Prefecture	Cargo ship MEDEA (Singapore) Fishing vessel KOSEI MARU Collision	The cargo ship MEDEA was navigating southwestward off the southwest of the East Channel of the Nagoya Port toward the vicinity of the Irago Channel North Entrance, and the fishing vessel KOSEI MARU was navigating westward off the west of Isewan Bay Light Beacon toward the fishing area north of the Isewan Bay. The ship and vessel collided with each other in the area referenced in the left column. The skipper and a crew member of the KOSEI MARU were injured and she capsized. The MEDEA sustained scratches on her bow. *** The report included Remarks**
32	Sept. 28, 2012	June 28, 2011 North Channel of Nagoya Port, Aichi Prefecture	Chemical tanker NISSHO MARU Fatality and injury to crew members	On the tanker navigating in the North Channel of Nagoya Port, three (chief officer, second engineer, and junior chief officer) of four crew members cleaning the tank fell down on the starboard side of the forecastle deck, and the remaining one (chief engineer) was in the clouded consciousness at the stern. The chief officer and second engineer were confirmed dead. The junior chief officer and chief engineer were injured.
33	Sept. 28, 2012	July 7, 2011 Around the mouth of Sodegaura channel, Chiba Section of Chiba Port, Chiba Prefecture	Chemical tanker HOTOKU MARU Injury to a crew member	In the tanker navigating northward from Chiba Port to the anchorage in the vicinity of Umihotaru Parking area on the Tokyo Bay Aqua Line, the second engineer found an engine rating unconscious in the ballast pump room. The engine rating was rescued and recovered from unconsciousness.

No.	Date of publication	Date and Location	Name of Accident	Summary
34	Oct. 26, 2012	Sept. 7, 2011 Off the southeast of Cape Nosappu, Nemuro City, Hokkaido Prefecture	Fishing vessel KASHIMA MARU No. 18 Fishing vessel TAIKO MARU No. 58 Collision	The fishing vessel KASHIMA MARU No. 18 was drifting the area referenced in the left column and the fishing vessel TAIKO MARU No. 58 was navigating southward in the same area. Two vessels collided with each other. Two of deckhands in the fishing vessel TAIKO MARU No. 58 were injured and the vessel sustained the dent and other damages on her bow. The fishing vessel KASHIMA MARU No. 18 sustained a breach on her stern but no one was injured.
35	Nov. 30, 2012	Aug. 25, 2010 Unknown (Offing of Tanomohama Shore, Inawashiro Lake, Aizuwakamatsu City, Fukushima Prefecture)	Personal watercraft IKARUGA Missing of skipper	Both of the operator and co-passenger on the watercraft departing the Tanomohama Shore fell in the water between the east-northeast and east off the Shore, and the operator sunk in the water and went missing. The co-passenger was rescued by the personal watercraft coming for help, and the watercraft IKARUGA was not damaged.
36	Nov. 30, 2012	Mar. 22, 2010 Off the west of Omaezaki, Omaezaki City, Shizuoka Prefecture	Fishing vessel KAISHO MARU Fishing vessel FUKUJU MARU Collision	When the fishing vessels KAISHO MARU and FUKUJU MARU collided with each other in the area referenced in the left column when the KAISHO MARU was heading at about 290° while searching a school of fish and the FUKUJU MARU was heading about 110° after completing the port turn to turn her around. Three crew members (one deckhand of the KAISHO MARU, skipper and deckhand of the FUKUJU MARU) were killed, and four members (skipper of the KAISHO MARU and three deckhands of the FUKUJU MARU) were injured. The KAISHO MARU was severely damaged and the FUKUJU MARU capsized.

No.	Date of publication	Date and Location	Name of Accident	Summary
37	Nov. 30, 2012	Apr. 9, 2010 Off the southwest of Nomozaki, Nagasaki City, Nagasaki Prefecture	Cargo ship RYUNAN II Recreational fishing vessel KOYO MARU Collision	The cargo ship RYUNAN II was navigating southward off the Nomozaki toward Naha Port in Okinawa Prefecture, and the recreational fishing vessel KOYO MARU was navigating south-southwestward toward Ajisone fishing spot off the Nomozaki. The port bow of the RYUNAN II and the starboard section of the KOYO MARU were collided with each other, causing the KOYO MARU capsized. The skipper and one of the passengers on the KOYO MARU went missing and two of the passengers were injured. Later on, the skipper and one passenger were removed from their family register per the posthumous recognition of their death. On the KOYO MARU, the wheel house and upper structure of the cabins were damaged and the starboard hull was bent. The RYUNAN II sustained scratches on her bow but no one was injured.
38	Nov. 30, 2012	June 29, 2011 Off the northwest of Umabanasaki, Yonaguni Town, Okinawa Prefecture	Diving boat YDS VII Injury to an instructor and diver	While helping out the surfaced instructor and divers get on the boat in the area referenced in the left column, the instructor and one of divers contacted with propeller blades and other fittings and the both of them were injured. *** The report included Remarks**
39	Nov. 30, 2012	Sept. 19, 2011 In Wajima Port, Wajima City, Ishikawa Prefecture	Tug boat KITA MARU No. 12 Capsizing	The boat capsized when she, together with the tugboat KITA MARU No. 8, was towing the patrol boat MIURA for her departure from the port. Two of the crew members on the boat were rescued but all of them were killed. Later on, the boat was salvaged but declared a total loss. *** The report included Recommendations**
40	Dec. 21, 2012	Oct. 24, 2010 No.1 Berth for Nansei Sekiyu K.K, Kin-nakagusuku Port, Okinawa Prefecture	Oil tanker PACIFIC POLARIS (Panama) Contact (with a berth)	When the tanker was berthing at the berth referenced in the left column under the command of the master supported by the berth master, she contacted with the dolphin of the berth. The tanker sustained a breach on the port stern making the fuel oil leak out of No.2 port side fuel oil tank and making the dolphin structure deformed. But no one was injured. *** The report included Remarks**

No.	Date of publication	Date and Location	Name of Accident	Summary
41	Dec. 21, 2012	Jan. 9, 2011 Off the southwest of Sadogashima Island, Sado City, Niigata Prefecture	Chemical tanker SEIYO Foundering	The tanker capsized and sank in the sea when it was navigating east-northeastward from an anchorage off the Oita Airport in Oita Prefecture to the Akadomari Port in Sado City (Sado Island), Niigata Prefecture by way of off the Rokkosaki in Suzu City (Noto Peninsula), Ishikawa Prefecture. The chief engineer was killed and the master went missing.
42	Dec. 21, 2012	Aug. 17, 2011 Tenryugawa River, Futamata, Tenryu Ward, Hamamatsu City, Shizuoka Prefecture	Passenger boat TENRYU MARU No. 11 Capsizing	The boat cruising down the Tenryugawa River grounded on the rocks on the left bank of the River and capsized, leaving four passengers and a skipper dead and five passengers injured.

9. Summaries of recommendations and opinions

There were six recommendations, four opinions, and two safety recommendations in 2012, which are summarized below:

(1) Recommendations (Six cases)

1) In view of the results of the accident investigation of fatality of workers on the cargo ship SINGAPORE GRACE on April 27, 2012 the Japan Transport Safety Board (the JTSB) recommended the Saganoseki Smelter & Refinery, Pan Pacific Copper Co., Ltd. to take the following measures for the purpose of prevention of accident caused by oxygen-deficient in cargo hold.

(1) To train all employees who have the possibility of being engaged in cargo work to understand the properties and risks of copper sulfide concentrate.
(2) To train all employees, who have the possibility of being engaged in cargo work, with the handling of O_2 meters in order to measure O_2 concentrations as necessary.
(3) To request the MSDS of floatation reagents from shippers.
(4) To inform employees who have the possibility of being engaged in cargo operation on the following:
 [1] Depending upon the properties of the floatation reagent adhered to copper sulfide concentrate, it may generate toxic gas.
 [2] Since the generated toxic gas is heavier than air, it stagnates in cargo hold; hence, there is a danger of not being replaced by air.
(5) To make the risks of oxygen-deficient conditions and anoxia known to all personnel who have the possibility of being engaged in cargo operation and to familiarize them with appropriate coping behavior in case of fatal accidents occurring in cargo holds loading copper sulfide concentrate.

2) In view of the results of the accident investigation of fatality of workers on the cargo ship SINGAPORE GRACE, on April 27, 2012 the JTSB recommended the Nissho Koun Co., Ltd., to take the following measures for the purpose of prevention of accident caused by oxygen-deficient in cargo hold.

(1) To train all employees who have the possibility of being engaged in cargo operation to understand the properties and risks of copper sulfide concentrate.
(2) To train all employees, who have the possibility of being engaged in cargo work, with the handling of O_2 meters in order to measure O_2 concentrations as necessary.
(3) To make the risks of oxygen-deficient conditions and anoxia known to all employees who have the possibility of being engaged in cargo operation and to familiarize them with appropriate coping behavior in case of fatal accidents occurring in cargo holds loading copper sulfide concentrate.

3) In view of the results of the accident investigation of the capsizing of the cutter (unnamed), the JTSB gave recommendations to the Shogakukan-Shueisha Productions Co., Ltd. for the safety of activities related to the cutter training at Shizuoka Prefectural Mikkabi Youth Center on January 27, 2012 as follows.

(1) The criteria for cutter training suspension and the cutter training methods used at the Shizuoka Prefectural Mikkabi Youth Center should be reviewed to ensure their adaptability based on the experience of the trainees, and the following provisions should be included in the instruction manual:
  a. The criteria for suspending training when weather advisories are broadcast.
  b. The criteria for suspending training under bad weather other than when weather warnings or advisories are broadcast.
  c. Training methods under bad weather
  d. The time for deciding the permission or no of training and the time (including a time during training) for deciding a training method.
  e. Treatment of training if suspended on its way
  f. Measures for safety in training (including the arrangement and duty of a guard boat, constant contact with weather information, and preparations for the tow of cutter)
(2) A rescue system, supposing cutter accidents and including procedures for towing and rescuing a cutter, should be established, and the Youth Center personnel should be periodically trained. Effort should be made to strengthen cooperation with rescuing agencies.
(3) Effort should also be made to improve the knowledge of the Youth Center personnel with respect to cutter and weather, and to inspire their consciousness of ensuring safety of training.

4) In view of the results of the accident investigation of the capsizing of the cutter (unnamed), the JTSB gave recommendations to the Shizuoka Prefectural Board of Education for the safety of activities related to the cutter training at Shizuoka Prefectural Mikkabi Youth Center on January 27, 2012 as follows.

The Board should review the criteria for training suspension, the training methods, and the crisis management manual of the Youth Center, should give them necessary corrections, if found any, and should have tow training practiced.

5) In view of the results of the accident investigation of capsizing of the tug boat KITA MARU No. 12 the JTSB recommended the Japan Coast Guard School to take the following measures for the purpose of ensuring the safety navigation of the MIURA on November 30, 2012.

In view of the fact that the Japan Coast Guard School has been accepting the MIURA every year as training ship, the School is recommended to define clear organization managed by the school principal to carry out safe onboard sea training on the MIURA, and to establish the comprehensive management system for ensuring; to prevent accidents and give safety guidance under normal circumstances; to share such information required for the safe navigations/operations as metrological and navigational warning information; to understand

the operational status of the MIURA when she is on the training mission; and to secure communications and support in case of emergency.

6) In view of the results of the accident investigation of capsizing of the tug boat KITA MARU No. 12 the JTSB recommended Kita-Gumi Co., Ltd. to take the following measures for the purpose of ensuring the safety of the towing the vessel with the tug boat on November 30, 2012.

The Kita-Gumi Co., Ltd. is recommended to take the following actions to ensure the safety of towing operations with its boat:
(1) To check and maintain towing hooks and to perform its operation training.
(2) To instruct the crew members to wear such outfits as lifejacket properly during the towing operations.

(2) Opinion (four cases)

1) In view of the results of the accident investigation of fatality of workers on the cargo ship SINGAPORE GRACE, on April 27, 2012, the JTSB expressed its opinions to the Minister of Land, Infrastructure, Transport and Tourism for the purpose of prevention of recurrence of similar accidents as follows.

The Board requests the Minister of Land, Infrastructure, Transport and Tourism to widely disseminate following information regarding the risks of the use of floatation reagents through the International Maritime Organization (IMO).
(1) Depending upon the properties of the floatation reagent adhered to copper sulfide concentrate, it may generate toxic gas.
(2) Since the generated toxic gas is heavier than air, it stagnates in cargo hold; hence, there is a danger of not being replaced by air.

2) In view of the facts of the foundering of the chemical tanker SEIYO, on June 29, 2012 the JTSB expressed its opinions to the Minister of Land, Infrastructure, Transport and Tourism for the purpose of prevention of recurrence of similar accidents as follows.

When the vessel with low freeboard is navigating under the condition where the green water hits onto the expansion trunk, the waves hit the upper deck and expansion trunk causing the sea water to remain on the ship. It may sometimes make the vessel to list and the sea water to flow into the ballast tank through the air pipes on the upper deck. It is necessary that the Minister is to instruct the vessel owner and operator to fully maintain the air pipe head.

3) In view of the facts of the capsizing of the passenger boat TENRYU MARU No. 11, on April 25, 2012 the JTSB expressed its opinions to the Minister of Land, Infrastructure, Transport and Tourism for the purpose of prevention of recurrence of similar accidents while going down a river as follows.

(1) Anticipation of risks hidden in route

Route of a boat (rafting boat) going down a river can become potentially dangerous when the river changes its condition such as the rising of the river. The rafting boat, if it is improperly steered against the condition of the river, can be in the serious condition such as grounding on rocks and the resultant capsizing.

The Tenryu Hamanako Railroad Co., Ltd. (hereinafter referred to as “the Corporation") had been making an effort to inform the skippers of such information as potentially dangerous points on the rafting route as well as cautions in steering the boat, however an system was not established to share the recognition of the situation in which an accident could occur in the route when the boat is turned.

It is desirable for the similar operators of the rafting boat (hereinafter referred to as “the Rafting boat operators") throughout the country to recognize the risks in the route they are operating in order to further increase the safety in operating the rafting boat; to establish the system to study proper steering method in case of situation that could trigger an accident; to do necessary studies; and to share among skippers and operation managers the results of the studies including the risk assessments in the route. In order to fulfill the above, the Minister of Land, Infrastructure, Transport and Tourism is to instruct the Rafting boat operators throughout the country to identify the risks in the route; to study proper steering method in case of situation that could trigger an accident, and to share among skippers and operation managers the results of the studies including the risk assessments.

(2) Provision and wearing of lifesaving outfits, and explanation of how to use them

The Corporation has equipped the boats with lifesaving cushions and lifejackets as the lifesaving outfits for the passengers but most of passengers and skippers could not grab the lifesaving cushions when they fell in the river, and the children including one infant did not wear the lifejacket. Also note that the Corporation did not equip the boats with the lifejacket suitable for the infant whose weight is 15 kg or less. It is probable that all of these matters were related with the worsening of the casualties.

Seven Rafting boat operators inspected last year was confirmed that they were equipped their boats with the appropriate lifesaving outfits and addressing to implement the proper use of the outfits in line with the guidance given by the MLIT Maritime Bureau after the occurrence of the accident. It is probable that other Rafting boat operators will also be observing the same guidance.

Thus, the Minister of Land, Infrastructure, Transport and Tourism is to keep providing the Rafting boat operators throughout the country with the guidance regarding the provision and wearing of lifesaving outfits, and explanation of proper use of the outfits in order to ensure the safety of the passengers and skippers.

4) In view of the results of the marine accident investigation and other activities of the personal watercraft, on March 30, 2012 the JTSB expressed its opinions to the Minister of Land, Infrastructure, Transport and Tourism for the purpose of prevention of marine accident caused by the personal watercraft as follows.

In view of the following occurrence situation of the marine accidents caused by the personal watercraft (hereinafter referred to as "the Personal watercraft accident"), the Minister is to make the importance of compliance to the maritime laws such as Act on Ships' Officers and Boats' Operators (hereinafter referred to as "the Act") well known to the operators and organizations related with the watercraft operation, as well as the occurrence situation of the Personal watercraft accident, and to give them guidance. Effort should continuously be made to penetrate this matter and give safety guidance to small craft operators and others.

(1) The total of 126 Personal watercraft accidents occurred in 175 personal watercrafts, leaving 21 persons dead and 142 persons injured.

(2) Among the Personal watercraft accidents, the most common accident was the collision, the number of which was 65, and the next common one was the injuries and others, the number of which was 54. The sum of these two types of accident counted for about nine tenths or more (about 94.4%) of the entire Personal watercraft accidents.

(3) In 17 Personal watercraft accidents in 20 watercrafts, the operator not having the License was maneuvering the watercraft and resulted in an accident. Four operators died and nine operators sustained such serious injuries as bone fracture.

(4) In 8 Personal watercraft accidents in 9 watercrafts, the operator did not observe the stipulations in the Act and two operators died and 12 operators sustained injuries. They violated such stipulations (i.e., matters to be observed) as Prohibition of drunken operation and Operation only by the holder of the Small Vessel Operator License.

(5) In 6 Personal watercraft accidents in 6 watercrafts, the operator did not notice the swimmer(s) swimming in the bathing beach or other place and hit the swimmer(s) with the watercraft injuring 7 swimmers (In 2 accidents in 2 watercrafts the operator was not a holder of the License).

(6) In 22 Personal watercraft accidents in 22 watercrafts, the person(s) on the floating body such as rubber raft was killed or seriously injured while the watercraft was towing the floating body. Two of the persons died and 11 of them sustained such serious injury as bone fracture.

The above-cited situations in which the Personal watercraft accident occurred are derived from the Investigation Reports of marine accidents and incidents published from Oct. 2008 and the end of March 2012.

(3) Safety Recommendations (two cases)

1) In view of the results of the accident investigation of fatality of workers on the cargo ship SINGAPORE GRACE, on April 27, 2012 the JTSB recommended the Ok Tedi Mining Limited to take the following measures for the purpose of safe transportation and cargo operation by making the properties of floatation reagents adhering to copper sulfide concentrate known to the persons involved.

In case of the possibility of the existence of floatation reagents adhering to copper sulfide concentrate, it is recommended to the Ok Tedi Mining Limited as the shipper to submit information (Material Safety Data Sheet, etc.) on floatation reagents in addition to information of copper sulfide concentrate (Material Safety Data Sheet, etc.) to ships and consignees in order to make the properties and the risks of copper sulfide concentrate and floatation reagents known to ships and consignees.

2) In view of the results of the accident investigation of Injuries to longshoremen of the pure car carrier VEGA LEADER, on August 31, 2012 the JTSB recommended the owners and operators of car carriers to take the following measures for the purpose of prevention of recurrence of similar accidents.

It is somewhat likely that the accident occurred because, while VEGA LEADER (hereinafter referred to as "the Ship") was loading cars at Nissan Motor Honmoku Wharf, Yokohama Section 5, Keihin Port, car deck No. 7, not supported by the deck support at the starboard bow end, while the loading of cars on the deck panel of cargo deck No. 7 (hereinafter referred to as "the Deck Panel") progressed, fell onto car deck No. 6, and the ten longshoremen working on the Deck Panel or car deck No. 6 immediately below the Deck Panel were injured.

It is somewhat likely that the height of the Deck Panel, while the Ship was navigating to Kanda Port, was readjusted from the middle position to the normal position, the Deck Panel was lowered without anyone being aware that the deck support on its starboard bow end was neither fully open nor in a state to support the Deck Panel, and the deck support on the starboard bow end moved outward from the Deck Panel.

It is somewhat likely that the absence of stipulation by the management company in their safety management manuals of work-procedures specifically describing the work for readjusting the height of a deck panel and the Ship's lack of systems for confirming the state of deck supports by, for example, using a check list prior to lowering deck panels contributed to the occurrence of the accident.

Therefore, it is necessary for owners and management companies of pure car carriers to reconsider and work out measures for ensuring confirmation that deck supports are in a state to correctly support a deck panel prior to lowering the deck panel and putting it on the deck support, and in addition, instruct their crew members regarding such measures.

Based on the experiences of the accident, a measure for preventing a fall of a deck panel by employing fixed-type deck supports was applied. Since ships are equipped with facilities and other things that may cause a severe accident, involving injury, due to a crew member's absence of confirmation, ship owners in general and others should consider hardware-based safety

measures for facilities as a lesson learned from the accident.

Therefore, it is most likely necessary for owners of car carriers to consider and employ safer systems, such as fixed-type deck supports at the lowest level to prevent a panel-falling accident.

10. Remarks

The JTSB made remarks on the following 33 marine accidents in 2012.

1) Marine accident of grounding of cargo ship MIHARU MARU

(Published on January 27, 2012)

It is probable that this accident occurred as the result of the following series of events. When this ship was navigating south southeastward off the northwest of Otate Island in the nighttime, the first officer on the bridge watch turned the heading about 070° to make the ship pass the north of the Island and then the officer turned the heading in clockwise for three times to make the heading be between 092° and 107°. During these three maneuvers, the officer did not check the ship position against the chart or with any other tools or means, and the officer did not foresee the ship's approach to the Irose Reef after these maneuvers. Thus, the officer kept the ship staying on the course without noticing that the ship was on the course approaching the Reef finally making the ship grounded on the Reef.

The following measures to avoid the recurrence of this accident are conceivable:

(1) The relieving officer on bridge watch, prior to his duty, is to check such conditions as shallow waters near the planned course in addition to the ship's position, heading, and speed.

(2) The officer on bridge watch is to follow the planned course instructed by the master. If the officer is going to change the planned course to new course, the approval from the master is required.

(3) The officer on bridge watch, prior to heading change, is to check the ship's position as well as such conditions as shallow waters near the new course.

(4) The officer on bridge watch is to be always and properly watchful by making full use of all the tools suitable for the situation such as the radar and GPS plotter in addition to visual lookout.

(5) The master and crew member(s) on duty on the bridge is expected to be daily aware of keeping good communications among themselves on the bridge by making use of the technique used in the BRM so that the shearing of such important navigational information as the course can become common practice.

2) Marine accident of contact (with breakwater) of cargo ferry NANKAI MARU No. 3

(Published on January 27, 2012)

It is probable that this accident occurred as the result of the following series of events. The master did not check the ship's position with the radar while the ship was navigating southward in the Naze Port in the nighttime, and kept navigating the ship without noticing that the ship was heading toward the breakwater off the Port, resulting in the collision with the breakwater.

It is probable that since the master was keeping an eye on a fishing boat navigating oppositely on the portside, the master failed to check the position with the radar.

The following measures to avoid the future recurrence of the similar accident are conceivable:

(1) Make sure to locate the ship's position with the radar and to understand the position relative to the breakwater.
(2) When navigating in the port, reduce the ship speed early enough to be able to have sufficient lead time to change the course near the breakwater and in preparation for the case where the ship cannot keep the planned course due to an encounter with other ship.

3) Marine accident of collision between chemical tanker SAMHO HERON and cargo ship GOLDEN WING

(Published on January 27, 2012)

It is probable that the chemical tanker SAMHO HERON and cargo ship GOLDEN WING collided with each other because the crew on both vessels did not conduct lookout off the southwest of Kajitori-no-Hana in the nighttime while SAMHO HERON was navigating northeastward on the left side of Akinada South Traffic Route centerline and GOLDEN WING was navigating southwestward on the right side of the same centerline.

In the Seto Inland Sea, the recommended routes are designated in major Traffic Routes even though the law does not designate them. At the center of the recommended routes there are light beacons installed and it has been penetrated among the vessels navigating on the recommended route to use the right side of the route centerline.

In this accident, the SAMHO HERON resulted in facing with multiple vessels including GOLDEN WING that were navigating the right side of the centerline because the SAMHO HERON was navigating the left side of the centerline, which caused the collision with the GOLDEN WING. In order to avoid the recurrence of the accident, it is expected for the vessels navigating on the recommended route to use the right side of the centerline.

4) Marine accident of flooding of passenger ship KASHIMA

(Published on January 27, 2012)

It is somewhat likely that this accident occurred as the result of the following series of events. Those who were involved in repairing the leak from the shaft seal device did not push back the wedge ring evenly, and in addition they did not retighten the locking bolts of the device after the test run of the engine. Vibrations caused by engine operations after the test displaced the wedge ring; loosened the locking bolt(s); made the shaft seal device leak water; and finally made water flooded in the engine room.

Those who inspect and maintain the shaft seal device is to follow such prescribed procedures as the use of the positioning gauge in maintaining the device and retightening of the locking bolts of this device after the engine test run. The crew members who inspect the engine section are to observe the maintenance and inspection manual; to periodically inspect the conditions of the locking bolts and shaft seal device for any leakage; and to visually inspect the bilge water level in the engine room.

The operation manager is to recognize the importance of properly inserting the packing materials in the emergency gland packing section in preparation for such serious situation as the flooding and foundering caused by a lot of water leaked out of the end-face seal of the shaft seal device.

5) Marine accident of collision between cargo ships TY EVER and LOFTY HOPE

(Published on January 27, 2012)

Around Kanmon-kyo Bridge above the Kanmon Passage, the cargo ship TY EVER navigating eastward was approaching another preceding vessel in the same direction when the cargo ship LOFTY HOPE was navigating against the TY EVER from the opposite direction. The TY EVER made an evasive left turn to avoid another vessel, which made her to collide with the LOFTY HOPE.

Since the Kanmon Strait becomes narrowest around the Kanmon-kyo Bridge, which is the position of this accident, the current gathers speed. If the eastbound preceding vessel is navigating near to the center of the route and the following vessel is navigating near to the sideline of the route, which is the Moji side of the Strait while the current is westbound, the preceding vessel loses its speed as it approaches nearer to the Bridge making the following vessel apt to approach near to the preceding vessel. This is because that in the center of the route west of the Bridge the current has faster speed than the speed along the sideline of the route in the Moji-side of the route.

Therefore, it is most likely necessary for a vessel, when navigating eastward in the west side of the Bridge against the westbound current, to be watchful for the speed change of and distance to the preceding vessel; to keep the safe distance to the preceding vessel as far as possible navigating the South (Dead astern) of the preceding vessel so that she will not be in parallel with or overtake the preceding vessel; and to navigate the right side of the Kanmon Passage along the route.

6) Marine accident of collision between cargo ships WIEBKE and MARINE PEACE

(Published on January 27, 2012)

It is probable that this accident occurred as the result of the following series of events. Off the Mojisaki at the Hayatomono-seto of the Kanmon Passage in the nighttime when the current was westbound at about 5 kn, the cargo ship WIEBKE was navigating north-eastward along the center of the Passage and cargo ship MARINE PEACE was navigating also north-eastward along Moji-side of the Passage. When the MARINE PEACE was going to take over the WIEBKE from the WIEBKE's starboard quarter, the bow of the MARINE PEACE encountered the current-rip across which the current speed changed significantly, and the strong current hit on the starboard bow that made the MARINE PEACE turn left, causing the MARINE PEACE proceed near to the WIEBKE navigating the portside. The both ships collided with each other.

The speed of westbound current along the Moji-side of the Passage is lower than the current speed at around the center of the Passage. Just like as this accident, a vessel navigating eastward at Hayatomono-seto off the Mojisaki in the Passage along the Moji-side of the Passage may sometimes approach another vessel navigating eastward along the center of the Passage; navigate in parallel with; and takeover another vessel.

When a vessel is navigating eastward off the Mojisaki in the Passage under this situation, the vessel encountering the current-rip is hit on her bow by the strong current and is made to turn her bow to the left. It should be noted that the more the speed difference across the rip is, the more severely the vessel is turned left, which poses the danger of approaching and colliding with another vessel navigating along the center of the Passage.

Since in the night time, it is hard for a vessel to identify the current-rip(s) off the Mojisaki, it

is most likely necessary for a vessel, to the maximum extent possible, to navigate dead astern of the preceding vessel while keeping the safe distance from the preceding vessel, and to be carefully controlled while properly watching the preceding vessel in preparation for the possible slowdown and/or course change of the preceding vessel that may encounter the current-rip.

7) Marine accident of contact (with revetment) of motor boat QUEEN III

(Published on January 27, 2012)

It is probable that this accident occurred as the result of the following series of events. When the skipper of this boat navigating southwestward off the southeast of the Tokyo International Airport in the nighttime stopped operating the radar and started changing the monitor window to display the GPS plotter image on the entire window, the skipper without knowing the signs indicating the construction area of the Airport runway D were flushing red concentrated on the window selection. Because of this concentration, he took the red flushing light from light beacon A of the south construction area observed to his starboard as the red flushing light of the No. 2 light beacon showing the entrance to the Kawasaki Passage, and he began to steer the boat to the right to enter the Passage. However he did not notice that the boat was running toward the revetment because he still kept manipulating the monitor to change the window, and finally the boat collided against the revetment.

It is most likely necessary for skippers navigating a small vessel in the nighttime within the port even if navigating in the familiar area to study and confirm the navigation aids on the planned route prior to departure and to concentrate on the watch and steering while navigating the boat.

8) Marine accident of capsizing of cutter (unnamed)

(Published on January 27, 2012)

It is probable that this accident occurred as the result of the following series of events. Under rainy weather of which heavy rain, thunder, gale, high-wave and flood advisories had been forecast, the cutter was used for an outdoor activity at the junior high school of the Youth Center and was engaged in a cutter rowing training without a trainer along an east course, which is a usual way of the training, off the north shore of Lake Hamana. The gale and waves grew stronger to render the rowing difficult, and the director of the Center went for rescuing on a motor boat, and towed the cutter in a portside-inclined state and also in a subsequent state of continuous inflow of lake water thereinto from the portside bow. When being towed in those states southwestward off the south of Sakume, the cutter's leftward inclination sharpened under increasing flowed-in water accumulation on her bottom and caused the portside oars to catch water and to turn her stem leftward. Sometime later, the students sitting on the starboard side lost balance and were shifted toward portside, to further increase the leftward inclination. Consequently, the portside gunwale submerged, lake water flooded into the cutter, and finally the cutter overturned portside.

It is most likely necessary for the local authorities having the facilities available for cutter training to review their rescue system, procedures, etc. against the cutter accident. The system should include a criteria to suspend the training when the weather warming/advisory is forecast; cutter training method; and procedure for towing a cutter. It is also necessary for the local authorities to take necessary actions if any problems found in the system; to enhance cooperation

with rescuing agencies; and to give the staff of the facilities trainings for cutter accidents, including a procedure for towing the cutter.

It is most likely necessary that when the local authorities entrust the management and operation of the cutter training facilities to the designated managers, they should make the said designated managers establish the rescue system, procedures, etc. against the possible cutter accidents including cutter towing procedure; run the cutter towing training; and establish cooperation with rescuing agencies.

9) Marine accident between cargo ships HARMONY WISH and SHINKAZURYU

(Published on February 24, 2012)

It is probable that this accident occurred as the result of the following series of events. When the cargo ships HARMONY WISH and SHINKAZURYU detected each other ahead the beam of the ship only with the radar while they were navigating off the north of Himeshima Island in the limited visibility condition due to fog, they did not properly judge that both of them could dangerously approach the other ship or that both of them could collide with each other. Because of this improper judgment, both ships collided.

In view of the results of this accident investigation, it is most likely necessary to observe the following items in order to avoid the recurrence of the accident similar to this accident:

1. Fundamental actions to be taken in limited visibility condition

   While navigating in the water area where the visibility is limited or around that area, the fundamental actions to be taken are to turn on lights required by law; blast the acoustic signal (fog signal); and navigate at the speed appropriately safe in such conditions as visibility and others.

2. Proper lookout

   In the limited visibility condition, the crew member(s) is to always keep lookout in an appropriate manner by making use of eyes, ears, AIS information, VHF communications, and any other means in addition to the radar. The crew member is to try to detect other vessels as early as possible by alternating the radar range between long and short ranges.

3. Proper judgment of other vessels

   The vessel, when she detects other vessel(s) only with the radar, is to properly judge if she could dangerously approach other vessel(s) or not, and if she could collide with other vessel or not by observing the image of the said other vessel(s) methodically.

4. Maneuver to avoid such events as dangerous approach

   When it is decided that the vessel could dangerously approach other vessel navigating ahead the beam of her or she could collide with other vessel, she is to take the evasive maneuver to avoid such events as above sufficiently earlier than the possible time of the event. In case of the evasive maneuver, the vessel is not to turn left unless it is absolutely necessary to make left turn.

5. Significant deceleration of vessel or bringing of vessel to stop

   If a vessel cannot avoid getting too close to other vessel navigating ahead the beam of her, the vessel should reduce her speed to the minimum that can keep the course or should stop if necessary. In this case, the vessel should very carefully navigate until there is no longer any fear of the collision.

10) Marine accident of contact (with breakwater) of motor boat CAPRICORN

(Published on February 24, 2012)

This accident was caused by the following series of events. While this boat was running back to her marina in Kobe City in the nighttime in the Shikama Section 1 of Himeji Port off the north of the lighthouse on the Shikama East Breakwater, the skipper did not confirm the boat's position when setting the course toward the entry of the Port. Therefore, he kept the boat running without noticing that the boat was heading to the East Breakwater and the boat contacted with the Breakwater.

On the GPS plotter on this boat, the East Breakwater was shown. It is desirable to utilize the GPS plotter effectively, because the plotter can give information effective to avoid an accident, when navigating in the nighttime in the area where the light from the target lighthouse cannot be visually identified due to confusable lights from a lot of other vessels.

The skipper, being required to make proper decision to cope with a variety of risks and dangerous situations which would occur while controlling the vessel, should refrain from drinking because the drinking brings about adverse influence on the decision making in controlling the vessel and may make the proper maneuvering impossible.

11) Marine accident of fatality of stevedore of cargo ship STAR KVARVEN

(Published on February 24, 2012)

It is somewhat likely that this accident was caused because the signal person used the maintenance ladder instead of the regular pathway for moving around the ship for loading and unloading of the cargo.

It is desirable that the Shinmaru Koun Co., Ltd. should make their foremen check the safety of the pathway on which workers move around during loading and unloading the cargo, and make their foremen let the safe pathway well known to the workers.

12) Marine accident of contact (with sediment control groin) of motor boat SAN

(Published on March 30, 2012)

It is probable that this accident occurred as the result of the following series of events. On this boat running back to her marina in Kanazawa Port in the nighttime, the skipper was alone to control the boat and could not confirm the light from the light buoy due to improper lookout; he kept running the boat without noticing the boat was approaching the sediment control groin; and finally the boat contacted with the groin.

The skipper, even if navigating in the familiar area, is required to make an effort to navigate safely by carrying out the lookout conscientiously and by confirming the ship's position with a GPS plotter or others.

13) Marine accident of fatality to a crew member and fishing passenger of recreational fishing vessel KAIRIN MARU

(Published on March 30, 2012)

1. Cautions in handling ship's anchor rope

It is probable that this accident occurred as the result of the following series of events. The master of the recreational fishing vessel KAIRIN MARU was adjusting the anchoring position in

the fishing spot off the west-southwest of Hinomisaki; he was trying to unhook the anchor rope caught on the stern bottom of the vessel and tightened; he was caught on his right ankle with the anchor rope on the quarterdeck and pulled by the rope that was drifted away out of the deck under the pressure of wind blowing leeward of the vessel making him fallen in the sea; and a fishing passenger trying to prevent the master from falling also fell in the sea.

In view of this series of event leading to the accident, it is most likely necessary for every crew member to be very careful when he is handing such ropes as anchoring rope so that he won't be on the rope, step over the rope or put the leg in the loop of the rope in order to prevent the leg from getting caught by the rope.

2. Measures to ensure the safety of fishing passengers and the like

It is probable that the fishing passenger if he put on a lifejacket would have been saved after he fell in the water; however that he did not have time to put on it because he rushed out of the cabin trying to save the master.

On the other hand, it is somewhat likely that two of other fishing passengers did not know where the life ring buoys were stored; that only if they were well informed of the storage space, then they would have thrown the life ring buoys soon after the fishing passenger fell in the water; and that the fishing passenger fallen in the water would have been saved.

It is also probable that the master did not instruct the fishing passengers to put on the lifejacket or did not put it on by himself when he was engaging in anchor work in spite of the operational rules, in which it was stipulated that the master should try to ask the passengers to put on the lifejacket while they were onboard and that the master should put on the lifejacket when there was any risk of falling into the sea.

In view of the above presumption, it is desirable to observe the followings in order to ensure the safety of the fishing passengers on the recreational fishing vessel:

(1) The recreational fishing vessel operators are to clearly stipulate in their operational rule that they let the passengers know where the life ring buoys are stored, and that to make sure to inform them of the storage space before departing the port. This is because of that the fishing vessel is operated with a few crew members; that the passengers are on the deck most of the time; and that the passenger(s) will have to take the lead in the rescue activities if, like this case of the accident, the master falls in the water or if someone falls in the water out of eyesight of crew members.

(2) The recreational fishing vessel operators are to, in accordance with their operational rule, try to make the fishing passengers put on lifejacket; as a matter of course the master shall put the lifejacket on whenever he or she is doing any works that have possible risk of falling into the sea; and in order to permeate the habit of wearing the lifejacket among the fishing passengers the crew members are to take the initiative and set a good example for the fishing passengers by putting on the lifejacket.

(3) The Fisheries Agency and every administrative divisions are to provide the operators of recreational fishing vessel with advices and/or guidance necessary for them to put the above (1) and (2) in action.

14) Marine accident related to swimmer injury by personal water craft (unnamed)
(Published on March 30, 2012)

It is probable that this accident occurred as follows: In the course of driving a personal water craft (PWC), the driver, without license for personal water crafts, decided to head the PWC along the sandy beach for the sunshade tent on the Kusuhama coast, and steered it accordingly while slowing down its speed. He thereupon lost his balance and narrowly escaped from falling into the sea. He struggled to hold himself stable but failed and was thrown out into the water. The PWC left his control and ran on to collide with two swimmers who were heading from the sea toward the sands.

For any PWC driver, it would be essential to previously obtain a driver's license for personal water crafts, to be fully careful of avoiding the act of approaching to or running around swimmers, and also the act of dangerous PWC operations such as high-speed running, sudden turning, and meandering, and to train himself for acquiring better knowledge and skills to ensure safe PWC maneuvering free of collision with swimmers, always with awareness that a PWC collision with a swimmer can give serious damage to the swimmer even when the PWC is running at a low speed.

It also seems likely to be important that a PWC driver, when driving it, should have a kill switch cord tied to his wrist or other body part in preparation for unexpected emergency including his own accidental fall into the sea.

While necessary information for the licensing and safe operation of PWC is published in the homepages of the Ministry of Land, Infrastructure, Transport and Tourism, the Japan Coast Guard, and marine organizations and institutions, or by their other means, more penetrating information is desirable in future.

15) Marine accident related to death of stevedores of cargo ship SINGAPORE GRACE
(Published on April 27, 2012)

This accident is likely to have occurred in the No.3 hold of this cargo ship moored to the private wharf of Saganoseki Smelter and Refinery of Nikko Smelting & Refining Co., Ltd. for discharging cargo work of copper sulfide concentrate when a stevedore entered the hold in which oxygen was deficient, and was stricken with anoxia, and subsequently when other workers entered the same hold to rescue the collapsed stevedore and suffered also from the same disease.

1 To personnel who are engaged in the transport and the cargo operation of copper concentrate

The Japan Transport Safety Board requests to the personnel who are engaged in the transport and the cargo operation of copper concentrate to pay further attention to the followings:

(1) In order to know the atmosphere of enclosed space, it is necessary that the O_2 concentration and gases to be measured properly.

(2) It is necessary that personnel should understand the atmosphere of enclosed space. No personnel should enter into enclosed space until the atmosphere becomes safe by forced draft, etc.

(3) It is necessary that personnel should keep in mind that it is not easy to enter the cargo hold and rescue quickly the injured, and that once anoxia developed, it is difficult to return from the cargo hold alive.

2 To the industry involved in the transport and the cargo operation of copper concentrate

Due to the risks in dealing with copper concentrates, the Japan Transport Safety Board

urges the Japan Mining Industry Association, the Japanese Ship Owners' Association, All Japan Seamen's Union, Japan Port Transport Industry Safety & Health Association, Japan Federation Dockworkers Unions and Japanese Confederation of Port and Transport Workers Unions to make this report known to those whom it may concern.

16) Marine accident related to passenger ferry ORANGE GRACE collision (against quay)

(Published on April 27, 2012)

This accident seems to have occurred as the advance inertia control by the starboard main engine of this ferry was lost owing to the total rupture of the elastic body for the starboard elastic shaft coupling when this ferry was maneuvering to come alongside the pier in the No.1 Section of Matsuyama Port.

The deterioration of rubber, of which the elastic body was made, develops on account of fluctuating torque caused by the main engine and also develops under environmental factors including heat, oxygen and ozone, to eventually entail cracks, creep, and hardening which, if left uncared, can lead to the rupture of the elastic body.

For the ship owner and the chief engineer who are responsible for the maintenance management of the elastic body, it should assumedly be necessary to understand that rubber deterioration in aging is unavoidable and therefore to conduct the maintenance implementation of the elastic body, planned with not only operating times but also the length of times of use taken into account.

17) Marine accident related to collision of passenger ferry FERRY KITAKYUSHU with the chemical tanker KOKI MARU No.78

(Published on May 25, 2012)

It is probable that this accident occurred as follows: When the passenger ferry FERRY KITAKYUSHU (FK) passed by the No.4 Buoy and took its course along the Kurushima Strait route, the master determined that the FK could overtake the chemical tanker KOKI MARU No.78 (KM78) to safely run into the West Channel, and started to pass the KM78. When being ahead of the KM78, the FK had already been at the point of course change to the West Channel, and then directed its course rightward to the West Channel, which obliged the FK to cross the forward traffic course of the KM78, to come into collision with it.

A consideration here is that the FK master was aware his ferry was 3 minutes behind the scheduled time for the entry in the Kurushima Strait route. Along with the "No-Overtaking" zone that had been newly established, Meimon Taiyo Ferry Co., Ltd. had revised its ferry operation timetable, reflecting the reduced ferry traffic speed through the Kurushima Strait route. This reduced traffic speed in the timetable reduced the significance of the delay of the FK. There had been no instructions given to relevant ships for preparations for possible delays in traffics at reduced speed through the Kurushima Strait route. It is therefore probable that the FK master reckoned that the FK would delay by about 20 minutes if it should navigate the Kurushima Strait route at the rear of the fleet and decided to overtake it.

It is therefore desirable for all ships navigating through the Kurushima Strait route and for all of their owners to prevent the recurrence of this kind of accidents with efforts as follows.

(1) If a ship heading through the West Channel toward its northern outlet should find ahead a fleet of ships navigating in the same direction, the ship should not easily attempt overtaking

them but should stick to safe navigation, considering the difficulty of navigation through the Channel route and reckoning of the location of the course change to the West Channel.

(2) A ship navigating through the Kurushima Strait route should maintain sufficient distances between ships traveling before and behind it in the same Channel, considering its own speed and tidal currents in the Channel.

(3) When a ship is going to change its course at a curved area, previously make a final backward check on the side toward which it is going to change, and then change the course while maintaining safe distances between ships traveling before and behind it.

(4) A ship-owner should provide thoroughgoing directions and instructions for the possible delay of its ships when navigating through the Kurushima Strait route, with emphasis placed on no-overtaking.

18) Marine accident related to collision between cargo ship DAISENZAN MARU and recreational fishing vessel HISA MARU

(Published on May 25, 2012)

It is probable that this accident occurred as follows: On waters off the northwest of Oshima, under hazy weather, the cargo ship DAISENZAN MARU (DM) was heading southwest, while the recreational fishing vessel HISA MARU (HM) was drifting about there. Both the master of DM and the skipper of HM used no radar but relied on visual lookout, assuming that there would be no other ships around there, to incur the collision.

Seeing that steerers are constantly required to measure the possibility of collision with other vessels, lookout not only by eyesight but by using furnished equipment such as radar as well is considered essential.

The skipper of a recreational fishing vessel, in particular, may be needed to do work other than the vessel steering, so as to meet fishing passengers' requests. In a case like this, it is considered necessary to accurately grasp the surrounding situation, to immediately stop doing such other work, and to ensure the safety of the fishing passengers.

19) Marine accident related to collision of recreational fishing vessel KAMOME MARU against breakwater

(Published on May 25, 2012)

It is probable that this accident occurred when this vessel collided against the breakwater in the Nakaminato Port, because the vessel skipper had started recording the location of floating items, without carefully watching around as the vessel had been navigating off the east of the Port toward the Port, under densely fogged view-obscured weather, and did not notice that the vessel was approaching the breakwater.

Seeing that a recreational fishing vessel skipper is required to ensure the safety of their fishing passengers, it will be necessary for the skipper to be always accurately conscious of surrounding circumstances even when working for other than vessel steering.

20) Marine accident of grounding of traffic boat FRESH ARIKAWA

(Published on June 29, 2012)

It is probable that this accident occurred when the skipper of this boat, who, seated in the

cockpit, had been manually steering alone the boat westward, off the north of the Kanagashirase situated to the north-northwest of Enoshima, fell asleep and allowed the steering wheel to be turned counterclockwise and, consequently, the boat, while curving leftward, moved toward and grounded on the rock.

It is considered necessary for the skipper, when steering a boat, to be always careful for preventing himself from falling asleep, particularly when monotonous steering continues or when drowsiness is likely to become overwhelming typically in circadian or semi-circadian rhythms, and, if should feel drowsiness is approaching, to try to take resisting actions including a change to standing steering. It is also considered necessary for the boat owner to be careful of the air condition in the steering chamber to reduce the possibility of the skipper's dozing and to take prompt action in the event of an air-conditioner failure.

If a bridge navigational watch alarm system were equipped, the warning buzzer might have awaken the dozing skipper to serve to avoid this accident. It is desired, therefore, that the boat owner equip his boat with such a system.

21) Marine accident related to injuries of passengers on motor boat SUZU

(Published on June 29, 2012)

It is probable that this accident occurred as follows: When this pleasure boat was heading south on waters between the eastern piers of the bridge and Tosaki at the Naruto Strait, where waves were rising on the south current flowing at a velocity of about 8 kn under the south wind of about 2.9 m/s, the skipper chose the course onto the rising waves, and the boat was upheaved and brought down, causing five of the passengers on the flying bridge to pop up off and down to their seats or the floor with bumping impacts to injure them.

It is desirable that small vessels including motorboats should avoid navigating the Naruto Strait, if not well informed of the tidal current and wave characteristics there, and that small vessels navigating there should, prior to departure, make sure of the times of changes and the directions of the current, and the time and velocity of the current at its highest, as well as wind directions and velocities there by referring to Sailing Directions for Seto Naikai and Internet information provided by the 5th Regional Coast Guard Headquarters, and should have meteorological and sea condition data in addition to the data of the topography and shoals there previously examined by Chart W112 (Naruto Kaikyo). When wind blows in the direction opposite to that of the tidal current in the Naruto Strait, navigation there should preferably be held back.

Passengers on a small vessel who are on its exposed deck such as a flying bridge should preferably wear a life jacket if there can be a danger of fall from the deck.

22) Marine accident related to collision between cargo ship SHINKENWA MARU and cargo ship SHOWA MARU No.8

(Published on June 29, 2012)

It is probable that this accident occurred when the cargo ship SHINKENWA MARU (SKM) was navigating south south-east off the north of Naruto Kaikyo and the cargo ship SHOWA MARU No.8 (SM8) was navigating north-northwest under foggy visibility-restricted weather, the master of SKM not watching out by radar, while the master of SM8 maintaining its course and speed unchanged, to come to collision with each other.

The Naruto Kaikyo in which this accident occurred is a strait where the navigable passage is narrow, tidal current is rapid, and fishing boats are operating sometimes, all these possibly being factors to restrict collision-avoiding actions, and it is considered therefore that the master of a cargo ship passing this strait under visibility-restricted conditions is required to pay careful attention to the early detection of other ships in the strait by appropriately using radar ranges and, on finding any other ship, to practice systematic observations, including radar plotting, of such other ship and to make sure of its navigation situations using VHF, so as to promptly determine the probability of the danger of a near miss or collision with the other ship in accordance with the requirements of Section 4, Article 19 of the Act on Preventing Collision at Sea, so that the master should take actions to avoid such danger if the probability is high.

23) Marine accident related to grounding of cargo ship DAIKO MARU (Published on June 29, 2012)

It is probable that this accident occurred as follows. When this ship was heading northwest off the east of Kuji Port at night, the second officer on duty alone on the bridge fell asleep, and his foot happened to hit the course control dial to turn the dial counterclockwise, which caused the ship to turn in the direction of the coast to the northeast of Kuji Port and to run aground a reef at the coast.

Since the time zone from midnight till early morning is a period for a bridge officer on duty to become liable to doze, it is considered probably necessary that the officer should take positive care for holding off sleepiness by, for instance, doing the duties in a standing pose, and that, if the ship is equipped with a bridge navigational watch alarm system, the system should be kept operative and a timer should be previously set appropriately.

24) Marine accident related to collision between fishing vessel DAIKO MARU and fishing vessel MIYAJIMA MARU

(Published on June 29, 2012)

It is probable that this accident occurred when the fishing vessel DAIKO MARU, which was running southeastward, and the fishing vessel MIYAJIMA MARU, which was drifting about, both at sea to the southeast of Sensui Island, collided with each other because both of the skippers of the vessels failed to keep watch appropriately.

Every fisherman operating or navigating on the sea, even when on familiar marine zones, will be required to bear in mind that navigation courses will always be varied and that the practice of careful navigation and constant appropriate lookout is always important to avoid collision.

25) Marine accident related to collision between motor boat YOSHIOKA MARU and racing boat (unnamed)

(Published on July 27, 2012)

It is probable that this accident occurred when the motorboat YOSHIOKA MARU, which was running eastward, and the racing boat, which was running westward, inside Katakami Port, collided with each other because both of the skipper of the motorboat and the rowers of the racing boat failed to keep watch appropriately.

A skipper when driving a motorboat is required to keep its windshield clear and to keep lookout appropriately so that no blind sector will intervene in his view of the bow, by changing his position, e.g. by standing up.

The rowers of a racing boat, when exercising alone, are required to pay careful attention to other boats or ships by alternately and evenly turning their heads forward.

For the prevention of collision with other ships, the rowers of a racing boat are also required to be versed in the basic marine traffic rules provided by the Act on Preventing Collision at Sea and the Act on Port Regulations as well as to abide by the water area safety rules for their rowing area.

In addition, it is desirable that the rowers wear life jackets for emergency, have simple air horns or so, capable of sounding signals to tell their presence to neighboring ships, and have portable waterproof phones or similar tools for communication.

26) Marine accident related to injury of crewman of cargo ship TSURUYOSHI MARU No.3

(Published on July 27, 2012)

It is probable that this accident occurred as follows: When this cargo ship was weighing her anchor at night off the Ichikawa Fairway of Chiba Port under such circumstances as storm, high-sea and drag anchor warnings had been issued for that district, the 1st officer was engaged alone in the anchor weighing work on the forecastle deck and was overturned by a surge of overriding waves as he had not noticed the surge, and was injured.

It seems likely that the master of this ship, without obtaining latest weather and sea condition information, cast anchor off the Ichikawa Fairway where laver farms were located, and that, had the master immediately informed the injury of the officer to the Japan Coast Guard, prompt makeshift treatment advices could have been given from medical facilities, to alleviate the injury.

Desirably, the operator of a ship should give directions to the master of a ship under the operator's ownership or management, to make it a practice to:

(1) obtain latest weather and sea-condition information prior to casting anchor;

(2) for the purpose of preventing net entangling and stranding by anchor dragging, choose an anchoring location free from obstructions and shoals in consideration of obtained information per (1) above as well as of wind direction in which wind velocity will be highest, and also choose an anchoring method with the extension capacity of the anchor cable in rough weather taken into account; and

(3) in the event of an injury accident, immediately contact the Japan Coast Guard and the operation manager to obtain first-aid treatment instructions.

27) Marine accident related to collision between cargo ship SEIREI MARU and cargo ship GYOREN 1

(Published on July 27, 2012)

It is probable that this accident occurred when the cargo ship SEIREI MARU (SEIREI) was heading southwest and the cargo ship GYOREN 1 (GYOREN) was heading northeast off the east of Aijima Island under a foggy visibility-restricted situation, and they collided with each other, because the officer of SEIREI kept on moving without changing her course and speed assuming

that GYOREN would change her course to avoid possible contact, and also because the boatswain of GYOREN was not duly watchful of the radar.

It is also probable that the officer of the watch were not complying with the provisions of the Operation Manual and that the operators of both of the two ships had not provided the ships with fog information in spite of the foggy season.

(1) Ship operators should obtain fog information from homepages or so of the Japan Meteorological Agency and provide ships under their ownership or management with such information.

(2) Ship operators should give the following directions to their ship crew:

i) Whenever the visibility has come to a level specified in Section 4, Article 3 of the Operation Manual, the officer of the watch must report it to the master without hesitation and the master must take appropriate actions, including a watch duty support, according to the provisions of the Manual.

ii) The navigation law applicable to visibility-restricted situations must be observed.

28) Marine accident related to injury of passengers on passenger ship RYOMA

(Published on August 31, 2012)

It is probable that this accident occurred relative to the fact that, although the master and crewmen of this ship of Tokyo Cruise Ship Co., Ltd. used to call passengers' attention, by broadcasting and passenger cabin safety check, to the danger of possible catch of passenger's hand or fingers in the passenger cabin windows on the second floor of this ship when the passengers should open or close the windows, this cruise ship Company had no recognition of such danger and had not provided procedures to safely open and close the windows as well as to previously check the safety.

In view of this fact and based on the investigation results of this accident, the Japan Transport Safety Board, with the intention of better contributing to the recurrence prevention of this kind of accidents, hereby expresses its comments as follows and requests the Japan Passengerboat Association to make this report known to, and to call greater attention of, all of the Association's concerned parties.

It is advisable that the owners of passenger boats that have windows in their passenger cabins whose opening/closing operations are remote-controlled should provide safety means to ensure the safety of passengers and crew, as follows.

(1) The windows should as far as possible have a construction that cannot hold the hands and fingers of passengers.

(2) For window construction that can hold hands or fingers, appropriate protective means should be provided.

(3) For windows that may hold hands or fingers when such windows are operated, a window operation safety checking procedure and window operation-related procedures should be previously established and crewmen should be trained by the procedures. For passengers having access to such windows, accident preventive means should also be provided, such as warning notices posted near such windows.

29) Marine accident related to collision of liquefied gas bulk carrier RYOAN MARU against Light Beacon

(Published on August 31, 2012)

It is probable that this accident occurred when the master of this carrier, heading north along the Nakanose Traffic Route at night, directed her bow toward the No.1 light beacon as the carrier was overtaking another ship in the same Route, and kept on moving her toward the beacon until she collided with it, because the master had directed the able seaman to turn the bow rightward after overtaking the another ship, with the intention of avoiding the beacon following the overtaking but because this direction failed to be observed owing to the lack of communication, that is, the communication was not sufficiently shared with, within the bridge.

It is considered probably necessary that able seamen on duty on the bridge should share information with to have good understanding among themselves by utilizing available means including BRM, and that a master and officers of the watch should make it a practice to give steering commands clearly, to have given steering commands repeated by the steersman, and to have steering condition information reported to them.

It is desired that ship owners continuously implement effective BRM training in order to build up a system to ensure smooth communication and information sharing among bridge officers and seamen so that errors among them can be corrected by their interactions.

30) Marine accident related to injuries of workers on pure car carrier VEGA LEADER

(Published on August 31, 2012)

It is somewhat likely that the accident occurred because, while the ship was loading cars at Nissan Motor Honmoku Wharf, Yokohama Section 5, Keihin Port, the Deck Panel on the car deck No. 7, not supported by Deck Support 2, while the car loading on the Deck Panel progressed, fell-down onto car deck No. 6, and the ten longshoremen working on the Deck Panel or on car deck No. 6 immediately below the Deck Panel were injured.

It is somewhat likely that, while the ship was proceeding to Kanda Port, the Deck Panel, when readjusted from the middle position to the normal position, was lowered without anyone being aware that Deck Support 2 was neither fully open nor in a state to support the Deck Panel, and Deck Support 2 moved outward from the Deck Panel.

Port-transportation-service providers are recommended to regard deck supports on a liftable deck as dangerous parts and confirm that the deck panel, on which cars will be loaded, should be correctly supported by them before loading.

31) Marine accident related to collision between cargo ship MEDEA and fishing vessel KOSEI MARU

(Published on September 28, 2012)

It is probable that this accident occurred as follows: When the cargo ship MEDEA was moving southwestward under the guidance of a pilot, while the fishing vessel KOSEI MARU (KM) was moving westward, off the southwest of the East Route of Nagoya Port at night, the pilot directed to change her course leftward to lead her to pass by the east side of the No.6 light buoy, which brought her to approach KM, while the skipper of KM, unaware of the approaching MEDEA, continued to move on toward a forward part of the MEDEA's course, to result in

collision with each other.

There seems to be a possibility that the absence of appropriate lookout by both the master and the skipper and the lack of information sharing among the pilot, master and third officer of MEDEA about the movement of other boats including KM took part in this accident.

(1) It is desirable that WALLENIUS MARINE SINGAPORE PTE LTD. give the following directions to the masters of the ships under its ownership or management:

i) Every master, on his boarding a ship, should make sure of the location of her whistle so that he can immediately blow it in an emergency.

ii) Every master should positively utilize BRM techniques so that he can share other vessels' information with her pilot whenever she is under the guidance of the pilot.

(2) It is desirable that the Fisheries Cooperative Association to which KM belongs makes the followings thoroughly known to all of its member fishing vessels:

i) Every skipper, whenever preparing on a ship-crowded sea area, for fishing, should practice careful lookout using timely means including a radar so as to be able to find approaching vessels if any.

ii) It should be borne in mind that a visual lookout immediately after a work in a brightly illuminated place at night can hardly find other vessels because the vision may not be dark-adapted, and that working lights on the front of a steering house will be obstructive to lookout.

(3) It is desirable that the pilots' associations, of which the pilot of this accident was a member, considers giving BRM education and training to all its member pilots in order to effectively implement BRM techniques to ensure that every pilot on duty will keep the master informed of the steering condition of their ship and will be promptly and positively informed from the master of the movement of other approaching vessels, if any, thus, will share information among them so that they can perform safe navigation, and is also desirable that the society endeavor anew to improve their skills relative to the IMO standard marine communication terms.

(4) We request anew the Japan Federation of Pilots' Associations to make effort to improve the skills of its pilots relative to the IMO standard marine communication terms through its safety training programs implemented every 5 years.

32) Marine accident related to diver injuries of diving boat YDS VII

(Published on November 30, 2012)

It is probable that this accident occurred as follows: When this boat was drawing up a diver at its stern offshore the northwest of Umabana-saki, a diving instructor dived into beneath the stern bottom because the boat had a fast backward momentum, advanced while rolling along the bottom toward the bow, and accidently contacted the propeller blade. At the same time, the passenger diver accidently got both of his flippers caught between the lowered ladder and the outside plating of the stern, fell into the water headfirst and contacted the boat bottom.

For preventing the recurrence of this kind of accident, therefore, it is considered necessary for the diving-related marine pleasure providers to implement the preventive measures as follows.

Considering that the Okinawa Prefectural Public Safety Commission has been energetic in giving instructions for ensuring the safety of diving passengers, the Japan Transport Safety

Board requests the Commission to cooperate for giving directions to diving-related marine pleasure providers for the implementation of the safety measures as follows.

(1) Giving cautions and instructions and making them well known when drawing up divers from waters to a diving boat

Diving-related marine pleasure providers should make the following cautions well known to their boat skippers and should instruct the skippers to observe them:

i) The diving boat skipper, when approaching a diving passenger, should approach at an immediately stoppable speed and should stop the boat before the diver comes in the blind spot of the boat.

ii) If a diving boat is equipped with a means of communication with a sea-surface instructor or a diving passenger, such as an underwater speaker, the skipper should use such means and announce the boat approaching situation to the diving passenger.

iii) As far as practicable, the skipper should assign a watcher or an instructor to watch out abroad for diving passengers' access to the boat.

iv) The instructor should carry a communicating means such as a whistle and inform the skipper by using it in the event of the danger of a possible nearing of the boat.

v) When taking actions to stop the boat and to bring up a diving passengers from waters, the skipper should make sure of the standstill of the propeller and then advise the diving passenger-guiding instructor that the boat is ready for bringing up the passenger.

vi) Upon receiving the information per v) above, the instructor should confirm that the propeller is in stoppage and then guide the passenger up onto the boat.

(2) Posting cautions for diving boats

Diving-related marine pleasure providers should post the cautions per (1) above at noticeable places from a skipper and should provide means for communicating with the instructors, to ensure the implementation of the cautions

(3) Report of underwater current information from instructor to skipper at start of diving

With a view to assuring that a diving boat can stand by at an apposite water area upward, the instructor should check the underwater tidal current and inform it to the skipper.

(4) Consideration of diving boat and instructor equipment

i) Diving-related marine pleasure providers should consider installing a propeller guard in their diving boats for the purpose of preventing accidents at the time of drawing up diving passengers from waters.

ii) Diving-related marine pleasure providers should consider prearranging the instructors to carry a radar wave reactive float or so which can facilitate detecting diving passengers on sea surface.

33) Marine accident related to collision of oil tanker PACIFIC POLARIS against berth

(Published on December 21, 2012)

It is probable that this accident occurred as follows: When the oil tanker PACIFIC POLARIS was in the process of her port being moored alongside the No.1 Berth in Kin-Nakagusuku Port, her stern approached the No.1 Berth at a landing speed of 15 to 18 cm/s, with her stem away at about 7 to 8° from the Berth, because the berth master who was engaged in a quasi-pilot work had no idea of the approaching condition of the PACIFIC POLARIS stern toward the Berth, and the port stern collided against the H-steel beam of the dolphin of the

Berth.

Practicing the following, therefore, may be useful for the prevention of the recurrence of similar accidents:

1) The berth master will dutifully make sure of the operating condition of the engine and tag boat and of the approaching condition of the ship close to a pier, and to abide by the requirements for laying the ship alongside the pier.

2) The master will reasonably watch the steering operation by the berth master and will question the berth master if find the berth master's operation questionable.

For the purpose of preventing approaching ships for mooring from being damaged, it is desirable that the owner of the Berth will either modify the Berth to have no steel structural projection or attach suitable fender to the projection.

11. Actions taken in response to recommendations in 2012

Actions taken in response to recommendations were reported with regard to three marine accidents in 2012. Summaries of these reports are as follows.

1) Marine accident related to injury of passengers of passenger ship AN-EI GO No.98 (Recommended on March 25, 2011)

Concerning the passenger injury accident of Passenger Ship AN-EI GO No.98 occurred off the northeast of Iriomote Island at Taketomi-cho, Okinawa Prefecture, on April 30, 2009, the Japan Transport Safety Board published a report on the investigation results of the accident and concurrently gave recommendations to Anei Kanko Co., Ltd. who was responsible for the cause of the accident, on March 25, 2011, and received a report on April 23, 2012 on the completion of the implementation of recommendation-based measures as follows.

● Outline of the Accident

At about 09:40 hrs, Thursday, April 30, 2009, while the ship, boarded by a master with an ordinary seaman and 28 passengers, was underway from Iriomote Shima (Iriomote Island), Taketomi Town, to Ishigaki Shima (Ishigaki Island), Ishigaki City, Okinawa Prefecture, two passengers suffered injuries when the ship pitched (moved up and down).

● Description of Recommendations

1. Safety education on the 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 ship in service, to develop a safety manual

for navigation on rough seas, provide education its crew about the manual, and ensure their compliance with it.

● Outline of Completion Report

1 Safety education relating to safety management regulations

・ We implemented safety education for safe navigation (including safety education in other fields).

・ Conducted information obtainment by means of questionnaire at short courses of lectures, for the purpose of sounding out the crewmen's understanding of the Safety Management Regulations. For crewmen whose understanding of the Regulations was found insufficient, we conducted course education again.

2 Preparation and observance of instruction manual for safe navigation on heavy sea, suited for actual situations for specific navigating passenger ships

・ We prepared “Instruction manual for safe navigation on heavy sea” which contains "Safety measures for passengers on heavy sea" and "Cautions for safe navigation on heavy sea" described in the navigation criteria charts for the specific navigation courses, in the form of attachment to the existing safety measures, and we gave education to the crewmen accordingly.

・ We made a survey about what the crewmen take care when weather is stormy at sea and informed the survey results to all of the crewmen.

2) Marine accident related to capsizing of cutter (unnamed)

(Recommended on January 27, 2012)

Concerning the investigation of the capsizing accident of the cutter (unnamed) occurred on June 18, 2010 in the north of Lake Hamana in Hamamatsu City, Shizuoka Prefecture, the Japan Transport Safety Board published its accident investigation report, placed recommendations with the accident-responsible party Shogakukan-Shueisha Productions Co. Ltd. and with the Shizuoka Prefectural Board of Education on January 27, 2012, and received reports from them on the measures taken (or planned measures) based on the recommendations on July 11, 2012 as follows.

● Outline of Accident

The cutter (unnamed), with 18 students and 2 teachers aboard it for rowing training as part of the outdoor class activities of the junior high school at Mikkabi Youth Center, was engaged in rowing for the training but, as the wind and waves became so high as disenabling the rowing, came to be tugged by a motor boat MikkabiYouthCenter of the Center. At around 15:25, June 18 (Friday) 2010, when moving southwestward off the south of Sakume at Lake Hamana, the cutter capsized portside.

One of students confined within the capsized cutter died. One of oars was broken, but the cutter body remained intact.

● Description of Recommendations

1. Shogakukan-Shueisha Productions Co. Ltd.

1) The criteria for cutter training suspension and the cutter training methods used at the Youth Center should be reviewed to ensure their adaptability based on the experience of

the trainees, and the following provisions should be included in the instruction manual:

a. The criteria for suspending training when weather advisories are broadcast.

b. The criteria for suspending training under bad weather other than when weather warnings or advisories are broadcast.

c. Training methods under bad weather.

d. The time for deciding the permission or no of training and the time (including a time during training) for deciding a training method.

e. Treatment of training if suspended on its way.

f. Provisions for safety in training (including the arrangement and duty of a guard boat, constant contact with weather information, and preparations for the tow of cutter).

2) A rescue system, supposing cutter accidents and including procedures for tugging and rescuing a cutter, should be established, and the Youth Center personnel should be periodically trained. Effort should be made to strengthen cooperation with rescuing agencies.

3) Effort should also be made to improve the knowledge of the Youth Center personnel with respect to cutter and weather, and to inspire their consciousness of securing training safety.

2. Shizuoka Prefectural Board of Education

The Board should review the criteria for training suspension, the training methods, and the emergency management manual of the Youth Center, should give them necessary corrections, if found any, and should have tow training practiced.

● Outline of Implementation Plans

1. Shogakukan-Shueisha Productions Co. Ltd.

1) Implementation plan based on recommendations 1)

[Arrangement Policy]

(1) We will establish criteria for determining permissible safe and sound activities free of accidents in the course of "marine activity programs" at Mikkabi Youth Center.

(2) We will establish criteria for determining training suspension, not based on only the experience and preconceptions of the personnel at the Youth Center but using actual specific weather and other information and data, by which determinations by all concerned parties would lead to an identical or similar conclusion.

(3) We will prepare and maintain a manual according to which prompt and appropriate actions can be taken in an emergency.

[Specific Safety Measures]

(1) We will identify specific criteria for determining implementation or implementation suspension.

(2) We will prepare training plans for sudden weather change.

(3) We will define time limits for deciding training implementation or suspension and for deciding training method.

(4) We will specify treatment to be taken in the event of a training suspension during its implementation.

(5) We will establish safety measures in training.

(6) We will expressly include in our manual actions to be taken when a cutter is towed.

(7) We will specify in our manual requirements for boarding a cutter.

2) Implementation plan based on recommendations 2)

[Basic Concept]

(1) We will implement rescue and tow trainings under conditions simulated to conceivable conditions of accidents, and will keep record of noticed problems at the Center for common information sharing.

(2) We will make effort to develop better cooperation with local concerned parties (police, fire department, and private organizations) and will have joint trainings with them as far as practicable.

(3) In addition to joint training, we will make out our own annual training plan and will realize it without fail.

[Consideration of Specific Measures]

(1) Concerning rescue

Improvement in knowledge of rescuing methods and in skills and knowledge of towing

(2) Concerning systems for emergencies

Consideration of rescuing methods and countermeasures for supposed emergencies including capsizing, periodic practice of rescue and tow trainings in emergencies, establishment of an organizational system and a chain-of-command structure in an emergency, strengthening of tie-up with external concerned parties for rescuing, and preparation of passenger list necessary for checking personal safety.

3) Implementation plan based on recommendations 3)

[Basic Concept]

(1) We will prepare a system to set up minimum necessary training time and acquisition levels and to allow only those Center people who attained the set levels to participate in our programs.

(2) Our Center people will be not only trained and educated at the Center but will also be encouraged to positively attend education and training programs offered by outside organizations, and the information of such activities will be made available within the Center.

[Consideration of Specific Measures]

(1) For enriching cutter-related knowledge

Invitation of outside consultants, attendance at outside training, training at the Center, and information exchange with outside facilities

(2) For improving knowledge of weather

Attendance at weather forecaster qualifying lecture courses, selection of staff members specialized in weather, routine collection of daily weather data, and collection of areal data from marinas.

(3) For inspiring consciousness of safety in training

Submittal of annual safety management plan, implementation of training for supposed accidents, collection of actually occurred examples of terrifying but narrowly escaped incidents, improvement of manual, selection of safety management specialists, and attendance at safety-related training.

2. Shizuoka Prefectural Board of Education

・To designated managers, the Board will give directions, advices and guidance, with the

main points of safety requirements provided by Shizuoka Prefectural Board of Education shown to them, based on comments at manual review meetings to be newly held by the prefectural safety measure committee and outside knowledgeable people, and will require the managers to prepare cutter training manual accordingly.

・For cutter tow training, the Board will require designated managers to establish implementing procedures, taking into consideration actual towing methods being used at similar training facilities and based on comments of experts, and to also establish training procedures in which implementing methods and system capabilities are incorporated, with comments at manual review meetings taken into account, and to reflect them on their manuals. The Board will also require them to prepare an annual tow training implementation plan, to review its appropriateness, and to develop and maintain a system capable of appropriately carrying out tow training.

・A system will be developed to periodically check to see, and to correct where necessary, if manuals and tow training implementation methods and plans are appropriately practicable.

3) Marine accident related to death of stevedores working for cargo ship SINGAPORE GRACE (Recommended on April 27, 2012)

Concerning the marine accident related to the death of the cargo ship SINGAPORE GRACE stevedores which occurred on June 13, 2009 at Saganoseki Port, Oita City, Oita Prefecture, the Japan Transport Safety Board investigated the accident, published on April 27, 2012 its investigation report and concurrently gave recommendations to the concerned responsible parties, Saganoseki Smelter and Refinery of Pan Pacific Copper Co., Ltd. and Nissho Koun Co., Ltd., and received a report on September 26, 2012 about the completion of recommendations-based measures taken as follows.

● Outline of the Accident

At about 08:30 on 13th June 2009 when the cargo ship was berthing at the wharf of Saganoseki Port for discharging cargo work of copper sulfide concentrate, one of the stevedores collapsed on his way of going down on the ladder into the No.3 cargo hold for cargo work, and two of the three stevedores who came to rescue the collapsed also collapsed in the hold.

The three collapsed stevedores were carried out of the hold but were found dead later.

●Description of Recommendations

1. Saganoseki Smelter and Refinery of Pan Pacific Copper Co., Ltd.

(1) To train all employees who have the possibility of being engaged in cargo work to understand the properties and risks of copper sulfide concentrate.

(2) To train all employees, who have the possibility of being engaged in cargo work, with the handling of O_2 meters in order to measure O_2 concentrations as necessary

(3) To request the MSDS of floatation reagents from shippers.

(4) To inform employees who have the possibility of being engaged in cargo operation on the following:

[1] Depending upon the properties of the floatation reagent adhered to copper sulfide

concentrate, it may generate toxic gas.

[2] Since the generated toxic gas is heavier than air, it stagnates in cargo hold; hence, there is a danger of not being replaced by air.

(5) To make the risks of oxygen-deficient conditions and anoxia known to all personnel who have the possibility of being engaged in cargo operation and to familiarize them with appropriate coping behavior in case of fatal accidents occurring in cargo holds loading copper sulfide concentrate.

2. Nissho Koun Co., Ltd.

(1) To train all employees who have the possibility of being engaged in cargo operation to understand the properties and risks of copper sulfide concentrate

(2) To train all employees, who have the possibility of being engaged in cargo work, with the handling of O_2 meters in order to measure O_2 concentrations as necessary

(3) To make the risks of oxygen-deficient conditions and anoxia known to all employees who have the possibility of being engaged in cargo operation and to familiarize them with appropriate coping behavior in case of fatal accidents occurring in cargo holds loading copper sulfide concentrate

● Outline of Completion Report

1 Saganoseki Smelter and Refinery of Pan Pacific Copper Co., Ltd.

[Implementation Plan Based on Recommendations 1)]

To the concerned people, including our production control section members in the main, we will conduct education in June (in the preparation period for the nationwide Safety Week) every year.

The points of the education will be as follows.

1) Copper concentrate is fine powder, has large surface area, and is therefore easily reactive with oxygen in the air in the cargo hold, to subsequently generate heat by oxidation. (Copper concentrates consumes oxygen.)

2) As copper concentrate is transported in a carrier from Chile (for about 35 days) , Indonesia (for about 14 days) or others, the oxygen concentration within the hold is often reduced to 18% or below (to a state of oxygen depletion).

3) Oxidative heat generation is often noticeable particularly when much dew is formed as the hatch is kept open. When such is a case, the oxygen concentration in the hold could be extremely low and should be taken care of.

[Implementation Results Based on Recommendations 1)]

For the concerned people (16 persons) including our production control section members in the main, we conducted education on June 18 with emphasis placed on the three points specified in our Implementation Plan.

We will continue our education in June (in the preparation period for the nationwide Safety Week) every year.

[Implementation Plan Based on Recommendations 2)]

For the purpose of achieving and maintain a level of the accurate usage of oxygen concentration meters, we will make our concerned people including the production control section members in the main join the education class to be opened in June (in the preparation period for the nationwide Safety Week) among the series of the classes

planned to be held 6 times a year by Nissho Koun Co., Ltd. for the handling of oxygen concentration meters.

[Implementation Results Based on Recommendations 2)]

Our concerned people (16 persons) including the production control section members in the main joined the education class held on June 20 by Nissho Koun Co., Ltd. for the education of the accurate handling of oxygen concentration meters and learned the accurate usage of the meters.

We will continue this education in June (in the preparation period for the nationwide Safety Week) every year to maintain a level assuring accurate usage.

[Implementation Plan Based on Recommendations 3)]

For copper concentrates we shall procure in and after June 2012 through our Raw Material Procurement Department, we will require the copper concentrate mines to furnish us with MSDS of the flotation reagents used for them.

Based on furnished MSDS, we will implement the education of the concerned people including our production control section members in the main in association with the implementation plan based on the Recommendations 1).

In addition, we will supply obtained MSDS to Nissho Koun Co., Ltd. and will direct MSDS-related education of all employees of Nissho Koun Co., Ltd. who will be engaged in cargo handling work.

[Implementation Results Based on Recommendations 3)]

On May 17, through our Raw Material Procurement Department, we requested copper concentrate mines to supply us MSDS of the flotation reagents. On August 28, regarding the MSDS of the 4 flotation reagents we could obtain, we carried out education of the concerned people (16 persons) including our production control section members in the main.

For other MSDS we may obtain in future, we will carry out similar education accordingly.

Meanwhile, we supplied our obtained MSDS to Nissho Koun Co., Ltd., which subsequently conducted education of all its employees who are likely to be engaged in the cargo handling during the period between 29th and 31st August. We will continue this MSDS education of obtained flotation reagents. Periodically, in particular, we will carry out it in June (in the preparation period for the nationwide Safety Week) every year.

[Implementation Plan Based on Recommendations 4)]

In June (in the preparation period for the nationwide Safety Week) every year, in association with our Implementation Plan based on the Recommendations 1), we will educate the concerned people including our production control section members in the main to make them understand that some of the flotation reagents used in the process of copper ore concentration can produce poisonous gases heavier than air and that such poisonous heavy gases can pose danger by staying in the cargo hold without being re-replaced with air.

[Implementation Results Based on Recommendations 4)]

We implemented education along with the implementation based on the Recommendations 1). In June (in the preparation period for the nationwide Safety Week) every year, we will conduct the education.

[Implementation Plan Based on Recommendations 5)]

To the concerned people including our production control section members in the main, we will give education as follows.

1) Implementation of education about the danger of oxygen-deficient conditions and anoxia in association with our implementation plan based on the Recommendations 1).

The points of the education will be as follows:

・The mechanism and cause of the onset of anoxia
・Symptoms of anoxia
・Properties and danger of copper concentrate
・Places where anoxia can occur and cautions

2) We will regularly join the training programs planned to be effectuated in March every year by Nissho Koun Co., Ltd. for the instruction, guidance, and mastering the treatment and rescuing in the supposed events of personal accidents in a cargo hold storing copper sulfide concentrates, and will learn appropriate treatment knowledge and skills.

[Implementation Results Based on Recommendations 5)]

For the concerned people (16 persons) including the production control section members in the main:

1) We made the danger of oxygen-deficient conditions and anoxia thoroughly known to them at the education implemented on June 18.

We will continue this education in June (in the preparation period for the nationwide Safety Week) every year.

2) We arranged and had their participation in the rescue training held by Nissho Koun Co., Ltd. on June 13.

We will continue to make them join the rescue training programs for the supposed events of personal accidents in a cargo hold planned to be effectuated in March every year by Nissho Koun Co., Ltd. and acquire necessary knowledge and skills of treatment. This year, they joined the rescue training conducted on March 3 by Nissho Koun Co., Ltd.

2. Nissho Koun Co., Ltd.

1) Concerning the properties and danger of copper sulfide concentrates, we gave education to 55 workers of the Cargo Handling Section on June 13, 2012 and to 54 workers of the same on 29th to 31st August 2012 with emphasis on the following points. We will continue similar education regularly.

[Points of Education]

(1) Copper ore is finely powdery, has therefore a large surface area, and is liable to react with oxygen in air in cargo holds to subsequently generate heat.

(2) When copper ore is transported from abroad in a cargo hold, the oxygen concentration in the cargo hold is often reduced to below 18%, i.e., to a state of oxygen insufficiency.

(3) It is known that when the hatch of a hold is kept open and much dew is formed, oxidative heat generation is active, denoting that the oxygen concentration in the hold may be extremely low.

(4) A flotation reagent contained in copper ores contains toxic gases heavier than air and can cause oxygen depletion.

(5) MSDS of flotation reagents contained in copper sulfide concentrates

2) In regard to the handling of oxygen concentration meters, we gave education to 55 workers of the Cargo Handling Section on June 20, 2012 and to 54 workers of the same on August 10, 2012 with emphasis on the following points. We will continue similar education regularly.

[Points of Education]

(1) Types of the meters
(2) Usage
(3) Meter maintenance procedure
(4) Locations to be measured at
(5) Recording procedure
(6) Protectors to be worn
(7) Evacuation in the event of danger

3) In regard to the danger of oxygen-deficient conditions and anoxia, we gave education to 55 workers of the Cargo Handling Section on condition that they should receive the education once on the three days from 27th till 29th of August 2012, with emphasis placed on the following points. We will continue similar education regularly.

[Points of Education]

(1) Mechanism and cause of occurrence
(2) Symptoms of anoxia
(3) Properties and danger of copper ore
(4) Places wherein the danger is liable to occur and cautions

4) On June 13, 2012, we conducted emergency training exercises and gave education and training to 47 workers of the Cargo Handling Section for the treatment of personal accidents in cargo holds containing copper sulfide concentrates, with emphasis placed on the following points. We will continue similar education regularly.

[Points of Education]

(1) Criteria for determining whether an oxygen deficiency accident or other accident
(2) Reporting on finding an accident victim
(3) Prevention of secondary accident
(4) Preparations for rescue
(5) Measurement of oxygen concentration
(6) Air supply to victims
(7) Situation comprehension and criteria for determining permissibility for entering the cargo hold to rescue victims
(8) Cooperation with rescue team

12. Actions taken in response to safety recommendations in 2012

Actions taken in response to the safety recommendations were reported with regard to one marine accident in 2012. A summary of it is as follows.

1) Marine accident related to collision between cargo ship MARINE STAR and container ship TAKASAGO

(Recommended on October 28, 2011)

The Japan Transport Safety Board investigated the collision accident which occurred on February 20, 2009 in the Bisan Seto East Traffic Route between the cargo ship MARINE STAR and the container ship TAKASAGO, issued an investigation report publicly and also safety recommendations to Blue Marine Management Corp. which is the management company of MARINE STAR on October 28, 2011, and received a responding report on the actions taken in reply to the safety recommendations on January 25, 2012 as follows.

● Summary of the Accident

The collision occurred at around 06:15 on February 20, 2009 between the cargo ship MARINE STAR which, with the master and 16 crew members abroad, was sailing northward off the north of Sakaide Port, and the container ship TAKASAGO which, with the master and 4 crewmen aboard, was moving eastward along the Bisan Seto East Traffic Route.

MARINE STAR suffered depressions in her stern port outer plating and TAKASAGO also suffered depressions in her bow, but the crew of both of the ships remained intact.

● Description of the Recommendations

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.

● Actions Taken in Response to the Safety Recommendations

1) BMMC disseminated “Instruction to Master” to all managed ships regarding this incident for crew further awareness of the accident stating its root cause and countermeasures to avoid recurrence.
2) BMMC provide onboard training for bridge personnel to ensure crew are competent to implement navigational procedures correctly and safety.
3) BMMC launched a year round “Campaign against Collision and Stranding "since the incident and constantly remind all vessels in the fleet especially passing narrow channels at Japanese ports, likewise to ensure the crew awareness of safe navigation.

4) BMMC monitor and ensure that the procedures of the safety management system has been followed and carrying out evaluation of the safety performance through reporting systems, by constant visiting of ships by Superintendent to check the safety operation of the vessel.

BMMC highly appreciate your authority for carrying out investigation with this accident and ensure to continue and keep monitor its managed ships to further enhance safety navigation and avoid recurrence of the incident.

★ The report (original) from BLUE MARINE MANAGEMENT CORP. is shown on the home page of the Board.
http://www.mlit.go.jp/jtsb/eng-mar_report/BMMC_20120125_Action.pdf

13. Information dissemination in the process of investigations

The JTSB disseminated information on the following four marine incidents in 2012. The information is summarized below.

1) Marine accident related to capsizing of fishing vessel KASUGA MARU

(Disseminated on April 5, 2012)

In regard to the capsizing accident of the fishing vessel KASUGA MARU that occurred on March 23, 2012, the Japan Transport Safety Board supplied information to the Ministry of Land, Infrastructure, Transport and Tourism and the Fisheries Agency as follows.

(Fact Information)

The facts found to date are as follows.

At the time of this accident, the engine room door on the portside upper deck, the crew space door at the stern, and the boatswain's store door at the bow of this vessel were open, and the seawater that came over to the upper deck flowed through the doors into the engine room, the crew space, and so forth.

2) Marine accident related to the death of personal watercraft LIB passenger

(Disseminated on June 27, 2012)

In regard to the fatality accident of the personal watercraft LIB pillion passenger that occurred on July 31, 2011 and the injury accident of the personal watercraft FAIRLADY pillion passenger that occurred on July 23, 2011, the Japan Transport Safety Board supplied information to the Ministry of Land, Infrastructure, Transport and Tourism as follows.

(Fact Information)

The facts found to date are as follows.

1) Process to death/injury

It is likely that the pillion passenger of the personal watercraft fell into the sea as the rider was starting or accelerating the watercraft, that sea water entered the body cavities of the passenger owing to the impacts of the fall and of the jet streams from the waterjet propulsion system, and that the entered water gave damage to the internal organs to death

of the passenger.

2) Warnings given in manual

The manual of the personal watercraft LIB contains the written warnings for possible danger of death or serious harm as stated below.

(1) The rider or passenger is required to wear body protective clothes.

(2) If you should fell into sea and exposed to strong water pressure on account of the impact of the fall or near the jet nozzle, there is a possibility of water inflow into your body cavities and subsequent damage to you. Ordinary bathing or swimming suit cannot fully protect your body. Always wear a wet suit and pants capable of protecting your body.

(3) Whenever somebody is behind the watercraft, do not open the throttle, but stop the engine or keep it idling. If the throttle should be opened, water and inclusions in it ejected from the jet nozzle may injure the person.

3) Marine accident related to the explosion of motorboat KEN-YU

(Disseminated on August 29, 2012)

In regard to the explosion accident of the motorboat KEN-YU that occurred on May 2, 2011, the Japan Transport Safety Board supplied information to the Ministry of Land, Infrastructure, Transport and Tourism and the Nuclear and Industrial Safety Agency of the Ministry of Economy, Trade and Industry as follows.

(Fact Information)

The facts found by our investigations so far are as follows, although our investigations in future will disclose more facts.

It is probable that this accident occurred as follows: When the motorboat was moored at a basin downstream of the river Ohmutagawa, the skipper cleaned the upper part of the main engine in the engine casing, by using and exhaustively consuming the contents of a cleaning agent spray can, and then soon closed the engine casing cover and started the main engine. Thereupon, the mixture of the flammable gases, consisting of gasified cleaning agent and LPG for jet propulsion and staying in the engine casing, caught electric sparks from the starter motor and exploded.

4) Marine Accident Related to Collision of Anchor-Dragging Foreign-Flag Ships by Typhoon

(Disseminated on September 6, 2012)

In view of the three collision accidents related to large foreign-flag ship anchor-draggings that were caused to occur serially in Tokyo Bay during at night of June 19, 2012 till dawn by violent wind and waves under the influence of the Typhoon No.4, the Yokohama Office of the Secretariat of the Japan Transport Safety Board supplied the following information to the Kanto District Transport Bureau, the Chubu District Transport Bureau, the 3rd Regional Coast Guard Headquarters of the Japan Coast Guard, the Ship's Agency Association of Kanagwa Prefecture, the Tokyo Bay Licensed PILOTS' Association, and the Yokohama Office of the Japan Foreign Steamship Association.

(Requisites for Recurrence Prevention)

- Obtain latest weather and sea condition information, and select a place for anchoring taking into consideration the direction of wind, the depth of water, bottom sediment, possible height of waves, and lee side distance.
- Previously calculate the anchor's maximum holding power of the ship and the maximum tolerable wind velocity, and previously determine countermeasures for possible wind at the maximum velocity.
- Keep the draught deeper, and keep the ship from swinging to and fro preferably by holding a trim by bow. On the other hand, support the holding power of anchor by fully extending its chain, and select an anchoring method best suited for the situation.
- Keep the main engine stand-by, ready for anchor relocation.
- Practice ship location check and lookout such that the drag anchor of own or other ship can be found early.
- Constantly listen to VHF to collect information.
- If the ship is found dragging its anchor, immediately take an anchor shifting or other appropriate action.
- If other ship is found dragging anchor, give a call to the ship by VHF with an advice for shifting the anchor or so.

Column

Motorboat Explosion Accident

This accident arose from the start of the engine of a motorboat to leave a basin in Ohmuta City, Fukuoka Prefecture, went through an explosion in the engine casing and the blow-off of the casing cover, and resulted in the injury of two passengers and the fracture of the boat body.

Prior to the explosion, the skipper of the motorboat had cleaned the smeared upper part of the engines using up a spray can (containing 840 ml) of cleaning agent. The skipper knew that the spray cleaning agent contained propane gas as an propulsion agent, that propane gas was heavier than air and was explosive, and that propane gas must not be used where there is fire nearby, but, seeing that the moment cleaning agent solution was shot upon and wetted the engine's upper part, the liquid cleaning agent evaporated from there in the form of flammable gas, thought that the propane gas was also diffusing together with the cleaning agent gas.

It is probable that although both the cleaning agent, when turned to flammable gas, and the propane gas, were heavier than air, they did not descend to the bottom of the engine casing but were taken and suspended in the air in the engine casing, caught electric sparks from the cell motor and exploded.

The spray cleaning agent bore a written warning statement, meaning "Do not use this agent near fire or flame. Do not use this agent in large volume in a room where fire is used.", according to the enforcement ordinance notification of the High Pressure Gas Safety Act, but had no statement giving caution for its use in a narrow closed space where there is a danger of explosion.

For the purpose of drawing more careful attention of small boat operators to the safety indication of spray-type cleaning agents in view of the recurrence probability of this kind of accidents, the Board supplied information to the Ministry of Economy, Trade and Industry and the Ministry of Land, Infrastructure, Transport and Tourism. On receipt of the information, some of the District Transport Bureaus prepared recurrence preventive leaflets and distributed them to small boat drivers.

At the request of the Board, the spray cleaning agent sales company A took a prompt action of adding to the said statement a paragraph of caution for use, saying "Do not use this cleaning agent in a narrow closed space, because flammable gases will stay in such a space." A newspaper publishing company in Fukuoka Prefecture reported this topic on its newspaper to help make the recurrence preventive knowledge widely known.

Nevertheless, afterward, a fishing boat incurred a similar accident in Kagoshima Prefecture again. Considering that all the spray cleaning agent sales companies have not prepared such cautions for use as Company A provides, and that all the boat operators are not informed of the danger of explosion of spray-type cleaning agents when used in a narrow closed space, we deem it necessary, for the recurrence prevention of similar accidents, to make the cautions for use of the spray-type cleaning agents more thoroughly known.

14. Summaries of major marine accident investigation reports

A cutter capsized when being towed homeward in bad weather by a motorboat

Capsizing of a Cutter (unnamed)

Summary: On June 18, 2010, 18 students and 2 teachers were in the training of cutter rowing on a cutter (Boat A) of Prefectural Youth Center as an outdoor activity lesson of the junior high school. The wind and waves became so heavy that the crew then found it difficult to continue the rowing. At around 15:25 when running southwestward off the south of Sakume in Lake Hamana, while being towed by a motorboat (Boat B) of the Youth Center, Boat A capsized.

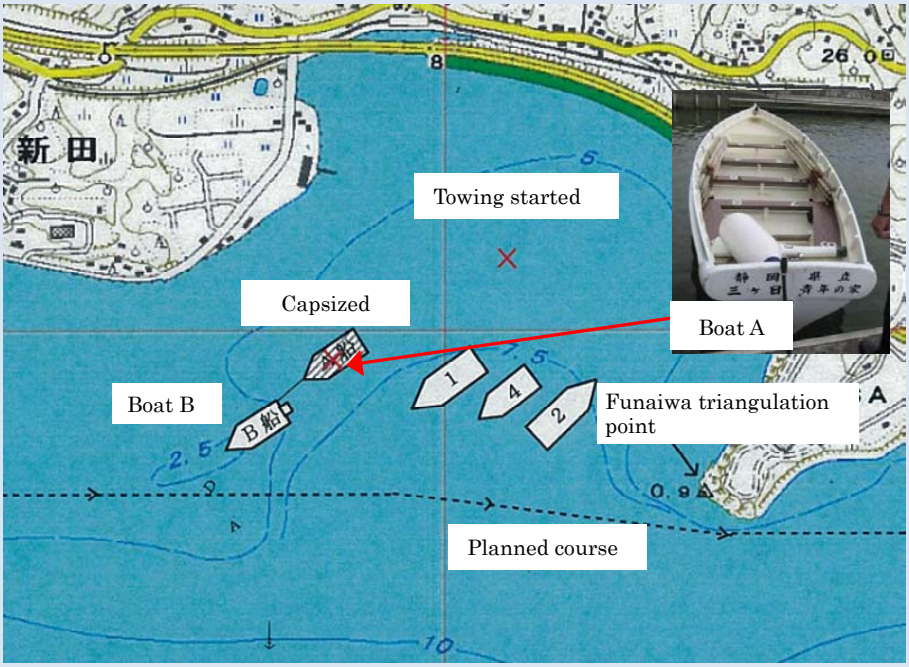
One of the students confined in the overturned boat died.

[Approx. 25 minutes before the capsizing]
The wind direction changed southward, waves became higher, and one of the students got seasick: the rowing became difficult.

[Approx. 20 minutes before the capsizing]
The teacher asked rescue to Youth Center by radio.

[Approx. 10 minutes before the capsizing]
Boat B met Boat A, tied their mooring ropes together, and decided to tow Boat A at a distance of 20 m.

[Approx. 5 to 2 minutes before the capsizing]
Boat B started towing Boat A, which was listing to port, and the bow violently repeated ups and downs and allowed continuous inflow of lake water from over the port bow. The accumulated water on the portside bottom gradually increased the port list.



[Capsized at 15:25]
The portside edge of Boat A subsided to allow massive inflow of lake water into her, Boat A overturned portside, two of the students and one of the teachers were thrown out, and the other 16 students and one teacher were confined inside the boat of which 12 students and one teacher found their way out of the boat by their own effort. Rescue was made to them later by an informed water rescue team, but one student confined in the boat died.

Probable causes: The probable causes of this accident are as follows. Under rainy weather of which heavy rain, thunder, gale, high-wave and flood advisories had been forecast, Boat A was used for an outdoor exercise for the junior high school at the Youth Center and was engaged in a cutter rowing training without a trainer along an east course, which is a usual way of the training, off the north shore of Lake Hamana. The gale and wind grew stronger to render the rowing difficult, and the director of the Youth Center went for rescuing on Boat B, and towed Boat A obliquely to port with continuous inflow of lake water thereinto from the port bow. When being towed in those states southwestward off the south of Sakume, the Boat A's port list developed under increasing flowed-in water accumulation on her bottom and caused the portside oars to catch water and to turn her bow to port. Sometime later, the students sitting on the starboard side lost balance and were shifted toward portside, to further increase the port list. Consequently, the port side submerged, lake water flooded into the boat, and the boat overturned portside.

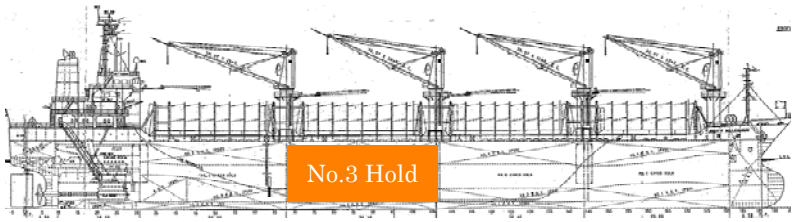
For details, please refer to the investigation report. (Published in Japanese on Jan. 27, 2012)
http://www.mlit.go.jp/jtsb/ship/rep-acci/2012/MA2012-1-8_2010tk0012.pdf

3 workers, when handling copper sulfide concentrate, inhaled oxygen-deficient air and died.

Fatality of Stevedores Working on Cargo Ship SINGAPORE GRACE

Summary: This cargo ship was moored for discharging copper sulfide concentrate alongside the quay in Saganoseki Port. At around 08:30 on June 13, 2009, one of the stevedore workers was stepping down the ladder in the No.3 Hold to work, and fell down on it. Two of three workers who went to rescue him also fell down in the Hold.

The three fallen workers were taken out of the Hold but eventually confirmed dead.



During the voyage, the copper sulfide concentrates in the closed NO.3 Hold had oxidized, consuming the inside oxygen, to turn the atmosphere*1 in the Hold oxygen-deficient. The flotation reagent adsorbing onto the copper concentrates had produced toxic odorous gases which, heavier than air, had stayed there.

*1: "Atmosphere" means a state of a mixture of certain gases.

Passage into the Hold

[Primary Accident]
When the ship was moored in Saganoseki Port, worker A entered the No.3 Hold, moved to its bottom, and died from oxygen deficiency.

[Probable causes of Primary Accident (Abstract)]
Worker A entered the No.3 Hold in which the atmosphere had been oxygen-deficient, probably because a sign permitting entry had been posted at the entrance to the Hold and because another worker had been driving a heavy vehicle in the No.1 Hold

[Secondary Accident]
In order to rescue Worker A, 3 workers entered No.3 Hold, and Worker B died from oxygen deficiency (while the other two workers felt suffocating and returned to the deck).

[Probable causes of Secondary Accident (Abstract)]
It is somewhat likely that Worker B could not become aware of oxygen deficiency in the atmosphere of No.3 Hold because he was so absorbed in a sense of responsibility for rescuing Worker A and that he was upset. The cause of this accident may also partly lie in the facts that there were some workers who thought that oxygen deficiency in a cargo hold would be prevented by natural ventilation in the course of time if the hatch was kept open, and that no measurement of oxygen concentration in oxygen-deficient atmosphere had been made nor a fatal accident due to oxygen depletion had occurred since the last accident that had took place in a cargo hold 4 years before.

[Tertiary Accident]
Two workers wearing a gas mask entered No.3 Hold again, and one of them, Worker C, died from oxygen deficiency (while the other of them returned up to near the hatch and was saved by crewmen of this ship.

[Probable causes of Tertiary Accident (Abstract)]
It is somewhat likely that Worker C entered No.3 Hold wearing a gas mask because he thought a gas mask could be effective for oxygen deficiency, that he, too, was so absorbed in a sense of responsibility that he was upset, and that the aftereffect of the oxygen depletion he had suffered when he had entered the Hold after the occurrence of the primary accident disabled him to make an appropriate decision.

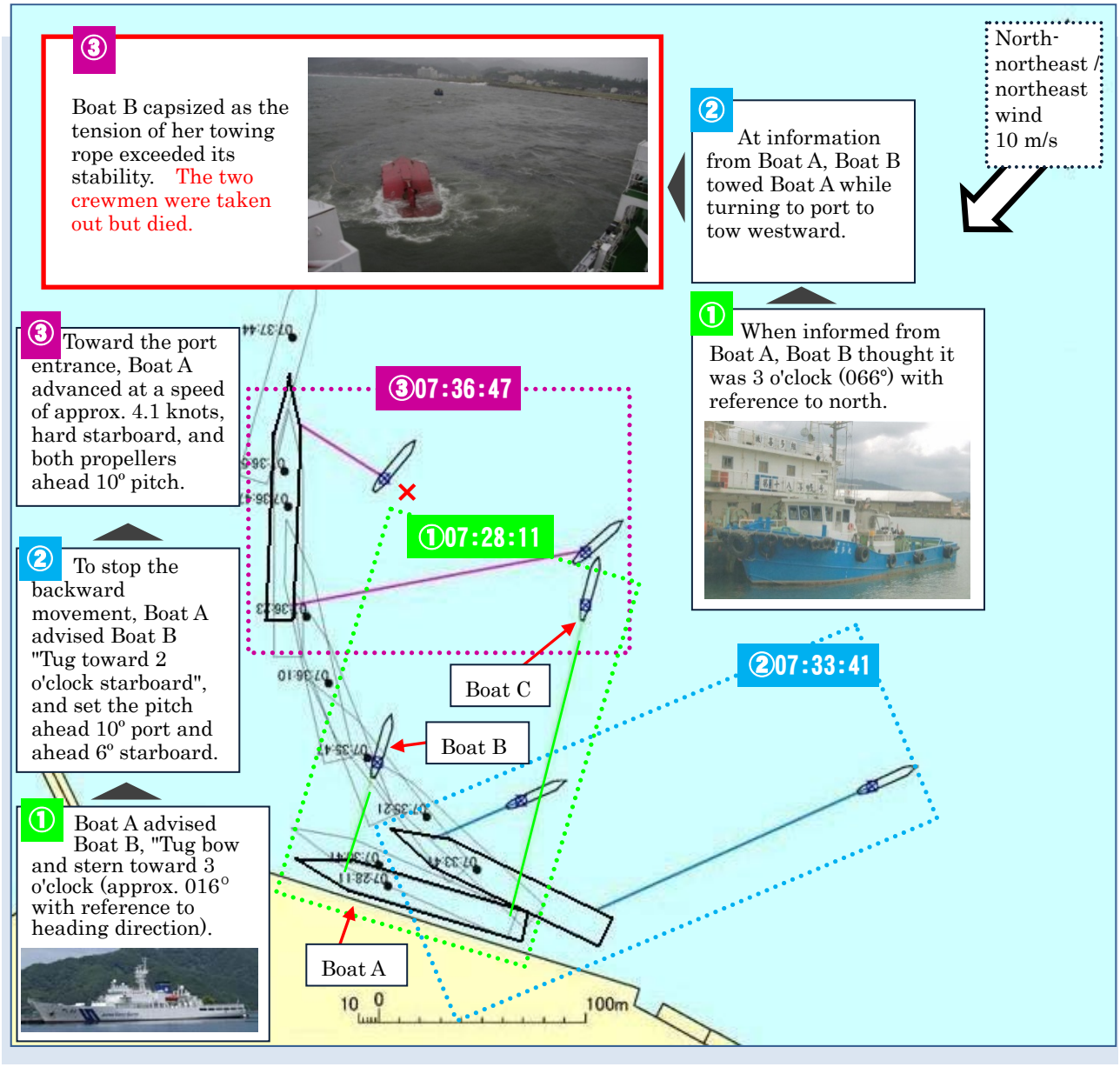
For details, please refer to the investigation report. (Published on Apr. 27, 2012)
http://www.mlit.go.jp/jtsb/eng-mar_report/2012/2009tk0008e.pdf

A tugboat capsized when towing a departing vessel, losing 2 lives.

Capsizing of Tugboat KITA MARU No. 12

Summary: When towing the patrol boat MIURA (Boat A) to assist her departure, together with the tugboat KITA MARU No.8 (Boat C), the tugboat KITA MARU No.12 (Boat B) with a skipper and a crewman aboard it capsized at around 07:36:47-54 on Sept. 19, 2011.

All the crew (2 crewmen) of Boat B were taken out of the water but died. On a later day, the boat was salvaged but was declared a total loss.



Probable causes: It is probable that when Boat B, along with Boat C, was towing Boat A to assist the departure of Boat A from Wajima Port, with the towing rope tied at the bow of Boat A, under north-northeast to northeast wind velocity of approx. 10 m/s and wave-height of approx. 3 m, Boat B capsized because the tension of her towing rope exceeded her stability.

For details, please refer to the investigation report. (Published in Japanese on Nov. 30, 2012)
http://www.mlit.go.jp/jtsb/ship/rep-acci/2012/MA2012-11-1_2011tk0034.pdf

A tanker listed, capsized and sank as seawater flowed in through air pipe of ballast tank

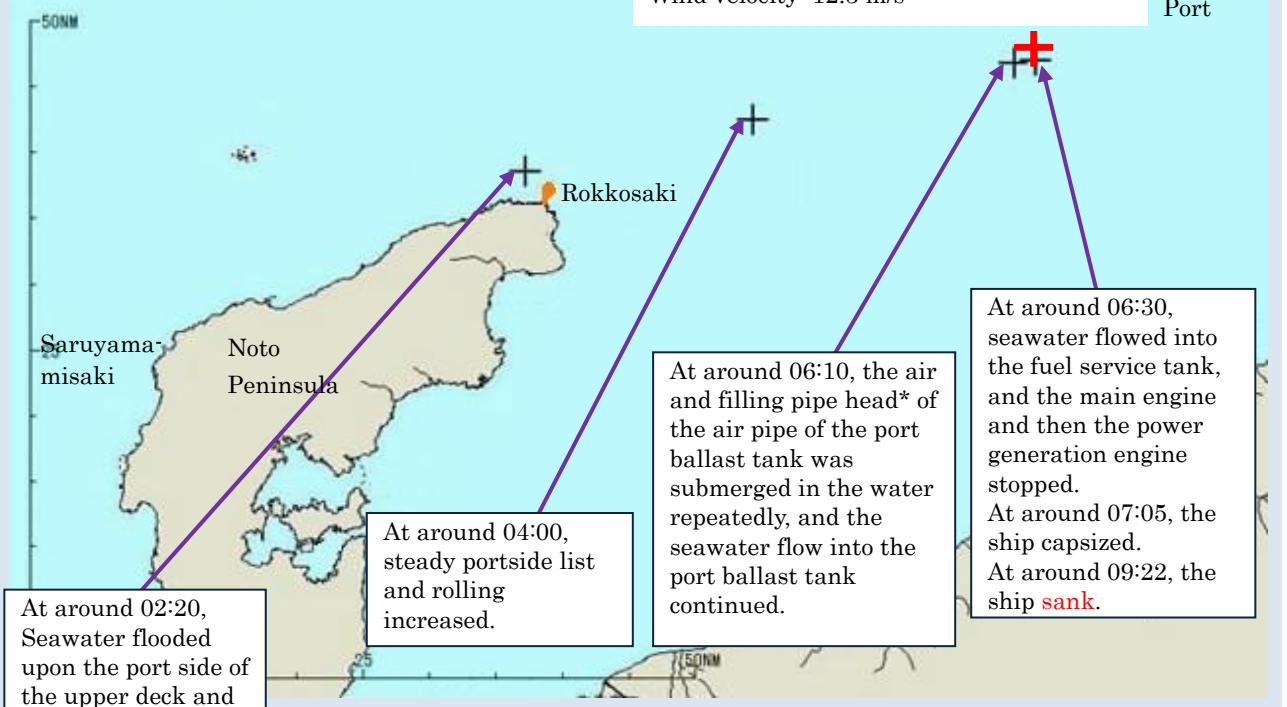
Foundering of Chemical Tanker SEIYO

Summary: When this tanker, manned with a master and 4 crewmen and loaded with approx. 1,000 tons of vinyl acetate monomer, which had left an anchorage off the Oita Airport, Oita Prefecture and had passed off the Rokkosaki (Noto Peninsula), Suzu City, Ishikawa Prefecture, was heading east-northeast toward Akadomari Port (Sadogashima), Sado City, Niigata Prefecture on Jan. 9, 2011, she capsized and, at around 09:22, sank.

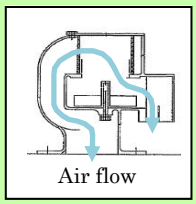
The chief engineer died and the master went missing.

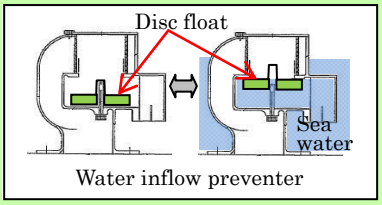
Gross tonnage: 499 tons
L x B x D: 64.8 x 10.0 x 4.5 (m)
Launched: December 2003

Weather & sea conditions when capsized (at around 07:00):
Wave height: 2.95 m; Wave cycle: 7.3 s;
Wave direction: 285°; Wind direction: 285°;
Wind velocity: 12.3 m/s



* The "air and filling pipe head of the air pipe" is an automatic closing device to block the inflow of waves, in which a disc float is designed to shut out seawater inflow as it rises up.





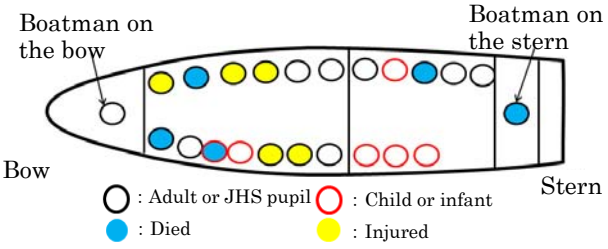
Probable causes: It is probable that this accident occurred as follows. When this ship was sailing off Saruyama-misaki toward Akadomari Port in a quartering sea from port side, the water inflow preventive function of the air and filling pipe head of the air pipe of the port ballast tank failed to function and allowed seawater to flood upon the port side of the deck and the expansion trunk and to continuously stay. The seawater that flowed into the ballast tank increased the list of the ship to port and caused to repeatedly submerge the air and filling pipe head of the air pipe. Flowed-in seawater from the air pipe into the port ballast tank continuously increased the port list to consequently turn over and sink the ship.

For details, please refer to the investigation report. (Published in Japanese on Dec. 21, 2012)
http://www.mlit.go.jp/jtsb/ship/rep-acci/2012/MA2012-12-1_2011tk0001.pdf

A sightseeing boat on a river cruise ran aground and then capsized

Capsizing of Passenger Boat TENRYU MARU No. 11

Summary: When cruising down the river Tenryugawa with 2 boatmen and 21 passengers aboard on August 17, 2011, this boat ran aground at around 14:17 on a rocky area on the left side of the bank of the Tenryugawa at Futamata, Tenryu Ward, Hamamatsu City, Shizuoka Prefecture, and was overturned, to take the life of four of the passengers and one of the boatmen and to injure five of the

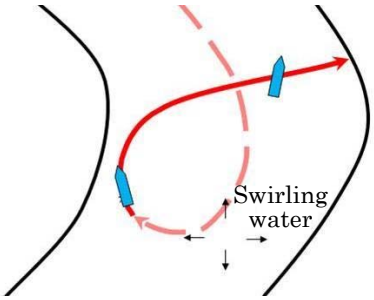


With a total of 21 passengers aboard, consisting of 14 adults including a boatman on the bow and a boatman the stern, 1 junior high school pupil, 5 children and 1 infant, this boat left the embarkation pier.

It is probable that when this boat approached the water area of this accident, the boatman on the stern started the outboard motor at upstream of the area and, at a central part of the rapids, took a course to run by the right-hand side of the swirling water without increasing the outboard motor speed. As a result, the bow was turned rightward by the swirling water so much as it was directed to face the right bank of the river.

It is somewhat likely that, with the addition of repelling waves from the right bank, the boat bow might have been turned upstream.

It is probable that, having been brought in an equilibrium between the pressure of strong current from upstream and the propelling force of the outboard motor, the boat moved obliquely toward a rocky area on the left bank side until the bottom of the starboard bow ran aground a rock, to incur port stern submergence and overturn.



Probable causes: It is probable that this accident occurred as follows. While cruising down along the route on the river Tenryugawa, this boat deviated her course from the center to the right-hand side of the swirling water which had arisen in the water area of this accident and was forcibly turned toward upstream direction. The boatman on the stern then increased the propeller speed by the throttle of the outboard motor, to bring about equilibrium between the pressure of strong steam from upstream and the propelling force of the outboard motor. In the equilibrium, the boat could not turn her bow upstream due to the strong downstream at the left bank side but was obliged to obliquely move toward a rocky area on the left bank side and to run aground the rock. Submergence started from her port stern and the boat was overturned.

For details, please refer to the investigation report. (Published in Japanese on Dec. 21, 2012)
http://www.mlit.go.jp/jtsb/ship/rep-acci/2012/MA2012-12-3_2011tk0026.pdf

Chapter 5 Efforts toward accident prevention

1. Publications

The JTSB prepares and issues various publications in addition to investigation reports regarding specific cases.

We place these publications on our website, and in order to make them more accessible to the public, we also introduce them through the monthly JTSB E-Mail Magazine service (only in the Japanese language).

Our e-mail magazine service is widely used by aviation, railway and shipping industry people, administrative agencies, and educational and research organizations.

2. Issuance of JTSB Digests

We launched the JTSB Newsletter in January 2009, on the occasion of the establishment of the JTSB, in order to help foster transport safety by introducing our frontline activities to readers. This newsletter, containing the summaries of published investigation reports and results of cause analyses in an easier-to-understand manner, was then issued on a regular basis.

In 2009, we carried out a questionnaire survey to readers relating to the views on the newsletter and could get the information about actually how the newsletter is used and readers' opinions about the service.

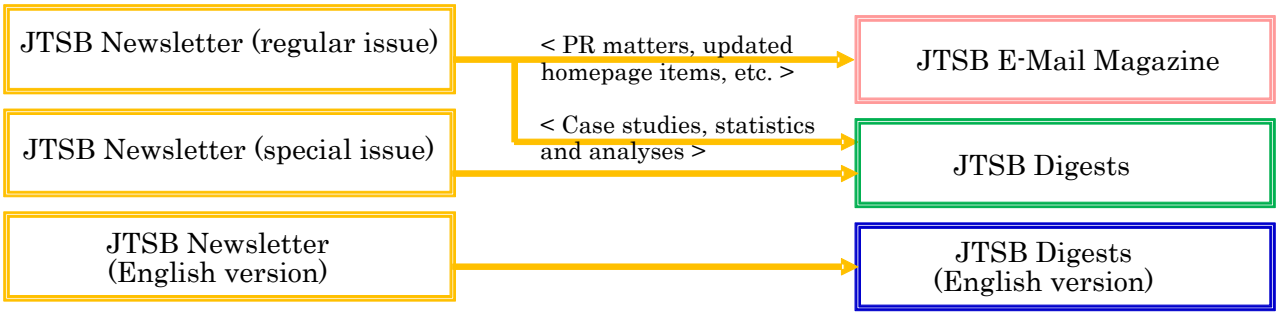
Based on these opinions, we divided the newsletter into the monthly JTSB E-Mail Magazine and the bimonthly JTSB Digests, and issued both of them in April 2012.

JTSB E-Mail Magazine (monthly)

The Magazine contains information such as PR matters on our activities, updates of our homepage items, published matters and column stories, and is delivered for registered members.

JTSB Digests (bimonthly)

The Digests, while maintaining the newsletter style, provides special articles about matters of interest for each transport mode or those common to them, as well as case studies which should be introduced and analyses based on statistics.



In 2012, we released the final issue of the JTSB Newsletter in January (the 13th issue). Then, we issued the JTSB Digests five times (the first to fifth issues, in April, June, August, October and December) and one English version of JTSB Digests in December.

The contents of the English version of JTSB Digests are described below.

JTSB Digests [Digest of Marine Accident Analyses]
For prevention of "Fatal and Injury Accidents Related to Shipboard Works"
(Issued on December 10, 2012)

- Statistics on fatal and injury accidents related to shipboard works
- Case Study 1: During discharge of copper sulfide concentrate, oxygen-deficient air was inhaled, leading to anoxia.
- Case Study 2: While in berthing operation for a container ship, a mooring rope attached onto a bitt on the berth broke, and snapped back, hitting mooring workers, and took their lives
- Case Study 3: While hoisting cargo with a deck crane, the wire rope broke and the cargo fell into the hold of the barge.

3. Issuance of Analysis Digests Local Office Edition

The JTSB has issued analysis digests local office edition (only in the Japanese language) in order to provide various kinds of information for prevention of marine accidents, based on analyses made by our regional offices regarding specific accidents which occurred in their respective jurisdictions, in which they focus on cases with characteristic features such as the sea area, the type of vessel and the type of accident.

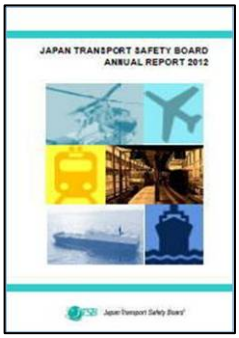
Analysis Digests Local Office Edition in 2012

Hakodate	Situation of the fishing vessel capsizings in waters around the Hokkaido coast
Sendai	Fires involving small fishing vessels
Yokohama	Situation of the marine accidents mainly resulting from incursions into fixed fishing nets in waters off the Kanto and Tokai regions
Kobe	For prevention of pleasure boat accidents
Hiroshima	Situation of the collision accidents in the Bisan Seto waters
Nagasaki	Situation of the fishing vessel accidents in waters west of the Kyushu coast

4. Issuance of JTSB Annual Report

In August 2012, we issued the JTSB Annual Report 2012 so that the lessons from the accidents and incidents may be widely shared among interested parties, by introducing our activities.

We also issued the English version of the JTSB Annual Report 2012 in December 2012 hoping to let people abroad know concerning the topics we took up from the original Japanese version as part of efforts to disseminate our information to other countries.



5. Dispatch of lecturers to seminars

The JTSB uses accident case studies and analysis results in accident prevention activities to impart knowledge and accident prevention measures to concerned parties.

JTSB lecturers were dispatched to conduct seminars and training organized by organizations and companies. We select a topic suitable for the audience and explain case studies, prevention measures and lessons learned from past accident investigations in an easy-to-understand manner.

The following is a list of some of the seminars JTSB lecturers were dispatched in 2012.

Japan Institute of Navigation, 126th Seminar and Study Meeting, Ocean Engineering Research Group

Major seminars JTSB lecturers were dispatched (2012)

Date	Name / Sponsor	Participants	Theme	Lecturer
Feb. 10	9th Light Airplane Safety Seminar / Japan Aircraft Pilot Association	150 pilots of light airplane	Accident statistics and analyses of recent accidents	Aircraft accident investigator (JTSB Secretariat)
May 25	Japan Institute of Navigation, 126th Seminar and Study Meeting, Ocean Engineering Research Group / Japan Institute of Navigation	50 university teachers and researchers	On centennial of Titanic Accident -- marine accidents and safety	Board member (JTSB)
July 5	Railway Technology Training (Onsite Inspection) / Kashiwa Training Center, College of Land, Infrastructure, Transport and Tourism	25 onsite inspectors	Roles of railway accident investigations	Railway accident investigator (JTSB Secretariat)
July 5	Joint Seminar for Electric Power, Raw Materials and Resources Safety Promotion / Shinwa Kaiun Kaisha Ltd.	45 safety managers	Organization and roles of JTSB	Regional accident investigator (Moji Office)
Sept. 10	General seminar (part of curriculum for comprehensive studies) / Miyagi Prefecture Izumitateyama High School	841 students	Seaborne experience and current job as marine accident investigator	Marine accident investigator (JTSB Secretariat)
Oct. 23	2012 Special Training for Aviation Security and Disaster Prevention Personnel / Aviation Safety Dept., Civil Aviation Bureau	11 aviation security and disaster prevention personnel	Case studies and verification of aircraft accidents	Aircraft accident investigator (JTSB Secretariat)
Nov. 17	2012 Seminar for Safety Instructor Training / Japan Sailing Federation	40 certified instructors for instructor license renewal	Prevention of reoccurrence of marine accidents	Special Assistant to the Director for Analysis, Recommendation and Opinion (JTSB Secretariat)

Date	Name / Sponsor	Participants	Theme	Lecturer
Nov. 27	Safety Seminar / An-ei Kanko Co., Ltd.	55 crewmen and back office employees of An-ei Kanko	Safety in ship operation	Regional accident investigator (Naha Office)
Dec. 11	2012 Special Course for Building Guidance and Elevator Safety and Accident Training / Kashiwa Training Center, College of Land, Infrastructure, Transport and Tourism	26 elevator safety and accident-related personnel	Investigations of railway accidents	Railway accident investigator (JTSB Secretariat)

6. Provision of information for accident victims and their families

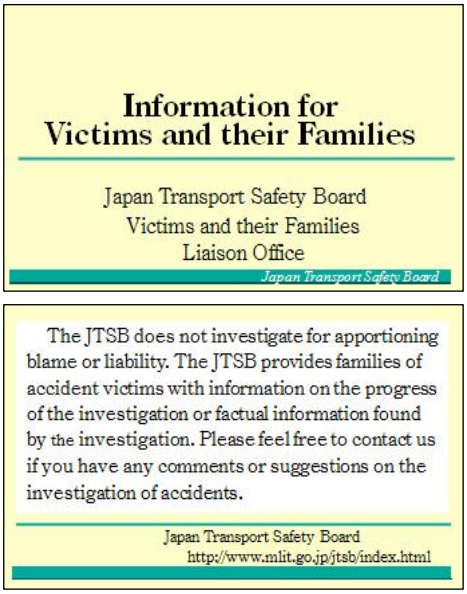
Following the alleged disclosure of information in the course of the investigation of the Train Derailment Accident between Tsukaguchi and Amagasaki Stations on the Fukuchiyama Line of the West Japan Railway Company, we established a meeting consisting of victims of the accident and members of their families and bereaved families as well as experts to verify the reliability of the investigation report about the accident. The verification meeting compiled a proposal on the future of the JTSB.

Based on this proposal, we established the Duty Improvement Action Plan which specified four action principles. In line with the plan, we are striving to improve our duties by combining all of our resources. We set "consideration for the victims" as one of the four principles and we make efforts to take the feelings of the victims and their families or the bereaved into account in an appropriate manner, and to provide them with information regarding the accident investigation in a timely and appropriate manner, and to sincerely respond to their input as well. To this end, we established a contact point for providing information regarding accident investigations in April 2011. To further promote the provision of related information, we also established the Victims and their Families Liaison Office as stipulated in the official directive in April 2012. Furthermore, contact points were established at our regional offices to deal with situations in coordination with the Tokyo Headquarters.

Through these contact points, we strive to ensure mutual communications with victims and their family members by carefully listening to their perspectives and concerns and using these as opportunities to further improve our duties.

In May 2012, we adopted the "Information Provision Manual" as a specific effort to better provide information to victims and their family members. At their request, we provide investigation reports and other information on investigations according to this manual. We have also prepared an information card to be distributed for easy access to information about contact points.

In addition, we have organized lecture meetings with victims and their family members as guest speakers in order to further our understanding of their situations and feelings as well as their expectations for our investigations and



Information Card for
Victims and their Families

Lecture meeting

information provision activities. At a meeting held in December 2012, a member of a family bereaved in the Train Derailment Accident on the Fukuchiyama Line spoke about information provision regarding the accident investigation from the perspective of bereaved families.

Column

Japan-Marine Accident Risk and Safety Information System

- Information on Accidents, Risks, Safety Which Can Be Found from a Map -

Japanese version : http://jtsb.mlit.go.jp/hazardmap/

English version* : http://jtsb.mlit.go.jp/hazardmap/index_en.html

*Not all contents are translated in English

The JTSB launched a web-based marine accident map, Japan-Marine Accident Risk and Safety Information System, in Japanese at the end of May 2013, followed by its English version in September of that year. The system, aimed at making it easier to search marine accident/incident investigation reports for using them for the prevention of reoccurrence of similar accidents and incidents, allows users to obtain information about where accidents/incidents occurred and what type of vessel is involved from a map overlaid with the location of accidents and incidents.

Users can search investigation reports by the location, the type of accident/incident and vessel, the date and time of occurrence, the gross tonnage and keywords, and also see a list of accidents/incidents that are being displayed on the map.

In addition to the search function of accident/incident information, the system can also display various information, such as safety alarts for waters where accidents frequently occur, vessel traffic density based on AIS (Automatic Identification System) information, fishing method and others on the map.

The information can be used to evaluate risks in the planned route and the place of fishing operation, and be utilized as materials for a variety of safety seminars.

With the cooperation of the Ports and Harbours Bureau, the Japan Meteorological Agency, the Japan Coast Guard and the Fisheries Agency, the data on weather and sea conditions, tarffic routes and fishing ground charts are incorporated, and that enable users to check weather and sea conditions in real time.

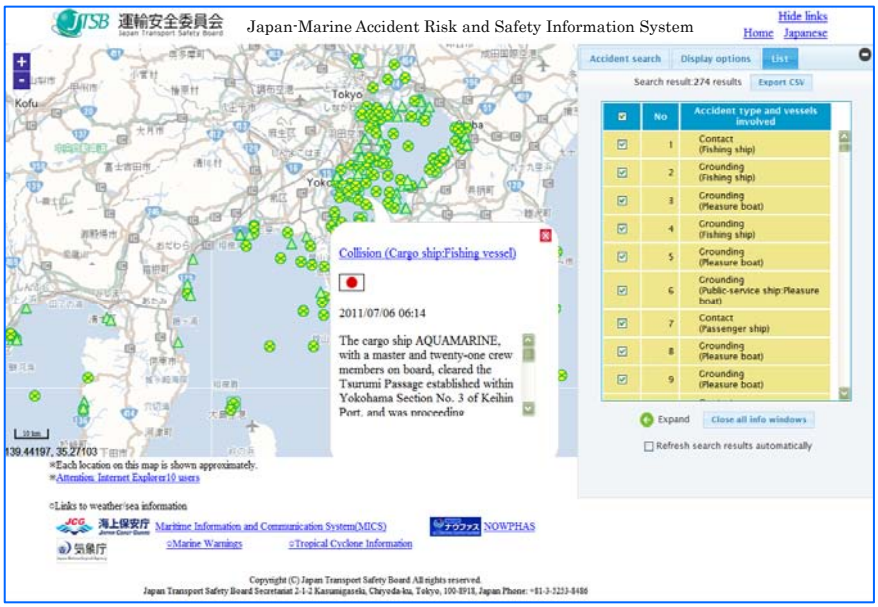
Numerous marine accidents occur every year, causing a loss of many precious lives and properties. We hope that this system is used by more people for developing their safety measures and then would help reduce marine accidents.

Screen image : safety alert for Ichikawa Waterway

Screen image : vessel traffic density in Uraga Channel

Illustration of typical fishing method in the area

Screen image : accident information



Chapter 6 International efforts in accident prevention

1. Objectives and significance of international cooperation

Aircraft and marine accidents have an international characteristic and their investigations are conducted in accordance with international standards adopted by international organizations, requiring cooperation and coordination with the accident investigation authorities of States involved in the investigation process.

In aircraft accidents, the relevant States involved are: the State where the accident occurred, the State of registry, the State of the operator, the State of the design and the State of manufacture. Annex 13 to the Convention of the International Civil Aviation of the International Civil Aviation Organization (ICAO) stipulates that while the State where the accident occurred has the responsibility of initiating and conducting an investigation, other relevant States have the authority to appoint representatives to participate in the investigation. This requires adequate coordination between the accident investigation authorities during the process.

In marine accidents, the International Convention for the Safety of Life at Sea (SOLAS) of the International Maritime Organization (IMO) sets out a common approach to accident investigation, which mandates that the flag State has the obligation to investigate certain vessels and allows the interested States such as the coastal State and nationals of that State lost their lives or received serious injuries to be involved in the investigation. The flag State and other interested States are supposed to cooperate in exchanging information during the conduct of the accident investigation.

2. Examples of cooperation with foreign accident investigation authorities

In the process of investigations of aircraft accidents and serious incidents, the State of Occurrence shall forward a notification of an accident or serious incident to the relevant State, such as the State of Registry, the State of Design and Manufacture, and the State of the Operator, in accordance with the provision of Annex 13, and relevant States shall each be entitled to appoint an accredited representative (AR) to participate in the investigation.

In 2012, we appointed our aircraft accident investigators to ARs in three cases for which investigations were launched by foreign accident investigation authorities and Japan was involved as the State of the Registry, the State of Design and Manufacture, the State of the Operator, or in other forms.

In December 2011, a privately owned small aeroplane sustained damage when it landed on an airport in the United States. To assist in the investigation by the U.S. accident investigation authority, our investigator was present at an aircraft component examination performed in Japan as AR. Upon reviewing the result of the examination, we sent it to the US authority. Meanwhile, a serious incident occurred in April 2012, when a passenger aircraft operated by a UK air carrier flew back to an airport in the UK because its smoke detection alarm was repeatedly activated after its take-off, and those aboard the aircraft conducted an emergency evacuation on a runway. In the investigation for this incident, our investigator was also present at an aircraft component examination performed in Japan in support for the UK accident investigation authority. In the remaining third case, a small aeroplane of Japanese manufacture hit the ground short of a runway and sustained damage when it landed on an airport in Brazil in June 2012. We also appointed AR

for this serious incident to assist in the investigation conducted by the Brazilian accident investigation authority.

In marine accident investigations, the IMO Code of the International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident (Casualty Investigation Code) requires the flag State, the coastal State of the accident and other interested States to cooperate in the investigation. When a marine accident involving multiple States occurs, the JTSB conducts the accident investigation in cooperation with the accident investigation authorities of the relevant States.

The marine accidents for which the JTSB launched investigations in 2012 included nine serious accidents involving foreign vessels. We notified the occurrence of these accidents to the accident investigation authorities of eace flag State. For two of the nine cases which accident investigators designated by the flag States came to Japan, we conducted investigations while coordinating with the investigators about how to progress with the investigations and areas of cooperation.

Regarding the three marine accident investigation reports we published in 2012, we sent those drafts upon request of the flag States in order to invite their comments.

When we have useful information with regard to accident investigations which are carried out by foreign accident investigation authorities, we provide such information to support their investigations. Main cases of this kind of cooperation in 2012 are as follows:

(1) On February 2, 2012, the Papua New Guinea registered passenger ship RABAUL QUEEN sank in the Solomon Sea, leaving many passengers dead or missing. The ship had been sold to Papua New Guinea after being built and operated in Japan. Therefore, we obtained materials related to the ship, such as the ship plan at the time when it was built and the routes and operation schedule when it was in service in Japan, and provided them upon request of the Papua New Guinea government and the Australian accident investigation authority.

(2) On April 3, 2012, the Hong Kong registered cargo ship NEW LUCKY 7 sank in the East China Sea west of Amamioshima Island and six crewmen went missing. Upon receiving a request from the Hong Kong accident investigation authority, we obtained materials about the weather and sea conditions in the waters near the island at the time of the accident and provided them to the Hong Kong.

3. Participation in overseas training

In order to conduct a proper accident investigation, the JTSB strives to improve the competence of its investigators through training and information exchange with foreign organizations, as well as active participation in accident investigation training conducted abroad.

In 2012, aircraft accident investigator was sent to Cranfield University in the UK, which is well-known in this field. The curriculum ranges from the basics of accident investigation to specialized knowledge. After the training, the participating investigator fed-back what the investigator have learned to the other investigators, thereby helping to improve the capabilities of the investigators as a whole.

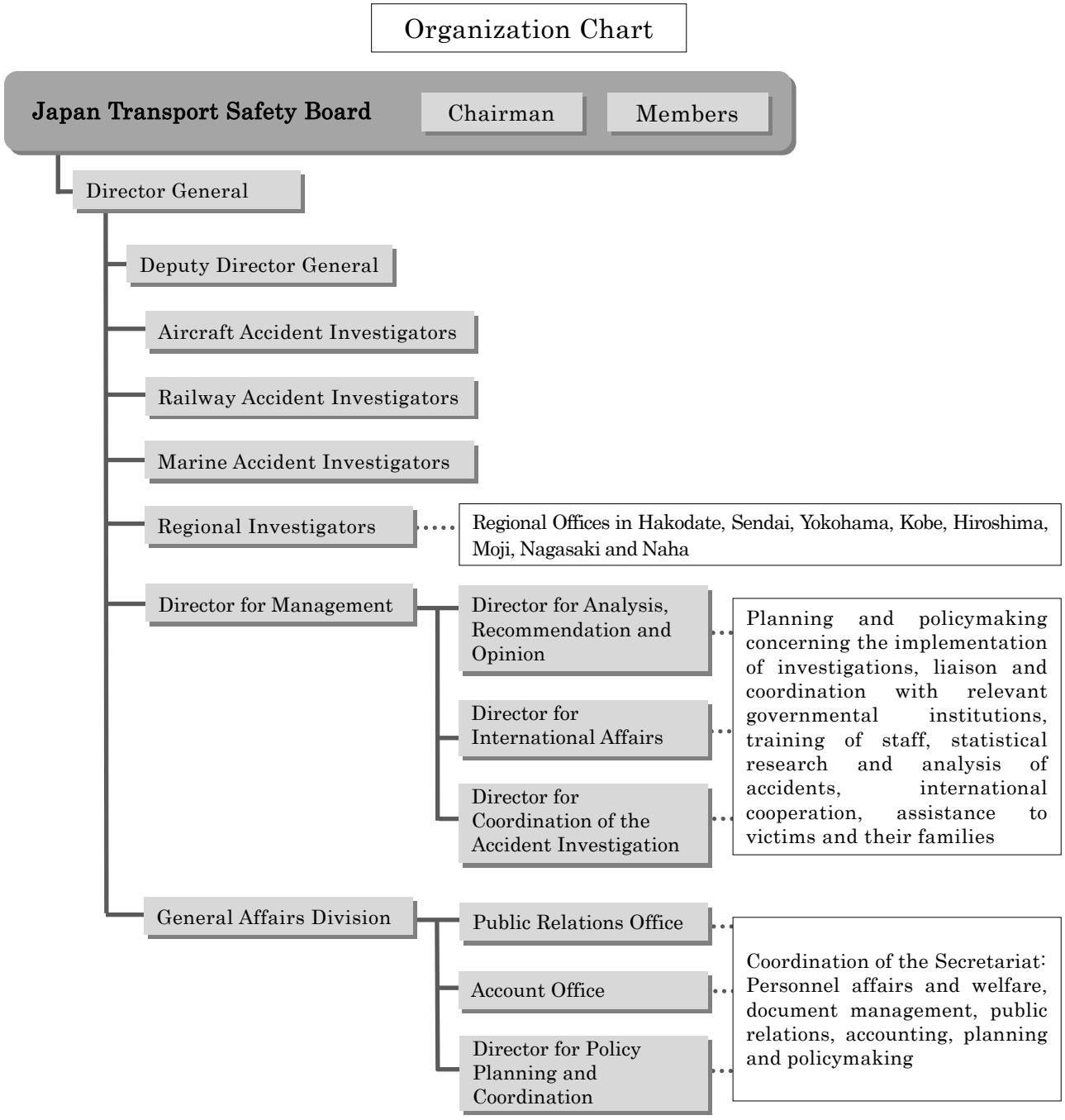
Appendixes

Japan Transport Safety Board
Annual Report 2013

Appendixes

1. Outline of the organization

The Japan Transport Safety Board consists of the Chairman, 12 members, and 176 secretariat staff (as of the end of March 2013). The staff in the secretariat consist of investigators who conduct investigations of aircraft, railway and marine accidents; the General Affairs Division that performs coordination-related jobs for the secretariat; and the Director for Management who is dedicated to the support and statistical analysis of accident investigations, and international cooperation. In addition, special support staff and local investigators are stationed at eight regional offices around the country (Hakodate, Sendai, Yokohama, Kobe, Hiroshima, Moji, Nagasaki and Naha). These local investigators investigate marine accidents (excluding serious ones) and support staff provide initial support for aircraft, railway and marine accidents.



2. Deliberation items of Board and each Committee

After accident investigators prepare a draft investigation report, the draft report will be deliberated at the Board or Committees. In general, the committee which set up in each mode: Aircraft, Railway, Marine and Marine Special Committees will deliberate on the draft reports while particularly serious accidents will be deliberated at the General Committee, and extremely serious accidents at the Board.

The Board (Committee) is convened by the Chairman (or the Director of Committee), and attended by the members from the respective disciplines. Any matters shall be decided by a majority of the members present. A meeting cannot be convened and a decision cannot be made unless more than half of the members are present.

The Board (Committee) meeting is also attended by the Director General, Deputy Director General, Director for Management, Investigators concerned from the Secretariat.

Deliberation items of Board and each Committee

Board and Committees	Matters to be deliberated
Board	・Matters that the Board considers as extremely serious accidents based on the scale of damage and other matters including social impact
General Committee	・Matters related to particularly serious accidents (i) An accident involving ten or more persons killed or missing (ii) An accident involving twenty or more persons killed, missing or seriously injured (With regard to aircraft accidents and a marine accidents, (i) and (ii) are limited to passenger transport services.) ・Any other matters deemed to be necessary by the Board
Aircraft Committee	・Matters related to aircraft accidents and aircraft serious incidents (excluding the accidents to be handled by the General Committee)
Railway Committee	・Matters related to railway accidents and railway serious incidents (excluding the accidents to be handled by the General Committee)
Marine Committee	・Matters related to marine accidents and marine incidents as may be deemed serious by the Board (excluding the accidents to be handled by the General Committee and the Marine Special Committee)
Marine Special Committee	・Matters related to marine accidents and marine incidents (excluding the accidents to be handled by the General Committee and the Marine Committee)

3. Board Members

As of April 1, 2013

Norihiro Goto, Chairman (Full-time), Director of Aircraft Committee

Chairman Norihiro Goto was appointed as Chairman of the Aircraft and Railway Accidents Investigation Commission in February 2007, currently in the third term of office.

During his tenure as Chairman, he has published many investigation reports concerning accidents and incidents, such as a train derailment and fire accident on the Sekisho Line of Hokkaido Railway Company, an accident in which the passenger boat TENRYU MARU No. 11 capsized in Tenryugawa River and an accident in which a McDonnell Douglas MD-11F operated by Federal Express Corporation was destroyed by fire on landing at Narita International Airport.

He has also started holding a regular press conference every month from August 24, 2011 and has been releasing a broad range of information mainly about the progress of accident and incident investigations, and the achievements of our duty improvement efforts.

Previously, he was engaged in education and research at the Department of Aeronautics and Astronautics at Kyushu University for about 35 years. He also took part in aeronautics and astronautics-related projects and accident investigations while serving mainly as members of the Space Activities Commission of the Ministry of Education, Culture, Sports, Science and Technology and a task force set up by the Japan Aerospace Exploration Agency (JAXA) to look into the causes for an accident involving an experimental supersonic airplane.

Career summary : Doctor of Engineering, Graduate School of Engineering, The University of Tokyo
(Mechanical engineering: mechanical dynamics and control, comprehensive engineering: aerospace engineering)

Former Professor for Department of Aeronautics and Astronautics, Faculty of Engineering, Kyushu University

Toshiyuki Ishikawa, Member (Full-time)

Toshiyuki Ishikawa was appointed as member on March 15, 2010, currently in the second term of office; specializes in legislation of administrative law and the others; in charge of the Aircraft Committee, the Railway Committee and the Marine Committee

Career summary : Doctor of Law, Graduate School of Law, Chuo University

Former Professor for Law School, Chuo University

Shinsuke Endoh, Member (Full-time), Acting Director of Aircraft Committee

Shinsuke Endoh was appointed as member on February 22, 2007, currently in the third term of office; specializes in aviation safety, and operation and maintenance of aircraft; in charge of the Aircraft Committee

Career summary : Master's course, Graduate School of Engineering, The University of Tokyo

Former adviser, Association of Air Transport Engineering and Research

Sadao Tamura, Member (Full-time)

Sadao Tamura was appointed as member on December 6, 2010; specializes in maneuvering of aircraft; in charge of the Aircraft Committee

Career summary : Former General Manager of Operations Support Office, Flight Operations Department, All Nippon Airways Co., Ltd.

Akira Matsumoto, Member (Full-time), Director of Railway Committee

Akira Matsumoto was appointed a member on October 1, 2007, currently in the second term of office; specializes in railway engineering and safety engineering; in charge of the Railway Committee

Career summary : Graduated from Department of Mechanical Engineering, Faculty of Engineering, Yokohama National University

Former Executive Researcher for Safety Technologies of New Urban Transportation Systems, National Traffic Safety & Environment Laboratory

Teruo Azukizawa, Member (Full-time), Acting Director of Railway Committee

Teruo Azukizawa was appointed as member on December 6, 2010; specializes in electrical engineering and electromagnetics; in charge of the Railway Committee

Career summary : Doctor of Engineering, Graduate School of Science and Engineering, Waseda University

Former Professor for Department of Electrical and Electronic Engineering, Tokyo City University

Tetsuo Yokoyama, Member (Full-time), Acting Chairman, Director of Marine Committee

Tetsuo Yokoyama was appointed as member on October 1, 2008, currently in the second term of office; specializes in maneuvering of ship; in charge of the Marine Committee and the Marine Special Committee

Career summary : Graduated from Japan Coast Guard Academy

Former Commissioner of Japan Marine Accident Inquiry Agency

Kuniaki Shoji, Member (Full-time), Acting Director of Marine Committee

Kuniaki Shoji was appointed as member on October 1, 2011; specializes in marine engineering and naval architecture; in charge of the Marine Committee and the Marine Special Committee

Career summary : Doctor of Engineering, Graduate School of Engineering, The University of Tokyo

Former professor, Faculty of Marine Technology, Tokyo University of Marine Science and Technology

Yuki Shuto, Member (Part-time)

Yuki Shuto was appointed as member on February 22, 2007, currently in the third term of office; specializes in ergonomics (human factors); in charge of the Aircraft Committee

Career summary : Master's course, Graduate School of Human Sciences, Waseda University

Representative Director and President of Research Institute for Social Safety

Keiji Tanaka, Member (Part-time)

Keiji Tanaka was appointed as member on February 27, 2013; specializes in flight simulation and flight dynamics; in charge of the Aircraft Committee

Career summary : Doctor of Engineering, Department of Aeronautics, Faculty of Engineering, The University of Tokyo

Former Professor for Aerospace Engineering Course, Monozukuri Engineering Department, Tokyo Metropolitan College of Industrial Technology

Norio Tomii, Member (Part-time)

Norio Tomii was appointed as member on October 1, 2007, currently in the second term of office; specializes in railway operation planning and management; in charge of the Railway Committee

Career summary : Doctor of Informatics, Graduate School of Informatics, Kyoto University

Professor for Department of Computer Science, Faculty of Information and Computer Science, Chiba Institute of Technology

Miyoshi Okamura, Member (Part-time)

Miyoshi Okamura was appointed as member on December 6, 2010; specializes in structural engineering, earthquake engineering and maintenance management engineering (steel structural engineering); in charge of the Railway Committee

Career Summary : Doctor of Engineering, Graduate School of Engineering, University of Yamanashi

Associate Professor for Department of Research Interdisciplinary Graduate School of Medicine and Engineering, University of Yamanashi

Mina Nemoto, Member (Part-time)

Mina Nemoto was appointed as member on October 1, 2008, currently in the second term of office; specializes in ergonomics (human factors); in charge of the Marine Committee and the Marine Special Committee

Career summary : Doctor of Philosophy, Graduate School of Media and Governance, Keio University

Manager, Maritime Service Team, Maritime Business Group, Japan Marine Science Inc.

The chairman and members of the Board shall be appointed by the Minister of Land, Infrastructure, Transport and Tourism with the consent of both houses of Representatives and Councilors.

4. Duties improvement of JTSB

The Japan Transport Safety Board (JTSB) was established in October 2008 under Article 3 of the National Government Organization Act. It is an independent professional investigation agency formed by the merger of the Aircraft and Railway Accidents Investigation Commission (ARAIC) and the Japan Marine Accident Inquiry Agency (JMAIA), which investigated marine accidents. The agency's purpose is to conduct scientific investigation into the causes of aviation, railway, and marine accidents or incidents from impartial and neutral standpoint so as to contribute to prevent the occurrence of accidents and mitigate the damage by them.

However, in September 2009, it came to light that a member of the ARAIC leaked information on the investigation of the Train Derailment Accident on the Fukuchiyama Line of the West Japan Railway Company in 2005 and that undermined the public's confidence in our investigation. After verification of this regrettable event, the JTSB established a mission, principles and the Duty Improvement Action Plan in March 2012 to promote its reforms so that the JTSB can achieve truly needed investigation and greater social confidence by improving the issues identified through the verification.

1 Duty improvement review process

(1) In order to verify the reliability of the Final Report on the JR Fukuchiyama line accident which was publicized in June 2007, including whether the information leakage had any influence on the report, a verification meeting consisting of the victims, their families and experts (the Verification Members) was formed in November 2009. The verification was subsequently conducted over the next one and a half years.

The verification concluded that the Final Report was not influenced by the leakage, but the Verification Members pointed out other issues and challenges the JTSB faced, and compiled a proposal on the future of the JTSB (the Proposal). The Proposal pointed out key areas that require improvement, such as ensuring transparency in accident investigation, enhancing the provision of information to victims, and various other issues. It recommended that the JTSB address the issue of duty improvement by setting up a panel of external advisors to review and improve the Board's duties where necessary in future.

> The Proposal on the future of the JTSB (excerpt)
>
> 10. JTSB Duty Improvement Policy
>
> Taking the regtettable event as a lesson, the JTSB is in the process of reviewing the work processes. It should continue to proactively review its duties so as to achieve truly needed investigation and greater social confidence, exploiting the Board's great capabilities. To this end, the external advisors should be invited to set up a panel to identify specific organizational and duty improvements to address the key issues raised in the Proposal and others necessary.

(2) In July 2011, the Advisory Meeting for the duty improvement of the JTSB was established. The members and the meetings held are as follows:

Members of the Advisory Meeting

Mr. Seiji Abe (Professor, Kansai University)
Mr. Takemune Sato (Attorney at law)
Mr. Shigeru Haga (Professor, Rikkyo University)
Mr. Kunio Yanagida (Writer)
Mr. Hiroyuki Yamato (Professor, Graduate School, the University of Tokyo)

○ First Meeting
Time : 2 p.m. to 4 p.m., July 27, 2011 (Wednesday)
Place : JTSB Board Room
Subjects : (i) Current initiatives (ii) Scope of review on JTSB duty improvement (iii) Introduction to concrete efforts in investigation reports (iv) Others

○ Second Meeting
Time : 3 p.m. to 5 p.m., March 19, 2012 (Monday)
Place : JTSB Board Room
Subjects : (i) JTSB Duty Improvement Action Plan (Draft) (ii) Others

○ Third Meeting
Time : 2 p.m. to 4 p.m., August 1, 2012 (Wednesday)
Place : JTSB Board Room
Subjects : (i) A review of the progress of the Duty Improvement Action Plan (ii) New challenges (iii) Comments from experts (iv) Others

○ Fourth Meeting
Time : 2 p.m. to 4 p.m., March 15, 2013 (Friday)
Place : JTSB Board Room
Subjects : (i) A review of the progress of the Duty Improvement Action Plan (ii) New challenges (iii) A revision of the Duty Improvement Action Plan

(3) In December 2011, a meeting on duty improvement was held among the advisors and the JTSB to exchange opinions on various issues. A meeting was also held with the Verification Members of the JR Fukuchiyama Line accident report to hear their comments.

2 Mission and Principles

As part of the duty improvement process, the mission of the JTSB and its guiding principles were established. The mission and principles are displayed at the Tokyo Headquarters and eight regional offices nationwide to remind each and every staff member to bear this in mind while carrying out their daily work.

(1) JTSB Mission

We contribute to
-preventing the occurrence of accidents and
-mitigating the damage caused by them,

thus improving transport safety while raising public awareness, and thereby protecting the people's lives by

-accomplishing appropriate accident investigations which thoroughly unveil the causes of accidents and damages incidental to them, and

-urging the implementation of necessary policies and measures through the issuance of safety recommendations and opinions or provision of safety information.

(2) JTSB Principles

1. Conduct of appropriate accident investigations

We conduct scientific and objective accident investigations separated from apportioning blame and liability, while deeply exploring into the background of the accidents, including the organizational factors, and produce reports with speed. At the same time, we ensure that the reports are clear and easy to understand and we make efforts to deliver information for better understanding.

2. Timely and appropriate feedback

In order to contribute to the prevention of accidents and mitigation of the damage caused by them, we send messages timely and proactively in the forms of recommendations, opinions or factual information notices nationally and internationally. At the same time, we make efforts towards disclosing information in view of ensuring the transparency of accident investigations.

3. Consideration for victims

We think of the feelings of victims and their families, or the bereaved appropriately, and provide them with information regarding the accident investigations in a timely and appropriate manner, and respond to their voices sincerely as well.

4. Strengthening the foundation of our organization

We take every opportunity to develop the skills of our staff, including their comprehensive understanding of investigation methods, and create an environment where we can exchange opinions freely and work as a team to invigorate our organization as a whole.

3 Duty Improvement Action Plan

In line with four action principles set forth in the Mission for the JTSB, we established the Duty Improvement Action Plan as a concrete action plan in March 2012. (The Action Plan was revised in March 2013.)

4. Continuous duty improvement

The JTSB will diligently implement the Duty Improvement Action Plan and review the plan on a timely and appropriate basis, while action items shall be followed-up during the Advisory Meeting.

5. Number of occurrence by aircraft category (aircraft accidents)

(Cases)

Category / Year of occurrence	Aircraft			Rotor craft		Glider	Airship	Total
	Large aeroplane	Small aeroplane	Ultralight plane	Helicopter	Gyroplane			
1974	8	15	0	17	1	8	0	49
1975	3	16	0	16	0	8	0	43
1976	9	26	0	14	0	7	0	56
1977	5	12	0	16	1	5	0	39
1978	4	10	0	18	1	6	0	39
1979	8	14	0	20	1	6	1	50
1980	5	11	0	22	0	3	0	41
1981	3	10	1	18	0	8	0	40
1982	3	16	0	9	1	7	0	36
1983	4	13	10	12	0	7	0	46
1984	4	5	6	13	1	3	0	32
1985	5	11	6	15	0	4	0	41
1986	4	12	14	15	3	4	0	52
1987	8	17	8	8	1	3	0	45
1988	5	6	7	12	2	3	1	36
1989	2	6	11	9	1	12	0	41
1990	3	11	9	16	2	7	0	48
1991	2	10	6	19	0	7	0	44
1992	3	5	5	7	0	4	0	24
1993	4	5	3	17	1	2	0	32
1994	3	4	8	13	0	2	0	30
1995	4	7	10	6	0	1	0	28
1996	8	11	5	8	0	4	0	36
1997	3	11	3	8	2	3	0	30
1998	4	14	5	6	1	6	0	36
1999	1	9	5	7	1	5	0	28
2000	1	5	5	11	1	5	0	28
2001	2	5	2	8	0	4	0	21
2002	4	4	5	15	0	7	0	35
2003	2	10	3	1	0	2	0	18
2004	4	11	2	6	1	3	0	27
2005	1	8	0	7	0	7	0	23
2006	3	3	4	2	1	5	0	18

Category / Year of occurrence	Aircraft			Rotor craft		Glider	Airship	Total
	Large aeroplane	Small aeroplane	Ultralight plane	Helicopter	Gyroplane			
2007	5	3	4	7	0	4	0	23
2008	3	6	2	3	0	3	0	17
2009	6	2	1	7	0	3	0	19
2010	0	4	2	4	0	2	0	12
2011	1	8	1	3	0	1	0	14
2012	8	3	2	4	0	1	0	18
Total	155	359	155	419	23	182	2	1,295

(Note) 1. The figures include the cases handled by the Aircraft and Railway Accident Investigation Commission.
2. Large aeroplanes are aircraft with a maximum take-off weight of more than 5,700kg.
3. Small aeroplanes are aircraft with a maximum take-off weight of 5,700kg or less, excluding Ultralight planes.

6. Number of occurrence by aircraft category (aircraft serious incidents)

(Cases)

Category / Year of occurrence	Aircraft			Rotor craft		Glider	Airship	Total
	Large aeroplane	Small aeroplane	Ultralight plane	Helicopter	Gyroplane			
2001	3	0	0	0	0	0	0	3
2002	0	1	2	1	0	1	0	5
2003	7	1	4	2	0	1	0	15
2004	5	3	4	2	0	0	0	14
2005	10	3	1	1	0	0	0	15
2006	2	2	0	0	0	0	0	4
2007	6	2	2	1	0	1	0	12
2008	4	1	0	0	0	0	0	5
2009	4	5	0	2	0	0	0	11
2010	7	1	3	1	0	0	0	12
2011	6	0	0	0	0	0	0	6
2012	4	2	0	3	0	1	0	10
Total	58	21	16	13	0	4	0	112

(Note) 1. The figures include the cases handled by the Aircraft and Railway Accident Investigation Commission.
2. Large aeroplanes are aircraft with a maximum take-off weight of more than 5,700kg.
3. Small aeroplanes are aircraft with a maximum take-off weight of 5,700kg or less, excluding Ultralight planes.
4. The number of cases for 2001 represents those that occurred from October onward.

7. Number of occurrence by type (railway accidents)

(Cases)

Year of occurrence \ Type	Railway							Tramway							Total
	Train collision	Train derailment	Train fire	Level crossing accident	Accident against road traffic	Other accidents with casualties	Heavy property loss without casualties	Vehicle collision	Vehicle derailment	Vehicle fire	Level crossing accident	Accident against road traffic	Other accidents with casualties	Heavy property loss without casualties	
2001	0	4	1	0	0	0	0	0	0	0	0	0	0	0	5
2002	1	14	1	2	0	1	1	0	0	0	0	0	0	0	20
2003	1	20	2	0	0	0	0	0	0	0	0	0	0	0	23
2004	0	18	0	1	0	0	0	0	1	0	0	0	0	0	20
2005	2	20	0	0	0	1	0	0	1	0	0	0	0	0	24
2006	1	13	0	1	0	0	0	1	0	0	0	0	0	0	16
2007	0	12	2	3	0	0	0	0	2	0	0	0	0	0	19
2008	0	7	2	2	0	1	1	0	0	0	0	0	0	0	13
2009	0	5	1	2	0	3	0	0	0	0	0	0	0	0	11
2010	0	6	0	0	0	1	0	0	0	0	0	2	0	0	9
2011	0	12	0	1	0	1	0	0	0	0	0	0	0	0	14
2012	0	13	2	0	0	2	0	0	2	0	0	1	0	0	20
Total	5	144	11	12	0	10	2	1	6	0	0	3	0	0	194

(Notes) 1. The figures include the cases handled by the Aircraft and Railway Accidents Investigation Commission.

2. The number of cases for 2001 represents those that occurred from October onward.

8. Number of occurrence by type (railway serious incidents)

(Cases)

Type / Year of occurrence	Railway										Tramway							Total
	Incorrect management of safety block	Incorrect indication of signal	Violating red signal	Main track overrun	Violating closure section for construction	Vehicle derailment	Dangerous damage in facilities	Dangerous trouble in vehicle	Heavy leakage of dangerous object	Others	Incorrect management of safety block	Violating red signal	Main track overrun	Dangerous damage in facilities	Dangerous trouble in vehicle	Heavy leakage of dangerous object	Others	
2001	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2002	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
2003	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
2004	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
2005	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	3
2006	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	4
2007	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	3
2008	0	0	0	0	1	0	0	3	0	0	0	0	0	0	0	0	0	4
2009	0	1	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	4
2010	1	0	0	0	1	1	0	2	0	0	1	1	0	0	0	0	0	7
2011	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2
2012	0	0	0	0	1	1	0	3	0	0	0	0	0	0	0	0	0	5
Total	1	7	0	0	6	2	1	19	0	1	1	1	0	0	0	0	0	39

(Notes) 1. The figures include the cases handled by the Aircraft and Railway Accidents Investigation Commission.

2. The number of cases for 2001 represents those that occurred from October onward.

9. Number of accidents and incidents by area (marine accidents and incidents)

(Cases)

Year \ Area	In Japanese waters			Outside Japanese waters	Total
	In ports specified by the Cabinet Order	Within 12 nautical miles	In lakes or rivers		
2007		3			3
2008	224	578	15	56	873
2009	325	1,081	34	82	1,522
2010	292	922	38	82	1,334
2011	229	789	28	79	1,125
2012	214	803	31	52	1,100
Total	1,284	4,176	146	351	5,957

Note: The above table shows the number of accidents and incidents into which the JTSB launched an investigation as of the end of April 2013 (including those carried over from the former Marine Accident Inquiry Agency).

10. Number of accidents and incidents by type (marine accidents and incidents)

(Cases)

Year \ Type	Types of marine accident											Type of marine incident				Total
	Collision	Contact	Grounding	Sinking	Flooding	Capsizing	Fire	Explosion	Facility damage	Casualty	Others	Loss of control	Stranded	Safety obstruction	Navigation obstruction	
2007		1	2													3
2008	181	101	255	12	4	28	15	3	30	61		54	34	8	87	873
2009	325	174	431	16	19	57	42	3	38	218	2	105	33		59	1,522
2010	356	180	369	15	18	50	35	2	26	146		83	16		38	1,334
2011	282	145	264	12	18	57	32	1	23	141	1	103	10	1	35	1,125
2012	245	127	260	5	21	55	43	2	34	155		109	5	4	35	1,100
Total	1,389	728	1,581	60	80	247	167	11	151	721	3	454	98	13	254	5,957

Note 1: The above table shows the number of accidents and incidents into which the JTSB launched an investigation as of the end of April 2013 (including those carried over from the former Marine Accident Inquiry Agency).

Note 2: The figures in the column "Casualty" are the number of cases involving death, death and injury, missing persons, or injury.

11. Number of vessels involved in accidents and incidents by type of vessel (marine accidents and incidents)

(Vessels)

Type of Vessel / Year	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
2007	2	1												3
2008	55	318	55	308	98	28	6	27	60	11	125	31	7	1,129
2009	103	480	83	605	163	39	6	35	104	40	249	65	22	1,994
2010	99	399	105	555	123	53	6	48	82	24	251	66	18	1,829
2011	68	285	105	503	89	38	6	29	50	16	250	46	21	1,506
2012	75	293	70	456	90	36	6	35	59	12	243	58	12	1,445
Total	402	1,776	418	2,427	563	194	30	174	355	103	1,118	266	80	7,906

Note: The above table shows the number of vessels involved in accidents and incidents into which the JTSB launched an investigation as of the end of April 2013 (including those carried over from the former Marine Accident Inquiry Agency).

12. Number of vessels involved in accidents and incidents by gross tonnage (marine accidents and incidents)

(Vessels)

Gross tonnage / Year	less than 20 tons	20 to less than 100 tons	100 to less than 200 tons	200 to less than 500 tons	500 to less than 1,600 tons	1,600 to less than 3,000 tons	3,000 to less than 5,000 tons	5,000 to less than 10,000 tons	10,000 to less than 30,000 tons	More than 30,000 tons	Unknown	Total
2007	1			1							1	3
2008	486	52	139	216	77	24	16	17	10	15	77	1,129
2009	903	89	230	288	116	42	34	49	30	14	199	1,994
2010	900	86	175	261	128	36	37	39	25	24	118	1,829
2011	822	59	142	194	101	39	18	32	21	17	61	1,506
2012	679	51	127	190	78	33	20	38	23	21	185	1,445
Total	3,791	337	813	1,150	500	174	125	175	109	91	641	7,906

Note: The above table shows the number of vessels involved in accidents and incidents into which the JTSB launched an investigation as of the end of April 2013 (including those carried over from the former Marine Accident Inquiry Agency).

13. Number of vessels involved in accidents and incidents in 2012 by type of accident/incident and type of vessel (marine accidents and incidents)

(Vessels)

Type of accident/ incident / Type of vessel	Marine accident											Marine incident				Total
	Collision	Contact	Grounding	Sinking	Flooding	Capsizing	Fire	Explosion	Facility damage	Casualty	Others	Loss of control	Stranded	Safety obstruction	Navigation obstruction	
Passenger ship	9	14	11		3		4		1	16		5		1	11	75
Cargo ship	111	42	88		4		8	1	8	8		16	3	1	3	293
Tanker	26	11	10		1				1	5		10	1		5	70
Fishing vessel	198	22	48		8	25	24	1	6	70	1	43			10	456
Tug boat, push boat	31	12	28	2	1	2	1		2	4		6		1		90
Recreational fishing vessel	20	3	4				2		1	3		2		1		36
Angler tender boat		3	3													6
Work vessel	17	3	10	3		1	1									35
Barge, Lighter	20	8	23		1	1	1			3		1		1		59
Public-service ship	3	1	3			1	1		1	1		1				12
Pleasure boat	71	12	59	3	4	27	1		15	25		19	1		6	243
Personal water craft	15	5	3				1			27		7				58
Others	8	1				1			1	1						12
Total	529	137	290	8	22	58	44	2	36	163	1	110	5	5	35	1,445

Note 1: The above table shows the number of vessels involved in accidents and incidents into which the JTSB launched an investigation as of the end of April 2013.

Note 2: The figures in the column "Casualty" are the number of cases involving death, death and injury, missing persons, or injury.

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