ANNUAL REPORT 2015

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.

A Message from the Chairman

The Japan Transport Safety Board has the duty that 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. In order to undertake accident investigations that are truly useful to citizens, we have made concerted efforts to tackle the following issues: "Conducting of appropriate accident investigations," "Timely and appropriate feedback," "Consideration for victims" and "Strengthening the foundation of our organization."

The 2015 Annual Report presents summaries of published reports and ongoing investigation outlines on aviation, railway and marine. Besides, it includes the recommendations and the actions, and statistics over last year.

The last year was a very productive year in terms of both the publication of investigation reports and the commencement of deliberations that became subjects of public concern. We published major investigation reports, such as the B787-8 battery fire, the nose dive of B737, the freight train derailment on Esashi Line, East Japan Railway Company (JR) that occurred in 2012, and the collision between cargo ship Nikkei Tiger and fishing vessel Horieimaru; as well as commenced the investigation on the freight train derailment on Esashi Line, JR and the deliberation of collision between Landing Platform Deck Osumi and pleasure boat Tobiuo that occurred in 2014.

Based on these circumstances, we continue to develop and maintain capability of accident and incident investigations; consequently, we tackle the utilization of investigation result. Moreover, we have been providing online access to the Japan-Marine Accident Risk and Safety Information System to the international maritime industry.

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

Norihiro Goto
Chairman
Japan Transport Safety Board
July 2015

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Chapter 1 Summary of major investigation activities in 2014

1 Statistics of accident investigation activities

In the case of occurrence of accident, the JTSB designates an investigator-in-charge and accident investigators to conduct investigations to determine the cause. Since the accidents is something that suddenly occur, we are making continuous efforts to be able to conduct investigation activities immediately.

In 2014, 17 accidents occurred, such as the collision of a privately owned Cessna 172M Ram with a tower for high voltage power lines in March and the crash after stall of Cirrus SR20 operated by TDL AERO in October. We conducted 35 investigations during the past year, including the ongoing 18 investigations from previous year.

In addition, in 2014, four serious incidents occurred, such as the emergency nose-up maneuvering of A320-214 operated by Peach Aviation Limited due to a warning issuance of a ground proximity warning system while approaching Naha Airport in April. We conducted 22 investigations during past year, including the ongoing 18 investigations from previous year.

Of these we have published the investigation reports of 13 accidents and eight incidents that completed the investigations.

As a result of the investigations, we made two safety recommendations and four recommendations in 2014. For instance, the safety recommendation to Federal Aviation Administration, United States of America (FAA), and the recommendations to the Minister of Land, Infrastructure, Tranport and Tourism and Air Nippon Co., Ltd. * were issued on the serious incident of B737-700 operated by Air Nippon Co., Ltd. In addition, the safety recommendation to FAA on the serious incident of B787-8 operated by All Nippon Airways was issued.

*: Air Nippon Co., Ltd., has been merged with All Nippon Airways Co., Ltd.

In 2014, 14 accidents occurred, the train collision with a preceding train in the Motosumiyoshi station yard, Tokyo Line, Tokyu Corporation and the collision between a deadhead train with a construction vehicle in the Kawasaki station yard, Keihin-tohoku Line, East Japan Railway Company in February, and the fatal accident that became a new investigation at the level crossings without automatic barrier machines. We conducted 35 investigations during the past year, including the ongoing 21 investigations from previous year.

Besides, in 2014, a serious incident of passenger door was opend during traveling between Isojima

station and Higashi Simojo station, Banetsu West Line, East Japan Railway Company occurred in September.

Of these we have published the investigation reports of 17 accidents and four incidents that completed the investigation.

In 2014, 931 accidents occurred, such as the collision between LPD Osumi and pleasure boat Tobiuo in January, and the fire on fishing vessel No.8 Kaiseimaru in March. We conducted 1,669 investigations during past year, including the ongoing 743 investigations from previous year and excluding five non-applicable accidents due to the results of the initial investigations.

(Provided by Japan Coast Guard)

Moreover, in 2014, 127 incidents occurred; consequently, we conducted 225 investigations during past year, including the ongoing 100 investigations and excluding two non-applicable incidents due to the results of the initial investigations.

Of these we have published the investigation reports of 980 accidents and 139 incidents that completed the investigation.

In addition, as a result of the investigations, we made six safety recommendations, such as the safety recommendation to SHANGHAI CSC Line Co., Ltd. (Operator) was issued on the fatality of a stevedore of Cargo Ship SCSC WEALTH. Moreover, we stated our opinion on 28 March to the Director General of the Fisheries Agency with analyzing published the related reports, because the accidents, such as the groundings on rocky areas and the collisions with breakwaters have continuously occurred.

Accident investigators conduct investigations and invite comments from parties relevant to the cause of the accident; accordingly, they make draft recommendations or opinions regarding the measures to be taken to prevent the recurrence of accidents and to mitigate damage caused by accidents. Therefore, they shall endeavor to improve their level of skill and knowledge by participating in national and international training; moreover, they share accident information among international society by attending international conferences.

We will further effort towards prevention of recurrence of accident through our accident investigation in the future.

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**

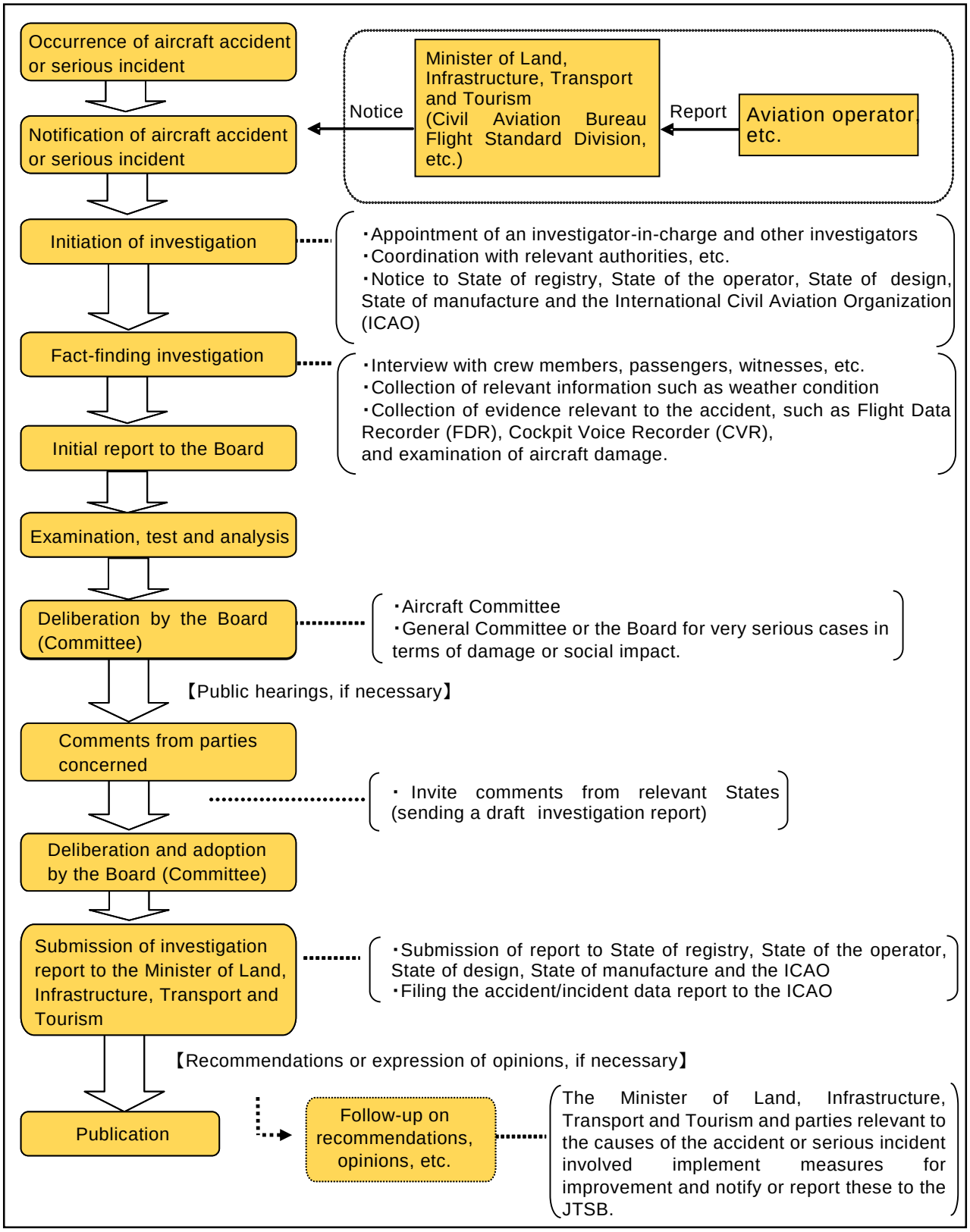
・When the pilot in command has recognized during flight that there was a danger of collision or contact with any other aircraft.

・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
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 a slung load, any other load carried external to an aircraft or an object being towed by an aircraft was released unintentionally or intentionally as an emergency measure
16 Case where parts dropped from aircraft collided with one or more persons
17 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 2014 as follows: 18 aircraft accident investigations had been carried over from 2013, and 17 accident investigations newly launched in 2014. 13 investigation reports were published in 2014, and thereby 22 accident investigations were carried over to 2015.

18 aircraft serious incident investigations had been carried over from 2013, and four serious incident investigations newly launched in 2014. Eight investigation reports were published in 2014, and thereby 14 serious incident investigations were carried over to 2015.

Among the 21 reports published in 2014, four were issued with recommendations and two with safety recommendations.

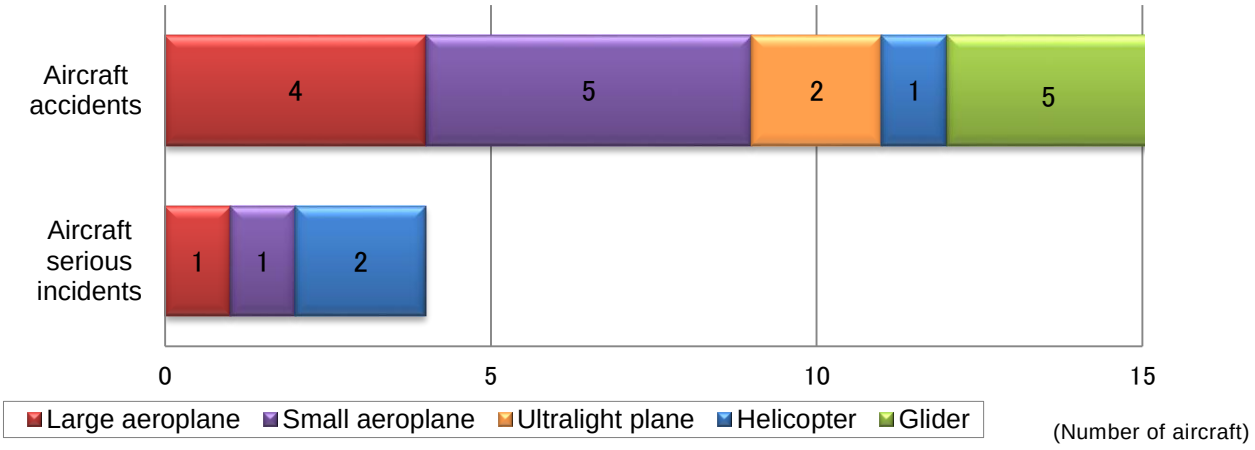
Category	Carried over from 2013	Launched in 2014	Total	Published investigat-ion reports	(Recom-mendat ions)	(Safety recom-mendat ions)	(Opinio -ns)	Carried over to 2015	(Interim report)
Aircraft accident	18	17	35	13	(0)	(0)	(0)	22	(0)
Aircraft serious incident	18	4	22	8	(4)	(2)	(0)	14	(0)

4 Statistics of aircraft accident and serious incident investigations launched in 2014

The number of aircraft accident and serious incident investigations launched in 2014 included 17 aircraft accidents, up six cases from 11 cases for the previous year, and four aircraft serious incidents, down four cases from eight cases for the previous year.

By aircraft category, four of the accidents involved large aeroplanes and five other cases concerned small aeroplanes, while two ultralight planes, one helicopter and five gliders were involved in the remaining cases. The aircraft serious incidents included one case involving large aeroplane, one case involving small aeroplane, and two cases involving helicopters.

Number of investigated aircraft accidents and serious incidents by aircraft category in 2014



In the 17 aircraft accidents, the number of casualties was 31, consisting of two deaths and 29 injured persons.

Statistics of number of casualties (aircraft accident)

(Persons)

2014							
Aircraft category	Dead		Missing		Injured		Total
	Crew	Passengers and others	Crew	Passengers and others	Crew	Passengers and others	
Large aeroplane	0	0	0	0	12	9	21
Small aeroplane	1	1	0	0	4	1	7
Ultralight plane	0	0	0	0	2	0	2
Helicopter	0	0	0	0	0	0	0
Glider	0	0	0	0	1	0	1
Total	1	1	0	0	19	10	31
	2		0		29		

5 Summaries of aircraft accidents and serious incidents which occurred in 2014

The aircraft accidents and serious incidents which occurred in 2014 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)

1	Date and location	Operator	Aircraft registration number and aircraft type
	February 12, 2014 On the runway of Nagasaki Airport, Nagasaki Prefecture	Oriental Air Bridge Co., Ltd.	JA801B Bombardier DHC-8-201 (large aeroplane)
	Summary	The aircraft took off from Nagasaki Airport, conducted consecutive touch-and-go training 6 times, then landed at the airport. The touchdown was slightly strong in the 4th touch-and-go training. External skins in the front of the fuselage, etc. sustained substantial damage.	

2	Date and location	Operator	Aircraft registration number and aircraft type
	March 5, 2014 Near Sasabara Town, Toyota City, Aichi Prefecture	Private	JA3853 Cessna 172M Ram (small aeroplane)
	Summary	During the flight over Toyota City, Aichi Prefecture, after taking off from Nagoya Airfield for flight training, the aircraft collided with a tower for high voltage power transmission lines, which is located in Oosawa, Sasabara Town, Toyota City. A captain and a passenger were on board the aircraft, and both of them suffered fatal injuries. The aircraft was destroyed and scattered.	 Left wing

3	Date and location	Operator	Aircraft registration number and aircraft type
	April 29, 2014 At an altitude of approximately 3,300m near Tsukuba City, Ibaraki Prefecture	J-AIR Co.,Ltd.	JA211J Embraer ERJ170-100STD (large aeroplane)
	Summary	During the flight after taking off from Yamagata Airport, the aircraft was shaken near the location referred to above. Two cabin attendants sustained injuries.	
4	Date and location	Operator	Aircraft registration number and aircraft type
	May 6, 2014 On the runway of Shikabe Airfield, Shikabe Town, Hokkaido Prefecture	Private	JA2529 Scheibe SF25C (motor glider)
	Summary	The aircraft bounced upon landing at Shikabe Airfield and stopped on the runway after sustaining substantial damage to the propeller, nose landing gear, etc. The pilot sustained injuries.	
5	Date and location	Operator	Aircraft registration number and aircraft type
	May 12, 2014 In the forest near Iizaka-cho, Fukushima City, Fukushima Prefecture	Private	JA111L Extra EA300/L (small aeroplane)
	Summary	The aircraft took off from Fukushima Sky Park Temporary Air Field in Fukushima City, Fukushima Prefecture. The aircraft made a forced landing near the location referred to above during landing approach to the Temporary Air Field. Left main wing, etc. sustained substantial damage. Two persons on board sustained injuries.	
6	Date and location	Operator	Aircraft registration number and aircraft type
	June 14, 2014 Kinugawa Gliding Field, Utsunomiya City, Tochigi Prefecture	Private	JA25CH Scheibe SF25C (motor glider)
	Summary	The aircraft took off from the above gliding field with one pilot while towing a glider. When the aircraft was landing at the gliding field after towing completed, the aircraft hit a winch towing line, which was falling after being detached from another glider. The aircraft sustained substantial damage. 	
7	Date and location	Operator	Aircraft registration number and aircraft type
	June 15, 2014 Near Kitami District Temporary Operation Site (for Agricultural Use), Kitami City, Hokkaido Prefecture	Non-profit Organization Aero Sports Kitami	JA2523 PZL-Bielsko SZD-50-3 "Puchacz" (glider)
	Summary	Refer to “6 Statistics of published aircraft accident and serious incident investigation reports” (No.9, P15)	
8	Date and location	Operator	Aircraft registration number and aircraft type
	July 26, 2014 Temporary helipad, Toba City, Mie Prefecture	Private	JA44AT Robinson R44 Ⅱ (rotorcraft)
	Summary	When the aircraft changed the direction on the hovering in order to land at the above temporary helipad, the tail boom hit a tree. The tail boom, etc. broke off and fell.	
9	Date and location	Operator	Aircraft registration number and aircraft type
	July 27, 2014 Koya, Kounosu City, Saitama Prefecture	Private	JR1096 Beaver RX550-R503L (ultralight plane)

	Summary	Refer to "6 Statistics of published aircraft accident and serious incident investigation reports" (No.13, P17)	
10	Date and location	Operator	Aircraft registration number and aircraft type
	August 17, 2014 Near runway of Fujigawa Gliding field, Shizuoka Prefecture	Private	JA2549 PZL-Bielsko SZD-51-1 junior (glider)
	Summary	During landing approach to Fujigawa Gliding field after taking off from the gliding field, the aircraft undershot in a garden short of the runway. The aircraft sustained substantial damage.	
11	Date and location	Operator	Aircraft registration number and aircraft type
	August 24, 2014 Haramamuro, Kounosu City, Saitama Prefecture	Private	JR1603 Quicksilver MXL II Top-R582L (ultralight plane)
	Summary	Immediately after taking off from a temporary airfield in Kounosu City, Saitama Prefecture, the aircraft crashed in a fallow garden. The pilot sustained injuries.	
12	Date and location	Operator	Aircraft registration number and aircraft type
	September 12, 2014 At an altitude of approximately 4,900m, about 95km southeast of Gimpo International Airport (Korea)	Japan Airlines Co., Ltd.	JA654J Boeing 767-300 (large aeroplane)
	Summary	While descending toward Gimpo International Airport after taking off from Tokyo International Airport, the aircraft was shaken near the above location. Seven cabin attendants sustained injuries.	
13	Date and location	Operator	Aircraft registration number and aircraft type
	October 12, 2014 On the runway of Chofu Airfield, Tokyo Prefecture	Private	JA59FB Piper PA-28R-201T (small aeroplane)
	Summary	The aircraft made a belly landing when it landed at Chofu Airfield after taking off from Akita Airport. The aircraft sustained substantial damage.	
14	Date and location	Operator	Aircraft registration number and aircraft type
	October 12, 2014 Near Nishikata, Ibusuki City, Kagoshima Prefecture	TDL AERO	N176CD Cirrus SR20 (small aeroplane)
	Summary	During the flight after taking off from Saipan, the engine stopped. The aircraft crashed near the above location. The pilot sustained injuries.	
15	Date and location	Operator	Aircraft registration number and aircraft type
	November 8, 2014 Kirigamine Gliding Field, Suwa City, Nagano Prefecture	Suwa City Glider Association	JA2320 Alexander Schleicher ASK18 (glider)
	Summary	The aircraft launched from Kirigamine Gliding Field with winch towing, but the speed did not increase. The aircraft released the tow line at 3-4m AGL and made a touchdown on the rough ground in the middle of the gliding field. On the touchdown, the aircraft sustained substantial damage.	
16	Date and location	Operator	Aircraft registration number and aircraft type
	November 16, 2014 Kitakyushu Airport, Fukuoka Prefecture	Private	JA4017 Mooney M20K (small aeroplane)
	Summary	When the aircraft landed at Kitakyushu Airport after taking off from Yamaguchi Ube Airport, it deviated from the runway. Then the aircraft crashed into the revetment and sustained	

		substantial damage. The pilot and one passenger sustained injuries.

17	Date and location	Operator	Aircraft registration number and aircraft type
	December 16, 2014 At an altitude of approximately 8,200m between Komatsu City, Ishikawa Prefecture, and Daigo-machi, Kuji-gun, Ibaraki Prefecture	American Airlines, Inc.	N751AN Boeing 777-200 (large aeroplane)
	Summary	During the flight toward Dallas/Fort Worth International Airport (U.S.) after taking off from Incheon International Airport (Korea), the aircraft was shaken near the above location. Three cabin attendants and nine passengers sustained injuries. The aircraft diverted to Narita International Airport, declared an emergency, and landed at Narita International Airport.	

(Aircraft serious incidents)

1	Date and location	Operator	Aircraft registration number and aircraft type
	April 28, 2014 During Landing approach to Naha Airport, Okinawa Prefecture	Peach Aviation Limited	JA802P Airbus A320-214 (large aeroplane)
	Summary	During landing approach to Naha Airport after taking off from New Ishigaki Airport, the aircraft experienced abnormal descending. Therefore, the aircraft made a go-around as an emergency avoidance maneuver. Its enhanced ground proximity warning system issued a warning. After the go-around, the aircraft landed at Naha Airport.	

2	Date and location	Operator	Aircraft registration number and aircraft type
	August 12, 2014 On the runway of Iki Airport, Nagasaki Prefecture	Private	JA344T Robinson R44 Ⅱ (rotorcraft)
	Summary	When the aircraft landed at Iki Airport after taking off from Saga Airport, the aircraft landed at the runway, which was closed due to vehicles on the runway for cleaning work.	

3	Date and location	Operator	Aircraft registration number and aircraft type
	September 20, 2014 Near Runway 03R of Hyakuri Airfield, Ibaraki Prefecture	New Central Airservice	JA4184 Cessna 172P (small aeroplane)
	Summary	While landing to Hyakuri Airfield after taking off from the airfield for sightseeing, the aircraft attempted to land on another runway which was closed for working near the runway, instead of the runway instructed by the air traffic controller. The aircraft conducted a go-around on instructions from the air traffic controller.	

4	Date and location	Operator	Aircraft registration number and aircraft type
	October 9, 2014 Komoro City, Nagano Prefecture	Shin Nihon Helicopter Co., Ltd.	JA6741 Aerospatiale AS332L1 (rotorcraft)
	Summary	During the flight with external cargo toward Asamayama Kazankan, where the cargo was scheduled to be unloaded, after taking off from a temporary helipad in Tsumagoi Village, Agatsuma-gun, Gunma Prefecture, a part (one door, aluminum material, approximately 180cm×80cm×3cm, approximately 5-6kg) of the cargo (bio-toilet) dropped near the above location.	

6 Statistics of published aircraft accident and serious incident investigation reports

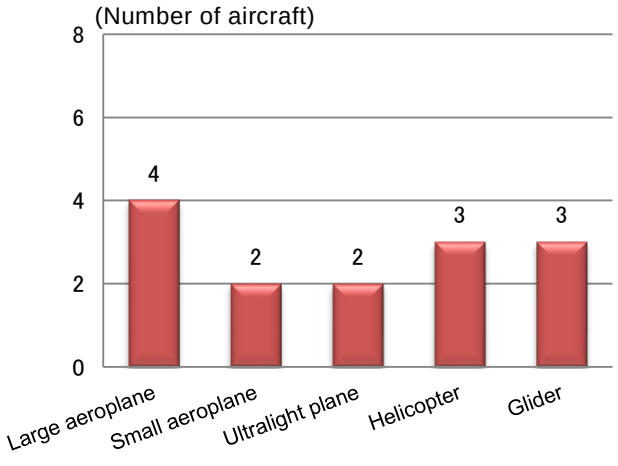
The number of investigation reports of aircraft accidents and serious incidents published in 2014 was 21, consisting of 13 aircraft accidents and eight aircraft serious incidents.

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

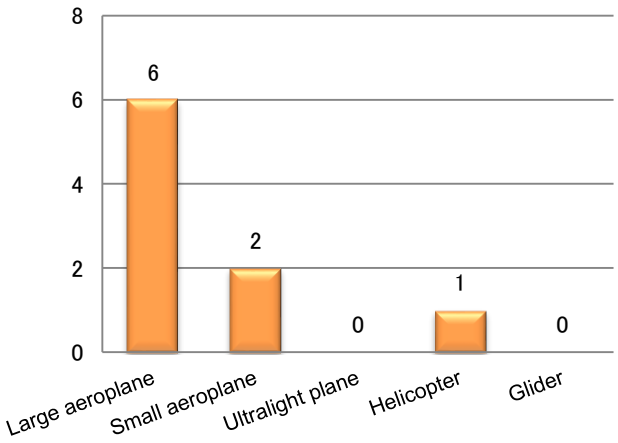
Note: In aircraft accidents and serious incidents, two or more aircraft are sometimes involved in a single case. See details on Pages 11-23.

In the 13 accidents, the number of casualties was 15, consisting of one death, and 14 injured persons.

Number of published aircraft accident reports (13 cases) by aircraft category in 2014



Number of published aircraft serious incident reports (eight cases) by aircraft category in 2014



The investigation reports for aircraft accidents and serious incidents published in 2014 are summarized as follows:

List of published investigation reports on aircraft accidents (2014)

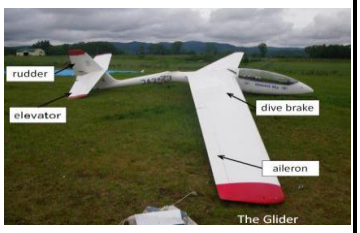
1	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	January 31, 2014	July 5, 2012 At an altitude of approx. 22,000ft (6,700m) about 160km north-northeast of Tokyo International Airport	Korean Airlines Co., Ltd.	HL7473 Boeing 747-400 (large aeroplane)
	Summary	While descending from the cruising altitude toward Tokyo International Airport from Gimpo International Airport (Korea), the aircraft was shaken at the altitude of approximately 22,000ft (6,700m) approximately 160km north-northwest of Tokyo International Airport (Mt. Yamizo in Fukushima Prefecture (approximately 20km east of Nasushiobara)). One passenger who was standing in aisle was thrown off-balance and sustained injuries. The aircraft continued to fly afterward and landed in Tokyo International Airport.		
	Probable Causes	It is highly probable that this accident occurred because the aircraft was shaken as it encountered turbulence during a descent, causing one passenger who was not in his seat to be thrown off-balance to sustain serious injuries. It is probable that the turbulence was caused by VWS (Vertical Wind Shear) or unstable atmospheric conditions where convective clouds developed.		
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/HL7473.pdf		

2	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	January 31, 2014	September 15, 2012 Kawashima Temporary Helipad Kujukuri Town, Sanbu Gun, Chiba Prefecture	Private	JA120H Eurocopter EC120B (rotorcraft)
	Summary	The aircraft, which was parked on the grass, rolled over to the right rearward during its transition to take off from the above temporary helipad. Two passengers sustained injuries.		
	Probable Causes	In this accident, the helicopter rolled over to the right pivoting around the right skid rear end which was trapped by the grass roots during its transition to take off from the grass helipad and sustained damage. It is highly probable that the pilot's following actions contributed to the occurrence: he raised the collective pitch unintentionally when he tried to wiggle the helicopter to confirm the skid restraints applying rudder inputs, as he sensed the slight rigidity of skids when the helicopter was light on the skids before liftoff.		
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA120H.pdf		
3	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	May 30, 2014	November 26, 2012 At an altitude of approx. 36,000ft (10,900m) above Fujinomiya City, Shizuoka Prefecture	Japan Airlines Co., Ltd.	JA610J Boeing 767-300 (large aeroplane)
	Summary	During the flight at the altitude of 36,000ft (10,900m) from Narita International Airport to Shanghai Pudong International Airport (China), the aircraft was shaken above Fujinomiya City, Shizuoka Prefecture. One passenger, who had left his seat, lost his body's balance and sustained injuries. The aircraft continued to fly afterward and landed in Shanghai Pudong International Airport. There was no substantial damage to the aircraft.		
	Probable Causes	It is highly probable that this accident occurred because the aircraft encountered the turbulence and was shaken at the cruising altitude of 36,000 ft. This shaking caused one of the passengers who had been away from his seat to lose his body's balance and to sustain serious injuries. It is probable that the turbulence the aircraft encountered was caused by the large VWS formed in a temporally and spatially limited narrow range due to the strong southerly warm wind which flowed into the developing front side of the Low.		
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA610J.pdf		
4	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	June 27, 2014	June 9, 2013 Yanagita Town, Utsunomiya City, Tochigi Prefecture	Private	JR1003 Ultralight Aircraft Challenger II-R503L (ultralight plane)
	Summary	During the solo flight around a temporary airfield in Yanagita Town, Utsunomiya City, Tochigi Prefecture, the aircraft flew away from the traffic pattern, hit a power pole, and crashed. The pilot sustained injuries.		
	Probable Causes	It is probable that the accident occurred as the aircraft crashed after its right main wing collided with a power pole because it became difficult for the pilot to control the aircraft due to the wind effect. The maneuverability of the aircraft gradually lowered as the aircraft's speed reduced. It is probable that the aircraft's deceleration was caused by the fact that the pilot reduced power and continued flying as well as the fact that the pilot failed to confirm the speed because he was concentrated on		

		maneuver of the control stick.		
	Report	http://www.mlit.go.jp/jtsb/aircraft/rep-acci/AA2014-3-1-JR1003.pdf		
5	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	June 27, 2014	December 31, 2013 On sea surface near the Kouri Bridge, Nago City, Okinawa Prefecture	ILAS Air Service Co., Ltd.	JA106Y Robinson R44 Ⅱ (rotorcraft)
	Summary	The aircraft performed sightseeing flights from Kouri-jima temporary helipad in Kouri island, Nakijin-son, Okinawa prefecture. It crashed into the sea surface near the Kouri Bridge in Nago City, Okinawa Prefecture. The pilot and two passengers sustained injuries. 		
	Probable Causes	It is highly probable that the accident occurred as the helicopter during sightseeing flight descended at excessive speed and descent rate until close to sea surface, the captain misjudged the altitude over calm and high degree of transparency sea surface, delayed the transition from descent to climb, crashed into sea surface and the helicopter was destroyed. Regarding the helicopter descended at excessive speed and descent rate until close to sea surface, it is highly probable that the Standard Operation Procedures which described detailed flight procedure in the Company were not provided and flight procedure of each flight operation was left to the captain's discretion. Moreover, the captain did not try to follow the laws and regulations and significantly lacked safety considerations.		
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA106Y.pdf		
6	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	July 25, 2014	August 21, 2012 At an altitude of approx. 40,000ft over Matsue City, Shimane Prefecture	Asiana Airlines. Inc.	HL8258 Airbus A330-300 (large aeroplane)
	Summary	The aircraft took off from Honolulu International Airport, the United States of America, for Incheon International Airport, the Republic of Korea, as a scheduled flight 231. While flying at approximately 40,000 ft over Matsue City, Shimane Prefecture, the aircraft was shaken. Two passengers were seriously injured and one passenger was slightly injured.  There were 221 people on board, consisting of the PIC, 14 other crew members and 206 passengers. The aircraft was not damaged.		
	Probable Causes	It is highly probable that in this accident, serious injury was sustained by a passenger walking in the rear aisle due to the severe shaking of the aircraft, and that serious injury was sustained by another passenger seated nearby when the passenger removed the seat belt in order to help the injured passenger, the aircraft shook severely again at that moment. It is probable that the initial severe shaking of the aircraft was a result of the aircraft passing through or nearby cumulonimbus, due to the PIC and the R Captain failing to notice that the weather radar was off, and encountering atmospheric disturbances with severe changes in wind direction and speed coupled with strong updrafts. It is possible that the next shaking of the aircraft may have been influenced by the PIC's control operations after disengaging the A/P to stabilize the aircraft. It is probable that the reason for the PIC and the R Captain failing to notice that the weather radar was off was that their monitoring of the weather conditions and instruments was insufficient.		
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/HL8258.pdf		

7	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	July 25, 2014	September 23, 2013 Osaki, Yachiyo City, Chiba Prefecture	Private	JA3492 Fuji Heavy Industries FA-200-160 (small aeroplane)
	Summary	During the flight over Yachiyo City, Chiba Prefecture, at the altitude of 1,500ft after taking off from Otone Temporary Airfield located in Inashiki County, Ibaraki Prefecture, for sightseeing, the engine of the aircraft stopped and the aircraft made an emergency landing in a harvested rice field in Osaki, Yachiyo City, Chiba Prefecture, after the engine stopped. The pilot and three other passengers were on board the aircraft. One person sustained injuries, and the aircraft sustained substantial damage.  The Aircraft		
	Probable Causes	It is highly probable that this accident occurred due to the check valve mounted between the left fuel tank and the sump tank of the aircraft becoming stuck in the closed position, resulting in the consumption of fuel only from the right fuel tank, leading to an engine stop due to interruption of the fuel supply by depletion of the fuel in the right fuel tank, compelling the making of the emergency landing, and resulting in damage to the aircraft during said emergency landing. It is somewhat likely that the left check valve became stuck in the closed position due to both age-related degradation of the left check valve and the presence of foreign substances, but this could not be determined. It is somewhat likely that misinterpretation of the asymmetrical consumption of the fuel during the preflight check as a temporary and ordinary phenomenon contributed to the accident.		
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA3492.pdf		

8	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	September 25, 2014	September 14, 2013 In the air, approx. 300m over Menuma Gliding Field, Kumagaya City, Saitama Prefecture	Private (Glider A)	JA22WP Rolladen-Schneider LS4-B (glider)
			Private (Glider B)	JA22RW Alexander Schleicher ASK21 (glider)
	Summary	The JA22WP launched from Runway 14 in Gliding field No. 1 of Menuma Gliding field in Kumagaya-City, Saitama Prefecture for the gliding competition, and JA22RW in the launching process at Gliding field No. 2 in Menuma Gliding field for the flight training, came into contact in the mid-air, and JA22WP was substantially damaged, while JA22RW sustained a minor damage. A pilot was on board JA22WP, and a flight instructor and a trainee pilot were on board JA22RW, but no one was injured.		
	Probable Causes	It is highly probable that this accident occurred when JA22WP, launched from Gliding field No. 1 for the gliding competition, came into contact with climbing JA22RW, by flying diagonally across the airspace over the adjacent Gliding field No. 2, where JA22RW was in the launching process.  It is highly probable that the reason why the JA22WP flew diagonally across the airspace above the adjacent Gliding field No. 2, where JA22RW was in the launching process, was that the Pilot of JA22WP had become preoccupied with finding a thermal in order to achieve an advantage in the gliding competition, and had lacked awareness to avoid flying into the airspace over the adjacent Gliding field. Furthermore, it is somewhat likely that the cause for the Pilot of JA22WP to lack		

<table>
<tr><td></td><td></td><td colspan="3">the awareness to avoid flying into the airspace above the adjacent Gliding field was attributed to the fact that a standard practice, advising the launched glider to avoid flying into the airspace over the adjacent Gliding field, was not specified in any regulations.</td></tr>
<tr><td></td><td>Report</td><td colspan="3">http://www.mlit.go.jp/jtsb/eng-air_report/JA22WP_JA22RW.pdf</td></tr>
<tr><td>9</td><td>Date of publication</td><td>Date and location</td><td>Operator</td><td>Aircraft registration number and aircraft type</td></tr>
<tr><td></td><td>September 25, 2014</td><td>June 15, 2014
Near the Kitami District Temporary Operation Site (For Agricultural Use), Kitami City, Hokkaido</td><td>Non-Profit Organization Aero Sports Kitami</td><td>JA2523
PZL-Bielsko
SZD-50-3 Puchacz
(glider)</td></tr>
<tr><td></td><td>Summary</td><td colspan="3">The glider, which was boarding the pilot only, undershot when landing to Kitami District Temporary Operation Site (for Agricultural Use) located in Kitami City, Hokkaido Prefecture. The aircraft collided with a metallic fence and a bank and sustained substantial damage.</td></tr>
<tr><td></td><td>Probable Causes</td><td colspan="3">In this accident, it is probable that the glider was not corrected to appropriate approach path by using dive brakes and lowered approach path during an approach, subsequently collided with the fence and the bank at the west side of airfield and sustained damage.
 
</td></tr>
<tr><td></td><td>Report</td><td colspan="3">http://www.mlit.go.jp/jtsb/eng-air_report/JA2523.pdf</td></tr>
<tr><td>10</td><td>Date of publication</td><td>Date and location</td><td>Operator</td><td>Aircraft registration number and aircraft type</td></tr>
<tr><td></td><td>October 30, 2014</td><td>August 18, 2012
Otone Airfield, Kawachi Town, Inashiki-gun, Ibaraki Prefecture</td><td>Private</td><td>JA3814
Cessna 172N Ram
(small aeroplane)</td></tr>
<tr><td></td><td>Summary</td><td colspan="3">The aircraft took off from the Otone Airfield for a familiarization flight. During a touch and go attempt back at the airfield, the aircraft bounced on the first touchdown and after the ensuing landing the aircraft ran obliquely resulted in running off the runway. The aircraft became airborne again and struck one of the workers mowing grass on the south side of the runway. The worker suffered fatal injuries.
 
On board the aircraft were the Captain and three passengers, none of whom was injured.
The aircraft sustained substantial damage, but there was no outbreak of fire.</td></tr>
<tr><td></td><td>Probable Causes</td><td colspan="3">It is highly probable that in this accident, the aircraft veered off the runway at the Otone Airfield during a touch and go attempt, striking a worker who was mowing grass.
With regard to deviation of the aircraft from the runway, it is highly probable that it was because the Captain moved the throttle lever to full open for takeoff concurrently with operating the left rudder to correct the direction of the landing roll, and that the Captain's maneuver was caused the aircraft to abruptly swerve to the left, which is the characteristic of the single-engine propeller airplane with a propeller rotating clockwise, and that the Captain could not take appropriate corrective actions.
With regarding to the Captain's failure to correct the deflection of the aircraft, it is somewhat likely that the Captain was upset by the bouncing and other factors after the ensuing landing. In addition, it is somewhat likely that the Captain did not have well-established capability to successfully handle in such the situations as something unexpected happened to him or something made the Captain temporally and psychologically pressed.
Moreover, it is somewhat likely that the weight and the location of the center of gravity, which were both beyond the operating limitations, had an adverse effect on the characteristic and maneuverability of the aircraft.</td></tr>
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<tr><td></td><td>Report</td><td colspan="3">http://www.mlit.go.jp/jtsb/eng-air_report/JA3814.pdf</td></tr>
<tr><td rowspan="3">11</td><td>Date of publication</td><td>Date and location</td><td>Operator</td><td>Aircraft registration number and aircraft type</td></tr>
<tr><td>November 27, 2014</td><td>March 16, 2013
Yamamoto, Asanamihara, Matsuyama City, Ehime Prefecture</td><td>Private</td><td>JA23TN
Robinson R22 Beta
(rotorcraft)</td></tr>
<tr><td>Summary</td><td colspan="3">The aircraft took off from a temporary operation site in Fukuyama City, Hiroshima Prefecture, for a leisure flight en route to Matsuyama Airport. The aircraft was damaged during a forced landing near Asanamihara, Matsuyama City, Ehime Prefecture, after the captain noticed an abnormality in the engine RPM.
The captain and one passenger were on board the aircraft, and the captain suffered a minor injury.
The aircraft was destroyed, but there was no outbreak of fire.</td></tr>
<tr><td></td><td>Probable Causes</td><td colspan="3">It is probable that when the engine/rotor RPM increased while cruising to the destination airport, the captain could not deal with the situation, which led him to aim for a bamboo grove to make a forced landing, and that the airframe was damaged at the time.
It is probable that the reason the captain could not deal with the situation is because he decided that the cause of the rotor over-speeding was that the engine was over-speeding and out of control, without confirming the engine/rotor RPM from the indication of the tachometer.
It is somewhat likely that the reason the engine/rotor RPM increased involved the power switch of the alternator being in the off position for some reason and there being no power supply from the alternator, which caused the master battery power to be consumed leading to a lack of the power supply required to operate the governor, which in turn caused the operation of the governor to be suspended. However, because it was not possible to identify when the alternator switch became in the off position, it could not be determined why the RPM increased.</td></tr>
<tr><td></td><td>Report</td><td colspan="3">http://www.mlit.go.jp/jtsb/eng-air_report/JA23TN.pdf</td></tr>
<tr><td rowspan="3">12</td><td>Date of publication</td><td>Date and location</td><td>Operator</td><td>Aircraft registration number and aircraft type</td></tr>
<tr><td>December 18, 2014</td><td>March 31, 2012
On Runway 34L of Tokyo International Airport</td><td>Japan Airlines Co., Ltd.</td><td>JA701J
Boeing 777-200
(large aeroplane)</td></tr>
<tr><td>Summary</td><td colspan="3">The aircraft took off from Shanghai Hongqiao International Airport and approached Runway 34L of Tokyo International Airport. When the aircraft made go-around after touching down on the runway, the lower part of its aft fuselage made contact with the runway, and then damaged the airframe. Afterwards, the aircraft landed at Tokyo International Airport.
There were 308 people on board, consisting of a Pilot-In-Command (PIC), 11 crew members, and 296 passengers, but nobody sustained injuries.
The aircraft sustained substantial damage, but there was no outbreak of fire.</td></tr>
<tr><td></td><td>Probable Causes</td><td colspan="3">In this accident, it is highly probable that the aircraft continued rolling with the pitch-up attitude after touchdown, causing the aft fuselage to come into contact with the runway and be damaged.
It is highly probable that the aircraft continued rolling with the pitch-up attitude due to the following reasons: after touchdown, the PIC had felt that the aircraft had bounced to the extent necessary for go-around, and judged to make go-around to avoid a hard landing, even after he became aware that the reverse thrust levers had been raised, he continued go-around; hence, it took time for the engine thrust to increase and he continued to pull his control column. Moreover, it is somewhat likely that, in a situation in which the PIC had been assisting the control of
  </td></tr>
</table>

		the FO, and without the PIC's declaring a takeover, the intention of the PIC was not properly conveyed to the FO, the sharing of duties between PF (Pilot mainly in charge of flying) and PM (Pilot mainly in charge of duties other than flying). became momentarily unclear, and the monitoring of flight information such as pitch angle and speed, which was the duty of PM, was not performed adequately.
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA701J.pdf http://www.mlit.go.jp/jtsb/aircraft/p-pdf/AA2014-8-1-p.pdf (Explanatory material)

13	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	December 18, 2014	July 27, 2014 Koya, Kounosu City, Saitama Prefecture	Private	JR1096 Beaver RX550-R503L (ultralight plane)
	Summary	During the familiarization flight over Fukiage Temporary Airfield located in Kounosu City, Saitama Prefecture, the aircraft crashed in the grass field outside of the Temporary Airfield when it attempted to perform a go-around. One pilot was on board the aircraft. The pilot sustained injuries, and the aircraft was destroyed. 		
	Probable Causes	It is probable that this accident occurred, while performing a go-around, the pilot pedaled the left rudder hard when he increased the engine output in the nose-up attitude at a low speed close to stall speed, which made the aircraft suddenly rolled to the left and losing the altitude and resulted in a crash. It is probable that the pilot pedaled the left rudder hard in the nose-up attitude at a low speed closing to stalling speed because he tried to avoid colliding with a trailer for aircraft storage. It is probable that the aircraft approached the trailer because the pilot could not appropriately control the aircraft, which drifted to the right direction after being exposed to strong cross wind from the right. It is also probable that the maneuver of the go-around was affected by the fact that the trailer was placed in the area where there should be no obstacle.		
	Report	http://www.mlit.go.jp/jtsb/aircraft/rep-acci/AA2014-8-2-JR1096.pdf		

List of published investigation reports on aircraft serious incidents (2014)

1	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	January 31, 2014	November 25, 2012 Satsuma-Iojima Airfield, Mishima-mura, Kagoshima Prefecture	Private	JA3689 Fuji Heavy Industries FA-200-180 (small aeroplane)
	Summary	When the aircraft landed at the above Airfield, the left brake became ineffective. The aircraft veered off the runway to the right as the captain intentionally pedaled the right brake hard, and it came to a halt upside down on the meadows. One passenger sustained injuries.		
	Probable Causes	It is highly probable that this serious incident occurred when the left brake became ineffective, and the aircraft ran off the runway to the right as the captain intentionally applied the right brake hard, and came to a halt after tumble in the meadows, and thus became unable to taxi by itself.  It is highly probable that the left brake system became ineffective because the O-ring of the left master cylinder in the brake system was worn out, and the master cylinder could not maintain sealing capability and could not sufficiently		

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<tr><td></td><td></td><td colspan="3">transmit the brake fluid pressure to the brake linings.
It is possible that the wear of the O-ring was caused from aging deterioration.</td></tr>
<tr><td></td><td>Recommendations</td><td colspan="3">Recommendations to Fuji Heavy Industries Ltd. (January 31, 2014)</td></tr>
<tr><td></td><td></td><td colspan="3">In the Fuji Heavy Industries FA-200 series aircraft, the O-ring of the master cylinder in the brake system is to be replaced if found defective when the master cylinder is disassembled and visually inspected at the 1,000hrs check. However, an O-ring tends to expand when soaked in hydraulic fluid, and in addition, the O-ring becomes hardened when pressured and may have wear or damage which is hard to recognize visually. Therefore, it is recommended to consider that the O-ring should be replaced when the master cylinder is disassembled and usable duration of the O-ring should be established.</td></tr>
<tr><td></td><td>Report</td><td colspan="3">http://www.mlit.go.jp/jtsb/eng-air_report/JA3689.pdf</td></tr>
<tr><td>2</td><td>Date of publication</td><td>Date and location</td><td>Operator</td><td>Aircraft registration number and aircraft type</td></tr>
<tr><td></td><td>April 25, 2014</td><td>June 30, 2013
Ryugasaki Airfield in Handa Town, Ryugasaki City, Ibaraki Prefecture</td><td>Private</td><td>JA3919
Piper PA-28-161
(small aeroplane)</td></tr>
<tr><td></td><td>Summary</td><td colspan="3">When the aircraft landed at the above Airfield, it could not stop within the runway and stopped in a grass overrun area.
No one sustained injuries, and there was no damage to the aircraft.</td></tr>
<tr><td></td><td>Probable Causes</td><td colspan="3">It is probable that the serious incident occurred because the airplane overran the runway due to the inadequate way of using the brakes, in addition to landing with making the touchdown point farther away.
As for landing with making the touchdown point farther away, it is probable that deceleration became insufficient due to the operation of correcting the lifted path.
Moreover, it is somewhat likely that the existence of a tailwind component against the airplane became a factor of the lifted path and the increase in the LGRD.
  </td></tr>
<tr><td></td><td>Report</td><td colspan="3">http://www.mlit.go.jp/jtsb/eng-air_report/JA3919.pdf</td></tr>
<tr><td>3</td><td>Date of publication</td><td>Date and location</td><td>Operator</td><td>Aircraft registration number and aircraft type</td></tr>
<tr><td></td><td>June 27, 2014</td><td rowspan="2">October 12, 2011
On Runway 06R at Kansai International Airport</td><td>Hawaiian Airlines
(Aircraft A)</td><td>N588HA
Boeing 767-300
(large aeroplane)</td></tr>
<tr><td></td><td></td><td>All Nippon Airways Co., Ltd.
(Aircraft B)</td><td>JA8356
Boeing 767-300
(large aeroplane)</td></tr>
<tr><td></td><td>Summary</td><td colspan="3">N588HA was holding short of Runway 06R at Kansai International Airport for takeoff as the scheduled flight 450 of the company for Honolulu International Airport (in the State of Hawaii in the United States), while JA8356 was on final approach to Runway 06R of Kansai International Airport as the scheduled (cargo) flight 8519 of the company.
When an arriving aircraft passed in front of N588HA that had been holding, the air traffic controller instructed N588HA again to hold, and then cleared JA8356 to land. However, N588HA entered the runway and, as a result, JA8356 made a go-around following the instructions of the air traffic controller.
There were 208 people on board N588HA, consisting of a Pilot in Command (PIC), 11 other crewmembers and 196 passengers, while two people on board JA8356, consisting of a PIC and another crewmember. No one was injured on either aircraft and no damage was sustained to the two aircraft.</td></tr>
<tr><td></td><td>Probable Causes</td><td colspan="3">It is probable that this serious incident occurred as a departing aircraft</td></tr>
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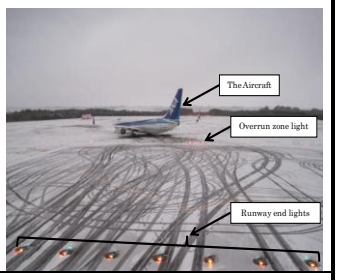
		(N588HA) entered a runway despite the fact that it had been instructed to continue holding short of the runway, leading to an arriving aircraft (JA8356), which was cleared to land after the instruction to N588HA, attempting to land on the same runway. It is probable that N588HA entered the runway because the flight crewmembers of the aircraft incorrectly heard the instruction to continue holding as an instruction to hold on the runway and misunderstood whereas the Controller assumed that his instruction was correctly understood by N588HA and did not request clarification despite the fact that the readback from N588HA did not match the phraseology of the original instruction. It is probable that the following contributed to the mishearing of the instruction by the flight crewmembers. (1) The words included in the instruction were the same as those previously used in the U.S. to instruct aircraft to hold on the runway. (2) The crewmembers were expecting that the next instruction from the Tower would be for them to hold on the runway. (3) The instruction to hold was issued to N588HA, which had been holding short of the runway, just when an arriving aircraft passed in front of them. (4) The crewmembers thought that they would be able to take off before JA8356 landed. It is probable that the following contributed to the Controller's assuming the instruction to be understood by N588HA. (1) The Controller did not know that the phraseology used in the readback was previously used in the U.S. to instruct aircraft to hold on the runway. (2) The readback included the same words that were used in the instruction.
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/N588HA_JA8356.pdf

4	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	September 25, 2014	September 6, 2011 At an altitude of 41,000ft, approx. 69nm east of Kushimoto, Wakayama Prefecture	Air Nippon Co., Ltd.	JA16AN Boeing 737-700 (large aeroplane)
	Summary	The aircraft nosedived after having an unusual attitude (upset) at an altitude of 41,000 ft about 69 nm east of Kushimoto while flying from Naha Airport to Tokyo International Airport as the scheduled flight 140 of the All Nippon Airways Co., Ltd. There were 117 people on board the aircraft, consisting of the captain, the first officer, three cabin attendants and 112 passengers. Of these people, two cabin attendants sustained slight injuries. There was no damage to the aircraft.		
	Probable Causes	 It is highly probable that this serious incident occurred in the following circumstances: During the flight, the first officer erroneously operated the rudder trim control while having an intention of operating the switch for the door lock control in order to let the captain reenter the cockpit. The aircraft attitude became unusual beyond a threshold for maintaining the aircraft attitude under the autopilot control. The first officer's recognition of the unusual situation was delayed and his subsequent recovery operations were partially inappropriate or insufficient; therefore, the aircraft attitude became even more unusual, causing theaircraft to lose its lifting force and went into nosedive. This led to a situation which is equivalent to "a case where aircraft operation is impeded." It is probable that the followings contributed to the first officer's erroneous operation of the rudder trim control while having an intention of operating the door lock control; he had not been fully corrected his memories of operation about the door lock control of the Boeing 737-500 on which he was previously on duty; the door lock control of the Boeing 737-500 series aircraft was similar to the rudder trim control of the Boeing 737-700 series aircraft in their placement, shape, size and operability. It is		

		somewhat likely that his memories of operation about the switch for the door lock control of the Boeing 737-500 aircraft had not been fully corrected because he failed to be fully accustomed with the change in the location of the switch for the door lock control. It is somewhat likely that this resulted from lack of effectiveness in the current system for determining the differences training contents and its check method, under which the Air Nippon Co., Ltd. and other airlines considered and adopted specific training programs to train pilots about how to operate the flight deck switches when their locations changed and the Civil Aviation Bureau of the Ministry of Land, Infrastructure, Transport and Tourism reviewed and approved them. It is probable that the first officer's failure to properly manage tasks contributed to his erroneous operation of the rudder trim control. It is somewhat likely that the similarities between the switches for the door lock control and the rudder trim control in their operability contributed to the delay in his recognition of the erroneous operation. Moreover, he was excessively dependent on autopilot flight and he failed to be fully aware of monitoring the flight condition. It is somewhat likely that the first officer's recovery operations were partially inappropriate or insufficient because he was startled and confused on the occurrence of an unexpected unusual situation in which the stick shaker was activated during the upset recovery maneuver. It is somewhat likely that the followings contributed to his startle and confusion: he had not received upset recovery training accompanied with a stall warning and in unexpected situations, thereby he lacked the experience of performing duties in such situations before the serious incident, and he had not received upset recovery training at a high altitude.
	Recommendations	Recommendations to the Minister of Land, Infrastructure, Transport and Tourism (September 25, 2014)
		The Minister should study the possibility of making "upset recovery training" mandatory for the air transport services provider and urge them to implement this training at a high altitude upon considering defined flight envelope validated region of flight simulators. If necessary, they should also be urged to introduce a system to examine whether the recovery process is made outside the validated region. Moreover, guidance should be made to have airlines prepare scenarios for such training in which a stall warning and others will be simultaneously activated or in which an upset cannot be expected by trainees. It should be noted that measures based on this recommendation shall be implemented after an international trend over related matters is fully confirmed.
		Recommendations to All Nippon Airways Co., Ltd. (September 25, 2014)
		(1) Thorough Implementation of Basic Compliance Matters for Cases when Aircraft is Operated by a single pilot and Training to This End The preventive measures concerned, as described in the OM information published by Air Nippon Co., Ltd. and in The Flight ANA Group, should be thoroughly implemented for all flight crew members as specific and permanent basic compliance matters and they should be continuously trained to this end. (2) Implementation of High Altitude Upset Recovery Training Accompanied with Stall Warning and Other Events All Nippon Airways Co., Ltd. should implement "upset recovery training" at a high altitude upon considering defined flight envelope validated region of flight simulators. If necessary, All Nippon Airways Co., Ltd. should also introduce a system to examine whether the recovery process is made outside the validated region of flight envelope. Moreover, scenarios in which a stall warning and others will be simultaneously activated or in which an upset cannot be expected by trainees should be prepared for such training.
	Safety Recommendations	Safety Recommendations to the Federal Aviation Administration (FAA) (September 25, 2014)
		The aircraft designer and manufacturer shall study the need to reduce or eliminate the similarities between the rudder trim control and the switch for the door lock control of the Boeing 737 series aircraft, in terms of the shape, size and operability as mentioned in this report. In particular, it shall consider the effectiveness of changing

		the shape and size of the rudder trim control to the design adopted for the rudder trim control for Boeing models other than those of the Boeing 737 series, in which the switch has a cylindrical shape about 50mm in diameter without a brim, so that the difference of the size and shape can be recognized only with a touch.
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA16AN.pdf http://www.mlit.go.jp/jtsb/aircraft/p-pdf/AI2014-4-2-p.pdf (Explanatory material) See 10 Summaries of major aircraft accident and serious incident investigation reports (case studies) (P.41)

5	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	September 25, 2014	December 8, 2012 East end of the runway at Shonai Airport, Yamagata Prefecture	All Nippon Airways Co., Ltd.	JA57AN Boeing 737-800 (large aeroplane)
	Summary	The aircraft took off from Tokyo International Airport as a scheduled Flight 899 of the above-mentioned company, and landed at Shonai Airport. The landing ended up a runway overrun and it came to a halt in a grass area. There were a total of 167 people on board, consisting of a PIC, five crew members, and 161 passengers. No one was injured, nor was there any damage to the aircraft.		
	Probable Causes	In the serious incident, it is highly probable that the overrun occurred as the aircraft failed to exert the expected braking force under the informed runway conditions after the landing. It is probable that the changed runway conditions due to snowfall and other elements near freezing temperature after the snow/ice measurement negatively affected the expected braking force. 		
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA57AN.pdf		

6	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	September 25, 2014	January 16, 2013 Takamatsu Airport, Kagawa Prefecture	All Nippon Airways Co., Ltd.	JA804A Boeing 787-8 (large aeroplane)
	Summary	The airplane took off from Yamaguchi Ube Airport for Tokyo international Airport as its scheduled flight 692. When it was climbing through 32,000 ft over Shikoku Island, an EICAS message of battery failure came on accompanied by unusual smell in the cockpit. The airplane diverted to Takamatsu Airport and landed there.  An emergency evacuation was executed using slides on T4 taxiway. Four passengers out of 137 occupants (the Captain, seven crewmembers and 129 passengers) suffered minor injuries during the evacuation. Although the main battery was damaged, it did not lead to a fire.		
	Probable Causes	The emergency evacuation was executed on Takamatsu Airport taxiway in the serious incident, which was a consequence of emergency landing deriving from the main battery thermal runaway during the airplane's takeoff climb. Internal heat generation in cell 6 very likely developed into venting, making it the initiating cell, resulting in cell-to-cell propagation and subsequent failure of the main battery. It is very likely that cell 6 internal heat generation and increased internal pressure caused it to swell, melt the surrounding insulation material and contact the brace bar creating a grounding path that allowed high currents to flow through the battery box. The currents generated arcing internal to the battery that contributed to cell-to-cell propagation consequently destroying the battery.		

		Cell 6 heat generation was probably caused by internal short circuit; however, the conclusive mechanism thereof was not identified. In the serious incident, the internal short circuit of a cell developed into cell heat generation, thermal propagation to other cells, and consequently damaged the whole battery. The possible contributing factors to the thermal propagation are that the test conducted during the developmental phase did not appropriately simulate the on-board configuration, and the effects of internal short circuit were underestimated.
	Safety Recommendations	Safety Recommendations to the Federal Aviation Administration (FAA) (September 25, 2014)
		1. Actions to be taken by the Federal Aviation Administration (1) Provide instruction to airplane manufactures and equipment manufactures to perform equipment tests simulating actual flight operations. (2) Review the technical standards for lithium ion battery to ensure that the electric environment is appropriately simulated, and if necessary, amend the standards. (3) Review the lithium ion battery failure rate estimated during the 787 type certification, and if necessary, based on its result, review the lithium ion battery safety assessment. (4) Review the type certificate for its appropriateness on heat propagation risk. (5) Assess the impact of contactor opening after the cell vent on the flight operation and take appropriate actions, if necessary. 2. Measures to Be Taken to Instruct The Boeing Company as a Designer and Manufacturer of the 787 (1) Continue the study of internal short circuit mechanism considering the effects of non-uniform winding formation and other factors deriving from manufacturing process; and continue efforts to improve lithium ion battery quality and its reliability, reviewing the LIB operational conditions, such as temperature. (2) Improve BCU and contactor operations which are outside the design envelop.
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA804A.pdf http://www.mlit.go.jp/jtsb/aircraft/p-pdf/AI2014-4-3-p.pdf(Explanatory material)

7	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	November 27, 2014	June 4, 2011 Above Okushiri Airport, Hokkaido	Hokkaido Air System Co., Ltd.	JA03HC SAAB 340B (large aeroplane)
	Summary	The aircraft took off from Hakodate Airport as a scheduled Flight 2891. During the approach to Runway 31 of Okushiri Airport, the aircraft executed a go-around and once started climbing, but it soon reversed to descend. Consequently, its flight crew became aware of the situation and executed an emergency operation to avoid crash to the ground. The aircraft flew back to Hakodate Airport, following some holdings over Okushiri Airport. There were a total of 13 persons on board: the Pilot-in-Command, the First Officer and a cabin attendant as well as 10 passengers, but no one was injured. In addition, there was no damage to the aircraft.		
	Probable Causes	In this serious incident, during the approach to Runway 31 of Okushiri Airport, the aircraft executed a go-around and once started climbing but it soon reverted to descend and came close to the ground. Consequently, flight crewmembers came to realize the situation and executed an emergency operation to avoid crash to the ground. It is highly probable that the aircraft's descent and approach to the ground was caused by the following factors: (1) The PIC followed the Flight Director command bar instructions, which indicated the descent because the altitude setting was not changed to the initial go around altitude, and subsequently the PIC made the aircraft descend even lower than the FD command bar instructions. (2) The PIC and the FO could not notice descending of the aircraft and their recovery maneuvers got delayed. It is highly probable that these findings resulted from the fact that the PIC could		

		not perform a fundamental instrument flight, the PIC and the FO used the autopilot/Flight Director System in an inappropriate manner without confirming the flight instruments and the flight modes, and the FO could not transiently carry out closer monitor of the flight instruments because of the other operations to be done. Moreover, it is probable that the FO's operation of engaging an autopilot and changing the vertical mode to make the aircraft climb by using the Autopilot/Flight Director System eventually became a factor to delay avoiding maneuvers against ground proximity. It is probable that the Company didn't create a standard procedure, reflecting the contents of Aircraft Operating Manual, for its crewmembers to confirm and call out the changes mode, without noticing its importance and didn't carry out adequate training. Furthermore, it is probable that the PIC and the FO excessively relied on the autoflight system.
	Recommendations	Recommendations to Hokkaido Air System Co., Ltd. (November 27, 2014)
		(1) Calling out and confirming the mode change for sure Hokkaido Air System Co., Ltd. should make its flight crewmembers comply with the specifics of Airplane Operating Manual (confirmation and callouts of mode changes upon using the Autopilot/Flight Director system or on progress of automatic mode changes), as described in 2.13.4 without fail, and it should consider that Flight Training Guide shall be revised in some related matters. (2) Appropriate use of autoflight system and management of pilots' skill It is important for the Hokkaido Air System Co., Ltd. to increase the opportunities for training as well as utilizing simulator's session to improve raw data instrument skills. The Hokkaido Air System Co., Ltd. also should clarify the problems caused by excessive reliance on the autoflight system and consider to fully inform its flight crewmembers of specific countermeasures against them.
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA03HC.pdf http://www.mlit.go.jp/jtsb/aircraft/p-pdf/AI2014-5-1-p.pdf(Explanatory material)

8	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	December 18, 2014	July 8, 2012 Japanese Red Cross Asahikawa Hospital Landing Field, Asahikawa City, Hokkaido	Aero Asahi Corp.	JA6911 McDonnell Douglas MD900 (rotorcraft)
	Summary	The aircraft diverted to Asahikawa Airport and landed at the Airport due to the fact that engine No.1 stopped immediately after taking off from the above Field.		
	Probable Causes	It is probable that this serious incident occurred due to the severely damaged CT vane ring (at the six o'clock position) causing the hot sections to become severe overtemperature condition, leading to the CT blades becoming fractured and the PT blades downstream also becoming fractured . For the reason as to why the CT vane ring was severely damaged at the six o'clock position in comparison with the other positions, it is somewhat likely that the cracks that extended into the fillet radii of the vane, and/or cracks that converged at a point had formed, and that said cracks expedited the progress of the cracks. However, it was not possible to identify the cause of this as the CT vane ring had been burnt away.		
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA6911.pdf		

7 Summaries of recommendations and opinions

Summaries of recommendations and opinions for 2014 are as follows.

① Aircraft Serious incident involving privately owned Fuji Heavy Industries FA-200-180, registered JA3689. (Recommended on January 31, 2014)
○Summary, Probable Causes and Recommendations of the Serious incident See「6 Statistics of published aircraft accident and serious incident investigation reports」on Page 17 No.1

② Aircraft Serious incident involving Boeing 737-700, registered JA16AN, operated by Air Nippon Co., Ltd. (Recommended on September 25, 2014)
○Summary, Probable Causes and Recommendations of the Serious incident See「Statistics of published aircraft accident and serious incident investigation reports」on Page 19 No.4
③ Aircraft Serious incident involving SAAB 340B, registered JA03HC, operated by Hokkaido Air System Co., Ltd. (Recommended on November 27, 2014)
○Summary, Probable Causes and Recommendations of the Serious incident See「Statistics of published aircraft accident and serious incident investigation reports」on Page 22 No.7

④ Aircraft Serious incident involving Boeing 787-8, registered JA804A, operated by All Nippon Airways Co., LTD. (Recommended on September 25, 2014)
○Summary, Probable Causes and Recommendations of the Serious incident See「Statistics of published aircraft accident and serious incident investigation reports」on Page 21 No.6

Column

Participating in the Exercise for Underwater Recovery in Taiwan

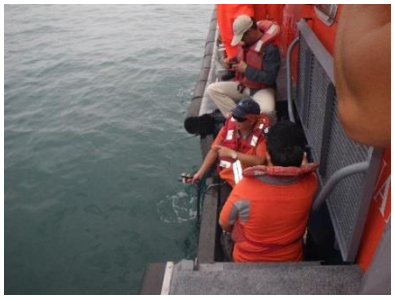
Aircraft accident investigator

It has been a year since I was employed as an aircraft accident investigator. Since investigations of aircraft accidents are highly specialized work, they require expertise and experience regarding aircraft, including piloting, maintenance, air traffic control, weather, aeromechanics, designs, etc.

Investigations of aircraft accidents also use various investigation equipment, so we must be familiar with the use. Therefore, we, investigators aim to improve our accident investigation capabilities by undergoing various trainings and workshops.

In this column, I would like to introduce the "Exercise for Underwater Recovery", which was held by the aircraft accident investigation organization "Aviation Safety Council (ASC)" of Taiwan, in June of 2014.

The Underwater Recovery is utilized to specify the location of aircraft when it crashes in the ocean, large river/lake, etc. in order to withdraw the black box and aircraft, etc. It is an international requirement for black boxes to equip a transmitter, which automatically transmits acoustic signals when they crash into water. In case an aircraft crash into water, it enables us to search for the location of the black box by using the acoustic signals transmitted by the transmitter. There are special signal receiver that can't be easily handled by anyone. In order to be able to accurately specify the location, we must undergo a certain amount of exercise. Although underwater accidents, in which the aircraft location cannot be specified, don't happen frequently, we cannot be in the condition where we don't know how to handle the receiver and are not able to conduct accident investigations in case of such accidents. Therefore, I attended the exercise held by the ASC and learned the operation procedures.



The training was held in the 3km radius sea area located north of the Taiwan island, off the coast of Bisha Fishing Port in Keelung City. A total of 18 investigators, including 13 investigators from Taiwan, 4 investigators from Singapore, and 1 investigator from Japan divided into 3 boats and specified the location of the training transmitter by using special signal receivers.

A training transmitter to simulate a black box that transmits the acoustic signal is somewhere underwater within this sea area. Each team records the locations of 12 check points, which were pre-arranged on the sea surface, in GPS and goes around the check points. At each check point, each team lowers the signal receiver under water to listen to the acoustic sound of the training transmitter. Simply put, a signal receiver is like an underwater microphone, which can change directions, with a handle about 1.5m long. When you slowly turn the handle while listening to the sound with the receiver, the sound becomes loudest in one direction. You record the direction of the microphone as well as the coordinate of the boat at the time, and you draw a line in the direction from which the sound was heard in the coordinate where the measurement is made. You repeat this process at each point, and where the lines cross each other is the location of the training transmitter. In reality, a program is included in a mobile PC, and the location is displayed on the PC screen when we enter the coordinates and directions.

The training is done by assigning and switching roles, including the measurement role, recording role, and role to guide the boat to the point. The exercise was hard, due to the work that I was

not used to as well as sea sickness, but I was able to specify the location of the training transmitter by cooperating with investigators of Taiwan. The fact that I was able to achieve the exercise goal while attempting to communicate with poor English skills resulted in great confidence. Aircraft accidents can occur anywhere in the world. We may have to investigate accidents in collaboration with foreign investigators. Unless we repeatedly confirm what is unclear and thoroughly discuss before the investigation, we wouldn't be able to smoothly conduct the accident investigation. Not only that, but it is also possible that time passes without making progress, resulting in we losing the trace of the accident. I hope to continue making efforts to better myself and utilize this experience in the future aircraft accident investigations.

8 Actions taken in response to recommendations in 2014

Actions taken in response to recommendations were reported with regard to three aircraft accidents and one aircraft serious incident in 2014. Summaries of these reports are as follows.

① Aircraft accident involving a privately owned Piper PA-46-350P (small aeroplane), registered JA701M

(Recommended on September 28, 2012)

As a result of the investigation of an aircraft accident which occurred at Mt. Yago approximately 14km northeast of Kumamoto Airport on January 3, 2011, the JTSB published an investigation report and made recommendations to the Minister of Land, Infrastructure, Transport and Tourism on September 28, 2012. The Board received the following notice on the measures in response to the recommendations.

○ Summary of the Accident

A privately owned Piper PA-46-350P, registered JA701M, took off from Kumamoto Airport at around 17:11 Japan Standard Time for Kitakyushu Airport and went missing on Monday, January 3, 2011. It was found on the south-southeast slope of Mt. Yago, 14 km northeast of the airport next day.

Two persons on board, a PIC and a passenger, suffered fatal injuries.

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

Accident Aircraft

○ Probable Causes

It is highly probable that the aircraft collided with the mountain slope during its in-cloud post-takeoff climb with low climb rate on its VFR flight to Kitakyushu Airport from Kumamoto Airport, resulting in the aircraft destruction and fatal injuries of two persons on board–the PIC and the passenger.

Accident Aircraft
(At the accident site)

It is somewhat likely that the contributing factor to in-cloud flight toward mountain slope with low climb rate is the PIC's lack of familiarization with terrain features near Kumamoto Airport; however, the JTSB was unable to clarify the reason.

○ Recommendations

In order to prevent the accidents in in-cloud flight under Visual Flight Routes, Civil Aviation Bureau publicizes again the following contents to the pilot associations and also make them known to a pilot individual using the opportunities of the newly introduced system "Pilot Competency Assessment" (2012 MLIT Ordinance No. 22):

· Commence flying only when VMC is maintained all across the enroute based on the latest weather

information.

· Prepare alternative plan in case of deteriorating weather while collecting weather information on enroute.

· Decide well in advance on returning to the departed airport or landing at a proper place.

○Actions Taken in Response to the Recommendations (notice)

While Japan Civil Aviation Bureau (JCAB) has been calling attention to the items, that are required to be publicized in the recommendation, hither to (Kokukuko No. 86, dated April 20, 2002, Kokukuko No. 359, dated August 2, 2012), JCAB has decided to newly prepare a pamphlet to encourage each pilot to re-acknowledge the hazard in in-cloud VFR flight based on the recent accident cases and to publicize this by distributing the pamphlet to pilots by using the opportunities such as "Pilot Competency Assessment", etc.

Pamphlet distribution and publicizing methods are as follows:

1. JCAB has decided to confirm how to secure flight safety for VFR flight with examinees in the oral examination conducted by pilot competence examiners, who are certified according to the stipulations under Article 71-3-1 of the Civil Aeronautics Act (Act No. 231 of 1952) and to distribute the above pamphlet to examinees in the briefing after the examination.

   There are 940 certified pilot competent examiners as of the end of November, 2013, and JCAB are scheduled to complete the pamphlet shipment to these examiners by the end of December of the same year.
2. JCAB has decided to utilize the opportunities of certification and periodical seminars for pilot competence examiners, which are held by Regional Civil Aviation Bureaus, to notify the response regarding the distribution of the above pamphlet to these examiners. Also JCAB has decided to request Regional Civil Aviation Bureaus to distribute the above pamphlet to all pilots belonging to air transport service operators that mainly perform VFR flight and issue notifications.

   In addition, JCAB has decided to distribute the above pamphlet to pilots through airport offices, etc. that are managed by Regional Civil Aviation Bureaus when the opportunity presents itself.
3. JCAB has issued the Kokukuko No. 738, dated December 2, 2013 "Thorough accident prevention in VFR operation" (hereinafter referred to as "the Notice") to the All Japan Air Transport and Service Association to notify regarding accident prevention of flight in cloud by VFR again. JCAB also requested member operators to cooperate with the activities promoted by JCAB.
4. JCAB has issued the Notice to the Japan Aircraft Pilot Association to notify regarding accident prevention of flight in cloud by VFR again. JCAB has also requested them to notify regarding the above pamphlet in seminars, etc. hosted by the Association and to encourage member pilot competence examiners to cooperate with the activities promoted by JCAB.

   *This notice, including materials, is published on the JTSB website:

   http://www.mlit.go.jp/jtsb/airkankoku/kankoku1re_140129.pdf

② Aircraft accident involving a Beechcraft A36 (small aeroplane), registered JA4215, operated by the Obihiro Branch School of the Independent Administrative Institution Civil Aviation College

(Recommended on December 20, 2013)

As a result of the investigation of an aircraft accident which occurred on the slope of Mt. Tsurugi in Memuro-cho, Kasai-gun, Hokkaido, on July 28, 2011, the JTSB published an investigation report and made recommendations to the Minister of Land, Infrastructure, Transport and Tourism and the Independent Administrative Institution Civil Aviation College as one of the parties relevant to the cause of the accident, on December 20, 2013. The Board received the following report (completion report) on the implementation of measures in response to the recommendations.

○ Summary of the Accident

On Thursday, July 28, 2011, a Beechcraft A36, registered JA4215, operated by the Obihiro Branch School of the Independent Administrative Institution Civil Aviation College, took off from Obihiro Airport for flight training at 09:11 Japan Standard Time. At around 09:22, when practicing basic instrument flight in the training and testing area, the airplane crashed into the slope of Mt. Tsurugi in Memuro-cho, Kasai-gun, Hokkaido.

Airplane of the same type

On board the airplane were four persons: an instructor who was captain, two students, and an instructor in educational and research flight. Three of them: the captain, one of the students, and other instructor suffered fatal injuries, and the remaining student sustained serious injury.

The airplane was destroyed and a post-crash fire broke out.

○ Probable Causes

It is highly probable that the accident occurred as follows: The airplane conducting VFR BIF training operated by a hooded student was instructed by his instructor to fly into the mountainous area; It then flew into clouds or close to the clouds that covered the mountains, losing sight of ground references and approached the ground very close against the instructor's expectation; The instructor took the controls from the student and attempted to evade the mountains, but the airplane failed to change its course to an appropriate direction and crashed into the slope of the mountain.

It is somewhat likely that the instructor flew close to or into the clouds which covered the mountain with some intention; however, his death denied us the clarification his intention.

It is somewhat likely that the basic safety policy of the College was not instilled into the field instructors, and that there was a gap in safety awareness between management and field instructors. It is also somewhat likely that behind the accident was a problem that involved the entire organization of the College—a work environment/organizational culture that consequently allowed unsafe

behaviors.

○ Recommendations to the Minister of Land, Infrastructure, Transport and Tourism

The Minister should grasp reliably the actual condition of efforts towards improvement of the safety management system of the College, check the implementation status whether such various safety measures set by the College based on the medium-term plans, etc. are carried out continuously and certainly by such as periodically audits in the field and provide more guidance depending on the results until the College becomes able to operate a safety management system autonomously and steadily. Moreover, in setting safety-related medium-term goals as prescribed in the Act on General Rules for Independent Administrative Agencies, the Minister should consider how the College's medium-term goals should be, such as setting specific goals to ensure that a safety culture is brewed and safety activity is implement surely and continuously, including reviewing in timely manner, based on the organizational climate cannot be built in a day but also it is brewed by daily ongoing activity.

○ Recommendations to the Independent Administrative Institution Civil Aviation College

(1) Review of the Training Procedures

In the accident, it is somewhat likely that the airplane of the College was into or close to clouds during VFR training, and that another instructor onboard the airplane gave no advice about this behavior.

The College should aim to create an opened educational environment that enables observer instructors and students to give advice on safety issues in the training airplane without hesitation if necessary. Therefore, it should also consider to introduce effective methods, such as utilizing of installed video cameras in the airplane, etc.

(2) Strengthening of the Safety Management System

The College should establish a system for grasping the actual condition of instructors' teaching methods and provide them with appropriate guidance and supervision.

The possible contributing factors to the accident occurrence are that the safety management of the College actually deviated from its philosophy in its Safety Management Regulations and that there was a gap in safety awareness between management and field instructors, creating a work environment/organizational culture that allowed unsafe acts—a problem that involved the entire organization.

Thus in order to prevent recurrence of such situation and brew and keep an appropriate organizational climate, the College needs to establish a safety management system with the commitment of the all personnel from the General Safety Manager to field instructors and to properly operate it with continued reviewing.

(3) Review of medium-term plans and other related plans

In order to make sure to carry out the initiatives recommended in (1) and (2) above and make them an integral part of its administration, the College should review the medium-term and annual

plans and reflect these initiatives on the plans.

○Actions Taken by the Independent Administrative Institution Civil Aviation College in Response to the Recommendations (completion report)

(1) Review of the training procedures

The college aimed to create an opened educational environment that enables instructors and students to give advice without hesitation if necessary through the following initiatives and will continue making efforts to maintain/improve the appropriate environment in the future.

・The college has implemented education regarding assertions (necessary advice regarding safety) and provided clear guidance for instructors to create an environment where they can make assertions.

・The college has implemented education on CRM (Crew Resource Management: Refers to making efficient use of all available human resources, hardware, and information in order to ensure safe and efficient airplane operation).

In addition, the following measures were taken in order to be able to objectively comprehend and evaluate the training situation. With these measures, the college think that the training environment, in which instructors and students can give advice if necessary, has been sufficiently established, judging from the student questionnaire survey results, etc.

・Student questionnaire surveys were implemented after each flight to comprehend the training situation.

・The management conducted interviews with students regarding the training situation.

・Observation of flight training by the management has been enhanced.

・The college has strengthened the function to check inappropriate guidance by establishing regulations regarding harassment, etc. and strictly operating them.

・The college used GPS logger to confirm the flight route, etc. after each flight.

・The college has introduced a system to bring in and use IC recorders to record the sound within aircraft.

Video cameras are difficult to be installed for the time being, due to the facts that there is no equipment that has confirmed to bein compliance with the safety standards of small aeroplanes and that there is no installation method that has been deemed safe. The college will continue the investigation/consideration to consider whether or not installation is possible.

(2) Strengthening of the safety management system

In addition to the above (1), the college has been providing instructors with appropriate guidance and supervision by grasping the actual condition of instructors' teaching methods and promoting the establishment of the safety management system, appropriate operation of the system, and continuous review of the system, as follows:

・The college has assigned a person who had experience of aircraft accident investigation to the

position to assist the Safety Manager in order to comprehensively review its safety management system and took drastic safety measures.

・In addition to the enhancement of questionnaire surveys, etc. mentioned in (1), the college has established a group dedicated to receiving confidential incident reports with protecting reporters. Not only that, but the college also provide feedback based on the analyzed results, etc. In addition, the college also encourages people to submit confidencial incident reports through safety month, etc.

・In order to develop a safety culture, the college periodically provides safety training by inviting external experts.

・The college has established the Joint Safety Committee in addition to each school's monthly Safety Committee meetings to periodically discuss/share safety issues and resolve them.

・General Safety Promotion Conference is periodically held to consider safety promotion. The college also prepares the annual safety operation plan and promote periodical safety audits, etc. based on the plan with the aim of maintaining/strengthening the safety management system.

・The college has made all staff/students read the entire Obihiro accident investigation report and held special lectures for students and staff.

・Based on the Safety Management Regulations, the college has reconfirmed that operations are appropriately conducted and has also confirmed that reported items based on the Safety Management Regulations are appropriately reported and appropriately considered/responded.

・The college has not only clarified that they would aim to promote safety based on the "establishment of a fair culture" within the Safety Management Regulations but also made it known to staff and students through posters, etc.

(3) Review of medium-term plans and other related plans

The college has revised the third medium-term plan (FY2011 – 2015) and reflected the revision on the FY2014 plan.

*The completion report is published on the JTSB website:
http://www.mlit.go.jp/jtsb/airkankoku/kankoku5re_140528.pdf

③ Aircraft serious incident involving a privately owned Fuji Heavy Industries FA-200-180 (small aeroplane), registered JA3689

(Recommended on January 31, 2014)

As a result of the investigation of an aircraft serious incident which occurred in Satsuma-Iojima airfield on November 25, 2012, the JTSB published an investigation report and made recommendations to Fuji Heavy Industries Ltd. as one of the parties relevant to the cause of the serious incident on January 31, 2014. The Board received the following report (completion report) on the implementation of measures in response to the recommendations.

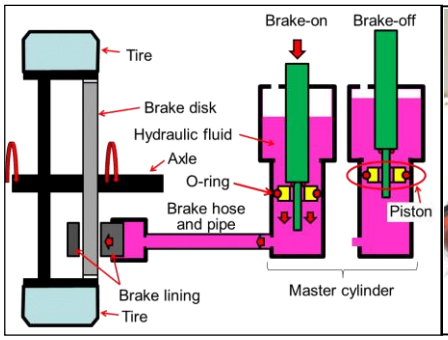
○ Summary of the Seious Incidents, Probable Causes, and Description of the Recommendations

Refer to "6 Statistics of published aircraft accident and serious incident investigation reports" (Page 17 No.1).

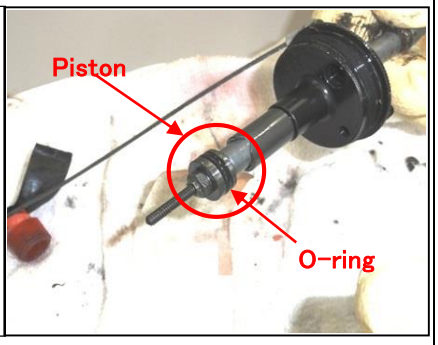
○Actions Taken in Response to the Recommendations (completion report)

(1) "Consider that the O-ring should be replaced when the brake master cylinder is disassembled"

According to the service manual, the O-ring for brake master cylinder was supposed to be replaced every 1,000 hours as necessary. The service manual was revised so that O-ring is replaced when the brake master cylinder is disassembled. The service manual was also revised so that the O-ring for other parts, which are required to be disassembled, is also replaced at the time of disassembly.



Schematic of brake system



Worn O-ring

(2) "Consider to establish the usable period of the O-ring for brake master cylinder"

Based on the flight time of FA-200, the usable period was established as 5 years.

Although the O-ring for brake master cylinder was to be replaced every 1,000 hours as necessary according to the service manual, the service manual was revised so that it is replaced every 1,000 hours or 5 years, whichever comes first.

(3) Other

Service bulletin was issued to ensure that O-rings of the aircraft in operation are replaced. Service news and the service bulletin were published on our special website for FA-200 (http://www.fhi.co.jp/fa200/).

*The completion report is published on the JTSB website:
http://www.mlit.go.jp/jtsb/airkankoku/kankoku5re_140528.pdf

④Aircraft accident involving a Eurocopter AS350B3 (rotorcraft), registered JA6522, operated by Shikoku Air Service Co., Ltd.

(Safety Recommendation on June 28, 2013)

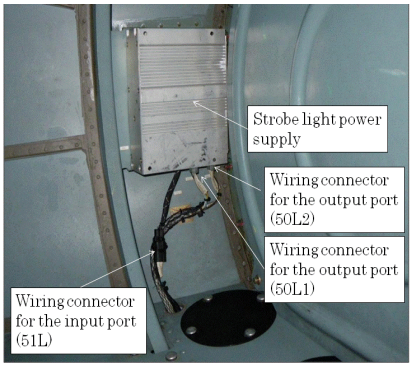
As a result of the investigation of an aircraft accident which occurred in Hiketa, Higashikagawa City, Kagawa Prefecture on September 22, 2011, the JTSB published an investigation report and made safety recommendations to the European Aviation Safety Agency (EASA) on June 28, 2013. The Board received the following responding report on the actions taken in response to the safety recommendations.

○ Summary of the Accident

On Thursday, September 22, 2011, a Eurocopter AS350B3, registered JA6522, operated by Shikoku Air Service Co., Ltd., took off from Takamatsu Airport at around 09:23 for power transmission lines inspection flight. A burnt smell and white smoke rose in the cabin during this flight, and at around 10:10, the helicopter made a forced landing at a baseball field located at Hiketa, Higashikagawa City, Kagawa Prefecture.

On board the helicopter were a pilot and two passengers, but none of them suffered injury.

After the forced landing, the helicopter caught fire and was destroyed.



Installation of the strobe light power supply (on the type of helicopter)

○ Probable Causes

In this accident, it is highly probable that a fire occurred in the rear hold of the Helicopter and the Helicopter made a forced landing.

Regarding a fire in the rear hold, it could not be identified the ignition source; nevertheless it is possible that a fire occurred from the wiring connected to the strobe light power supply, which was installed in the rear hold, and that it spread to inflammables placed around the power supply.

This is because the wiring was not designed and structured so that it was fully protected so as to prevent it from being damaged due to the movement of embarkation and preclude a risk of occurring a fire even if it was damaged or destroyed.

It is also possible that since it was not covered with nets to prevent its movement, embarkation in the rear hold damaged the wiring, which was not fully protected from damage due to the movement of the embarkation.

○ Safety Recommendations

(1) Electrical equipment and its wiring in the baggage compartment

The EASA should make it mandatory to modify the rear hold of the Eurocopter AS350 series so that electrical equipment and its wiring are fully protected.

(2) Manifestation of the matters which must be dealt with immediately by memory among the emergency procedures

In the Flight Manual of the Eurocopter AS350 Series, the EASA should urge the designer and manufacturer of the helicopter to specify the memory items among emergency procedures so that they can be performed immediately.

○Actions Taken in Response to the Safety Recommendations

On November 27, 2013, EASA issued the Airworthiness Directive 2013-0281 which supersedes the Airworthiness Directive 2011-0244-E and requires the installation of the protector assembly on the wiring and on the power supply unit of the position strobe light installation, thus providing a terminating action of the repetitive inspections and allowing any deactivated systems to be activated again.

*The report (original) from the European Aviation Safety Agency (EASA) is published on the JTSB website.
http://www.mlit.go.jp/jtsb/airkankoku/anzenkankoku7re_140318.pdf

9 Provision of factual information in 2014

The JTSB provided factual information on one case (one aircraft serious incident) to relevant administrative organs in 2014. The contents are as follows.

① Aircraft serious incident involving a Cessna TU206G (small aeroplane), registered JA4000, operated by Honda Airways Co., Ltd.

(Disseminated on June 11, 2014)

The JTSB provided factual information regarding the aircraft serious incident involving a Cessna TU206G, which occurred on November 16, 2013, as follows to the Japan Civil Aviation Bureau, the Ministry of Land, Infrastructure, Transport and Tourism:

(Summary of the Serious Incident)

On Saturday, November 16, 2013, a Cessna TU206G (Continental TSIO-520-M7 engine), registered JA4000, operated by Honda Airways Co., Ltd., which had been heading to a photography

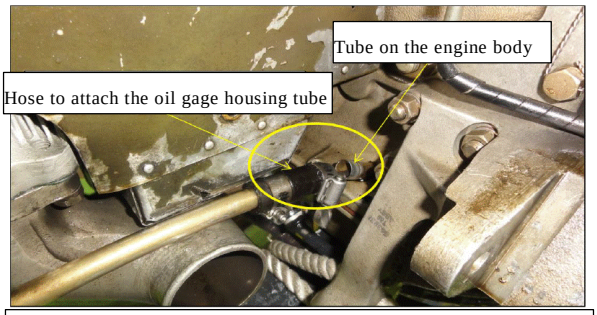
location over Noshiro City, Akita Prefecture for an aerial survey, experienced a low oil pressure, and then at about 11:43 Japan Standard Time, experienced engine halt; consequently, made a forced landing to the site of closed Akita Airport in Akita City, Akita Prefecture.

(Provision of factual information)

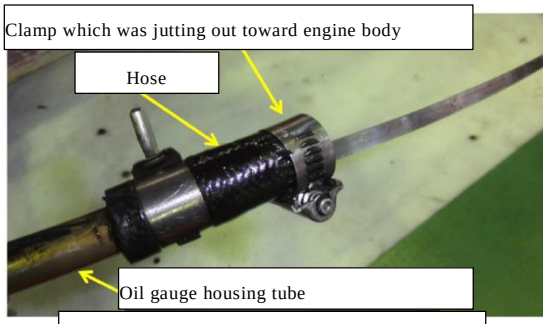
(1) The following items were clarified in the aircraft investigation into the serious incident:

① Hose for the oil gauge housing tube, which is part of the oil gauge used to measure the engine oil amount, was detached from the tube on the engine body.

② The fitting which clamps the hose connecting the oil gauge housing tube to the tube on the engine body was out of position; therefore, the clamp jutted out toward the engine body, and the hose connection came loose.



Reproduction of detachment of hose from the tube on the engine body



Condition of hose clamping fittings

(2) When the engine manufacturer conducted the engine teardown examination, the following items were clarified.

① In the photo that was taken around the oil gauge housing after the serious incident, traces of oil splattering around the housing were confirmed.

② A test run was performed with the oil gauge housing tube detached from an engine of the same model. The results revealed leakage of oil around the housing.

*This information dissemination is published on the JTSB website.
http://www.mlit.go.jp/jtsb/iken-teikyo/JA206J20130606.pdf

Column Accident investigator training in a university overseas

Aircraft accident investigator

There is a university overseas where they teach methods of accident investigations.

The university is Cranfield University in the U.K.Cranfield University is located adjacent to Cranfield Airport, which is approximately 100km north-northwest of London.

Aircraft accident investigation training course of the university started in 1977, and a new 3-week fundamentals of accident investigation course, in which students learn accident investigation methods that are common for aircraft, railway, and marine, was opened in 2004.

In the aircraft accident investigation course, those who have completed the fundamentals of accident investigation course learn for another 3 weeks about specialized aircraft accident investigations.

In the fundamentals of accident investigation course, students learn about the fundamentals of accident investigations, such as investigation methods on accident sites, potential hazards on accident sites, effective interview methods, human factors, simulated investigation demonstrations outside, etc.

In the aircraft accident investigation course, students are required to actually practice what they learned in the lectures of the fundamentals of accident investigation course. As the photo shows, mock accident aircraft, parts, and pieces are arranged by the university staff to simulate accident sites.

Accident sites may have a collision depression that is assumed to have been made by accident aircraft or tree branches that are assumed to have been cut by the accident aircraft, etc.

Students investigate the simulated accident sites to collect evidence while collaborating within the team. They prepare accident investigation reports while actually interviewing witnesses, who suddenly show up at accident sites, and responding to the media (students are not informed prior to the occasion), etc. They ultimately receive detailed evaluations from teachers with great experience.

Several railway and marine accident investigators from the JTSB attend the fundamentals of accident investigation course, and several aircraft accident investigators attend the fundamentals of accident investigation course and the aircraft accident investigation course every year.

24 people from over six countries attended the fundamentals of accident investigation course, which started in February of this year, and 15 people attended the aircraft accident investigation course,

which started in February after the other course.

Over 50% of the students are accident investigators from various countries, and the rest are airline company employees, aircraft manufacturer employees, and engine manufacturer employees.

10 Summaries of major aircraft accident and serious incident investigation reports (case studies)

Crashed into sea surface during sightseeing flights

Robinson R44II, registered JA106Y, operated by ILAS Air Service Co., Ltd.

Summary: On Tuesday, December 31, 2013, the aircraft crashed into sea surface near Kouri Bridge while performing sightseeing flights using Kouri-jima temporary helipad in Kouri island, Nakijin-son, Okinawa prefecture, at around 15:48 Japan Standard Time.

Onboard the aircraft were a pilot and two passengers, and all three of them suffered serious injuries.

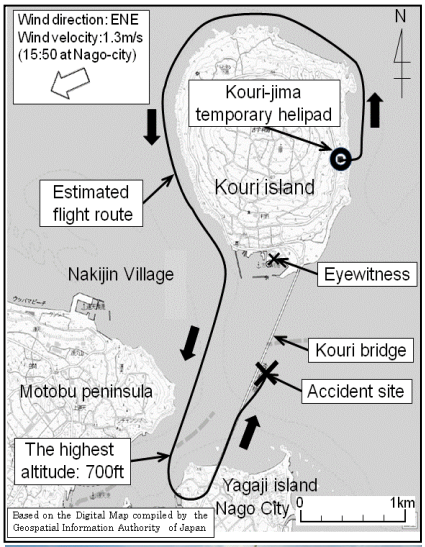
The aircraft was destroyed and sank to the sea bed.

Findings

According to the moderate wind at the time of the accident and high degree of transparency sea surface vicinity of the accident site in the area where billows didn't enter from the open sea, it is highly probable that decision of altitude by visual sense was extremely difficult because discrimination between the sea surface and the sea bed was difficult.

It is highly probable that the captain try to descend at about 120 kt until they could see the Kouri bridge, the highest point height is 25 m (about 83 ft) from sea surface (Nearly Highest High-water Level), just beside, for special service to the passengers. According to the Safety Notice, low altitude flight is very dangerous, not to mention the flight at excessive speed and descent rate until close to sea surface is extreme in hazard. It is highly probable that the captain's action significantly lacked safety considerations.

It is probable that the captain tried to fly 150 m away from Kouri bridge to keep the minimum safety altitude（※1）. However, it is highly probable that the helicopter had away only about 70 m from the bridge when it crashed into sea surface. To observe strictly the minimum safety altitude by visual sense, the pilot must fly with enough margin of separation from obstacles. Though the flight altitude is above 500 ft (150 m) in the operation plan for this sightseeing flight, it is highly probable that the captain did not try to follow this restriction.



※1 "minimum safety altitude" in the Civil Aeronautics Act is an altitude at which an aircraft can continue flight while maintaining a distance of 150 meters or more from persons or objects on the ground or on water in the case of above an area without human beings or houses. (Omitted)

Rescue

The helicopter did not equip with a lifeboat which shall be onboard in this accident flight. It is highly probable that the situation was dangerous that could result in loss of human life without rescue activities properly and quickly by the witness and the rescuer. Emergency equipment to be equipped with an aircraft in accordance with the provisions of regulations shall be onboard without fail.

Probable causes: It is highly probable that the accident occurred as the helicopter during sightseeing flight descended at excessive speed and descent rate until close to sea surface, the captain misjudged the altitude over calm and high degree of transparency sea surface, delayed the transition from descent to climb, crashed into sea surface and the helicopter was destroyed.

Regarding the helicopter descended at excessive speed and descent rate until close to sea surface, it is highly probable that the Standard Operation Procedures which described detailed flight procedure were not provided in the Company and flight procedure of each flight operation was left to the captain's discretion. Moreover, the captain did not try to follow the laws and regulations and significantly lacked safety considerations.

For details, please refer to the investigation report. (Published on June 27, 2014)
http://www.mlit.go.jp/jtsb/eng-air_report/JA106Y.pdf

Runway excursion during landing after sightseeing flights

Fuji Heavy Industries FA-200-180, registered JA3689, privately owned

Summary: On Sunday, November 25, 2012, when making a landing in Satsuma-Iojima Airfield in Mishima-mura, Kagoshima Prefecture, the aircraft veered off the runway and advanced through meadows with horizontal attitude; and then the aircraft came to a halt upside down after making a slow tumble just before a halt at around 11:40 Japan Standard Time.

Onboard the aircraft were a pilot and three passengers, and one passenger sustained minor bruising to the head.

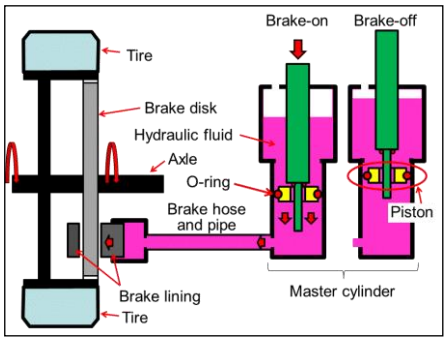
The aircraft was slightly damaged with one of the propeller blades bending rearwards, etc.

Findings

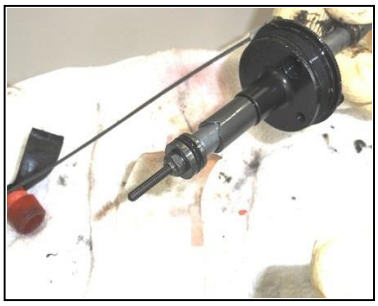
It is probable that the captain could not anticipate the left brake would become ineffective as he performed brake check during taxiing and found normal function before take-off and the left brake was effective just after touch-down. It is highly probable that the left brake became ineffective at the landing and the aircraft ran off the runway to the right as the captain intentionally applied the right brake hard, and then the nose wheel was tackled by the meadows and the aircraft came to a halt after tumble.

Serious incident aircraft

Since the wear of a rubber-made O-ring (mounted on the piston to prevent fluid leaks) in the left master cylinder of the brake system was confirmed, it is highly probable that the left brake system became ineffective because the master cylinder could not maintain sealing capability and brake fluid pressure could not be sufficiently transmitted to the brake linings.



Schematic of brake system



Worn O-ring

In the record of the 1,000hrs check performed on October 2011, the check mark indicating to have carried out the replacement was recorded on the check item which instructs to replace the O-ring as necessary. However, it is highly probable that the O-ring had not been replaced at the time of this check, in consideration of the fact that the O-ring of the left master cylinder was worn out enough to result in the hydraulic fluid leaks although this serious incident occurred after about a year and only about 46 flight hours since the last check, and that there is no requirement in the service manual to replace the O-ring in the case of no defect, and that there was no record of the O-ring name which is to be recorded when replaced. (Total flight time: 3,804hrs. 19min)

Probable causes: It is highly probable that this serious incident occurred when the left brake became ineffective, and the aircraft ran off the runway to the right as the captain intentionally applied the right brake hard, and came to a halt after tumble in the meadows, and thus became unable to taxi by itself.

It is highly probable that the left brake system became ineffective because the O-ring of the left master cylinder in the brake system was worn out, and the master cylinder could not maintain sealing capability and could not sufficiently transmit the brake fluid pressure to the brake linings.

It is possible that the wear of the O-ring was caused from aging deterioration.

For details, please refer to the investigation report. (Published on January 31, 2014)
http://www.mlit.go.jp/jtsb/eng-air_report/JA3689.pdf

Nosedived from upset during flight

Boeing 737-700, registered JA16AN, operated by Air Nippon Co., Ltd.

Summary: On Tuesday, September 6, 2011, the aircraft operated by Air Nippon Co., Ltd., nosedived after having an unusual attitude (upset) at around 22:49 Japan Standard Time (JST: UTC+9hr, unless otherwise stated all times are indicated in JST) at an altitude of 41,000 ft about 69 nm east of Kushimoto while flying from Naha Airport to Tokyo International Airport as the scheduled flight 140 of the All Nippon Airways.

There were 117 people on board the aircraft, consisting of the captain (hereinafter referred to as "the PIC"), the first officer (hereinafter referred to as the FO"), three cabin attendants (hereinafter referred to as "the CAs") and 112 passengers (including one infant). Of these people, two cabin attendants sustained slight injuries.

There was no damage to the aircraft.

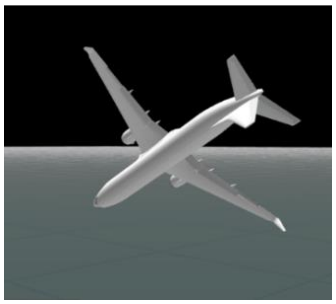
Findings

It is probable that the followings contributed to the first officer's erroneous operation of the rudder trim control (rudder trim SW ※1) while having an intention of operating the door lock control (door lock selector) when the PIC tried to reenter the cockpit after using the restroom; he had not been fully corrected his memories of operation about the door lock control of the Boeing 737-500 on which he was previously on duty; the door lock control of the Boeing 737-500 series aircraft was similar to the rudder trim control of the Boeing 737-700 series aircraft in their placement, shape, size and operability.

※1 "rudder trim control (rudder trim SW)" is a switch to be operated to shift the rudder neutral position either to the left or to the right.

Rudder Trim SW operation

The results of the flight simulator examination indicate that the upset occurred because the FO did not quickly recognize his erroneous operation.
It is probable that the following factors were responsible for his delayed recognition:
(1) Similarities in the operability of the Both Switches
Because the operations of two switches are similar -- they must be held at the rotated positions --, it is somewhat likely that the FO felt nothing unusual in continuously holding the wrong switch when he was operating the Rudder Trim SW while having an intention of operating the Door Lock Selector.
(2) Monitoring of flight conditions
It is somewhat likely that the FO was excessively dependent on autopilot flight and he failed to be fully aware of monitoring the flight condition.



Unusual attitude
(demonstration)

It is probable that the following factors contributed to this:
(1) Upset Recovery Training
The FO did not receive upset recovery training accompanied with a stall warning and in an unexpected situation; accordingly, the upset which suddenly occurred and the activation of the stick shaker (※2) during recovery operation were the first such event for the FO to experience. Therefore, it is somewhat likely that the FO got startled and confused on the unusual situation.
(2) High altitude Upset Recovery Training
Because the FO did not receive upset recovery training at a high altitude, it is somewhat likely that he was startled and confused on the activation of the stick shaker.

※2 "stick shaker" is a typical stall warning system. This system shakes the Column to warn the pilot that the aircraft is going to be stalled.

Probable causes (Excerpt): It is highly probable that this serious incident occurred in the following circumstances: During the flight, the FO erroneously operated the Rudder Trim SW while having an intention of operating the Door Lock Selector in order to let the PIC reenter the cockpit. The aircraft attitude became unusual beyond a threshold for maintaining the aircraft attitude under the autopilot control. The FO's recognition of the unusual situation was delayed and his subsequent recovery operations were partially inappropriate or insufficient; therefore, the aircraft attitude became even more unusual, causing the Aircraft to lose its lifting force and went into nosedive. This led to a situation which is equivalent to "a case where aircraft operation is impeded."

For details, please refer to the investigation report. (Published on September 25, 2014)
http://www.mlit.go.jp/jtsb/eng-air_report/JA16AN.pdf

Emergency evacuation after emergency landing at Takamatsu Airport (malfunction of main battery)

Boeing 787-8, operated by All Nippon Airways Co., LTD., registered JA804A

Summary: On Wednesday, January 16, 2013, the aircraft operated by All Nippon Airways Co., LTD., registered JA804A, took off from Yamaguchi Ube Airport for Tokyo international Airport at 08:11 local time as its scheduled flight 692. When it was climbing through 32,000 ft over Shikoku Island, an EICAS message of battery failure came on at 08:27 accompanied by unusual smell in the cockpit. The airplane diverted to Takamatsu Airport and landed there at 08:47.

An emergency evacuation was executed using slides on T4 taxiway at 08:49.

Four passengers out of 137 occupants (the Captain, seven crewmembers and 129 passengers) suffered minor injuries during the evacuation.

Although the main battery was damaged, it did not lead to a fire.

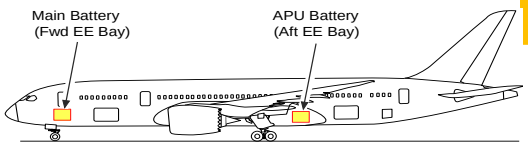
Findings

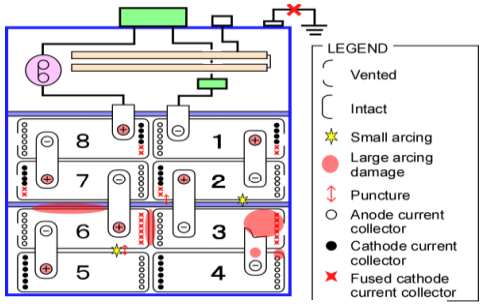
Judging from the deformation observed in the CT scan image, the FDR main battery voltage value, Kakuda test results in November, 2013, and the battery damage, the cell vented (※1) first was very likely cell 6.

※1 "vent" denotes that pressure within a cell causes safety valve to be ruptured.

Possible major causes for battery heat generation are overcharging, over-discharging, external short circuit, cell case short circuit, and internal short circuit. The FDR records and battery damage suggest that the possible cause of battery heat generation is, among other things, internal short circuit.

Fluctuating charging currents and transient peak voltage are observed on 787 battery system, it is possible that these electric transient or other factors combined may have affected the lithium metal deposition leading to an internal short circuit.





Main battery damage

We have three possible candidates for interior short circuit: lithium metal deposition in the cell, metal piece contamination, and damaged separator. Given the fact that all similar battery incidents (※2) occurred in January, during cold season, among three candidates, lithium metal deposition deriving from charging under cold conditions could have existed. However, it is unlikely that lithium metal deposition was the sole causal factor of the internal short circuit leading to venting. It is possible that these electric transient or other factors combined may have affected the lithium metal deposition leading to an internal short circuit.

※2 "Three similar battery incidents" are Takamatsu event, Boston event (on January 7, 2013), and Narita event (on January 14, 2014).

Probable causes: The emergency evacuation was executed on Takamatsu Airport taxiway in the serious incident, which was a consequence of emergency landing deriving from the main battery thermal runaway during the airplane's takeoff climb.

Internal heat generation in cell 6 very likely developed into venting, making it the initiating cell, resulting in cell-to-cell propagation and subsequent failure of the main battery. It is very likely that cell 6 internal heat generation and increased internal pressure caused it to swell, melt the surrounding insulation material and contact the brace bar creating a grounding path that allowed high currents to flow through the battery box. The currents generated arcing internal to the battery that contributed to cell-to-cell propagation consequently destroying the battery.

Cell 6 heat generation was probably caused by internal short circuit; however, the conclusive mechanism thereof was not identified.

In the serious incident, the internal short circuit of a cell developed into cell heat generation, thermal propagation to other cells, and consequently damaged the whole battery. The possible contributing factors to the thermal propagation are that the test conducted during the developmental phase did not appropriately simulate the on-board configuration, and the effects of internal short circuit were underestimated.

For details, please refer to the investigation report. (Published on September 25, 2014)
http://www.mlit.go.jp/jtsb/eng-air_report/JA804A.pdf

Emergency operation to avoid collision with the terrain

SAAB 340B, registered JA03HC, operated by Hokkaido Air System Co., Ltd.

Summary: On Saturday, June 4, 2011, the aircraft 340B, registered JA03HC, operated by Hokkaido Air System Co., Ltd., took off from Hakodate Airport as a scheduled Flight 2891. During the approach to Runway 31 of Okushiri Airport, the aircraft executed a go-around and once started climbing, but it soon reversed to descend. Consequently, at around 11:38 Japan Standard Time, its flight crew became aware of the situation and executed an emergency operation to avoid crash to the ground.

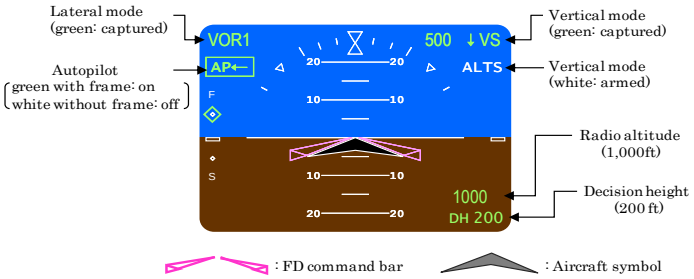
The aircraft flew back to Hakodate Airport, following some holdings over Okushiri Airport.

There were a total of 13 persons on board: the Pilot-in-Command, the First Officer and a cabin attendant as well as 10 passengers, but no one was injured. In addition, there was no damage to the aircraft.

Findings

It is possible that the PIC had to push the control column forward to control the nose up tendency accompanying engine power increase for go-around, and while feeling something uncomfortable about the FD command bar, he actually followed its directions. Therefore, it is highly probable that the PIC eventually made the Aircraft descend without his intention.

It is highly probable that the PIC could not perform a fundamental instrument flight at this time.



EADI (Electronic Attitude Director Indicator)
the attitude indication symbol of aircraft, the FD command bar to show pitch and roll command signals

The FO could not closely monitor the instruments transiently and did not realize that the Aircraft was descending. It is probably involved that the Aircraft was accelerating, and the FO had already checked the initial climb state immediately after executing the go-around operation and the FO assumed that the Aircraft would climb as usual.

But they don't always need to follow AOM and it might be only necessary for them to call out the mode as long as they can. AOM also urges both PF and PM to confirm the mode indication and call it out while using the AP/FD system, but the corresponding part of FTG does not necessarily require them to do so. Accordingly, the relevant descriptions were vague and inconsistent. Based on the findings, it is probable that the procedures of mode confirmation and callout as well as importance of these procedures had not been specified as standard procedures of the Company in a manner of reflecting AOM, and education and training for these procedures were not sufficient.

It is highly probable that the PIC and the FO failed in their basic confirmation and monitoring practices in using the autoflight system of the Aircraft.

The Company should consider reviewing the contents of its education and training programs so that its flight crewmembers may fully understand the basic principles of the autoflight system without fail. It is probable that the PIC and the FO excessively relied on the autoflight system.

Probable causes (Excerpt): In this serious incident, during the approach to Runway 31 of Okushiri Airport, the Aircraft executed a go-around and once started climbing but it soon reverted to descend and came close to the ground. Consequently, flight crewmembers came to realize the situation and executed an emergency operation to avoid crash to the ground.

It is highly probable that the Aircraft's descent and approach to the ground was caused by the following factors:

(1) The PIC followed the Flight Director command bar instructions, which indicated the descent because the altitude setting was not changed to the initial go around altitude, and subsequently the PIC made the Aircraft descend even lower than the FD command bar instructions.

(2) The PIC and the FO could not notice descending of the Aircraft and their recovery maneuvers got delayed.

It is highly probable that these findings resulted from the fact that the PIC could not perform a fundamental instrument flight, the PIC and the FO used the Autopilot/Flight Director System in an inappropriate manner without confirming the flight instruments and the flight modes, and the FO could not transiently carry out closer monitor of the flight instruments because of the other operations to be done.

For details, please refer to the investigation report. (Published on November 27, 2014)
http://www.mlit.go.jp/jtsb/eng-air_report/JA03HC.pdf

Chapter 3 Railway accident and serious incident investigations

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) (except for accidents that involve working snowplows that specified in item 2 of the above paragraph);

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) a fatal accident that occurred at a level crossing with no automatic barrier machine;

(d) an accident found to be likely to have been caused owing to a railway officer's error in handling or owing to malfunction, damage, 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 involving five or more casualties (with at least one of the casualties dead);

(c) a fatal accident that occurs at a level crossing with no automatic barrier machine;

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 on 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="3">・ Accidents involving the death of a passenger, crew member, etc
・ Accidents involving five or more casualties with at least one of the casualties dead
・ Fatal accidents that occur at level crossings with no automatic barrier machines
・ 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="4">Accidents that are particularly rare and exceptional
[Ordinance 1-3]</td></tr>
<tr><td>Dedicated railway</td><td colspan="7">Accidents that are particularly rare and exceptional [Ordinance 1-4]</td></tr>
<tr><td rowspan="2">Tramway
[Ordinance 1-5]</td><td colspan="6">Accidents involving the death of a passenger, crewmember, etc., accidents involving five or more casualties with at least one of the casualties dead, and fatal accidents that occur at level crossings with no automatic barrier machines.
[Notice 1-1]</td><td></td></tr>
<tr><td colspan="7">Accidents that are particularly rare and exceptional [Notice 1-2]</td></tr>
</table>

*1 Except for derailment accidents that involve working snowplows.

*2: 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, damage, 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, damage, 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, damage, 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, damage, destruction, etc., bearing a particularly serious risk of collision, derailment 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.]

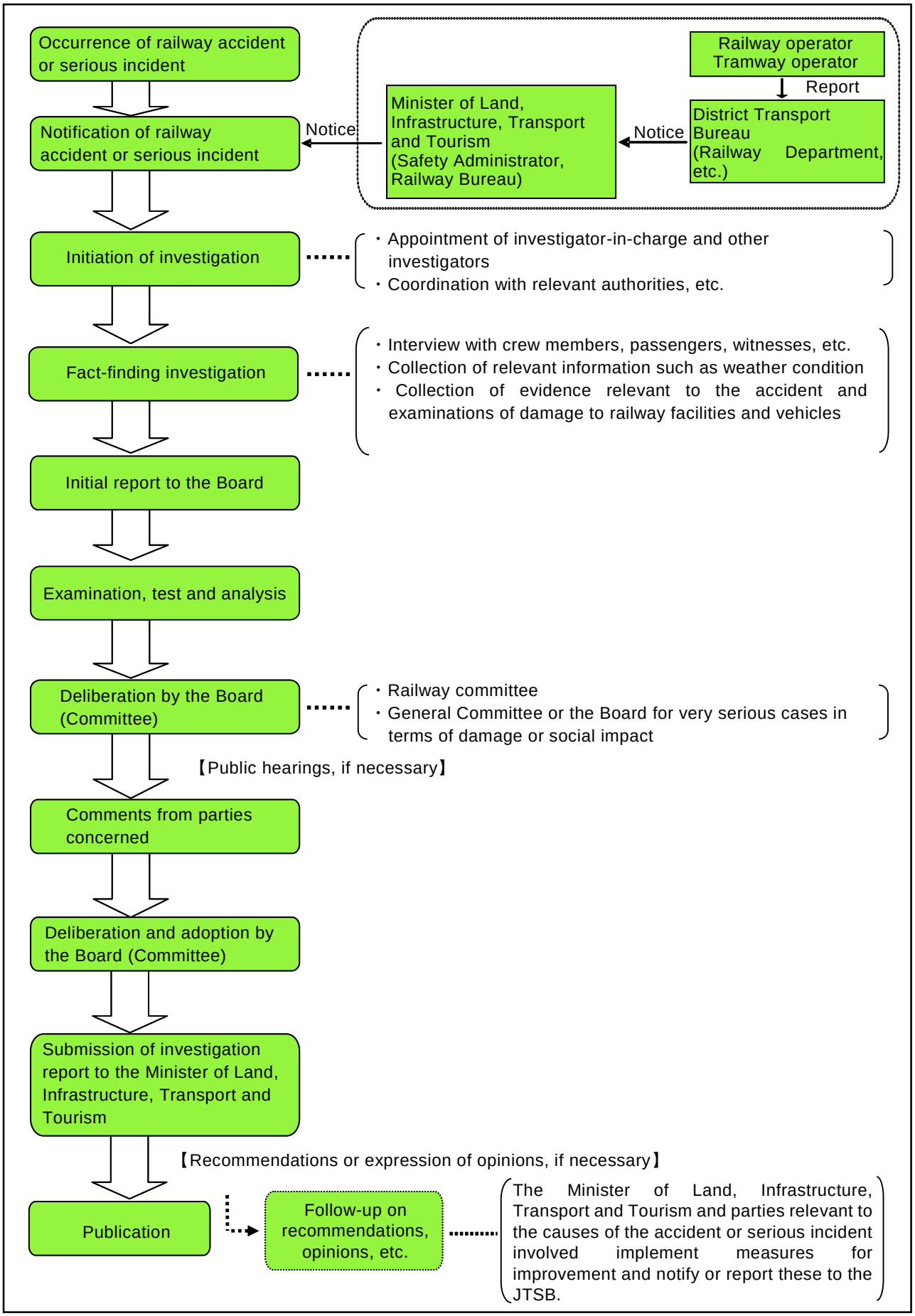
5 From among the situations occurring on a tramway operated under the application of the Ministerial Ordinances to provide Technical Regulatory Standards on Railways mutatis mutandis as specified in paragraph 1 of Article 3 of the Ordinance on Tramway Operations, the situations equivalent to those specified 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><th>Category</th><th>・Incorrect management of safety block (Railway)
・Incorrect management of safety block (Tramway)</th><th>・Incorrect indication of signal (Railway)
・Violating red signal</th><th>Dangerous damage in facilities</th><th>Dangerous trouble in vehicle</th><th>・Main track overrun
・Violating closure section for construction (Railway)
・Vehicle derailment (Railway)
・Heavy leakage of dangerous object
・Others</th></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 for the investigations of railway accidents and serious incidents

In 2014, the JTSB carried out investigations of railway accidents and serious incidents. The results are as follows. 21 accident investigations had been carried over from 2013, and 14 accident investigations were newly launched in 2014. 17 investigation reports and one interim report were published in 2014, and 28 accident investigations were carried over to 2015.

Five railway serious incident investigations had been carried over from 2013, and one railway serious incident investigation was newly launched in 2014. Four investigation reports were published in 2014, and two railway serious incident investigations were carried over to 2015.

There were 4 fatal accidents that occurred at level crossings with no automatic barrier machine (class 3 and class 4 level crossing), which should be investigated since April of 2014. One of the investigation reports was published.

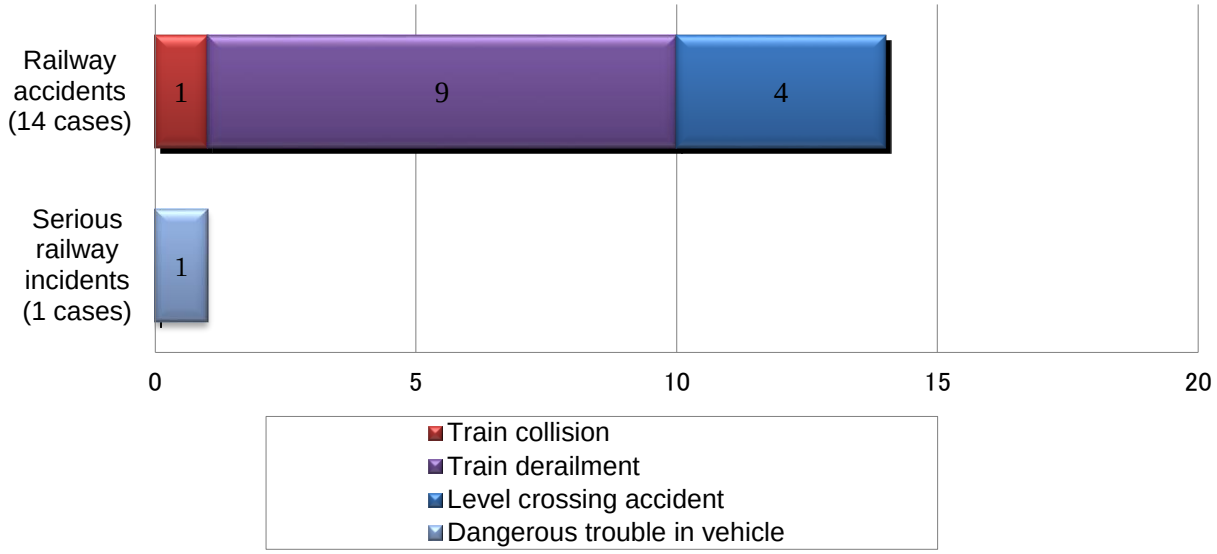
Category	Carried over from 2013	Launched in 2014	Total	Published investigation report	(Recommendations)	(Opinions)	Carried over to 2015	(Interim reports)
Railway accidents	21	14	35	17	(0)	(0)	18	(1)
Railway serious incidents	5	1	6	4	(0)	(0)	2	(0)

4 Statistics for investigations launched in 2014

The railway accidents and railway serious incidents that were newly investigated in 2014 consisted of 14 railway accidents (down by one from the last year associated with 15 accidents) and one railway serious incident (down by one from the last year associated with two incidents).

The breakdown by accident categories shows that the railway accidents are comprised of one train collision, nine train derailments, four level crossing accidents. The railway serious incident comprised of one dangerous trouble in vehicle.

Number of railway accidents and serious incidents by type



The number of casualties was 57 across the 14 accidents. These consisted of six death and 51 injured persons.

The number of casualties (in railway accidents)

(Persons)

2014							
Category	Dead			Injured			Total
	Crew	Passenger	Others	Crew	Passenger	Others	
Casualties	0	0	6	5	44	2	57
Total	6			51			

5 Summaries of railway accidents and serious incidents that occurred in 2014

The railway accidents and railway serious incidents that occurred in 2014 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)

1	Date and accident type	Railway operator	Line section (location)
	January 11, 2014 Train derailment	Choshi Electric Railway Co., Ltd.	In the premises of Kasagami-Kurohae Station, Choshi Electric Railway Line (Chiba Prefecture)
	Summary	While the train was entering Kasagami-Kurohae Station at about 20 km/h, the train driver noticed an abnormal sound from below. The driver applied the emergency brake to stop the train. A survey revealed that all of the axles in the rear bogie of the front vehicle and all of the axles in the front bogie of the second vehicle derailed. Out of the 9 passengers and the driver on board, no one was injured.	
2	Date and accident type	Railway operator	Line section (Location)
	February 13, 2014	Kyushu Railway Co.,	Between Amagase station and Sugikawach

	Train derailment	Ltd.	station, Kyudai Line (Oita Prefecture)
	Summary	See the "6 Publication of investigation reports" (P.65 No.12).	
3	Date and accident type	Railway operator	Line section (location)
	February 15, 2014 Train collision	Tokyu Corporation	In the premises of Motosumiyoshi Station, Tokyu Toyoko Line (Kanagawa Prefecture)
	Summary	The driver of the preceding train was stopped about 30m beyond the stop position in Motosumiyoshi Station. The driver of the following train was instructed by the operation dispatcher to immediately stop while traveling at about 80 km/h and applied the emergency brake; but the train collided with the preceding train. Out of about 80 passengers in the preceding train, about 60 passengers in the following train, and the driver and the conductor of each train on board, 16 people were injured.	
4	Date and accident type	Railway operator	Line section (location)
	February 23, 2014 Train derailment	East Japan Railway Company	In the premises of Kawasaki Station, Tokaido Line (Keihin-Tohoku Line) (Kanagawa Prefecture)
	Summary	While traveling on the premises of Kawasaki Station, the deadheading train collided with a construction vehicle. The first car and the second car became derailed, and the first car overturned to the side. The driver and the conductor of the deadheading train were injured.	
5	Date and accident type	Railway operator	Line section (Location)
	March 16, 2014 Train derailment accompanied with level crossing accident	Amagi Tetsudou Co., Ltd.	Jumonji level crossing, class one level crossing with automatic barrier machine and road warning device, in the premises of Nishi-Tachiarai station in Amagi line (Fukuoka Prefecture)
	Summary	See the "6 Publication of investigation reports" (P.66 No.14).	
6	Date and accident type	Railway operator	Line section (Location)
	April 12, 2014 Level crossing accident	Central Japan Railway Company	Yuzawa level crossing, class four level crossing without automatic barrier machine nor road warning device, between Ina-Kamisato station and Moto-Zenkoji station, Iida Line (Nagano Prefecture)
	Summary	See the "6 Publication of investigation reports" (P.67 No.15)and summaries of major railway accident and serious incident investigation reports (P.94).	
7	Date and accident type	Railway operator	Line section (location)
	June 9, 2014 Level crossing accident	Kanto Railway Co., Ltd.	Kita Daiho level crossing No. 8, class four level crossing without automatic barrier machine nor road warning device, between Daiho Station and Tobanoe Station, Joso Line(Ibaraki Prefecture)
	Summary	After passing Daiho Station on schedule, the train shifted to powering operation; and it shifted to coasting operation when the train speed reached 80 km/h. About 30 m before Kita Daiho No. 8 level crossing, the driver confirmed a compact car that was entering from the left side of the level crossing. The driver immediately blew the whistle and applied the emergency brake. However, it was too late, and the front of the train collided with the right side of the car. The train stopped after running for about 130 m while pushing the car. This accident resulted in the car driver's death.	
8	Date and accident type	Railway operator	Line section (location)
	June 21, 2014 Train derailment	Kyushu Railway Company	Between Satsuma-Imaizumi Station and Nukumi Station, Ibusuki Makurazaki Line (Kagoshima Prefecture)

	Summary	While traveling in the above section, the train driver confirmed a tree blocking the tracks. The driver immediately applied the emergency brake, but the train derailed after climbing up the tree and the pile of sand. 16 passengers (3 with serious injuries/13 with minor injuries) and 2 cabin attendants (2 with minor injuries) were injured.

9	Date and accident type	Railway operator	Line section (location)
	June 22, 2014 Train derailment	Japan Freight Railway Company	Between Soutaku Station and Satsukari Station, Esashi Line (Hokkaido Prefecture)
	Summary	While traveling on the premises of Satsukari Station, the train was automatically stopped due to the emergency brake. When the driver checked, all of the two axles in the rear bogie of the second wagon (19th freight wagon) from the last freight wagon (20th freight wagon) of the 21-wagon train derailed to the right, and the 20th freight wagon was stopped 17m away from the 19th freight wagon. No one was injured.	

10	Date and accident type	Railway operator	Line section (Location)
	July 11, 2014 Train derailment, accompanied by level crossing accident	Ryutetsu Co., Ltd.	The Dai-juichi-gou level crossing, class four level crossing without automatic barrier machine nor road warning device, between Kogane-Joshi Station and Koya Station, Nagareyama Line (Chiba Prefecture)
	Summary	See the "6 Publication of investigation reports" (P.68 No.17).	

11	Date and accident type	Railway operator	Line section (location)
	September 2, 2014 Train derailment, accompanied by level crossing accident	West Japan Railway Company	Tabe level crossing, class one level crossing with automatic barrier machine and road warning device, between Kinomoto Station and Takatsuki Station, Hokuriku Line (Shiga Prefecture)
	Summary	While traveling in the above section, the train collided with a truck in Tabe level crossing. All of the two axles in the front bogie of the front vehicle derailed. Out of about 180 passengers and three crew members on board, no one was injured. The truck driver was injured (serious injury).	

12	Date and accident type	Railway operator	Line section (location)
	October 3, 2014 Level crossing accident	Kyushu Railway Company	Takanosu level crossing, class three level crossing with no automatic barrier machine and installed road warning device, between Buzen-Kawasaki Station and Nishi Soeda Station, Hitahikosan Line (Fukuoka Prefecture)
	Summary	While traveling in the above section, the train collided with one pedestrian in Takanosu level crossing. Out of the 17 passengers and one crew member on board, no one was injured. The pedestrian, who collided with the train, died.	

13	Date and accident type	Railway operator	Line section (location)
	October 27, 2014 Level crossing accident	Kanto Railway Co., Ltd.	Kojima No. 1 level crossing, class four level crossing without automatic barrier machine nor road warning device, between Sodo Station and Shimotsuma Station, Joso Line (Ibaraki Prefecture)

	Summary	While traveling, the train collided with a motorcycle, which was crossing Kojima No. 1 level crossing. A rider of the motorcycle died.

14	Date and accident type	Railway operator	Line section (location)
	December 18, 2014 Train derailment, accompanied by level crossing accident	East Japan Railway Company	Tanigawa level crossing, class one level crossing with automatic barrier machine and road warning device, between Kuwanohara Signal Station and Inariyama Station, Shinonoi Line (Nagano Prefecture)
	Summary	While traveling in the above section, the train collided with a car in Tanigawa level crossing. One of the front axles in the front bogie of the first car became derailed.	

(Railway serious incidents)

1	Date and incident type	Railway operator	Line section (location)
	September 26, 2014 Dangerous trouble in vehicle	East Japan Railway Company	Between Igashima Station and Higashi-Gejo Station, Ban'etsu West Line (Niigata Prefecture)
	Summary	While the train was traveling in the above section at about 60 km/h, employees of the company who were on board confirmed that two of passenger doors had opened on the right side of the second car and then he notified to the train driver. The driver, who received the notification, immediately applied the emergency brake and stopped the train. Out of about 110 passengers and three crew members on board, no one was injured.	

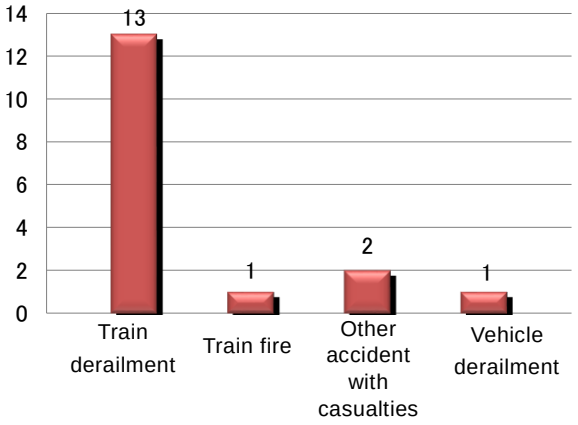
6 Publication of investigation reports

The number of investigation reports of railway accidents and serious incidents published in 2014 was 21. These consisted of 17 railway accidents and four serious incidents.

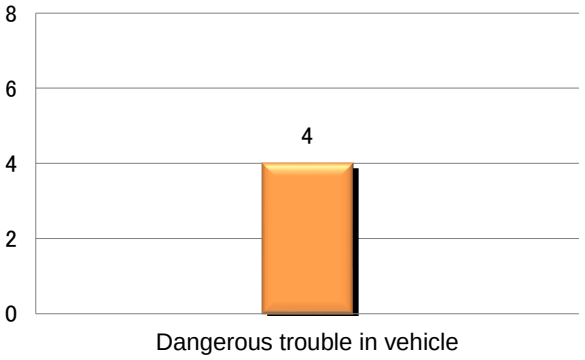
Breaking them down by category, the railway accidents contain 13 train derailment accidents, one train fire accidents, two level crossing accident and one vehicle derailment accidents. However, the serious railway incidents contain four dangerous trouble in vehicle.

In the 17 accidents, the number of casualties was 61, consisting of three death and 58 injured persons.

Railway accident reports (17 cases) published in 2014



Serious railway incident reports (one cases) published in 2014



The investigation reports for railway accidents and serious incidents published in 2013 are summarized as follows:

List of published investigation reports on railway accidents (2014)

1	Date of publication	Date and accident type	Railway operator	Line section (location)
	January 31, 2014	November 8, 2012 Train derailment	Sangi Railway Co., Ltd.	In the premises of Misato Station, Sangi Line (Mie Prefecture)
	Summary	Due to the fact that it did not pass the inbound train in Misato Station, the train driver thought that the down track starting signal was indicating the proceed signal. After closing passenger doors without confirming the signal indication of the starting signal, the driver departed from Misato Station on schedule without noticing the starting signal indicating the stop signal. During the powering operation at about 45 km/h, the train was shaken to the left side when the ATS (automatic train stop) alarm went off simultaneously. The driver immediately applied the emergency brake, but the train entered into the safety siding and stopped after destroying the car stop. All of the two axles in the front bogie of the front vehicle derailed passing through the car stop, and all of the two axles in the rear bogie derailed toward the left of the rail buried under gravel for the car stop. Out of the two passengers and one driver on board, no one was injured.		
	Probable Causes	It is highly probable that this accident occurred as follows: The driver of the outbound train assumed that the starting signal of the down line was indicating the proceed signal as usual, due to the fact that the train did not pass the inbound train in Misato Station. The driver did not confirm the signal indication of the starting signal of the down line, which was supposed to be confirmed before closing passenger doors, and the driver also did not perform thorough finger-pointing and call prior to the departure. Due to this, the driver departed the train without noticing the stop signal indicated on the starting signal of the downline, and ATS emergency brake was activated. However, the train entered into the safety siding and stopped after destroying the car stop. It is highly probable that the stop signal was indicated on the starting signal of the		

<table>
<tr><td></td><td></td><td colspan="3">down line due to the following reasons: The operation dispatcher of the CTC Center misread the train diagram, thought that trains were passing in Misato Station, and handled the train passing control button for the station by mistake. Due to this, the stop signal was indicated on the starting signal of the down line for the station.</td></tr>
<tr><td></td><td>Report</td><td colspan="3">http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2014-1-1.pdf</td></tr>
<tr><td rowspan="4">2</td><td>Date of publication</td><td>Date and accident type</td><td>Railway operator</td><td>Line section (location)</td></tr>
<tr><td>February 28, 2014</td><td>March 30, 2012
Train derailment</td><td>Toyama Chihou Tetsudou, Inc.</td><td>In the premises of Uchiyama Station, Main Line (Toyama Prefecture)</td></tr>
<tr><td>Summary</td><td colspan="3">The driver of the deadheading train felt unusual sounds and shocks before entering Uchiyama Station. Then the driver applied the emergency brake and stopped the train, and confirmed that the wheels of the front axle had become derailed to the left. The driver notified to the dispatcher regarding the derailment.
Out of the one driver and two railway workers on board, no one was injured.
  </td></tr>
<tr><td>Probable Causes</td><td colspan="3">It is probable that the wheel climb up the outside rail and became derailed to the left because the derailment coefficient on the outside (left) wheel for the front axle of the deadheading train (snow plow) increased while the critical derailment coefficient decreased in the 200m-radius right curve.
It is probable that the derailment coefficient increased because alignment was deformed in a direction that results in the reduction of the radius, the twist of the track increased by 5 m and the snow plow was running with excess of cant, and the increase in lateral force as well as a decrease in the wheel load. It is also somewhat likely that the fact that the front axle weight was lighter than the rear axle weight of the snow plow had affected the decrease in the wheel load of the front axle when traveling in a largely twisted section.
It is probable that the critical derailment coefficient decreased because a shifting of alignment, which was associated with a reduction of the radius, resulted in an increase in the angle of attack for the front axle of the snow plow.</td></tr>
<tr><td></td><td>Report</td><td colspan="3">http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2014-2-1.pdf</td></tr>
</table>

3	Date of publication	Date and accident type	Railway operator	Line section (location)
	February 28, 2014	February 8, 2013 Train derailment	East Japan Railway Company	Between Shimokita Station and Ominato Station, Ominato Line (Aomori Prefecture)
	Summary	While traveling near Sanbonmatsu level crossing at about 60 km/h, the driver of the train felt shocks; and immediately applied the service brake and stopped the train. After stopping the train, a check by the driver revealed that all of the axles in the front bogie of the front car had become derailed to the left. Out of the 11 passengers, one driver, and one track maintenance worker on board, no one was injured. 		
	Probable Causes	It is probable that this derailment accident has occurred due to the fact that the train shifted to the left after running over the snow, which had become hard likely ice, on the rail and in the flangeway of Sanbonmatsu level crossing. It is somewhat likely that the accident was affected by the facts that it had snow and a temperature change near the accident site while the operation was suspended due to strong wind and that ice-like hard snow had accumulated and packed down on the rail and in the flangeway by passing a number of dump trucks in Sanbonmatsu level crossing, where trains were not passing.		
	Report	http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2014-2-2.pdf		
4	Date of publication	Date and accident type	Railway operator	Line section (location)
	March 28, 2014	April 6, 2013 Train derailment	East Japan Railway Company	Between Myoko-Kogen Station and Sekiyama Station, Shinetsu Line (Niigata Prefecture)
	Summary	When the train was in coasting operation at about 65 km/h, the driver of the train felt that the car-body was rising up when the train entered a left curve. Then the driver applied the emergency brake to stop the train. When he checked the cars from the outside, all of the two axles in the front bogie of the front vehicle had become derailed to the right. Out of the 25 passengers and two crew members (driver and conductor) on board, no one was injured. 		
	Probable Causes	It is probable that this accident has occurred due to the fact that the train ran over a pile of earth, etc., which had come onto the tracks due to the landslide that occurred on a slope, resulting in the derailment. It is somewhat likely that the landslide on the slope was affected by the following factors: Part of the agricultural land, etc. (private land, etc.), which was locate higher than the slope, flooded, and the water mainly flowed into the top of the slope, which belongs to the railway operator. This and the increase of the underground water level in the foundation behind the retaining wall affected the percolating water pressure in around the foundation of the retaining wall. As a result, foundation around the area was destroyed, and the top soil layer on the slope collapsed.		
	Report	http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2014-3-1.pdf		
5	Date of publication	Date and accident type	Railway operator:	Line section (Location)
	April 25, 2014	March 2, 2013 Train derailment	East Japan Railway Company	Between Jinguji station and Kariwano station, Ou Line (Akita Prefecture)

	Summary	 While the train driver repeated on/off operation of the notch following the caution signal of the block signal and considering the train speed decline by the snow, between Jinguji station and Kariwano station at about 20 km/h, he felt the shock and irregular sound from the right bottom of the driving desk, and applied the maximum notch of the service brake and stopped the train. He checked the vehicles, after the train stopped, and found the first axle in the front bogie of the front vehicle had derailed to the left with respect to the direction of the train. It was found by the later inspection, the first axle in the front bogie derailed to the left by about 25 mm, and the second axle derailed to the left by about 20 mm. There were 125 passengers, 3 train crews and 2 cabin attendants were on board the train, but there is no casualty.
	Probable Causes	It is probable that the left wheels of the first and the second axles in the front bogie of the front vehicle derailed to the left by slip climbing up the standard gauge rail, due to the vehicle being lifted by a large amount of snow underneath it, respectively, while powering in the section of the three-rails track where much attention was necessary for the snowdrift. It is probable that the snowdrift grew large in a short time before the accident by the deep fallen snow compared to that of the average year and snowfall with strong wind in the accident day, moreover there were no snow fences around there. And the situation that much snows were likely to remain on the standard gauge rail side of the three-rail track due to narrower space between the track and side snow wall in the standard gauge rail side compared to the narrow gauge rail side of the track was effected to the background inducing the accident. In addition, it is probable that snow between the standard gauge rail and the narrow gauge rail were effected to the background inducing the accident.
	Report	http://www.mlit.go.jp/jtsb/eng-rail_report/English/RA2014-4-1e.pdf http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2014-4-1-p.pdf(Explanatory material)

6	Date of publication	Date and accident type	Railway operator	Line section (Location)
	May 30, 2014	October 14, 2012 Train derailment	Kyushu Railway Co., Ltd.	In the premises of Kagoshima-Chuo station, Kagoshima Line (Kagoshima Prefecture)
	Summary	The train passed the left curve at about 25 km/h after departure. The train driver noticed the scream of the passengers when the front of the train passed the No.79-Ro turnout. As the train driver checked rear of the train he found the gangway bellows leaned to right considerably, then he applied the brake to stop the train. The train driver checked the situation of the train and found that the rear bogie of the second vehicle was on the track different from the scheduled route and the second axle derailed to the right. There were 157 passengers and a crew on board the train but there was no injured person.		

<table>
<tr><td></td><td>Probable Causes</td><td colspan="3">

It is somewhat likely that the first axle in the rear bogie of the second vehicle of the train climbed up the outside rail, i.e., right rail, of the left curved track and derailed to the right of the outside rail, and the second axle dragged by the first axle derailed to the right, in this accident. It is probable that the train stopped after the first axle in the rear bogie of the second vehicle restored to the wrong track at the turnout.
It is probable that the first axle in the rear bogie of the second vehicle derailed to the outside rail of the left curved track due to the following reasons.
(1) The lateral force of the outside rail had increased because the alignment of the left curved track had exceeded the maintenance standard and the alignment was increased toward the right, i.e., outside direction.
(2) The wheel weight of the outside wheel had decreased because the twist in the left curved track had exceeded the maintenance standard and became large in the direction to decrease wheel load of the outside wheels. In addition, it is probable that the mud pumping in the ballast, the loosen spikes, partial corrosion in the sleepers and the gaps between rail and tie plates, observed around the start point of flange climbing, were related to climb up of the first axle in the rear bogie of the second vehicle. In addition, it is somewhat likely that the increased spring coefficient of the axle spring of the vehicle by aging was related to climb up of the first axle in the rear bogie of the second vehicle.
It is somewhat likely that the rear bogie of the second vehicle derailed because the lateral force acting on the outside wheel due to larger static wheel loads in the inside wheels, i.e., left wheels, of the rear bogie, while the static wheel loads in the outside wheels, i.e., right wheels, were larger than in the inside wheels of the front bogie, although the ratio of wheel load unbalance were within the managed values in the regulations of the company.
</td></tr>
<tr><td></td><td>Report</td><td colspan="3">http://www.mlit.go.jp/jtsb/eng-rail_report/English/RA2014-5-2e.pdf</td></tr>
<tr><td>7</td><td>Date of publication</td><td>Date and accident type</td><td>Railway operator</td><td>Line section (Location)</td></tr>
<tr><td></td><td>May 30, 2014</td><td>July 31, 2013
Vehicle derailment, accompanied by the accident against road traffic</td><td>Nagasaki Electric Tramway Co., Ltd.</td><td>Between Tsuki-Machi stop and Shiminbyoin-Mae stop, Oura branch line (Nagasaki Prefecture).</td></tr>
</table>

	Summary	 The train driver found the bus entered into the track to turn right while powering the vehicle at about 21 km/h from Tsuki-Machi stop towards Shiminbyoin-Mae stop, immediately he sounded a whistle and applied an emergency brake, but the vehicle collided with the bus and stopped after derailed to right. There were about 60 passengers and a vehicle driver on board the vehicle, 11 passengers were injured. In addition, there were 6 passengers and a bus driver on the bus, among them, 5 passengers were injured. The front right part of the vehicle was damaged, and for the bus, the right side of the body was damaged but a fire did not outbreak.
	Probable Causes	It is probable that the tram driver applied an emergency brake immediately after he noticed the bus ahead, the tram derailed with the bus and the first axle in the front bogie derailed to the right because the bus driver moved the bus into the tramway track, without checking whether the tram approaches the intersection, to turn right crossing tramway track and obstructed the route of the tramway, in the situation that it was difficult to see the traffic condition by standing buses around the intersection.
	Report	http://www.mlit.go.jp/jtsb/eng-rail_report/English/RA2014-5-1e.pdf

8	Date of publication	Date and accident type	Railway operator	Line section (Location)
	June 27, 2014	February 12, 2013 Train derailment, accompanied with level crossing accident	Sanyo Electric Railway Co., Ltd.	Shinkomae level crossing, category one level crossing with automatic barrier machine and road warning device, between Iho station and Arai station, Main Line (Hyogo Prefecture)

	Summary	 The train driver noticed the obstacle at Shinkomae level crossing while the train was coasting at about 95 km/h between Iho station and Arai station. Immediately, he sound a whistle and applied an emergency brake, but the train collided with the rear of the car carrier trailer truck and the stretch board for loading. After that, the train ran with destroying poles planted in the left side of the up track and the block fence along the track, and collided with the platform of Arai station and stopped. The front part of the train was completely demolished. The front bogie of the front vehicle was separated from the vehicle body and its first axle derailed to the left of the rail and the second axle derailed inside the track. The all axles in the rear bogie of the front vehicle and the all axles of the front bogie of the second vehicle derailed to the right of rail. The all axles of the rear bogie of the second vehicle derailed as the left wheels were raised up from the rail. There were about 60 passengers, a train driver and a conductor on board the train. The train diver was seriously injured and 15 passengers were slightly injured. In addition,

		the drivers of the freight truck and a taxi collided with the freight truck were slightly injured.
	Probable Causes	It is probable that the accident occurred by the inbound through limited express train derailed to the left of the up-track because the train collided with the load carrying platform of the freight truck and ran onto its stretch board for loading, which was lowered to cross the railway track, at the same time, when the train passed the Sinkomae level crossing, in this accident. It is probable that the rear portion of the freight truck had been staying inside the level crossing because the the truck driver drove the truck into the level crossing road, without noticing that the sedan ahead his truck might stopped at the road between the level crossing and the intersection ahead, and the truck was obliged to stop behind the sedan stopped at the intersection. It is probable that the stretch board for loading was lowered to cross the railway track because the truck driver had lowered them in the level crossing road to forward the truck without damaged the crossing rod because the truck driver had considered if the truck had forwarded with the stretch board for loading was set at vertical position, the stretch board would fell down in the level crossing and would contact with the train, furthermore, he judged that the truck could be forwarded because the sedan stopped at the intersection in front of the truck seemed to move forward.
	Report	http://www.mlit.go.jp/jtsb/eng-rail_report/English/RA2014-6-1e.pdf

9	Date of publication	Date and accident type	Railway operator	Line section (Location)
	July 25, 2014	February 29, 2012 Train derailment	Hokkaido Railway Company	In the premises of Yakumo Station, Hakodate Line (Hokkaido)
	Summary	 The train driver left Yakumo station behind schedule after waited passing limited express operating behind schedule. After the train had departed, the train driver felt the swaying motion around the turnout, and he applied an emergence brake and stopped the train. After that, he checked the vehicle and found all two axles of the front bogie derailed to right of the turnout side track, after passed #10-Ro turnout located in the route to the up-track main line from the No.4 platform. There are 2 passengers and a train driver on board the train, but there is no casualty.		
	Probable Causes	It is probable that the wheels of the front bogie climbed up the right side lead rail and derailed because there were the hard frozen snow or ice were built up to the rail top in the flange way at the lead rail when the train ran into the branch line side route, in this accident. It is probable that there were the hard frozen snow or ice around the flange way because the snow removal work were insufficient. It is somewhat likely that the insufficient snow removal work was caused by the		

		insufficient comprehension about the status of snow removal in the station, because the employees contracted in winter season did not understand the importance about the snow and ice removal work around flange way due to lack of description about it in the education material used in Yakumo station, and the company had not determined how to grasp the status of snow removal work by the contract employees and how to report about the snow removal work.
	Report	http://www.mlit.go.jp/jtsb/eng-rail_report/English/RA2014-7-1e.pdf http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2014-7-1-p.pdf（Explanatory material）

10	Date of Publication	Date and accident type	Railway operator	Line section (Location)
	July 25, 2014	April 26, 2012 Train derailment	Japan Freight Railway Company	Between Izumisawa station and Kamaya station, Esashi Line (Hokkaido)
	Summary	The train departed from Aomori signal station, and arrived at Goryokaku station. The transport staff waiting for the train at Goryokaku station found smoke rose from the freight wagon, 18th car of the arrived train, and notified to the station office. The rushed station staffs fought the fire of the freight wagon that the smoke rose from around the bogie. On the other hand, the switching malfunction of the turnout occurred in the premises of Kamaya station, Esashi Line, on the same day. The track maintenance staffs of Hokkaido Railway Company checked track condition in the premises of Kamaya station, and found that the turnout was damaged and there were traces of derailment on the sleepers around it. The freight wagon emitting smoke at Goryokaku station was not derailed but judged as it had derailed once, by the results of the inspection about status of the wheels of the freight wagon. A train driver was onboard the train, but there was no injury.		
	Probable Causes	It is probable that the outside wheel climbed up to the top of outside rail, i.e., it was the flange climb derailment, by the increased derailment coefficient for the outside wheel, because the lateral force acting on the outside wheel had increased by the increased wheel load of the inside wheel, and the wheel load of the outside wheel had decreased, due to the large unbalance in the static wheel loads between right and left wheels of the freight wagon loaded containers, compared to the wagon with balanced static wheel load, while the train passed in the curved track of 300m radius, in this accident. It is highly probable that the uneven loading in the containers caused the large unbalance in the wheel loads in the derailed freight wagon. In addition, it is somewhat likely that the combination of track alignment and cross-level, which should be managed in the section where freight trains are operated, had relatively large at the point climbing up by the wheel started, promoted the decrease of wheel load of the outside wheel.		
	Report	http://www.mlit.go.jp/jtsb/eng-rail_report/English/RA2014-7-2e.pdf http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2014-7-2-p.pdf（Explanatory material）		

See summaries of major railway accident and serious incident investigation reports (P.90).

11	Date of publication	Date and accident type	Railway operator	Line section (Location)

	August 29, 2014	February 4, 2013 Train fire	East Japan Railway Company	Between Tsukuda station and Iwamoto station, Joetsu Line (Gunma Prefecture)
	Summary	The train driver felt as the train was dragged from the rear after the train passed the station. However, the driver did not find any malfunction by checking the instrument panels, and he continued to drive the train. After a while, when the train ran by powering operation at about 60 km/h, the train driver felt again as the train was dragged from the rear, but he could not find any malfunction from the instrument panels. However, when he checked the rear of the train, he found a fire broke out from the diesel locomotive of the second car that deadheads without its own power, and he applied an emergency brake to stop the train at the safe place. After that, the fire of the diesel locomotive was extinguished by fire fighting, but a part of the vehicle such as the transmission device were damaged by fire. There was a train driver alone on board the train, but he was not injured.		
	Probable Causes	 It is probable that the remaining converter oil in the torque converter was ignited by the high temperature fragments etc. of the converter which was broken and heated by missing cooling function of the converter because the coolant was drained, and the first stage converter rotated while the deadhead diesel locomotive were running, because the "neutral rock" of the forward/backward switching device was not correctly performed when a diesel locomotive was hauled as the deadhead operation without powering. It is probable that the reason why the neutral rock did not correctly performed was that the staff had set neutral rock without understanding the method to rock correctly and the staff in charge of checking also did not understand correctly the neutral rock. It is probable that the reason why the neutral rock operation had performed by the staff who did not understand the operation procedure and had been checked by the staff who did not understand correctly the neutral rock operation, was the poor recognition of the company about the importance of the neural rock operation, whose frequency is low because it was insufficient to prepare the operation manual and the prior education and training in advance were not performed or poor. Furthermore, it is probable that the automatic emergency brake did not operated when the velocity exceeded the permissible value, because the electric power of the speed detector was not supplied while the locomotive was in the deadhead operation without powering, due to the meter relay of the over speed detector was replaced to the new type which required power supply from independent batteries, was related to induce the accident.		
	Report	http://www.mlit.go.jp/jtsb/eng-rail_report/English/RA2014-8-1e.pdf See summaries of major railway accident and serious incident investigation reports (P.92).		

<table>
<tr><td rowspan="4">12</td><td>Date of publication</td><td>Date and accident type</td><td>Railway operator</td><td>Line section (Location)</td></tr>
<tr><td>August 29, 2014</td><td>February 13, 2014
Train derailment</td><td>Kyushu Railway Co., Ltd.</td><td>Between Amagase station and Sugikawachi station, Kyudai Line (Oita Prefecture)</td></tr>
<tr><td>Summary</td><td colspan="3">The train driver found the fallen tree about 50m ahead on the track while the train was in powering operation at about 70 km/h, and immediately applied an emergency brake, however, the train collided with the fallen tree and stopped after running about 60m.
The train driver checked the train after it stopped, he found that all axles of the vehicle derailed and the vehicle leaned into the right.
There were two passengers and a train driver on board the train, one passenger was injured.</td></tr>
<tr><td>Probable Causes</td><td colspan="3"> 
It is probable that because a cedar tree had fallen as to cross the track, the running train ran onto it and moved to the right and derailed, in this accident.
It is probable that the cedar tree had fallen by the root considering the followings.
(1) The position of the gravity center of the cedar tree became higher than as usual because the wet and adhesive snow stacked on the crown of the tree fallen on the accident day.
(2) The suspension force of the root was considered weak compared to the relatively strong strength of the trunk, because the fallen cedar tree was the tree in its prime and its trunk had sufficient diameter against its height.
In addition, it is somewhat likely that the tree had fallen by a little snowfall because the slope around the root of the tree had been in the water-rich state, because the landform of the slope around the fallen tree is ravine that the rainwater fell in the surrounded area will be concentrated, in addition, the water was leaking from the damaged sewerage system of the hot spring facility in the upper part of the slope.</td></tr>
<tr><td>Report</td><td colspan="3">http://www.mlit.go.jp/jtsb/eng-rail_report/English/RA2014-8-2e.pdf</td></tr>
<tr><td rowspan="4">13</td><td>Date of publication</td><td>Date and accident type</td><td>Railway operator</td><td>Line section (Location)</td></tr>
<tr><td>October 30, 2014</td><td>May 28, 2013
Train derailment</td><td>Kobe Electric Railway Co., Ltd.</td><td>In the premises of Arimaguchi station, Sanda Line (Hyogo Prefecture)</td></tr>
<tr><td>Summary</td><td colspan="3">The train driver noticed an abnormal sound and the following big sound while operating coasting at about 25 km/h at the turnout in Arimaguchi station, and applied the emergency brake to stop the train. After that he found the front bogie of the second car entered into the route to Arima-Onsen station, different route from the predetermined route, and found all two axles in the front bogie of the second vehicle were derailed.
The first vehicle, the rear bogie of the second vehicle and the third vehicle had entered and stopped in the predetermined route to Dojyo-Minamiguchi station.
There were about 60 passengers and the driver on the train, but no one was injured.</td></tr>
<tr><td>Probable Causes</td><td colspan="3">It is probable that the front bogie of the second vehicle of train started at No.2 platform of Arimaguchi station, Sanda line, had entered into the unexpected route to Arima-</td></tr>
</table>

		Onsenguchi station and derailed, because the flange of the right wheel of the first axle in the front bogie of the second vehicle had climb over the tongue rail around edge of the right tongue rail of the point in the double slip switch, followed after passing the symmetrical turnout in the premises of Arimaguchi station, in this accident. And, it is probable that the second axle of the front bogie had derailed to the right in the double slip switch following to the first axle entered into the wrong route, although it had entered into the predetermined route at the point in the double slip switch. It is probable that the status of the track, the vehicles, the electric facilities and operating status were within the company's reference values or the limits to be operated, however, right wheel of the first axle of front bogie of the second vehicle had climbed up to the rail top, due to the combination of the following situations: (1) The large lateral force had on the right wheel of the first axle of the front bogie of the vehicle while the vehicle was passing the S-shaped track where the shape of curvature changes in the distance between the first axle and the fourth axle of a vehicle, that is shorter than the length of a vehicle, i.e., 18.14m. (2) It is possible that a relatively large lateral force is easy to occur because the track alignment increased as to decrease radius curvature near the tongue rail, which has the entrance angle, in the double slip switch at the accident site. (3) It is possible that the wheel flange climbs up to a rail top by contacting with the tongue rail at its entrance portion, because the flange part of the wheel of the vehicle had worn vertical compared to the designed cross sectional shapes.
	Report	http://www.mlit.go.jp/jtsb/eng-rail_report/English/RA2014-9-1e.pdf See summaries of major railway accident and serious incident investigation reports (P.91).

14	Date of publication	Date and accident type	Railway operator	Line section (Location)
	October 30, 2014	March 16, 2014 Train derailment accompanied with level crossing accident	Amagi Tetsudou Co., Ltd.	Jumonji level crossing, class one level crossing with automatic barrier machine and road warning device, in the premises of Nishi-Tachiarai station in Amagi line (Fukuoka Prefecture)
	Summary	When a train was travelling at about 65km/h in a straight section, the train driver found a commercial truck entering from the right side of the Jumonji level crossing. Although the train driver applied an emergency brake, the train collided with the truck and stopped after travelling about 14m. Eight passengers on train were injured in this accident.		
	Probable Causes	 It is highly probable that the train driver applied the emergency brake as he found the commercial truck entered into the Jumonji level crossing, while the crossing rod of the automatic barrier machine had already set at its close position according to the approaching train, but the train collided with the truck and derailed, in this accident. It is probable that the truck had entered into the Jumonji level crossing where the crossing rod had already set at its close position, because the truck driver noticing the existence of the level crossing and took braking operation just before the level crossing but		

		it was too late.		
	Report	http://www.mlit.go.jp/jtsb/eng-rail_report/English/RA2014-9-2e.pdf		
15	Date of publication	Date and accident type	Railway operator	Line section (Location)
	October 30, 2014	April 12, 2014 Level crossing accident	Central Japan Railway Company	Yuzawa level crossing, class four level crossing without automatic barrier machine nor road warning device, between Ina-Kamisato station and Moto-Zenkoji station, Iida Line (Nagano Prefecture)
	Summary	A train departed from Ina-Kamisato station on schedule. When the train passed a curve track of 400m radius at 60 to 65km/h, the train driver found an agricultural tractor close to the right rail within Yuzawa level crossing located about 70m ahead of the train. Although the train driver immediately applied an emergency brake and use a whistle, the right side on the train collided with the agricultural tractor in the level crossing, and the train stopped after about 140m running. The tractor driver was killed in this level crossing accident.		
	Probable Causes	It is probable that the accident had occurred by the collision of the train and the tractor entered into and could not pass across the Yuzawa level crossing, where tractors are prohibited to enter. It is somewhat likely that the tractor driver moved his tractor into the level crossing, without noticing that the train was approaching to the level crossing, because it might be effected that the tractor driver had concentrated his attention to driving the tractor while passing the level crossing, as the width of the level crossing road is narrow and he usually did not drive the tractor in the level crossing. It is also somewhat likely that the reason because the tractor driver had moved his tractor into the level crossing where tractors are prohibited to enter, is that he usually passed the level crossing with the cart to transport farm products.		
	Report	http://www.mlit.go.jp/jtsb/eng-rail_report/English/RA2014-9-3e.pdf http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2014-9-3-p.pdf（Explanatory material） See summaries of major railway accident and serious incident investigation reports (P.94).		
16	Date of publication	Date and accident type	Railway operator	Line section (Location)
	November 27, 2014	November 5, 2013 Level crossing accident	Kyushu Railway Co., Ltd.	Shinbori-Kendo level crossing, class one level crossing with automatic barrier machine and road warning device, in the premises of Takahashi station, Sasebo Line (Saga Prefecture)
	Summary	The train driver noticed the obstacle at the Shinbori-Kendo level crossing in front of the train and applied an emergency brake immediately, but the train collided with the rear flap of the load carrying platform and the loaded iron plates of trailer truck, and the train stopped about 106m away from the level crossing.  There were 65 passengers and the train driver on board the train, among them 10 passengers were injured. There was the truck driver on board the truck but he was not		

		injured. The iron plates loaded on the trailer truck were fell on the ground but there was no injury in the public. The front face and right side of the front vehicle were damaged, and a part of the load carrying platform of the trailer truck was damaged but the fire did not break out.
	Probable Causes	It is highly probable that the train, when passed the Shinbori-Kendo level crossing, collided with the rear part of the load carrying platform and the loaded iron plates of the trailer truck, which stood for the stop signal at the intersection ahead of the level crossing, staying inside the level crossing disturbing the train route. It is probable that the trailer truck stood keeping the rear part of the load carrying platform and the loaded iron plates remained in the level crossing because the truck driver did not suspect that distance between the stop line of the intersection and the level crossing might be shorter than the length of the trailer truck, while the truck driver had missed his way and his consciousness was concentrated how to return to the scheduled route. In addition, it is probable that the collision of the train with the trailer truck was induced by the effect of the late emergency brake timing due to the thin thickness of the iron plate covered by the sheets disturbing the train route at the level crossing, which was difficult to recognize as the obstacles by the train driver, and the position of the load carrying platform and the loaded iron plates could not be detected by the obstruction detecting device for the level crossing because they were out of detecting area.
	Report	http://www.mlit.go.jp/jtsb/eng-rail_report/English/RA2014-10-2e.pdf

17	Date of publication	Date and accident type	Railway operator	Line section (Location)
	November 27, 2014	July 11, 2014 Train derailment, accompanied by level crossing accident	Ryutetsu Co., Ltd.	The Dai-juichi-gou level crossing, class four level crossing without automatic barrier machine nor road warning device, between Kogane-Joshi Station and Koya Station, Nagareyama Line (Chiba Prefecture)
	Summary	The running train collided with a sedan at the class four level crossing, and all 2 axles in the front bogie of the first car of the train were derailed. The sedan driver and a fellow passenger were dead, and five passengers on the train got injured.		
	Probable Causes	 It is probable that all 2 axles of the front bogie of the first car of the train were derailed because the left side of the front bogie of the first vehicle of the train contacted with the sedan, that had entered into the Dai-juichi-gou level crossing, category four level crossing, and collided with left lower part of the front of the passing train and hit the pole planted in the left side of the track after dragged by the train, in this accident. Although it is probable that the sedan driver usually had confirmed the approaching train by the reflecting mirror, the reasons why the sedan driver moved his sedan into the level crossing just before the train passed there, could not be clarified.		
	Report	http://www.mlit.go.jp/jtsb/eng-rail_report/English/RA2014-10-1e.pdf		

List of published investigation reports on serious railway incidents (2014)

<table>
<tr><td rowspan="4">1</td><td>Date of publication</td><td>Date and incident type</td><td>Railway operator</td><td>Line section (location)</td></tr>
<tr><td>February 28, 2014</td><td>June 19, 2012
Vehicle accident</td><td>Fukui Railway Co., Ltd.</td><td>Sanjuhassha station premises, Fukubu Line (Fukui Prefecture)</td></tr>
<tr><td>Summary</td><td colspan="3">When a train arrived at Sanjuhassha station, the train driver received a notification from a driver of the crossing train, which had stopped at the station. The notification was that when the train entered the station, a rear and right sliding door for passengers of the No.1 car was opened.
When the train driver checked all cars after receiving the notification, the rear and right sliding door of the No.1 car was open.
Although there were one passenger and the train driver on board, there was no injured passenger by falling from cars, etc.
  </td></tr>
<tr><td>Probable Causes</td><td colspan="3">It is probable that this serious incident has occurred as follows: One of the two installation bolts had fallen off and the other was loose where an arm to connect a door engine and a side sliding door was installed on the door engine in the mechanism to open and close the door. Due to this fact, the door would move regardless of the opening/closing function of the door engine, and the side sliding door opened in the forward direction due to inertia force of the train decelerating, etc. when arriving at the station.
It is somewhat likely that the bolts had fallen off/become loose due to lack of tightening or use of uneven bolts/nuts, based on the fact that there was no damage to the bolt and that it is considered that the bolts fell off/became loose over a short period of time.</td></tr>
<tr><td>Report</td><td colspan="3">http://www.mlit.go.jp/jtsb/railway/rep-inci/RI2014-1-1.pdf</td></tr>
<tr><td rowspan="4">2</td><td>Date of publication</td><td>Date and incident type</td><td>Railway operator</td><td>Line section (location)</td></tr>
<tr><td>March 28, 2014</td><td>June 4, 2012
Vehicle accident</td><td>East Japan Railway Company</td><td>Between Koriyama Station and Mogi Station, Ban-etsu East Line (Fukushima Prefecture)</td></tr>
<tr><td>Summary</td><td colspan="3">When a train was in coasting on the bridge over Abukuma river, the train driver found an extinguished door-pilot lamp and trouble of a side sliding door for passengers at the place where the first car approached the other side of Abukuma river. Therefore the train driver immediately applied an emergency brake and stopped the train. After stopping the train, the train conductor checked around the train. Therefore the car side pilot lamp on the right side of No.3 car was lit and the rear sliding door for passengers (No.3 position) was fully opened.
Although there were about 300 passengers, one train driver, one train conductor, and one driver who was riding along on board, nobody was injured.</td></tr>
<tr><td>Probable Causes</td><td colspan="3">It is probable that this serious incident has occurred as follows: A coating of an electric wiring for a side sliding door control circuit was damaged and the electric wiring touched a carbody. Furthermore, as a power wire of an electric mirror touched the carbody of No.1 car, the sliding door of the No.3 car was opened due to voltage flowed to a door-closing solenoid valve via the carbody.
It is somewhat likely that the power wire on the electric mirror side was touching the car due to the following reasons: A circuit of an operation switch for remote control of the electric mirror short-circuited. As a result, an electric wire between the electric wire and the electric mirror connected electrically; and the coating of the electric wire on the electric mirror side was damaged; and the exposed part touched the carbody and short-circuited.
It is probable that the reason why an electric current ran between the power wire and the electric wire on the side of the electric mirror was that the electric circuit was formed on the circuit board due to wear of the electric wire, dirt on the circuit board.
It is probable that the reason why the coating of the electric wiring for the side sliding door control circuit was damaged due to friction by vibration of train. It is somewhat likely that the reason why coating of the electric wiring on the side of the electric mirror was damaged due to the faulty installation at reconstruction works for installing the electric mirror.</td></tr>
</table>

	Report	http://www.mlit.go.jp/jtsb/railway/rep-inci/RI2014-2-2.pdf		
3	Date of publication	Date and incident type	Railway operator	Line section (location)
	March 28, 2014	November 26, 2012 Vehicle damage	Kyushu Railway Company	Between Sue Station and Sue-Chuo Station, Kashii Line (Fukuoka Prefecture)
	Summary	A train driver noticed a door-pilot lamp under coasting after accelerating up to about 40 km/h. Therefore the train driver immediately applied an emergency brake and stopped the train. When the train driver checked all cabins of the train, the train driver noticed that the front and right side sliding door in a front car was opened about 30cm. The train driver locked all sliding doors including the opened sliding door, and restarted the operation. After the train was travelling at Sue-Chuo station, the train stopped the operation. Although there were about 150 passengers and a train crew in the train, nobody was injured by a fall from the cabin. 		
	Probable Causes	It is highly probable that this serious incident is considered to have occurred as follows: An axial force of a fork and a joint screw decreased due to the fact that the fork and joint screw of the door-closing device were fastened with almost no overlap allowance. Due to this reason, the fork and the joint screw were separated, resulting in the door opening while traveling. It is probable that the axial force has decreased due to the following reasons: Since the fork and the joint screw were fastened with almost no overlap allowance, a shear stress to a thread in a fastened part significantly increased. Due to this reason, non-rotational looseness occurred from a plastic deformation in part of the thread. Rotational looseness occurred due to external force from doors opening/closing and vibration from the train traveling. It is probable that the joint screw and the fork were separated due to rotation of the piston rod as well as the inertia from the changes of acceleration from powering operation to coasting operation during an operation prior to this serious incident while the axial force was reduced due to the looseness mentioned above. It is probable that the overlap allowance was insufficient due to the following reasons: Changing the drawing as a measure against breakage could possibly affect the overlap allowance. The fact that attention must be paid at the time of installation was not sufficiently considered by the company or the manufacturer of the door-closing device, which proposed the change of the drawing. Due to this reason, necessary information for work was not notified to workers.		
	Report	http://www.mlit.go.jp/jtsb/railway/rep-inci/RI2014-2-1.pdf		
4	Date of publication	Date and incident type	Railway operator	Line section (Location)
	July 25, 2014	January 7, 2013 Vehicle damage	Hokkaido Railway Company	Between Tsunetoyo signal station and Kami-Atsunai station, Nemuro Line (Hokkaido)
	Summary	The train driver noticed that the door pilot lamp was turned off while driving at about 90 km/h, he applied an emergency brake and stopped the train. After the train stopped, the conductor checked the doors of the fifth vehicle, and found that the front right door opened about 30 cm. The train operation was resumed after the door had been locked and the watchman had been posted. There were 37 passengers and two crews on boarded the train, but there was no fallen passenger and no injury.		
	Probable Causes	It is somewhat likely that the door was opened by the negative pressure and a jolt while the train ran in the Atsunai tunnel, because the closed door could not be held by the		

		door open/close device in which the compressed air was not supplied due to a frozen drainage in the air pipe for closing door in the front right, fourth position, of the fifth vehicle by the low temperature of the open air, in this railway serious incident. It is highly probable that a drainage was collected in the air pipe for closing door because the vapor contained in the compressed air was condensed, as the compressed air did not dehumidified because the dehumidify bypass cock in the compressed air pipe of the fifth vehicle was left open. In addition, it is somewhat likely that the dehumidify bypass cock, which should be fixed and locked at close position, was left open by mistakes due to some reasons, in the circumstances that the staffs in the section of periodical inspection of vehicles and in the section where management of vehicles was handed over were not informed that the dehumidify bypass cock should be fixed and locked at the close position, due to the insufficiency and impropriety of the order system and instruction transfer system when management of vehicles were transferred to another section in Hokkaido Railway Company.
	Report	http://www.mlit.go.jp/jtsb/eng-rail_report/English/RI2014-3-1e.pdf

7 Summaries of recommendations and opinions

There were no cases of recommendations and opinions issued in 2014.

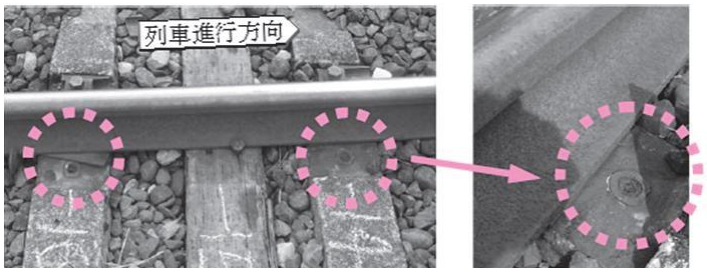
8 Actions taken in response to recommendations in 2014

Actions taken in response to recommendations were reported with regard to two railway accidents and two serious railway incidents in 2014. Summaries of these reports are as follows.

① Toyama Chiho Railroad Co., Ltd.; Train derailment accident between Kosugi Station and Kamihori Station, Kamitaki Line

(Recommendation issued on July 26, 2013)

On July 26, 2013, the Japan Transport Safety Board (JTSB) published an investigation report and issued a recommendation to Toyama Chiho Railroad Co., Ltd. as one of the parties relevant to the cause of the accident. The report and recommendation were in regards to the train accident that occurred between Kosugi Station and Kamihori Station on the Kamitaki Line on July 28, 2012. The JTSB received the answers (completion report) of Toyama Chiho Railroad Co., Ltd. against the JTSB's recommendation as follows:



Damage of inserts of rail fasteners on PC

○Summary of the accident

On July 28 2012, a driver was operating a Toyama Chihou Tetsudou No. 624 two-car local train from Iwakuraji Station to Dentetsu-Toyama Station. On the way, he noticed unusual sounds and shocks when stopping at Kamihori Station. He then applied the emergency brake to immediately stop the train. A check after the train stopped revealed that all eight of the axles were derailed.

There were 20 passengers and the driver on board the train. No one was injured.

○Probable Causes

It is probable that the lateral force associated with the running of the train extended the gauge, leading the left wheel inside the rail to derail to the right at the outlet-side transition curve of the left-hand curve, which is followed by a reverse right-hand curve, because the lateral displacement of the track (track irregularity) was larger than allowed under the maintenance criteria and decreased the fastening force of the rail fastening system.

It is probable that these are the result of the following factors:

(1) The looseness of the bolts of the line's rail fastening system, which was caused by repetitive lateral force under running of trains. This had not been re-fastened since the rail had been replaced two months before this accident.

(2) The excessive shifting of track that had not been maintained. However the track irregularity was larger than allowed under the criteria for maintenance at the time of rail replacement, the rails had been in use with this situation not being addressed. Also, the result of a regular inspection on the shifting of track after the rail replacement had remained unanalyzed.

○Description of the recommendation

(1) Toyama Chiho Tetsudou, Inc. (TCT) should establish a solid management system for maintenance of tracks. Within this system, the measurement results for the shifting of track should be analyzed and evaluated immediately after measurement. Any problems should be quickly resolved in accordance with the established repair plan.

(2) TCT should not only develop a detailed implementation plan regarding the following items, with the active involvement of its business administrations, including its safety management committee, but also properly manage an implementation status of such the plan.

① All the items of the preventive measures defined by TCT in response to the train derailment accident occurred on Nakakazumi station premises in 2008.

② Thorough checks after working on the tracks and management of a fastening system for PC sleepers, as well as the management system for the maintenance of tracks that was developed in (1).

○Measures taken based on the recommendation (completion report)

I. Measurement maintenance of track

(1) We changed a base-date for track inspections to base-date for each section as follows and conducted track inspections (measurement and analysis/evaluation).

Furthermore, we decide that we hold a report conference, which consisted of the Safety General Manager, Engineering Manager, Management Section Leader (Engineering Manager), Manager in Inaricho Technical Center and the Manager for Track Maintenance Group, every 15 days, and the Manager for Track Maintenance Group reports the inspection update to the Safety General Manager via the Management Section Leader.

○Section (Base-date: 1st March)

Section	Extension	Measurement	Analysis/evaluation
Between Dentetsu-Toyama and Dentetsu-Kurobe, Main Line	37.3km	March 11 - March 27	March 12 - March 28
Between Terada and Iwakuraji, Tateyama Line	10.3km	March 24	March 25
Between Inaricho and Minami-Toyama, Fujikoshi Line	3.3km	March 25 - March 31	March 26 - April 1
Between Minami-Toyama and Iwakuraji, Kamitaki Line	12.4km		

○Section (Base-date: 1st April)

Section	Extension	Measurement	Analysis/evaluation
Between Dentsu-Kurobe and Unazuki Onsen, Main Line	16.0km	April 2 - April 8	April 3 - April 9
Between Iwakuraji and Tateyama, Tateyama Line	13.9km	April 15	April 16

2) With regard to track inspection and maintenance, an analysis/evaluation of a result was conducted within 15 days after the measurement. After a repair work plan is formulated in report meetings and get agreement in the meeting for each department, a track maintenance is implemented based on the plan.

(3) In order to grasp the progress of a track maintenance and the check of it, we decide to hold the report meetings every 15 days, and to share the situation of the progress of a track maintenance and the check of it between the head office and the field departments for the decision of measure.

(4) With regards to the maintenance progress, after the report meeting, we circulate the situation of the progress and minutes of the meeting internally with the aim of sharing information throughout the company.

II. Active involvement of business administrations in detailed implementation plan, etc.

In order to thoroughly implement following items, an implementation result of each items is thoroughly reported to the Safety General Manager. Summarized results are reported in the safety management committee to be evaluated.

1. Efforts with preventive measures

(1) Establishment of the management system for sleeper/rail fastening system

With regard to a sleeper and a fastening system, we conduct inspections based on the track maintenance plan approved by the safety management committee and repair any faulty parts swiftly. Furthermore, we make the system which the inspection results and the status of implementation for repair are reported to the Safety General Manager in report meetings.

(2) Establishment of the management system for track inspections

① We define the base-date of inspection and conduct the measurements of each item.

② After the measurement, we make the system that we analyze/evaluate the results within about 15 days.

③ With regard to analyze/evaluate, in order to share the results of analyze/evaluation, we hold the report meeting with the Safety General Manager, Engineering Manager, Management Section Leader (Engineering Manager), Manager in Inaricho Technical Center, and the Manager for Track Maintenance Group after finishing the analysis.

After we consider the repair contents based on the results in the report meetings, we define the repair work plans.

Furthermore, we circulate the results of inspections in a company. Any faulty parts are repaired sequentially.

④ We make a track maintenance plan, which is an annual plan, in report meetings. After the safety management committee approved the plan, we implement the maintenance.

⑤ With regard to a progress of track maintenance, we make a system that we hold the report meetings with the Safety General Manager every 15 days and confirm the progress of track management in report meetings.

(3) Training enhancement for technical staff

① We hold a training regarding track maintenance and inspection by inviting external lecturers. Furthermore, we will continue to hold the training to improve a technical skill approximately twice a year.

② In a training for young staff, we conduct the training to improve fundamental action of work and awareness toward safety work. We will continue to hold the training to improve a technical skill approximately twice a year.

③ In a meeting for leader and chief once a month, we confirm the progress reports of track maintenance and status in each workplace. Furthermore, we also evaluate the contents of near-miss information and share information in each workplace.

(4) Sharing information

We are summarizing the near-miss information in each workplace and are conducting preventive measures, which are evaluated in the monthly leader and chief meetings, in each

workplace. Furthermore, we are re-evaluating the results of the measures in leader and chief meetings and are posting the results in each workplace. Through these initiatives, we aim to prevent accidents and share information.

2. Management of the rail fastening system for PC sleepers

(1) Thoroughness of checks after working on the track

① Preparation of work instructions

With the aim of conducting thorough checks after working on the tracks, we decide to prepare work instructions for each work. The final check is done by the staff in charge of the work and assistant appointed by the Manager for Track Maintenance Group regarding whether or not checks for the entire work have been done. After the final check, the staff in charge of the work enters that the work has been completed; and the Group Manager reports it to the Manager in Inaricho Technical Center.

The Safety General Manager inspects work instructions at the Technical Center without deciding the date prior to the inspections, with the aim of confirming that they are appropriately implemented.

② Management of work instructions

We prepare the work instruction management manual and aim to prepare and manage work instructions based on the manual in each workplace.

(2) Management of the rail fastening system for PC sleepers

① Management of the rail fastening system

a. We replaced all of the sleepers and the rail fastening systems in the derailed section after the accident.

b. We inspected the condition of rail fastening system on 12 rail replacement points, which were installed at the same time as the above section, and we confirmed that there is no issue for running safety.

c. We checked the condition of rail fastening by re-fastening the bolts, etc. With regard to consecutive faulty sleepers, we replaced/inserted sleepers and replaced the rail fastening systems.

d. When we implement the construction to replace the rail fastening systems, the responsible staff for operation and the assistant, who are appointed by the Manager for Track Maintenance Group, check the condition of rail fastening system and confirmed looseness of bolts based on the work instruction.

In addition, we decide to re-fasten all bolts in replaced parts after 2 weeks. The responsible staff for operation and assistant conduct the final checks in the same rule as the replacement work.

e. With regard to the condition of rail fastening systems, we confirm faulty part based on the track maintenance plan and conduct an appropriate management.

Furthermore, we decide to hold the report meeting to check the results of inspection, and we report to the Safety General Manager.

In addition, we continuously confirm the looseness of bolts and we also write the condition of bolts in the inspection table with the aim of promoting appropriate management.

② Correction of inappropriate parts

a. We repaired consecutive faulty rail fastening system on sleeper.

b. We have been repairing other faulty rail fastening system on sleeper to the plan.

FY2013 result: About 4,500 sleepers were replaced

FY2014 plan: About 3,700 sleepers are to be replaced

(3) Management system for the maintenance of tracks

We promote maintenance as per the track management plan after the approval is given to the plan by the safety management committee.

With regard to the progress of track management, we hold report meetings involving the Safety General Manager every 15 days, and confirm the condition of maintenance in the meetings to appropriately manage.

*The completion report is published on the JTSB website:
http://www.mlit.go.jp/jtsb/railkankoku/railway-kankoku3re-1_20130809.pdf

② Hokkaido Railway Company; Train derailment accident on the premises of Seifuzan signal station, Sekisho Line

(Recommendation issued on May 31, 2013)

On May 31 2013, the Japan Transport Safety Board (JTSB) published an investigation report and issued a recommendation to Hokkaido Railway Company as one of the parties relevant to the cause of the accident. The report and recommendation were in regards to the train derailment accident that occurred on the Seifuzan Signal Station premises on the Sekisho Line, which was managed by Hokkaido Railway Company, on May 27, 2011. The JTSB then received the following report regarding the measures (interim plan) taken based on the recommendation.

Status of the burnt cars

○SUMMARY

The six-car of the inbound train limited express “Ki-4014D train” (Super Ozora 14), of Hokkaido Railway Company, starting from Kushiro station bound for Sapporo Station, departed Tomamu Station about 2 minutes behind schedule, on May 27, 2011.

The conductor, in the conductor's compartment of the fourth vehicle of the train, running toward Seifuzan signal station, have heard an abnormal sound and have felt irregular vibration, so he notified those events to the train driver. The train

driver applied braking operation immediately after notified from the conductor. The train stopped in Niniu No.1 tunnel in the premises of Seifuzan signal station.

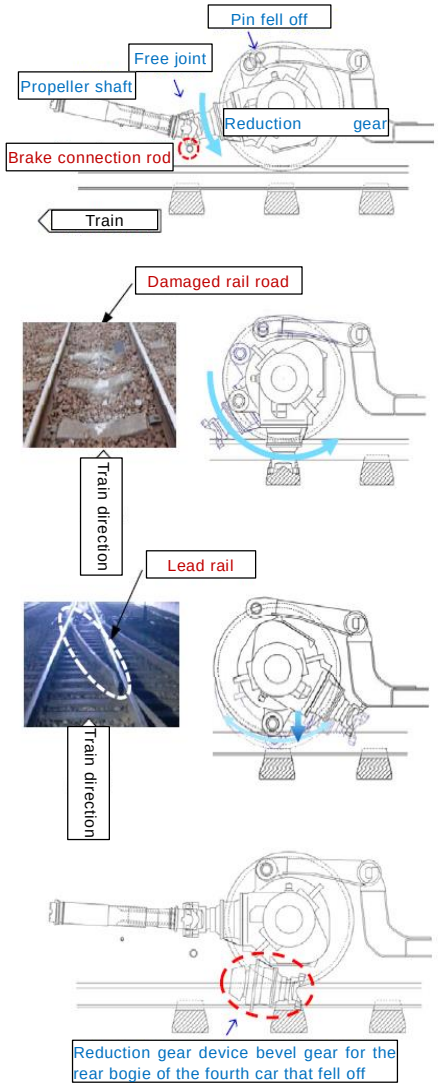
After that, the smoke of the fire which broke out from the train flowed into the train. The train driver tried to move the train halting in the tunnel to outside of the tunnel, but the train could not be moved.

There were 248 passengers, the train driver, the train conductor, and 2 cabin attendants on board the train. All members had evacuated outside the tunnel on foot, but 78 passengers and the conductor were injured.

It was found that the first axle of the rear bogie of the fifth vehicle of the train had derailed to the left. There were many parts of the dropped power transmission device, etc. scattered along the track for about 2 km length away from the halted point of the train. Moreover, all the 6 vehicles of the train were burnt by the fire.

○ PROBABLE CAUSES

It is probable that all 2 axles of the rear bogie of the forth vehicle and the first axle of the rear bogie of the fifth vehicle of the train were derailed as a results of the following steps, originated from the pin dropping out the reduction gear device on the rear part of the fourth vehicle fell down.



(1) When the reduction gear device was hung down forward as rotate around the axle, the propeller shaft was also hung down. As a result, the universal joint was broken and finally the reduction gear and the propeller shaft were separated.

(2) As the separated reduction gear device further rotated, the suspender of the reduction gear device hit the lead rail of the turnout No.12-Ro in the premises of Seifuzan signal station. At this moment, the rear bogie of the fourth vehicle was pushed to the left along the lead rail and the first axle derailed, the second axle of the rear bogie derailed following the first axle. The derailed 2 axles were restored at the turnout No.11-I.

(3) As the rear bogie of the fifth vehicle hit the bevel gear on the track fallen off from the hanged reduction gear device, the rear bogie was pushed up and the first axle was derailed.

It is probable that the pin suspending the reduction gear device fell down following the process described below. It is also probable that these process were related with huge vibration acting on the rear bogie of the fourth vehicle, due to the circular irregularity of the tread profile of the left wheel in the first axle of the rear bogie of the forth vehicle.

(1) There were local wear caused by contacts with other components in the split pin which fixed the grooved hexagonal nut for the suspension pin supporting the reduction gear device, and in the stopper split pin which was inserted at the head of the suspension pin to prevent fallen out.

(2) As the grooved hexagonal nut was loosened, the split pin inserted in the groove was exposed to the iterative tangential load and finally fell out of the groove of the hexagonal nut.

(3) The grooved hexagon nut loosened by missing the split pin and rotated still more until fell out.

(4) The stopper split pin which was inserted at the head of the suspension pin fell out by the iterative tangential load from the suspension pin.

(5) After the grooved hexagonal nut and the stopper split pin fell out, the suspension pin dropping out the reduction gear device fell out of the guide.

About the damage of the train by fire after the train derailment accident, it is probable that the fallen bevel gear of the reduction gear device hit and broke the fuel tank in the front part of the sixth vehicle, the light oil scattered on the track around the wooden sleeper had caught a fire ignited at around the generator or rear upper part of the engine and spread to the whole train.

According to the results of the overhaul inspection about the under floor equipments that were badly burnt and the equipments to get high temperature during operation, it is probable that all equipments caught fire by the external heat sources, then, the precise point where a fire was outbreak and the cause of outbreak fire were not identified.

○RECOMENDATIONS

Hokkaido Railway Co. should establish the proper inspection system, i.e., inspection period and methods for monitoring the condition of the wheel tread, and should manage the condition of the wheel tread throughout, and never use the wheel which should be treated as the wheel whose size of the tread defects or exfoliation are exceeded the limit to be used.

○ Measures taken based on the recommendation (interim report)

1. Measures taken with regard to "Establish a system to constantly check the wheels for states of tread defect and exfoliation. For example, using a procedure to record any discovered tread defects or exfoliations below the regulation value in the inspection book, which should be inspected again in order to understand how much the wheels have deteriorated."

Wheel tread exfoliation condition

(1) The vehicle planning division has made an agreement in October and December of 2013 with field managers, who are involved with car inspections and repair, regarding the promotion of activities to continue monitoring in case they find any wheel whose size of the tread defects or exfoliations is below the regulation value.

(2) The vehicle planning division has notified employees engaged in car inspections and repair involving wheel management via "Regarding the dimension regulation at the time of tread inspections" (Syakenshidou No.193, dated December 24, 2013) that continuous sets of defects and exfoliations on the tread, etc. are to be handled as a single tread defect/ exfoliation according to the conventional criteria used for wheel inspections.

(3) The vehicle planning division has notified employees engaged in car inspections and repair involving wheel management via "Regarding the program change and usage start of the car maintenance management system" (Syakenshidou No.164, dated July 30, 2014) that in case they find tread defects or exfoliations, etc. below the regulation value at the time of wheel inspections, they must enter the dimension, etc. in the "car maintenance management system" to leave a record; and that managers, etc. must confirm the entered dimensions, etc. and leave a record.

(4) The vehicle planning division has established a system in which they can continue inspecting the progress in case they find tread defects or exfoliations, etc. by comparing the dimensions with the dimensions at the time of the previous inspection, through the initiatives mentioned in 1. (1) – 1. (3).

(5) The vehicle planning division shall add the system mentioned in 1. (4) to the maintenance standard for each car type by the end of March, 2015, based on the situation of the wheel management and wheel inspections conducted in winter of 2014.

2. Measures taken with regard to "Employees of the vehicle planning division should visit each field twice a year to understand the status of wheel management and wheel inspections. They should also guide and review the inspection methods if necessary."

(1) Employees of the vehicle planning division visited the field, where the cars are, at least twice a year between October of 2013 and March of 2014 according to "Regarding comprehending the changes in the conditions of diesel railcars taken for periodic inspections" (Syakenshidou No.128, dated October 15, 2013) and "Regarding comprehending the changes in the conditions

of diesel railcars that have undergone periodic inspections (expanded scope)" (Syakenshidou No.156, dated November 6, 2013) to measure the actual dimensions of tread defects and exfoliations, etc. and to check them with the results measured by the employees in the field. They also comprehended the actual situation regarding wheel management and wheel inspections by confirming the entry status in the car maintenance management system, etc. Through this initiative, we have confirmed that the wheel management and wheel inspection contents, which were notified in 1. (2) and 1. (3), have been implemented, that there is no issue with the operation of wheel management, and that there is no need to revise the wheel inspection method.

(2) Employees of the vehicle planning division visit each field twice between October of 2014 and March of 2015 according to "Regarding intelligence exchanges with the head office and comprehension of the actual situation" (Unkan No.174, dated October 30, 2013 notified jointly by the general manager of transport department and general manager of rolling stock department) to comprehend the actual situation of wheel management and wheel inspections to determine whether or not we must review the wheel inspection method.

3. Measures taken with regards to "Introduction at a system should be discussed as early as possible in order to continuously and quantitatively detect heat cracking and defects (including exfoliationss) on the wheel. The system should be able to be executed while the train is operated and should be able to detect issues."

(1) With regard to the "wheel flat detection system", which can continuously and quantitatively detect heat cracking and defects (including exfoliations) on the wheel while the train is operated, the vehicle planning division has decided to introduce the system in November of 2014 after considering the specifications and installation location, etc. The division has decided to install the system on all trains in the Sapporo area and locations where all limited express diesel railcars pass in June of 2015.

After the installation, we will conduct the test-run until June of 2016 with the aim of comprehending the conditions in summer and winter. We will investigate the correlation between the detection data and wheel defect/ exfoliation, etc. and plan the full-scale operation, which will start in July of 2016.

(2) With regard to the expansion of installation of "wheel flat detection system" for cars that do not pass the areas where the system was installed in 3. (1), the vehicle planning division will consider the matter based on the actual situation in 2. (2) and the test-run in 3.(1).

*The interim report is published on the JTSB website:
http://www.mlit.go.jp/jtsb/railkankoku/railway-kankoku3re-2_20141222.pdf

③ Hokkaido Railway Company; Serious railway incident on the premises of Oiwake Station, Sekisho Line (dangerous damage in facilities)

(Recommendation issued on November 30, 2012)

On November 30, 2012, the Japan Transport Safety Board (JTSB) published an investigation report and issued a recommendation to Hokkaido Railway Company as one of the parties relevant to the cause of the serious incident, regarding the serious railway incident that occurred on the premises of Oiwake Station in Sekisho Line between June 14 and June 16, 2011. JTSB then received the following report regarding the measures (completion plan) taken based on the recommendation.

○SUMMARY

The first incident:

The outbound train composed of one vehicle, starting from Oiwake station bound for Yubari station of Hokkaido Railway Company, departed from the No.1 track of Oiwake station on schedule, Tuesday, June 14, 2011.

A signaler in the signal cabin of Oiwake staion, noticed that even though the train departed from Track No. 1, the indicator lamp of the No.1 track starting signal on the display panel, kept lighting in green and did not light off to show the stop indication. According to the records of the interlocking device, the No.1 track starting signal did not indicate the stop signal at this time.

The second incident:

The outbound train composed of 4 vehicles, starting from Sapporo station bound for Obihiro station of the Company, departed from the No.1 track of Oiwake station on schedule, June 14, 2011.

The same signaler involved in the first incident noticed that even though the train departed from Track No. 1, the indicator lamp of the No.1 track starting signal on the display panel, kept lighting in green and did not light off to show the stop indication. According to the records of the interlocking device, the No.1 track starting signal did not indicate the stop signal at this time.

The third incident:

The outbound train composed of 5 vehicles, starting from Sapporo station bound for Obihiro station of the Company, departed from the No.1 track of Oiwake station on schedule, Wednesday, June 15, 2011.

A signaler, different from the one involving the first and the second incidents, noticed that even though the train departed from No.1 track, the indicator lamp of the No.1 track starting signal on the display panel, kept lighting in green and did not light off to show the stop indication. An employee in charge of construction confirmed that the No.1 track starting signal did not indicate the stop signal at this time.

The fourth incident:

The outbound train composed of one vehicle, starting from Chitose station bound for Yubari station of the Company, departed from the No.4 track of Oiwake station two minutes behind the schedule, Thursday, June 16, 2011.

A signaler, different from the one involving the first to the third incidents, noticed that even though the train departed from No.4 track, the indicator lamp of the No.4 track starting signal on the display panel, kept lighting in green and did not light off to show the stop indication. According to the records of the interlocking device, the No.4 track starting signal did not indicate the stop signal at this time.

○PROBABLE CAUSES

It is probable that the starting signal for the down track of Sekisho Line did not change from the proceed signal to the stop signal when the departed train entered into the protection area of the starting signal, for the plural times, because the wiring works in the existing signal control circuit was mistaken, so that the signal current flows into the signal control circuit for the down track starting signal indicating the proceed signal when the down track starting signals of Sekisho Line and Muroran Line are routed at the same time, in the construction works to introduce the CTC and PRC system in the future.

It is probable that the signal current flowed into the relays in the signal control circuit of the starting signal in the routed track through the cathodes of the new relays connected with each other, when the routes of Sekisho Line and Muroran Line are set at the same time, considering the following situations.

(1) The anodes of the new relays were connected directly to the existing facilities, without using any switching plug.

(2) The cathodes of the new relays were connected with each other.

(3) New relay devices had been inserted into the electric circuit in the relay rack.

It is probable that the followings were related to induce the above situations.

(1) The Company's regulation that a switching plug should be inserted into both the positive and the negative terminals of the existing facilities when the switching plugs are used to replace the existing facility by the new one, did not be obeyed.

(2) It is not enough informed to the related staffs that the wiring works connected to the existing facilities should be treated as the work to effect the train operation, in the improving works of the interlocking device that is a signaling system.

(3) The prior check for the wiring works were not performed using the wiring diagrams in which the switching plugs are indicated, even though the electric connection diagrams were double-checked.

(4) The wiring works were performed before the wiring diagram had been approved.

(5) The management of the progress of the wiring works was not properly performed.

It is somewhat likely that both the supervisor and the subcontractor of the wiring work were too busy with other construction work performed at the same time, then the prior check was

performed for only a part of them due to their overcrowded jobs.

It is probable that the plural incidents occurred in relation with that the phenomena were not recognized as the incident, the communication network for an emergency were not organized, and the information was not transferred properly between the related employees, when the stop signal did not indicated by the signal device which should indicate the stop signal.

○RECOMMENDATIONS

(1) Hokkaido Railway Company has defined the preventive measures that would not effect safety operation of the existing signaling system during the construction works, such as to determine the appropriate position where the switching plug should be inserted, and the checking rules for the various wiring diagrams or electric connection diagrams, furthermore, the company defined clearly the procedures to be performed when a staff recognized that the indicator lamp to be changed to the stop signal did not light off to indicate stop signal in the operation manual. These measures are considered effective for the prevention of reoccurrence. However, it is essential to educate the company's employees continuously so that they fully understand the points of these measures and can take the appropriate measures against malfunctions.

(2) The company experienced a serious incident, i.e., a block signal that should have indicated a stop signal did not changed to the stop signal in the Hakodate Line on January 15, 2009, and the company had taken the preventive measures after the serious incident. However, the same kind of serious incident occurred this time, then the company should examine again about the system for construction and the management methods, and train the staffs engaged in the construction works, including subcontractors, so that they can acquire the basic operations for construction related to the signaling system, and should discuss about safety measures and take all necessary measures to prevent any more serious events.

○Measures taken based on the recommendation (completion report)

I. Ask that preventive measures be understood and undertake continuous training of employees

We have conducted the following educational training, which relates to the purposes of the preventive measures, and we will continue the initiative in the future.

1. Educational training for those engaging in signal work

(1) In the group training, which is performed on our employees and group company employees, we perform practical training relating to the approval of drawings and wiring work, including lecture education as well as hands-on training for wiring in training facilities. This is so we can enable anyone to perform wiring work in accordance with the rules for wiring. We also grasp the degree of understanding through end-of-course examinations.

(2) In the lecture about the qualifications that signal work technicians are required to finish once every three years by the Hokkaido Branch of the Railway Electrical Construction Association on Safety, lectures on the purposes of the preventive measures are added to the curriculum. Qualification is given by reflecting the degree of understanding.

2. Education and training for station attendants

We have added how to respond to failures in an interlocking device to the curricula for the general training, signalers, and transport officers. We grasp the degree of understanding through end-of-course examinations.

3. Education and training for dispatchers

The section in charge of the operation management involving in the electric blocking section added this serious incident as part of the education for employees in charge of operation management and educated them accordingly.

II. Safety measures for construction of the signaling systems

Education and training have been undertaken for those engaging in the construction of signaling systems in various training sessions, such as for preventing serious incidents like this one. In addition to this, the staff members of the electricity planning division in the head office have also visited the office of the contractor to recheck whether the defined rules are being correctly performed.

We have also rechecked for discrepancies in the related regulations to determine whether or not they include expressions that may cause misunderstanding as well as insufficient content in the preventive measures for case studies of past accidents. We have revised regulations that required revisions by changing expressions and reflecting instruction documents, etc.

We immediately took safety measures against any problems identified in these checks. We have also taught these problems in our education.

Furthermore, we have also revised our operation manual by standardizing the inspection methods and response to results, etc. by re-assessing the inspection items based on inspection results, so that field managers in charge of constructions and employees of the electricity planning division in the head office inspect continuously whether or not the defined rules and basic operations are being adhered to in the progress management of wiring work and wiring check after wiring, etc.

*The completion report, including materials, is published on the JTSB website:
http://www.mlit.go.jp/jtsb/railkankoku/railway-kankoku2re-2_20140625.pdf

④ Sangi Railway Co., Ltd.: Serious railway incident on the premises of Higashi-Fujiwara Station on the Sangi Line

(Recommendation issued on October 25, 2013)

On October 25, 2013, the Japan Transport Safety Board (JTSB) published an investigation report and issued a recommendation to Sangi Railway Co., Ltd. as one of the parties relevant to the cause of the serious incident, regarding the serious railway incident that occurred on the premises of Higashi-Fujiwara Station on the Sangi Line on June 27, 2012. JTSB then received the following report

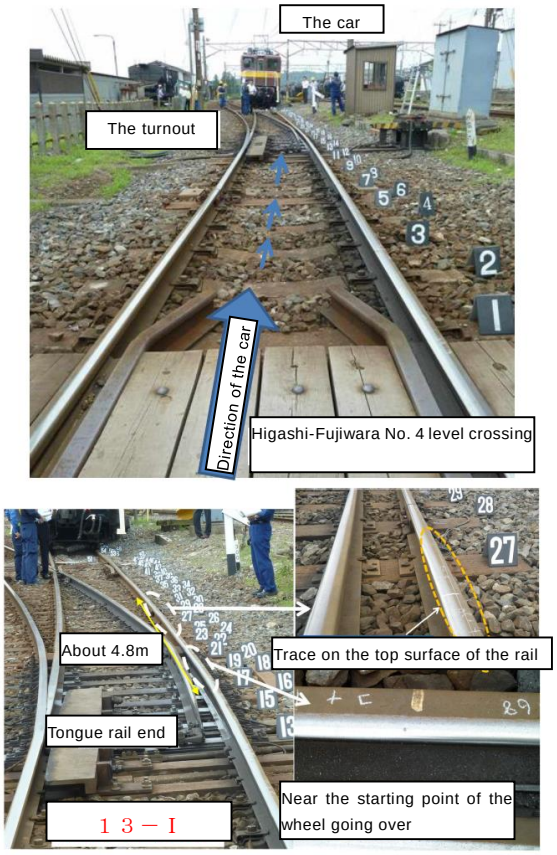
regarding the measures (interim report) taken based on the recommendation.

○Summary of the serious incident

At about 3:00 P.M. on June 27 2012, one of Sangi Railway Co., Ltd.'s 18-car shunting train (two electric locomotives and 16 freight cars) sets started from the private siding of a cement factory for the downbound main line in Higashi-Fujiwara Station.

The driver of the train set, noticing an abnormal condition when it was passing the Higashi-Fujiwara No. 13-I turnout, immediately applied the emergency brake to stop the train. The first axle in the front bogie of the second locomotive was derailed to the right.

A driver was working in the second locomotive, and two guides were in the first one, as well as a switchman in the third one. None of them were injured.



Derailment site

○Probable causes

This serious incident occurred when the set of 18-car shunting train (two electric locomotives and 16 freight cars) was running along the section of the base line side of a turnout that goes in the same direction as the curve. The turnout was in a section that contained four consecutive curves. The situation was attributable to an increase in the derailment coefficient, which occurred at the same time as a decrease in the threshold derailment coefficient. As a result, the right wheel in the first axle of the second locomotive's front bogie subsequently ran up the outside rail and derailed to the right.

It is probable that the increase in the derailment coefficient is a result of the increase in lateral force, as well as a decrease in the wheel weight. This situation can be deduced from the following factors: the track was deformed in a direction that results in the reduction of the radius; the twist of the track increased so that the train leaned to the front right, and; it is probable that that the train was running with excess of cant, which was due to its low-speed. It is somewhat likely that the shift of the axle load due to the power running at an ascent was also a contributing factor.

It is probable that the decrease in the threshold derailment coefficient results from a shifting of track, which is associated with an excessive reduction of the radius, resulting in an increase in the angle of attack for the first axle of the front bogie.

It is probable that the rapid shifting of track and the increase in twists resulted from their poor management of the shapes and shifts of the tracks. They did not understand the specification of plain curves, or did not inspect the shifts of the tracks in the turnouts. As a result, they were not able to recognize that the state of the tracks exceeded the allowances of its maintenance criteria.

○Description of the recommendation to Sangi Railway Co., Ltd.

Sangi Railway Co., Ltd. should make sure that their tracks are well maintained. They should do so by grasping the design values for maintenance and management and by inspecting shifts properly in accordance with the "Practice Criteria for construction works" in sections involving curves and/or turnouts.

○Measures taken based on the recommendation (interim report)

Since specifications of curves have been clarified for curves of our Sangi main line between each station, we have utilized them for track maintenance. However, some specifications of curves were not clarified in the main line, side lines, and curves with turnouts on the premises of each station. We had depended on the "long experience" and "review" of field workers.

As a result of investigations, we have clarified that stations, in which the specifications of curves were unclear, are 10 stations, including Tomida Station, Oyachi Station, Heizu Station, Hobo Station, Umedoi Station, Misato Station, Nyugawa Station, Ise-Hatta Station, Higashi-Fujiwara Station, and Nishi-Fujiwara Station. We have taken measurements in order to clarify the specifications in these stations, in which the specifications of curves are unclear, along Sangi Line. We are now promoting the work to define specifications of curves one by one by reading the current curves from the survey maps.

With regard to turnouts in each station, we will also report the work progress of the 3 locations, including Tomida Station Sa No. 60 turnout, No. 91 turnout, and Higashi-Fujiwara Station No. 60 turnout, which are adjusted on site due to the fact that there are no specifications (hereinafter referred to as "similar turnout").

・Tomida Station

We have started taking measurements on April 2, 2013, and field measurements have been completed on March 11, 2014. We are currently preparing the survey. We plan to promote work to define specifications of curves after the completion of the production of these measurements. We will promote the maintenance until the specification is defined by using the current figures as the criteria.

・Oyachi Station

We have started taking measurements on January 10, 2014, and field measurements have been completed on January 18. We are currently preparing the survey, and we will define specifications of curves after the completion of the survey. We will promote the maintenance until the specification is defined by using the current figures as the criteria.

・Heizu Station

While we have not taken field measurements at the moment, we will swiftly take measurements within this FY. We will define specifications of curves after the completion of the survey. We will promote the maintenance until the specification is defined by using the current figures as the criteria.

・Hobo Station

We have started taking measurements on March 4, 2014, and field measurements have been completed on April 4. We are currently preparing the survey, and we will define specifications of curves after the completion of the survey. We will promote the maintenance until the specification is defined by using the current figures as the criteria.

・Umedoi Station

We have started taking measurements on April 2, 2013, and the field measurements have been completed on April 22.

Based on these measurement results, we have prepared line survey maps including the specifications of curves in accordance with the Practice Criteria for construction works. We have applied for approval of application for modification of relevant railway facilities (Sangi tetsu No.80, dated November 14, 2013) regarding the new track shapes and received the approval by the Director-General of the Chubu District Transport Bureau (Chu-untetsugi No.157, dated December 12, 2013).

In response to this, we have implemented the construction to replace turnouts with heavy tracks within the station in accordance with the defined track shape (37kg→50kgN) (a total of 4 turnouts, including No. 11-I turnout, No. 11-Ro turnout, No. 12-I turnout, and No. 12-Ro turnout) as well as the curve improvement construction along with it by March 20, 2014.

Due to these constructions, all 4 curves have been improved to the new track shapes.

We will appropriately store the line survey maps and appropriately maintain and manage the tracks in accordance with the allowances of the maintenance criteria included in the Practice Criteria for construction works.

・Misato Station

We have started taking measurements on April 5, 2014, and field measurements have been completed on January 15. We are currently preparing the survey, and we will define specifications of curves after the completion of the survey. We will promote the maintenance until the specification is defined by using the current figures as the criteria.

・Nyugawa Station

We have started taking measurements on January 20, 2014, and field measurements have been completed on February 10. We are currently preparing the survey, and we will define specifications of curves after the completion of the survey. We will promote the maintenance until the specification is defined by using the current figures as the criteria.

・Ise-Hatta Station

We have started taking measurements on February 25, 2014, and field measurements have been completed on March 3. We are currently preparing the survey, and we will define specifications of curves after the completion of the survey. We will promote the maintenance until the specification

is defined by using the current figures as the criteria.

・Higashi-Fujiwara Station

We have started taking measurements on May 22, 2012, and the field measurements have been completed on August 7 of 2012.

Based on these measurement results, we have prepared line survey maps for 5 curves, which required improvement, including the specification of curves in accordance with the Practice Criteria for construction works. We have applied for approval of application for modification of relevant railway facilities (Sangi tetsu No.50, dated September 21, 2012) regarding the new track shapes and received the approval by the Director-General of the Chubu District Transport Bureau (Chu-untetsugi No.148, dated November 21, 2012). In response to this, we have implemented the construction to replace turnouts with heavy tracks within the station in accordance with the defined track shape (37kg→50kgN) (a total of 5 turnouts, including No. 13-I turnout, No. 13-Ro turnout, No. 17-I turnout, No. 17-Ro turnout, and No. 14-Ro turnout) as well as the curve improvement construction along with it by March 13, 2013.

We have also prepared line survey maps for the other 17 curves including the specifications of curves in accordance with the Practice Criteria for construction works, and we have included the specifications for each curve. (Work completed on May 22, 2014)

We will appropriately store the line survey maps and appropriately maintain and manage the tracks in accordance with the allowances of the maintenance criteria included in the Practice Criteria for construction works.

・Nishi-Fujiwara Station

While we have not taken field measurements at the moment, we will swiftly take measurements within this FY. We will define specifications of curves after the completion of the survey. We will promote the maintenance until the specification is defined by using the current figures as the criteria.

・Tomida Station Sa No. 60 turnout

We have started taking measurements on April 2, 2013, and field measurements have been completed on March 11, 2014. We are currently preparing the survey, and we will promote work to define specifications of curves after the completion of the production of these measurements. We will plan curve improvement constructions in accordance with this.

・Tomida Station No. 91 turnout

We have started taking measurements on April 2, 2013, and field measurements have been completed on March 11, 2014. We are currently preparing the survey, and we will promote work to define specifications of curves after the completion of the production of these measurements. We will plan curve improvement constructions in accordance with this.

・Higashi-Fujiwara Station No. 60 turnout

We have started taking measurements on May 22, 2012, and field measurements have been completed on August 7, 2014. We are currently preparing the survey, and we will promote work to define specifications of curves after the completion of the production of these measurements. We will plan curve improvement constructions in accordance with this.

Regarding the transitional and appropriate maintenance for these Tomida Station Sa No. 60 turnout, Tomida Station No. 91 turnout, and Higashi-Fujiwara Station No. 60 turnout until the fundamental improvement construction is completed, we have requested the Railway Technical Research Institute to conduct a field check on December 12, 2013, and give us instructions on the maintenance method. We have decided to conduct the inspections, which are normally conducted once a year, once a month based on the advice regarding the maintenance method by the Railway Technical Research Institute until the major curve improvement is completed. We will promote the management by using the current management figures with the aim of ensuring safety.

*The interim report, including materials, is published on the JTSB website:
http://www.mlit.go.jp/jtsb/railkankoku/railway-kankoku5re-2_20140625.pdf

9 Provision of factual information in 2014

There were no cases of provision of factual information in 2014.

10 Summaries of major railway accident and serious incident investigation reports (case studies)

Derailment due to decrease of wheel load of the outside wheel caused by uneven loading in the containers

Japan Freight Railway Company; Train derailment accident between Izumisawa station and Kamaya station, Esashi Line

Summary: On Thursday, April 26, 2012, the freight train composed of 20 car departed from Aomori signal station on schedule, and arrived at Goryokaku station. The transport staff waiting for the train at Goryokaku station found smoke rose from the freight wagon, 18th car of the arrived train, and notified to the station office. The rushed station staffs fought the fire of the freight wagon that the smoke rose from around the bogie.

On the other hand, the switching malfunction of the turnout occurred in the premises of Kamaya station, Esashi Line. The track maintenance staffs of Hokkaido Railway Company checked track condition in the premises of Kamaya station, and found that the turnout was damaged and there were traces of derailment on the sleepers around it.

The freight wagon emitting smoke at Goryokaku station was not derailed but judged as it had derailed once, by the results of the inspection about status of the wheels of the freight wagon.

A train driver was onboard the train, but there was no injury.

Findings

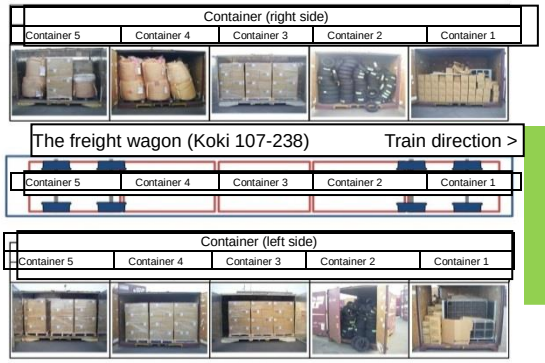
It is probable that the freight wagon became derailed as follows. Due to the large unbalance in the static wheel loads, in which the outside (right) wheel of each axle of the rear bogie was light, the wheel load of the outside (right) wheel was lighter than the wheel load of the inside (left) wheel while the train passed the curved track. Due to this, the lateral force for the outside (right) wheel had increased.

It is highly probable that the large unbalance in the static wheel loads, in which the outside (right) wheel of each axle of the freight wagon's rear bogie was light, occurred due to the uneven loading, in which a heavier load was on the left side compared to the right side, in containers (container 4 and 5) that were loaded on the freight wagon's rear bogie.

Loading situation of container 4
1. 48 cardboard boxes on the right side of the direction (about 540kg)
2. 6 flexible container bags boxes on the left side of the direction (about 3,600kg)

Loading situation of container 5
1. 48 cardboard boxes on the right side of the direction (about 540kg)
2. 16 cardboard boxes (about 180kg) and 3 flexible container bags (about 1,800kg) on the left side of the direction (1,980kg total)

*Left side had heavier loading than the right side's.



Loading situation in container

Due to the fact that there was a relatively large combination of track alignment and cross-level (*1) before the point where the wagon climbed over the rail, it is somewhat likely that the force to roll the wagon increased the decrease of the wheel load of the outside (right) wheel, resulting in a situation in which the wagon was prone to climbing over the right rail.

*1 "Combination of track alignment and cross-level" is one of the parameters of track irregularity maintenance. When a cross level occurs in which the track surface tilts according to track alignment, a value 1.5 times the size of the cross level is subtracted from or added to the alignment to increase the absolute value of the combination of alignment and cross levels. As the combination of alignment and cross levels increases, freight wagons can roll or hunt more easily.

It is probable that the first axle of the rear bogie of the freight wagon became derailed to the right when the outside (right) wheel climbed over the right rail due to the derailment coefficient for the first axle of the rear bogie increasing when the train passed the curve.

Probable causes: It is probable that the outside wheel climbed up to the top of outside rail, i.e., it was the flange climb derailment, by the increased derailment coefficient for the outside wheel, because the lateral force acting on the outside wheel had increased by the increased wheel load of the inside wheel, and the wheel load of the outside wheel had decreased, due to the large unbalance in the static wheel loads between right and left wheels of the freight wagon loaded containers, compared to the wagon with balanced static wheel load, while the train passed in the curved track of 300m radius, in this accident.

It is highly probable that the uneven loading in the containers caused the large unbalance in the wheel loads in the derailed freight wagon.

In addition, it is somewhat likely that the combination of track alignment and cross-level, which should be managed in the section where freight trains are operated, had relatively large at the point climbing up by the wheel started, promoted the decrease of wheel load of the outside wheel.

For details, please refer to the investigation report. (Published in Japanese on July 25, 2014)
http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2014-7-2.pdf

Derailment due to entering into a different track from the predetermined track after climbing up the tongue rail of a turnout

Kobe Electric Railway Co., Ltd.; Train derailment accident in the premises of Arimaguchi Station, Sanda Line

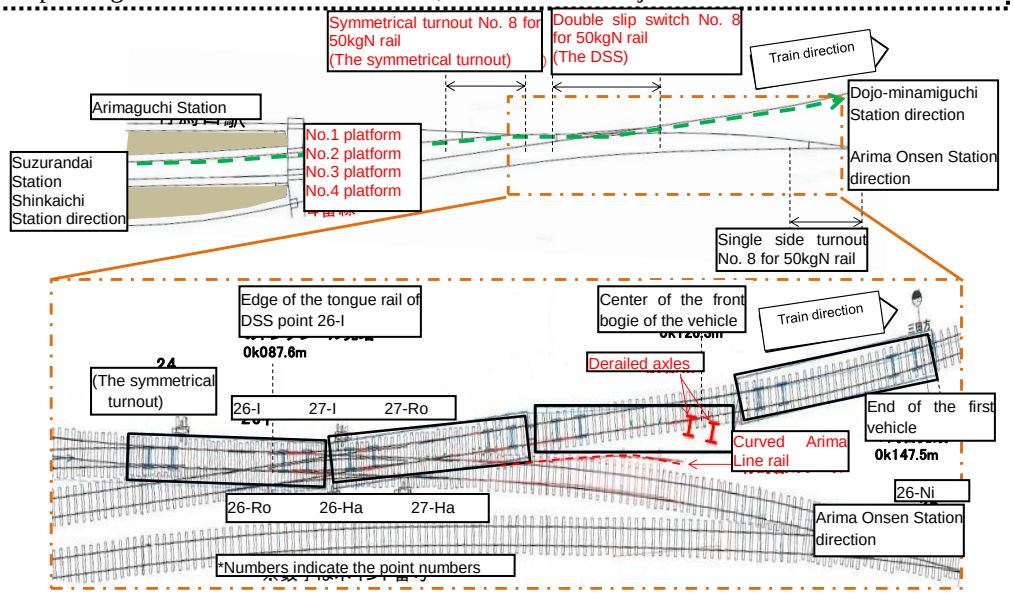
Summary: On Tuesday, May 28, 2013, the train composed of four vehicles had started on schedule at No.2 platform of Arimaguchi station, Sanda line. The train driver noticed an abnormal sound and the following big sound while operating coasting at about 25 km/h at the turnout in the station, and applied the emergency brake to stop the train. After that he found the front bogie of the second car entered into the route to Arima-Onsen station, different route from the predetermined route, and found all two axles in the front bogie of the second vehicle were derailed.

The first vehicle, the rear bogie of the second vehicle and the third vehicle had entered and stopped in the predetermined route to Dojo-Minamiguchi station.

There were about 60 passengers and the driver on the train, but no one was injured.

Findings

Lateral force tends to increase on the first axle of the front bogie of the car when a train, which leaves from No.2 platform, travels, compared to when a train, which leaves from No.1 platform, travels. It is probable that the tolerance against derailment was reduced due to the fact that the vehicle was passing the S-shaped track where the shape of curvature changes in the distance between the first axle and the fourth axle, which is shorter than the length of a vehicle.



Lines and sketch of the accident site

It is somewhat likely that a relatively large lateral force was easy to occur due to the facts that the double slip switch (*1) had an entrance angle (about 0.38 degrees) in the design near the Point 26-I tongue rail edge and that the track alignment based on the moving average method (*2) including the alignment in the design had changed as to decrease the radius curvature where the wheel is considered to have climbed over the rail.

*1 “Double slip switch (DSS)” refers to a type of special turnout. It refers to a track with connecting lines (track structure to connect 2 neighboring tracks) on both sides of a diamond crossing (track structure where 2 tracks cross each other on the same surface)

*2 “Track alignment based on the moving average method” refers to the value gained from subtracting the average measurement value of a certain distance near the measurement point from the measurement value at the time of the track alignment inspection.

There was wear of about 4-6mm in the thickness direction of the wheel flange and about 1-2mm in the height direction. Each of the flange part had been worn vertically compared to the designed cross sectional shapes, and the flange angle was larger than the designed cross sectional shapes of the wheels. Due to this, it is probable that the area near the edge of the flange of the right wheel was prone to be close to the right tongue rail of point 26-I of the double slip switch and climb over it.

Probable causes (excerpt): It is probable that the front bogie of the second vehicle of train started at No.2 platform of Arimaguchi station, Sanda line, had entered into the unexpected route to Arima-Onsenguchi station and derailed, because the flange of the right wheel of the first axle in the front bogie of the second vehicle had climb over the tongue rail around edge of the right tongue rail of the point in the double slip switch, followed after passing the symmetrical turnout in the premises of Arimaguchi station, in this accident. And, it is probable that the second axle of the front bogie had derailed to the right in the double slip switch following to the first axle entered into the wrong route, although it had entered into the predetermined route at the point in the double slip switch.

For details, Please refer to the investigation report. (Published in Japanese on October 30, 2014)
http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2014-9-1.pdf

Oil in the torque converter was ignited when the temperature of a diesel locomotive converter became high, damaging it

East Japan Railway Company; Train fire accident between Tsukuda station and Iwamoto station, Joetsu Line

Summary: On Monday, February 4, 2013, the train driver of the train composed of an electric locomotive and a diesel locomotive deadhead as a car felt as the train was dragged from the rear after the train passed Shikishima Station. However, the driver did not find any malfunction by checking the instrument panels, and he continued to drive the train. After a while, when the train ran by powering operation at about 60 km/h after passed the Tonegawa No.2 Bridge, the train driver felt again as the train was dragged from the rear, but he could not find any malfunction from the instrument panels. However, when he checked the rear of the train, he found a fire broke out from the diesel locomotive, and he applied an emergency brake to stop the train at the safe place.

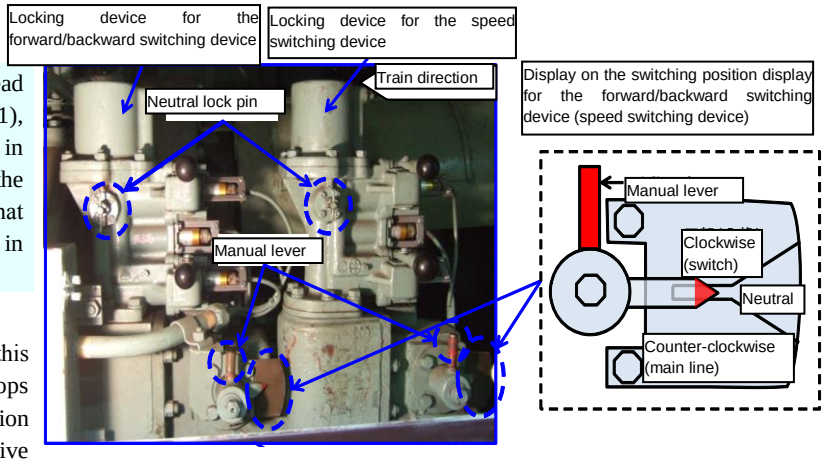
After that, the fire of the diesel locomotive was extinguished by fire fighting, but a part of the vehicle such as the transmission device were damaged by fire.

There was a train driver alone on board the train, but he was not injured.

Findings

When a diesel locomotive is in the deadhead operation without powering (*1), forward/backward switching device must be in "neutral lock". However, it is probable that the shifter was not in the "neutral" position and that the forward/backward switching device was not in "neutral lock".

*1 "Deadhead operation without powering " in this report refers to when a diesel locomotive stops its functions and is deadhead to the destination while being towed by an electric locomotive without using the power of the diesel locomotive.



The locking device for the forward/backward switching device and the high speed/low speed switching device

Due to the fact that the forward/backward switching device was not in "neutral lock", it is probable that the rotation of the car's wheel was conducted to the turbine axle of the first stage converter due to the fact that the car was being towed by an electric locomotive, resulting in the turbine blade wheel rotating inside of the first stage converter and the temperature of the turbine blade became high.

Under normal circumstances, the converter is cooled by the coolant that is circulated by the engine. However, the coolant was drained due to the fact that this was in the deadhead operation without powering. Due to this, it is probable that the remaining converter oil (oil used to conduct power) in the torque converter was ignited by the high temperature fragments etc. of the converter which was broken and heated by missing cooling function of the converter.

It is probable that the forward/backward switching device did not correctly switch to "neutral" in the "neutral lock" operation because the staff did not know how to operate it due to the facts that it was the first time for the staff to operate the "neutral lock" operation for the car, that the staff did not have prior education and training, and that there was no operation manual to explain the specific operation method.

Although the emergency brake was supposed to function in case the velocity exceeded the permissible value even if "neutral lock" was forgotten during deadhead operation without powering, the meter relay had been replaced: due to this, the power for the new meter relay was also cut off if the battery switch was turned off. It is somewhat likely that the emergency brake did not operate when the velocity exceeded the permissible value because the battery was turned off in the deadhead operation without powering and the electric power was not supplied to the emergency brake circuit in the new meter relay.

Probable causes (excerpt): It is probable that the remaining converter oil in the torque converter was ignited by the high temperature fragments etc. of the converter which was broken and heated by missing cooling function of the converter because the coolant was drained, and the first stage converter rotated while the deadhead diesel locomotive were running, because the "neutral rock" of the forward/backward switching device was not correctly performed when a diesel locomotive was hauled as the deadhead operation without powering.

For details, please refer to the investigation report. (Published in Japanese on August 29, 2014)
http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2014-8-1.pdf

Derailment caused by collision with the rear portion of the freight truck, which could not cross the intersection ahead of the level crossing

Sanyo Electric Railway Co., Ltd.; Train derailment accident in Shinkomae level crossing, main line

Summary: On Tuesday, February 12, 2013, the inbound six vehicle train set departed at Oshio station on schedule. The train driver noticed the obstacle at Shinkomae level crossing while the train was coasting at about 95 km/h between Iho station and Arai station. Immediately, he sounded a whistle and applied an emergency brake, but the train collided with the rear of the car carrier trailer truck and the stretch board for loading. After that, the train ran with destroying poles planted in the left side of the up track and the block fence along the track, and collided with the platform of Arai station and stopped.

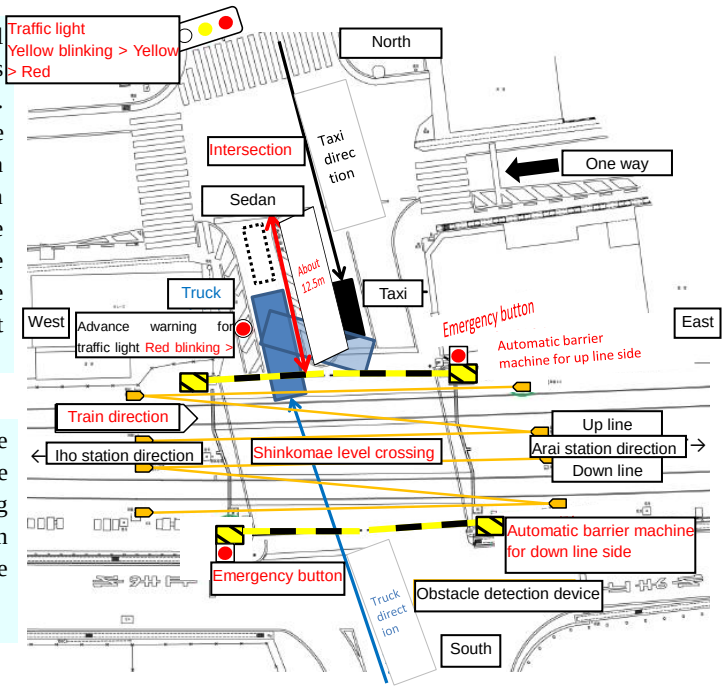
The front part of the train was completely demolished. The front bogie of the front vehicle was separated from the vehicle body and its first axle derailed to the left of the rail and the second axle derailed inside the track. The all axles of the rear bogie of the front vehicle and the all axles of the front bogie of the second vehicle derailed to the right of the rail. The all axles of the rear bogie of the second vehicle derailed as the left wheels were raised up from the rail.

There were about 60 passengers, a train driver and a conductor on board the train. The train diver was seriously injured and 15 passengers were slightly injured. In addition, the drivers of the freight truck and a taxi collided with the freight truck were slightly injured.

Findings

As for the road to the intersection ahead of the level crossing, the distance from where the crossing rod comes down to the stopping line of the intersection is about 12.5m. If the truck stops behind one sedan, which is stopped before the stopping line, it is probable that there was more than about 1.7m of the rear portion of the freight truck, which was stopped behind a sedan that had stopped before the stopping line of the intersection, on the inside of the crossing rod of the level crossing, due to the fact that the sedan length is about 4. 6m and the truck length is about 9.6m.

It is probable that the truck driver left the rear portion of the truck inside of the level crossing due to the fact that he entered the truck inside of the level crossing without pausing before the level crossing, without thinking that the sedan ahead of his truck might stop at the intersection; because he was not familiar with the road circumstances.



Sketch of the area near the level crossing

It is probable that the truck driver was trying to move forward with the stretch board lowered in order to avoid colliding with the train. However, it is somewhat likely that the train became derailed because the wheels of the first axle of the front bogie of the train's first car climbed over the stretch board due to the fact that the stretch board was lowered.

Probable causes (excerpt): It is probable that the accident occurred by the inbound through limited express train derailed to the left of the up-track because the train collided with the load carrying platform of the freight truck and ran onto its stretch board for loading, which was lowered to cross the railway track, at the same time, when the train passed the Sinkomae level crossing, in this accident.

It is probable that the rear portion of the freight truck had been staying inside the level crossing because the truck driver drove the truck into the level crossing road, without noticing that the sedan ahead his truck might stopped at the road between the level crossing and the intersection ahead, and the truck was obliged to stop behind the sedan stopped at the intersection.

For details, please refer to the investigation report. (Published in Japanese on June 27, 2014)

http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2014-6-1.pdf

Collision with a farming tractor that entered into a level crossing without automatic barrier machine
Central Japan Railway Company; Level crossing accident in Yuzawa level crossing, Iida Line

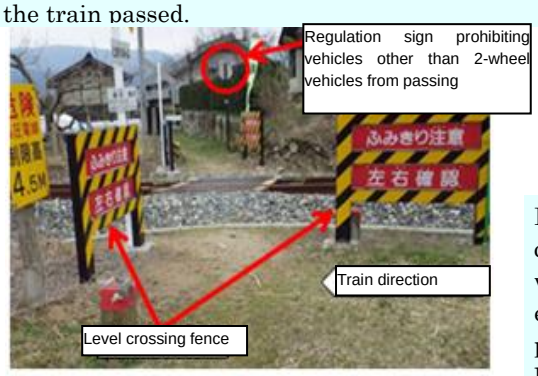
Summary: On Saturday, April 12, 2014, while performing coasting operation along the 400m-radius curve at 60-65km/h after departing Ina-Kamisato station on time, the 2-car outbound train noticed a farming tractor facing right near the right side rail in Yuzawa level crossing, which was about 70m ahead. The driver immediately applied the emergency brake and blew the whistle, but it was too late. The right side of the train collided with the farming truck and came to a stop after running about 140m.

The tractor driver died by the accident.

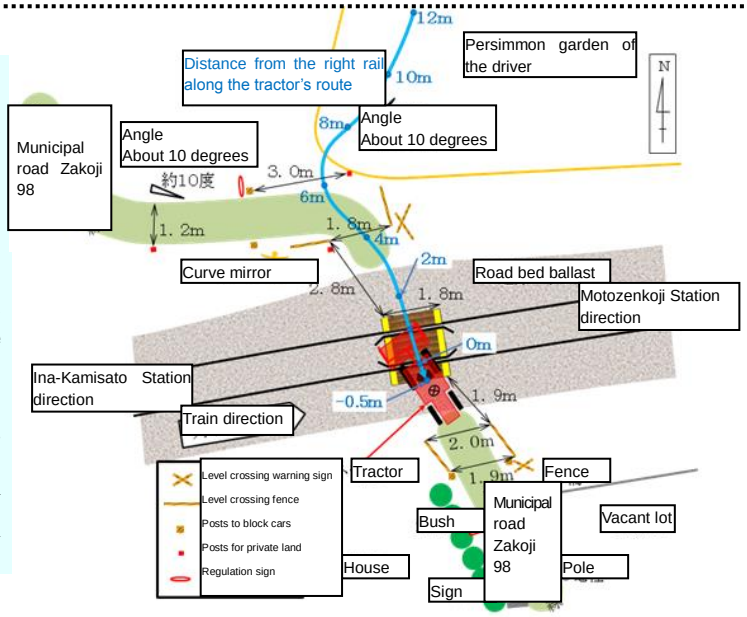
Findings

It is probable that the driver entered the tractor, which is stored in a shed in a persimmon garden to the left of the track of Yuzawa level crossing, in the level crossing to use it in the garden on the other side of the track.

When carts, etc. passed the level crossing, two people were always involved, and one of them checked for approaching trains by using the alarm sound, etc. of the nearby Zakoji level crossing, etc. However, due to the fact that the driver was crossing the level crossing without paying attention to the time when the train passes the level crossing, it is somewhat likely that the driver was not aware of the time when the train passed.



Level crossing from where the tractor entered



Sketch of the accident site

It is somewhat likely that the driver did not use the road that connected to the level crossing due to the following reasons. The road was an unpaved and narrow (minimum width of about 1.2m) embankment, and it was difficult to drive with the tractor. It was not possible to enter with a truck to transport products, etc. It was also a longer route to the garden on the other side of the track. Due to this, the driver chose the route to pass the level crossing, where he normally passed carts, and passed the level crossing with the tractor.

Due to the facts that the width of the level crossing is narrow and that the driver was attempting to cross the level crossing, where tractors do not normally pass, with a tractor, it is somewhat likely that the driver did not notice the train approaching until the driver of the train blew the whistle because he was concentrating on operating the tractor when passing the level crossing.

Probable causes: It is probable that the accident had occurred by the collision of the train and the tractor entered into and could not pass across the Yuzawa level crossing, where tractors are prohibited to enter.

It is somewhat likely that the tractor driver moved his tractor into the level crossing, without noticing that the train was approaching to the level crossing, because it might be effected that the tractor driver had concentrated his attention to driving the tractor while passing the level crossing, as the width of the level crossing road is narrow and he usually did not drive the tractor in the level crossing.

It is also somewhat likely that the reason because the tractor driver had moved his tractor into the level crossing where tractors are prohibited to enter, is that he usually passed the level crossing with the cart to transport farm products.

For details, please refer to the investigation report. (Published in Japanese on October 30, 2014)
http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2014-9-3.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.

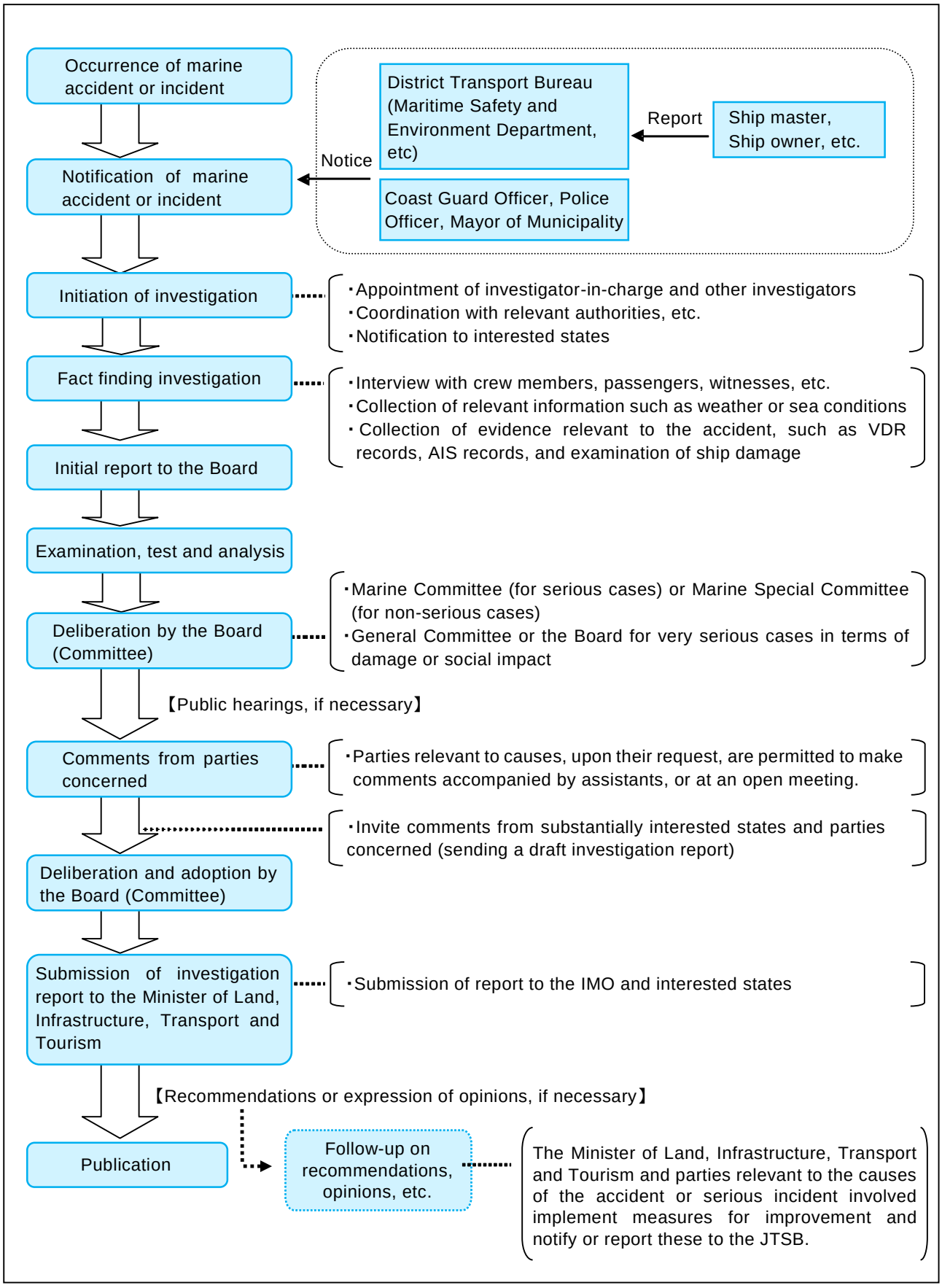
2 The situation where a ship grounded without any damage to the hull; and

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>

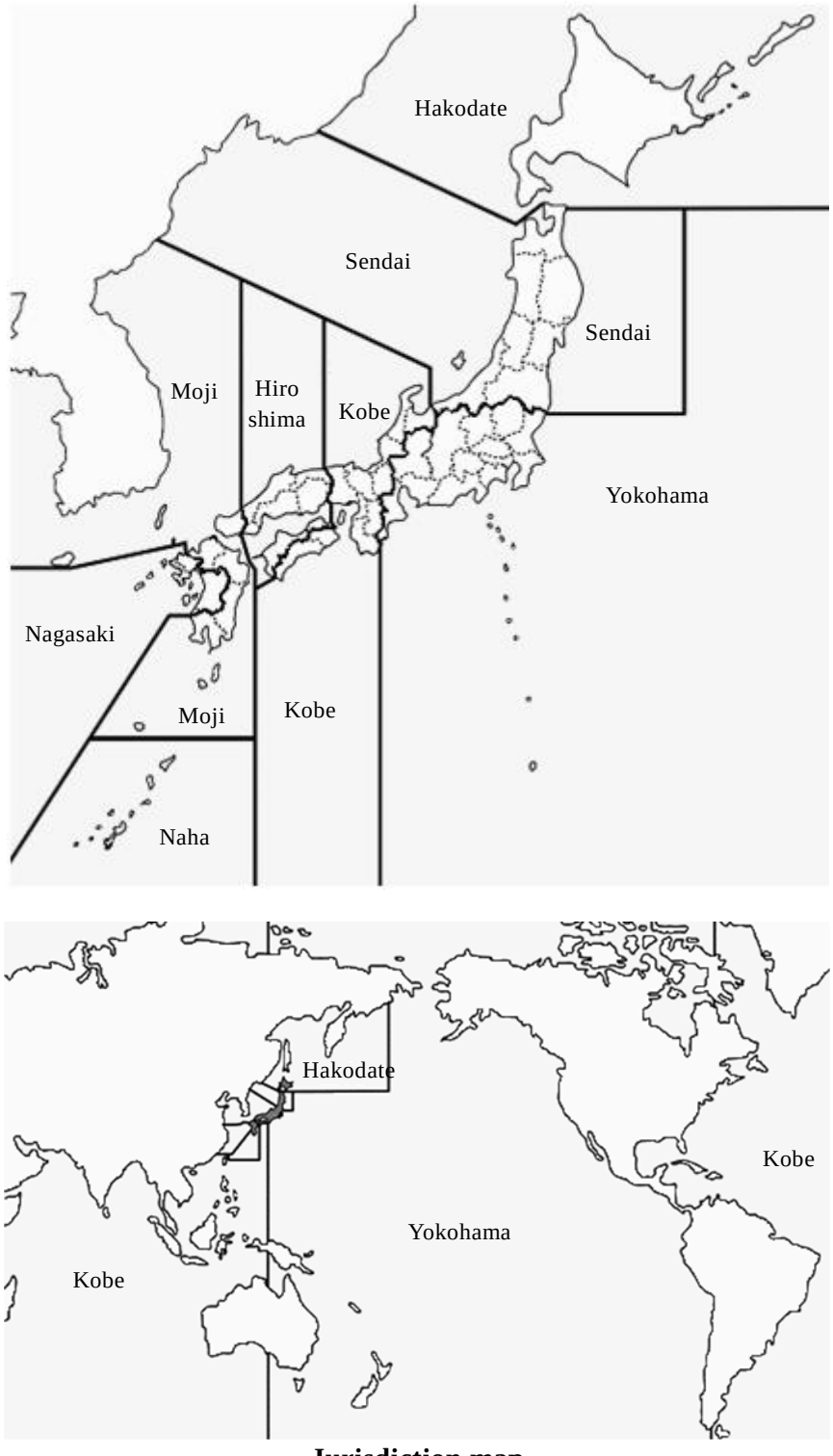
Marine accident and incident to be investigated		Type of marine accident and incident
Marine accident	Damage to ships or other facilities involved in ship operation	Collision, Grounding, Sinking, Flooding, Capsizing, Fire, Explosion, Missing, Damage to facilities
	Casualty related to ship structures, 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 (As of end of February 2015)

The JTSB carried out investigations of marine accidents and incidents in 2014 as follows:

Investigations into 743 accidents had been carried over from 2013, and 931 accident investigations newly launched in 2014. Investigation reports on 980 accidents were published, and thereby 689 accident investigations were carried over to 2015.

Investigations into 100 incidents had been carried over from 2013, and 127 incident investigations newly launched in 2014. Investigation reports on 138 incidents were published, and thereby 86 incident investigations were carried over to 2015.

Among the 1,191 reports published in 2014, six were issued with recommendations.

Furthermore, due to numerous occurrences of similar accidents, investigation reports that had been published in the past were analyzed, and one opinion was issued.

Investigations of marine accidents and incidents in 2013

(Cases)

Category	Carried over from 2013	Launched in 2014	Not applicable	Transferred to Tokyo Office	Total	Publication of investigation report	Recommendations	Safety recommendations	Opinions	Carried over to 2015	Interim report
Marine accident	743	931	△5	0	1,669	980	(0)	(6)	(1)	689	(0)
Tokyo Office (Serious cases)	36	15	△1	4	54	30		(6)	(1)	24	
Regional Offices (Non-serious cases)	707	916	△4	△4	1,615	950				665	
Marine incident	100	127	△2	0	225	139	(0)	(0)	(0)	86	(0)
Tokyo Office (Serious cases)	1			1	2	2				0	
Regional Offices (Non-serious cases)	99	127	△2	△1	223	137				86	
Total	843	1,058	△7	0	1,894	1,119	(0)	(6)	(1)	775	(0)

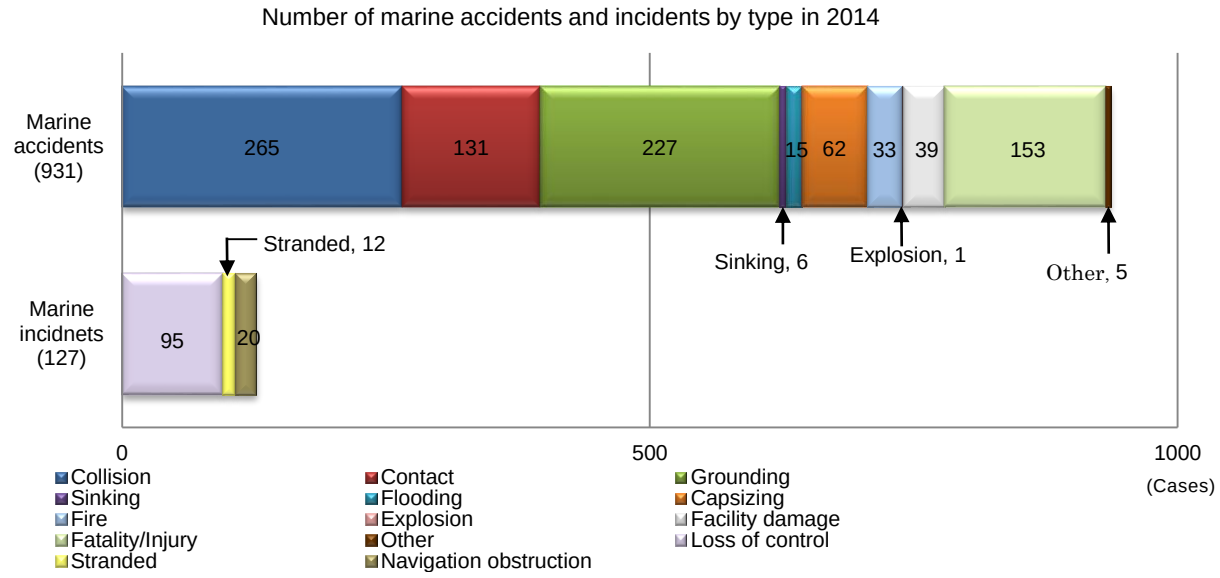
Note 1: The column “Not applicable” shows the number of cases which did not come under the category of accident or incident as defined in Article 2 of the Act for Establishment of the Japan Transport Safety Board.

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 2014 (As of end of February 2015)

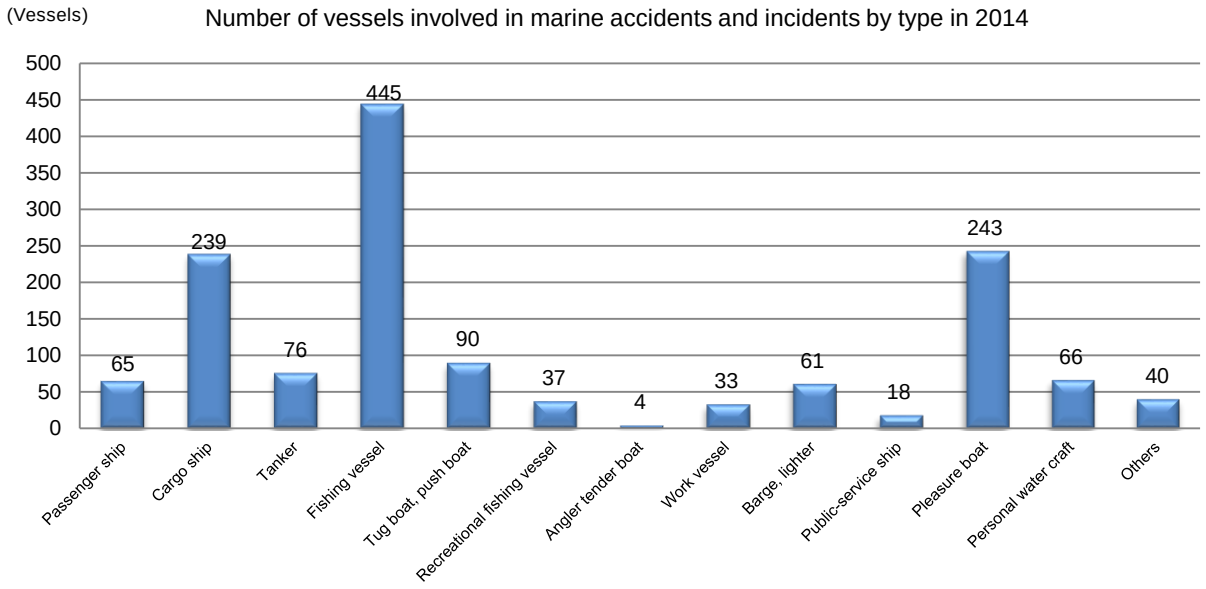
(1) Types of accidents and incidents

The 1,058 investigations launched in 2014 are classified by types as follows: With regard to marine accidents, there were 265 cases of collision, 227 cases of grounding, 153 cases of fatality/injury (not involved in other types of accidents), and 131 cases of contact. With regard to marine incidents, there were 95 cases of loss of control, 20 cases of navigation obstruction, and 12 cases of stranded. The objects of contact were quays in 30 cases, breakwaters in 23 cases, and piers in 11 cases.



(2) Types of vessels

The number of vessels involved in marine accidents and incidents is 1,417. Those vessels are classified by type as follows: 445 fishing vessels, 243 pleasure boats, 239 cargo ships, 90 tug boats and push boats, and 76 tankers.



The number of foreign-registered vessels involved in marine accidents and incidents was 97, and they were classified by accident type as follows: 54 vessels in collision, 16 vessels in grounding, and 13 vessels in contact. As for the flag of vessels, 26 vessels were registered in Panama, 14 vessels in Cambodia and South Korea, eight vessels in China, and six in Hong Kong. The number of vessels registered in Asian countries or regions was accounting for a half of the accidents and incidents.

Number of foreign-registered vessels by flag

(Vessels)

Panama	26	Hong Kong	6	Marshall Islands	3
Cambodia	14	Belize	4	Mongolia	3
South Korea	14	Liberia	4	Netherlands	2
China	8	Kiribati	3	Others	10

(3) Number of casualties

The number of casualties was 444, consisting of 118 deaths, 33 missing persons, and 293 injured persons. By type of vessel, 173 persons in fishing vessels and 102 persons in pleasure boats. By type of accident, 159 persons in casualties, 151 persons in collision, 38 persons in contact, 36 persons in grounding, and 36 persons in capsizing.

With regard to persons dead or missing, 91 persons were involved in fishing vessel accidents, 22 persons in pleasure-boat accidents, indicating dead or missing cases occurred frequently in fishing vessels.

Number of casualties (marine accident)

(Persons)

2014										
Vessel type	Dead			Missing			Injured			Total
	Crew	Passengers	Others	Crew	Passengers	Others	Crew	Passengers	Others	
Passenger ship	0	0	0	0	0	0	3	24	1	28
Cargo ship	7	0	1	8	0	0	9	0	0	25
Tanker	3	0	1	0	0	0	11	0	0	15
Fishing vessel	69	0	1	21	0	0	82	0	0	173
Tug boat, push boat	1	0	0	0	0	0	8	0	2	11
Recreational fishing vessel	0	1	0	0	0	0	2	10	0	13
Angler tender boat	0	1	0	0	0	0	0	1	0	2
Work vessel	2	0	0	0	0	0	1	0	1	4
Barge, lighter	0	0	5	0	0	2	1	0	3	11
Public-service ship	0	0	0	0	0	0	1	0	0	1
Pleasure boat	16	0	4	2	0	0	27	1	52	102
Personal water craft	3	0	2	0	0	0	16	0	31	52
Others	1	0	0	0	0	0	3	0	1	5
Total	102	2	14	31	0	2	164	38	91	444
	118			33			293			

7 Summaries of serious marine accidents and incidents which occurred in 2014

The serious marine accidents which occurred in 2014 are summarized as follows: The summaries are based on information available at the initial stage of the investigations and therefore, may change depending on the course of investigations and deliberations.

(Marine accident)

1	Date and location of accident	Vessel type and name, accident type
	January 15, 2014 Off the eastern coast of Atata Island, Otake City, Hiroshima Prefecture	Tank landing ship OSUMI (Ship A) Pleasure boat TOBIUO (Ship B) Collision
	Summary	Ship A, with the master, chief navigator, and 120 crew members onboard, was proceeding southward from Kure Port, Kure City in Hiroshima Prefecture toward Tamano City in Okayama Prefecture. Ship B, with the skipper and three acquaintances of skipper onboard, was proceeding south-south-west from Hiroshima City, Hiroshima Prefecture, toward the coast of Kabuto Island, located south of Atata Island, Otake City, Hiroshima Prefecture. The two ships collided off the eastern coast of Atata Island. For Ship B, the skipper and one passenger died, and one other passenger sustained injuries. In addition, there were abrasions and other damage to the starboard side of the ship, and the ship capsized. For Ship A, there were abrasions extending from the center part of the port side to the stern, but there were no fatalities.
2	Date and location of accident	Vessel type and name, accident type
	March 2, 2014 Off the southern coast of Murotomisaki, Kochi Prefecture	Fishing vessel KAISEIMARU No. 8 Fire
	Summary	The ship, with the skipper, chief engineer and five crew members onboard, became uncontactable off the southern coast of Murotomisaki, Muroto City in Kochi Prefecture. A consort ship then made contact with the Fifth Regional Coast Guard Headquarters via a fishery radio station. The ship was discovered to be on fire. Thereafter, four persons were rescued onto the consort ship, while three persons were confirmed to be dead. Three other persons and the ship went missing.
3	Date and location of accident	Vessel type and name, accident type
	March 9, 2014 Hotokezaki, Nagasaki City, Nagasaki Prefecture	Angler tender boat TSURISHIOMARU Fatality of fishing passenger
	Summary	Refer to “8. Publication of Investigation Reports” (p. 102, No. 25).
4	Date and location of accident	Name of accident
	March 18, 2014 Off the coast of Miura Peninsula, Kanagawa Prefecture	Cargo ship BEAGLEⅢ(Ship A, Panama) Container ship PEGASUS PRIME (Ship B, Korea) Collision
	Summary	Ship A, with the master and 19 crew members onboard, had departed from the Uraga Suido Traffic Route and was proceeding southward. Ship B, with the master and 13 crew members onboard, was following the same route and was heading northward. The two ships collided off the southeastern coast of Miura Peninsular in Kanagawa Prefecture. Ship A foundered, while the bow part of ship B was crushed and developed cracks and other damage. One crew member on Ship A died and eight crew members went missing, while three crew members on Ship B sustained injuries during the rescue operations.

5	Date and location of accident	Vessel type and name, accident type
	March 30, 2014 Building construction site for mooring facilities for Okinotorishima Harbor, Metropolitan Tokyo	Fatality and injury of construction workers at Okinotorishima Harbor
	Summary	While pulling out the pier from the barge at the building construction site for mooring facilities for Okinotorishima Harbor, the pier collapsed and overturned. Five persons died, and two persons went missing.
	Status	As a result of the investigations, the maneuvering of the towboat was not the direct cause of this accident. Therefore, this was not regarded as a marine accident that should be handled by the Japan Transport Safety Board.
6	Date and location of accident	Vessel type and name, accident type
	April 11, 2014 Off the northern coast of the Izumo-Nagaogahana Lighthouse located in Izumo City, Shimane Prefecture	Recreational fishing vessel FUJIMARU Fatality of fishing passenger
	Summary	The ship, with the skipper and three fishing passengers onboard, was being towed by a consort ship to return to port off Koizu fishing port in Izumo City, Shimane Prefecture, when the port side was hit by waves and the hull listed toward the starboard side. One fishing passenger fell into the water and died. 
7	Date and location of accident	Vessel type and name, accident type
	May 29, 2014 Approximately 5km off the southern coast of Hirohata, Himeji City, Hyogo Prefecture	Oil tanker SHOKOMARU Explosion
	Summary	The ship was carrying eight crew members. On the waters off the southern coast of Himeji Port in Himeji City, Hyogo Prefecture, five crew members were working on the deck when the hull exploded. One person died, and four persons sustained serious injuries.
8	Date and location of accident	Vessel type and name, accident type
	June 5, 2014 Off the northwestern coast of Saku Island, Nishio City, Aichi Prefecture	Passenger ship HAMAKAZE Injury of passengers
	Summary	The ship, with the skipper and one crew member, as well as nine passengers onboard, was navigating toward the West Port of Saku Island in Nishio City, Aichi Prefecture, when the hull was hit by high waves. Passengers were thrown onto the floor, and three passengers sustained fractures and other serious injuries.
9	Date and location of accident	Vessel type and name, accident type
	July 18, 2014 Near the area about 3 nautical miles off the eastern coast of Tokushima Komatsushima Port	Ferry OCEAN EAST Grounding
	Summary	The ship, with the master and 20 crew members, as well as 43 passengers onboard, was grounded in shallow waters after leaving Tokushima Komatsushima Port, but managed to get out of these shallow waters. The bottom part of the starboard side broke, but there were no fatalities or injuries, and the ship returned to Tokushima Komatsushima Port on its own.
10	Date and location of accident	Name of accident
	September 1, 2014 Kashima Port, Kamisu City, Ibaraki Prefecture	Cargo ship CAMPANULA (Panama) Fatality of worker
	Summary	The ship was unloading timber at the aforementioned port when the timber hit a Japanese worker. The worker was sent to hospital, but died after that.
11	Date and location of accident	Vessel type and name, accident type
	November 15, 2014 Nakagusuku New Port, Okinawa Prefecture	Cargo ship YONG SHENG Ⅶ(Ship A, Panama) Sand collecting ship HOKUEI No. 18 (Ship B) Collision
	Summary	Ship A, with 14 crew members onboard, and Ship B, with five crew members onboard, collided at the Nakagusuku New Port in Okinawa Prefecture. Ship B overturned on its side.

12	Date and location of accident	Vessel type and name, accident type
	December 20, 2014 Naka Suido channel of the Kurushima Strait	Cargo ship MIGHTY ROYAL (Bangladesh) Grounding
	Summary	The ship was navigating the Naka Suido channel of the Kurushima Strait when the bottom of the ship struck shallow waters at the east coast of Umashima Island in Imabari City, Ehime Prefecture.
13	Date and location of accident	Vessel type and name, accident type
	December 24, 2014 Sea of Japan approximately 25M off the coast of Hamada City, Shimane Prefecture	Fishing vessel GENPUKUMARU No. 1 Foundering
	Summary	The ship foundered off the coast of Hamada City, Shimane Prefecture.
14	Date and location of accident	Vessel type and name, accident type
	December 26, 2014 Off the coast of Ajigasawa Town, Aomori Prefecture	Cargo ship MING GUANG (Cambodia) Foundering
	Summary	Water ingressed into the ship, and it foundered off the coast of Ajigasawa Town, Aomori.

(Marine incident)

No marine incident occurred in 2014.

Column

High-speed passenger ship accidents that cause passenger injury

Marine Accident Investigator

Every year, several cases of accidents occur where high-speed passenger ships encounter stormy weather while on passage, and the violent movements of the ship causes passengers sitting on chairs in the passenger cabins sustain injuries to their lumbar and thoracic spines as a result.

The Japan Transport Safety Board had stated its opinions to the Minister of Land, Infrastructure, Transport and Tourism with regard to policies and measures for such accidents in the past. At the same time, recommendations have been made to ship operators. However, the current situation is such that similar accidents continue to occur even today.

When a ship begins to move increasingly violently, getting passengers to fasten their seatbelts or move to the stern where the movements are less violent are considered to be effective measures. However, there are also cases where passengers forget to fasten their seatbelts or leave the seatbelts stored in the seats, or where there are no empty seats even when they move to the stern of the ship, or where the movements of the ship are still violent at the stern side of the ship, thereby resulting in injuries.

Based on recent findings*, regardless of where passengers are seated, when acceleration exceeding 1G (acceleration due to gravity) arises in a downward direction while on passage, the body will be lifted from the seat. When the body is slammed back into the seat, the lumbar spine, thoracic spine, and cervical spine sustain injuries. Based on these findings, it is now possible to calculate the relationship between the speed of the ship and wave heights exceeding 1G for each seat position.

Example: Guidelines for maximum speed (kn)

Seat position from the front	Wave height			
	0.5m	1.0m	1.5m	2.0m
First row	Standard speed	10.6	Below 5kn	Below 5kn
Second row	Standard speed	13.7	5.6	5.6
Third row	Standard speed	16.5	7.5	7.5
Fourth row	Standard speed	18.9	9.2	9.1
Fifth row	Standard speed	21.4	11.9	11.1
Sixth row	Standard speed	Standard speed	15.2	13.8

If ship operators organize the data in a way similar to the chart shown above, it would be possible to reduce speed significantly, or decide to return to port, corresponding with the height of the waves at each point in time, in order to prevent causing injury to passengers. However, in order to make full use of this chart, it is vital to observe and predict wind and wave height accurately in the same way as always. Hence, the master of the passenger ship has to check before departure and while on passage if the situation meets the criteria for cancelling the operation by constantly observing the wave situation around the ship and checking the weather forecast as well as marine warnings and advisories for the waters in the navigation plan.

Furthermore, in order to ensure the effectiveness of this stance of observing the weather and sea conditions so as to assess when to cancel the operation, it is important to develop an integrated ship and shore system led by the top management, and which includes the master, the safety manager, and the operation manager. That also represents the spirit of transport safety management, but in the course of accident investigation, cases have been found whereby such systems were not established thoroughly.

Passenger ships serve as a means of transportation for commuting to school and work, as well as a means of transportation for passengers enjoying a tour or cruise. While it is important to ensure that such ships operate punctually without cancellations, the ship operator and crew members should gain a renewed recognition of the role they play in ensuring safety for many lives, and to take steps to check their safety management systems.

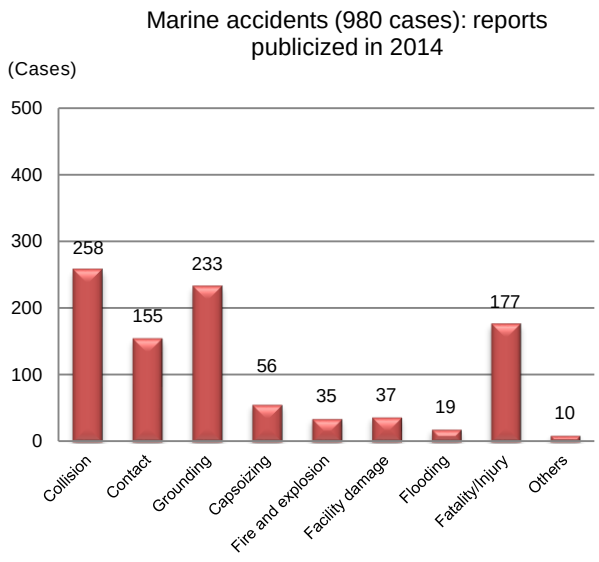
*"Report on Investigations and Research into the Safety of Passengers in Small High-Speed Passenger Ships Navigating Through Waves" (December 2014, Japan Craft Inspection Organization)

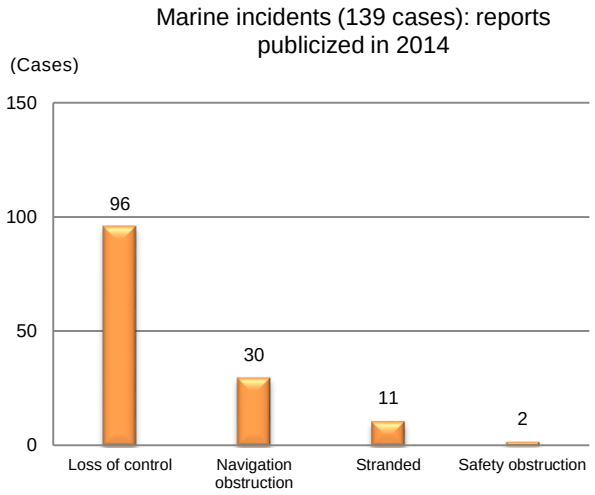
8 Publication of investigation reports

The number of investigation reports of marine accidents and incidents published in 2014 was 1,119 composed of 980 marine accidents (among them, 30 were serious) and 139 marine incidents (among them, two were serious).

Looking those accidents and incidents by type, there were 258 cases of collision, 233 cases of grounding, 177 cases of fatality/injury, and 155 cases of contact in marine accidents. Whereas in marine incidents, there were 96 cases of losses of control, (including 86 cases of navigational equipment failure and seven cases of out-of-fuel), 30 cases of navigation obstruction, and 11 cases of stranded.

As for the objects of contact, 46 were quays, 25 were breakwaters, and 16 were light buoys.





The number of vessels involved in marine accidents and incidents was 1,507. Looking at those vessels by type, the vessels involved in marine accidents were 418 fishing vessels, 241 cargo ships, 231 pleasure boats, and 102 tug boats and push boats. The vessels involved in marine incidents were 49 fishing vessels, 27 cargo ships, 24 pleasure boats, and 19 passenger ships.

Number of vessels by type involved in marine accidents and incidents for which reports were publicized in 2014

(Vessels)

Classification	Passenger ship	Cargo ship	Tanker	Fishing vessel	Tug boat, push boat	Recreational fishing vessel	Angler tender boat	Work vessel	Barge, lighter	Public-service ship	Pleasure boat	Personal water craft	Others	Total
Marine accident	56	241	65	418	102	36	7	34	73	22	231	62	16	1,363
Marine incident	19	27	7	49	7	1	0	2	3	3	24	2	0	144
Total	75	268	72	467	109	37	7	36	76	25	255	64	16	1,507
%	5.0	17.8	4.8	31.0	7.2	2.5	0.5	2.4	5.0	1.7	16.9	4.2	1.0	100.0

An overview of the published investigation reports on serious marine accidents and incidents in 2014 is as follows.

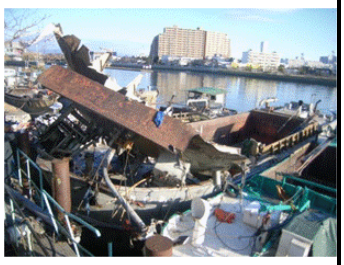
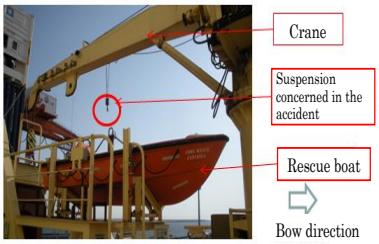
List of published investigation reports on serious marine accidents (2014)

<table>
<tr><td rowspan="4">1</td><td>Date of Publication</td><td>Date and location</td><td>Vessel type and name, accident type</td></tr>
<tr><td>January 31, 2014</td><td>August 19, 2011
The Sea Wall on the northern side of the Akashi Kaikyo Bridge, Kobe City, Hyogo Prefecture, Japan</td><td>Container ship FLEVODIJK (Netherlands)
Collision (Sea Wall)</td></tr>
<tr><td>Summary</td><td colspan="2">The container ship FLEVODIJK, with the master, the second officer and 13 other crew members on board, while she was proceeding north-eastward on the Harima Nada Sea off the western coast of the Awajishima Island, Hyogo Prefecture, collided with the Sea Wall on the northern side of the Akashi Kaikyo Bridge at around 0439 hrs. The FLEVODIJK was damaged on its bulbous bow and along with some recesses and broken holes, and she broke part of the Sea Wall at the same time, but there were no casualties.
  </td></tr>
<tr><td>Probable Causes</td><td colspan="2">It is probable that the accident occurred because the second officer who was on the sole look-out on the bridge had fallen asleep, while the Ship was proceeding north-eastward through the Harima Nada Sea toward the west entrance of the Akashi Strait with the autopilot steering at night, and the Ship proceeded toward the Sea Wall and collided with it.
As to why the second officer had fallen asleep, is probable that he was sitting on the Chair without his drowsiness relieved, even though he began to feel drowsy and walked around in the bridge to relieve his drowsiness.</td></tr>
<tr><td>Report</td><td colspan="2">http://www.mlit.go.jp/jtsb/eng-mar_report/2014/2013tk0009e.pdf</td></tr>
<tr><td rowspan="4">2</td><td>Date of Publication</td><td>Date and location</td><td>Vessel type and name, accident type</td></tr>
<tr><td>January 31, 2014</td><td>January 11, 2012
Katsunan District, Chiba Port, Chiba Prefecture</td><td>Cargo ship GUANG DA (Panama)
Fatality during mooring operation</td></tr>
<tr><td>Summary</td><td colspan="2">While the cargo ship GUANG DA, with the master and 11 other crew members on board, was berthing at the south berth of the Keiyo Food Industrial Complex in Katsunan District, Chiba Port, Chiba Prefecture, a stand roller on the forecastle deck came off the deck. Subsequently, the stand roller or the associated mooring line hit an ordinary seaman who was on the deck at that time. The seaman died.</td></tr>
<tr><td>Probable Causes</td><td colspan="2">It is probable that in this accident, while the GUANG DA was berthing at the south berth of the Keiyo Food Industrial Complex in Chiba Port, the master put the engine astern in an attempt to bring the stern closer to the berth and that when the first headline, which had been secured onto the berth, became taut, the stand roller in the center of the forecastle deck, on which the line had been engaged, came off the deck, causing either the stand roller or the headline to hit the ordinary seaman.
It is probable that the stand roller in the center of the forecastle deck came off the deck because the weld between the doubling plate and the deck developed brittle fracture, causing the weld to break at or below the breaking strength of the first headline.
It is somewhat likely that improper ship management by HK LIWEIDA SHIPPING MANAGEMENT LIMITED, not having the stand roller in the center of the forecastle deck surveyed and approved by ISTHMUS BUREAU OF SHIPPING, contributed to the occurrence of the accident.</td></tr>
<tr><td>Report</td><td colspan="2">http://www.mlit.go.jp/jtsb/eng-mar_report/2014/2012tk0001e.pdf</td></tr>
<tr><td rowspan="2">3</td><td>Date of publication</td><td>Date and location</td><td>Vessel type and name, accident type</td></tr>
<tr><td>January 31, 2014</td><td>March 4, 2012
Off the northwest coast of Sunosaki, Tateyama City, Chiba Prefecture</td><td>Fishing vessel OURAMARU (Ship A)
Recreational fishing vessel IKUMARU No. 5 (Ship B)
Collision</td></tr>
</table>

	Summary	Ship A, with the skipper and two crew members onboard, had departed from the fishing grounds off the southern coast of Sunosaki in Tateyama City, Chiba Prefecture, and was heading north to return to the port. Ship B, crewed by the skipper alone and carrying six fishing passengers, had been drifting and fishing off the northwestern coast of Sunosaki, when the two ships collided. On Ship B, one fishing passenger died, and the skipper sustained injuries. In addition, the stern on the starboard side sustained damage, while the toilet at the stern, the spanker mast, and the top part of the wheelhouse fell off. For Ship A, the handrails on the bow on the ports side were bent and damaged, the front part of the mast broke off, the bottom section of the ship was broken and sustained abrasions.
	Probable Causes	It is somewhat likely that the two ships collided because the two skippers were not keeping a proper lookout while Ship A was proceeding north and Ship B was drifting and fishing off the northwestern coast of Sunosaki. It is probable that the skipper of Ship A was not keeping a proper lookout because the radar screen with a range scale of 1.5M did not show any ships that may hinder navigation and he thought that there were no ships that may hinder navigation as he was keeping a lookout by depending on the radar while sitting on a chair on the port side of the wheelhouse resulting in a blind spot on the bow side.
	Report	http://www.mlit.go.jp/jtsb/ship/rep-acci/2014/MA2014-1-1_2012tk0006.pdf

4	Date of Publication	Date and location	Vessel type and name, accident type
	January 31, 2014	April 15, 2012 Off the north-northeast coast of Rokkosaki in Suzu City, Ishikawa Prefecture	Container ship YONG CAI (Ship A Saint Vincent and the Grenadines) Fishing vessel SHINYOMARU No.2 (Ship B) Collision
	Summary	Ship A was proceeding west-northwest toward Port of Busan in the Republic of Korea with the master and 17 other crew members onboard, Ship B was proceeding south-southwest toward the Noroshi Fishing Port in Suzu City with the skipper and a crew member onboard. Both vessels collided with each other at off the North-northeast coast of Rokkosaki. The skipper on Ship B was killed and a crew member went missing. The bow section of the vessel was crushed, and she was capsized. Ship B suffered scratch to the bulbous bow on the starboard side.	
	Probable Causes	It is somewhat likely that this accident occurred while Ship A was proceeding west-northwest and Ship B was proceeding south-southwest off the north-northeastern coast of Rokkosaki at night due to the two vessels colliding with each other due to the facts that the third officer of Ship A did not appropriately keep watch on the starboard side and that Skipper of the Ship B noticed Ship A only when it approached very closely. It is probable that Ship A collided with Ship B due to the fact that the third officer of Ship A was not appropriately keeping watch on the starboard side, not noticing Ship B coming close. Therefore, it is probable that appropriate watch must be kept at all times with vision, hearing, and all other means appropriate for the situation so that bridge watch keeper can make judgments on the surrounding situation and possibility of collision with other vessels.	
	Report	http://www.mlit.go.jp/jtsb/eng-mar_report/2014/2012tk0023e.pdf	

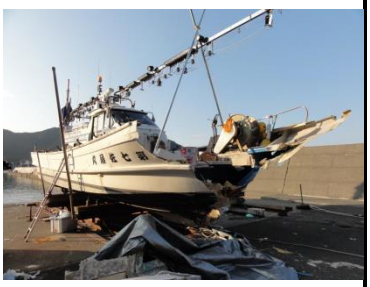
5	Date of publication	Date and location	Vessel type and name, accident type
	January 31, 2014	December 11, 2012 Ship mooring facility on the right bank of Okawa, located in Kita-ku, Osaka City, Osaka	Gravel carrier SEIWAMARU Explosion
	Summary	While mooring at the aforementioned ship mooring facility, an explosion occurred in the store compartment below the deck on the bow side of the ship. The seaman died, a worker sustained serious injuries, and the master sustained minor	

		injuries. There was damage to the deck on the bow side and other parts of the ship. Workers on the other ship sustained minor injuries, and there was damage to the surrounding facilities.
	Probable Causes	 It is somewhat likely that this accident occurred because gases ignited and exploded when a worker on the ship attempted to light a stove burner with a torch lighter as liquefied petroleum gas composed mainly of propane had leaked from the stove burner placed in the store comnpartment below the deck on the bow side of the ship and mixed with the air to produce mixed gases resulting in accumulation of combustible mixed gases that had reached the concentration within the explosive range in the store compartment while the ship was mooring at the aforementioned ship mooring facility. It is somewhat likely that liquefied petroleum gas composed mainly of propane had leaked from the stove burner because the valve of the container had been left opened from the day before the accident, and the appliance valve of this stove burner had been left opened after the stove was used the day before this accident occurred. It is considered probable that liquefied petroleum gas composed mainly of propane had mixed with the air to form mixed gases, and these combustible mixed gases had built up inside the store compartment below the deck on the bow side to reach explosive range, because this store compartment could only be ventilated by natural ventilation from the ventilation tube and the entrance hatch. The hatch had been closed on the day before this accident occurred, therefore making it even more difficult to ventilate the compartment.
	Report	http://www.mlit.go.jp/jtsb/ship/rep-acci/2014/MA2014-1-5_2012tk0047.pdf
6	Date of Publication	Date and location / Vessel type and name, accident type
	February 28, 2014	March 27, 2012 Rokko Island Container Berth 5, Kobe Ku of Hanshin Port Container Ship ANNA MAERSK (Denmark) Fatality and injury of crew members
	Summary	The ship, with the master and 25 crew members onboard, had berthed alongside the aforementioned berth and was carrying out cargo handling work, while a rescue boat launching training was being conducted on the ship. The rescue boat, which had been suspended away from the side of the ship, fell on the surface of the sea. As a result, the able seaman who was on the rescue boat died, while the chief officer sustained serious injuries.
	Probable Causes	 It is probable that the ship was berthing alongside Rokko Island Container Berth 5 in Kobe Ku of Hanshin Port and during the rescue boat launching training, the chief officer and the able seaman boarded the rescue boat lowered to the level of the boat deck, and at that time the split pin in the shackle pin of the shackle part of the swivel of the Suspension was shear fractured; therefore, the shackle pin came off and the hook slipped out of the shackle part; consequently, the rescue boat dropped to the sea surface 18m below, and thus this accident occurred.
	Report	http://www.mlit.go.jp/jtsb/eng-mar_report/2014/2012tk0018e.pdf
7	Date of publication	Date and location / Vessel type and name, accident type
	February 28, 2014	November 14, 2012 Off the southeast coast of Nasake Island, Suo-Oshima Town, Yamaguchi Prefecture Passenger ship GINGA Grounding
	Summary	The ship, with the master and five crew members, as well as 162 passengers and three hall staff onboard, grounded on Nenashisho, located off the southeast coast of Nasake Island, Suo-Oshima Town in Yamaguchi Prefecture, while it was heading west off the northwest coast of Futagami Island in Matsuyama City, Ehime Prefecture. The ship sustained dents alongside with breakage on the bottom shell of the ship, as well as damage to the propeller blades on the port side propeller. However, there were no fatalities or

		injuries. The 162 passengers were rescued by the consort ship of the ship as well as the Japan Coast Guard patrol boat that had come to the aid of the ship.
	Probable Causes	 It is probable that this accident occurred while the ship was proceeding west toward the northern coast of Nenashisho because the seaman who was on watch duty on the bridge continued navigating believing that the ship could pass by the northern coast of Nenashisho, and the ship came within close quarters of Nenashisho and consequently went aground as this ship began to take course over the ground toward Nenashisho. It is probable that the seaman continued navigating believing that the ship could pass by the northern coast of Nenashisho because although he was aware that the ship was being pushed in a southerly direction due to the northwest wind and southwest current, the bow was heading toward Nasake Island Lighthouse, north from the passage route between Ihota Port and Matsuyama Port, and the ship was proceeding as the light beacon for Nenashisho was visible on the port bow. It is somewhat likely that Setonaikaikisen Inc.'s non-compliance with safety management manual, such as the fact that the company did not draw up operation plans, including the navigation route between Ihota Port and Matsuyama Port, in accordance with the procedures under the safety management manual, when establishing the navigation route between Ihota Port and Matsuyama Port, which was a navigation route of non-scheduled ferry service, contributed to the occurrence of this accident.
	Report	http://www.mlit.go.jp/jtsb/ship/rep-acci/2014/MA2014-2-3_2012tk0046.pdf

8	Date of publication	Date and location	Vessel type and name, accident type
	February 28, 2014	June 26, 2013 Oniike Port, Amakusa City, Kumamoto Prefecture	Passenger ferry FERRY AMAKUSA Injury of passengers
	Summary	The ship, with the master and five crew members, as well as 85 passengers and 19 vehicles onboard, had been carrying out berthing work at Prefectural No. 2 Shallow Draft Quay at the aforementioned Oniike Port, when the starboard side of the bow came into contact with the quay wall. Three passengers sustained minor injuries. The hull of the ship on the starboard side of the bow was dented, and cracks emerged in the base section of the fender system on Prefectural No. 2 Shallow Draft Quay.	
	Probable Causes	 It is probable that this accident occurred as follows: Under conditions where advisories had been issued for strong wind and waves, the ship was berthing head in along Prefectual No. 2 Shallow Draft Quay at Oniike Port on her starboard side; The master set the course of the ship to be parallel with the quay wall, while two passengers were in the toilet and one passenger was in the vehicle deck; As the ship had approached the quay with a horizontal distance of about 6 – 7m between the quay wall and the starboard side, the west-south-west wind coming at a wind speed (relative) of about 16m/s from the port side of the bow pushed the bow leeward (starboard side), causing the starboard side of the bow to hit Prefectural No. 2 Shallow Draft Quay; Consequently, one passenger in the toilet sustained a bruise on the little finger of the right hand, and the other passenger in the toilet sustained a cervical spine sprain; The passenger in the vehicle deck suffered from a lumbar bruise. It is probable that the master of the ship had approached Prefectural No. 2 Shallow Draft Quay at a distance of about 6 – 7m from the starboard side because, based on the wind from the port side of the bow at a wind speed (relative) of more than 10m/s, as well as the fact that the horizontal distance between Prefectural No. 2 Shallow Draft Quay and the starboard side was more than double the usual distance at about 6 – 7m, and that he had berthed at this same quay many times before, he believed that he would be able to berth safely if he maintained a horizontal distance of about 6 – 7m between the quay wall and the starboard side as he had done in previous times when the wind from the port side of the bow had been more than 10m/s (relative wind speed). It is probable that two passengers had been in the toilet and one passenger had been on the	

		vehicle deck because the ship did not take thorough precautions to ensure that passengers remain in their seats and the ship had not been compliant with the provisions of the safety management manual and work standards, such as preventing passengers from entering the vehicle deck (area) until the ship is berthed.	
	Report	http://www.mlit.go.jp/jtsb/ship/rep-acci/2014/MA2014-2-2_2013tk0028.pdf	
9	Date of publication	Date and location	Vessel type and name, accident type
	March 28, 2014	October 12, 2012 Shishi Komagasaki, Hirado City, Nagasaki Prefecture	Angler tender boat SHOEIMARU No. 18 Grounding
	Summary	The ship, crewed by the skipper alone, and carrying five fishing passengers, was proceeding north-north-west along Hiradoseto toward Yokoshima Island in Hirado City, Nagasaki Prefecture, when the engine stopped and the ship was pushed by the wind, and eventually grounded on a rocky area at Shishi Komagasaki.  One fishing passenger died, while two fishing passengers and the skipper sustained injuries. The ship sustained severe damage.	
	Probable Causes	It is probable that while proceeding north-north-west along Hiradoseto, the ship had run out of fuel supply to the fuel injection pump, causing the engine to stop and the ship to be pushed by the north-north-east ~ north-east wind, eventually resulting in its grounding on a rocky area at Shishi Komagasaki.	
	Report	http://www.mlit.go.jp/jtsb/ship/rep-acci/2014/MA2014-3-3_2012tk0041.pdf	
10	Date of publication	Date and location	Vessel type and name, accident type
	March 28, 2014	May 27, 2013 Off the eastern coast of Oishinohana, Sumoto City, Hyogo Prefecture	Push boat 38 SANKYOMARU Capsize
	Summary	The boat, with the skipper and two seamen onboard, had been navigating toward Osaka of Hanshin Port from Tokushima Komatsushima Port, Tokushima Prefecture, when it capsized off the eastern coast of Oishinohana, Sumoto City, Hyogo Prefecture. The two seamen died, and the boat foundered while it was being towed by a tug boat toward Shimotsu Port in Wakayama, Wakayama Prefecture.	
	Probable Causes	It is somewhat likely that this accident occurred because the boat listed to port side so that the top end of the bulwark submerged and the boat lost its stability after turning the rudder above 4.7° to starboard and consequently overturned to the port side by the impact from waves while the boat was proceeding off the eastern coast of Oishinohama, Awaji Island toward Osaka of Hanshin Port at a speed of about 9kn with waves of height of about 2 – 3m and period of about 5 seconds hitting the starboard side under conditions where advisories had been issued for strong winds and waves in the Tokushima and Naruto areas, and gale warning had been issued for the Seto Inland Sea 	
	Report	http://www.mlit.go.jp/jtsb/ship/rep-acci/2014/MA2014-3-4_2013tk0015.pdf	
11	Date of publication	Date and location	Vessel type and name, accident type
	March 28, 2014	August 14, 2013 Rocky area at the northeastern end of Oshima Island, Sakai City, Fukui Prefecture	Recreational fishing vessel HOSHINMARU No. 5 Grounding
	Summary	The ship, with the skipper and one crew member, as well as three fishing passengers onboard, was returning to port after a recreational fishing trip, when it grounded on the rocky area at the northeastern end of Oshima Island of Sakai City, Fukui Prefecture. All members on the ship, including the three fishing passengers, sustained minor to serious injuries.	

	Probable Causes	It is probable that this accident occurred as follows: While the ship was sailing toward the Mikuni district of Fukui Port at night, the skipper was navigating by using the lights of a fishing boat as the head mark, and was approaching toward Oshima Island; However, when it came within close quarters of the boat and attempted to avoid it, the skipper sighted several fishing boats with their fishing lamps lit at the starboard side of the bow and turned to port; When checking the course, he realized that the ship was on a course to come into close quarters with the shore and turned to starboard instead, therefore heading toward the rocky area on the northeastern side of Oshima Island, consequently grounding the ship on this rocky area. 
	Report	http://www.mlit.go.jp/jtsb/ship/rep-acci/2014/MA2014-3-5_2013tk0021.pdf
12	Date of publication	Date and location / Vessel type and name, accident type
	March 28, 2014	September 22, 2013 Rocky area off the coast of Yashiro Bay, Obama City, Fukui Prefecture Recreational fishing vessel SATOMARU No. 7 Collision (Rocky area)
	Summary	The ship, crewed by the skipper alone and carrying six fishing passengers, had departed from the Inukuma district of the Uchitomi Port of Obama City, Fukui Prefecture, and was navigating along the coast of Yashiro Bay of Obama City when it collided into a rocky area of the same bay (Okinoishi). Six fishing passengers and the skipper sustained injuries, while the bow of the ship was severely damaged.
	Probable Causes	It is probable that this accident occurred because the skipper was not able to keep a proper lookout, and did not realize that the ship was navigating toward a rocky area (Okinoishi), resulting in the collision into the rocky area (Okinoishi) while the ship was proceeding northwest off the coast of Yashiro Bay at night, deviating from its usual course. It is probable that the skipper was not able to keep a proper lookout because: the work lamps installed on the outer walls in front of the wheelhouse had been lit, resulting in high intensity brightness for a part of the field of view on the bow side; The glare arising from the light of these work lamps reduced visibility, making it difficult to see on the bow side of the ship; In addition, the yield of the fishing trip at midnight had been poor, giving rise to concerns about fishing grounds and fishing methods, reducing the number of times that the skipper looked at the radar and GPS plotter screens; At the same time, he had probably forgotten to switch the range scale of the radar and GPS plotter from a range scale used in the port, to a range scale for outside the port. 
	Report	http://www.mlit.go.jp/jtsb/ship/rep-acci/2014/MA2014-3-2_2013tk0025.pdf
13	Date of publication	Date and location / Vessel type and name, accident type
	March 28, 2014	July 15, 2013 Off the western coast of Fukaura Port, Fukaura Town, Aomori Prefecture Tug boat SHIMAFUJI (Ship A) Work vessel MIYABI (Ship B) Fishing vessel HISAYOSHIMARU No. 88 (Ship C) Collision
	Summary	Ship A, with the skipper and two crew members onboard, was towing Ship B and proceeding north-north-east. Ship C, with the skipper and one crew member onboard, was proceeding west toward the fishing grounds off the west coast of Henashizaki in Fukaura Town, Aomori Prefecture, when it collided with Ship B off the western coast of Fukaura Port in Fukaura Town. The outer shell of the central part of the starboard of Ship B suffered breakage. Cracks emerged on the bulbous bow of Ship C. No one on the ships had fatalities or injuries.

	Probable Causes	 It is probably that this accident occurred because the seaman of Ship A did not realize that the ship was coming into close quarters with Ship C and the skipper of Ship C had received a call from his family and was crouching on the floor in the wheelhouse taking notes, and consequently Ship B and Ship C collided, while Ship A was proceeding north-north-east towing Ship B forming a row of ships with total length of about 300m and Ship C was proceeding west. It is probable that the seaman of Ship A did not realized that the ship was coming into close quarters with Ship C because: when he sighted four fishing vessels that had departed from Fukaura Port, he believed that Ship C was on a course that would allow it to pass by the stern of Ship A; The other three fishing vessels passed by the bow of the ship; and he was watching the gravel carrier on the starboard bow believing that there were any fishing vessels posing danger to the ship as the ship was sailing near the coast. It is probable that the skipper of Ship C had received a call from his family and had been taking notes while crouching on the floor in the wheelhouse, because he was paying attention to checking the situation of the two squid fishing vessels in front, and did not notice the the row of ships.
	Report	http://www.mlit.go.jp/jtsb/ship/rep-acci/2014/MA2014-3-1_2014tk0002.pdf
14	Date of Publication	Date and location: May 10, 2011 Public Wharf, Hibi Port, Tamano City, Okayama Prefecture Vessel type and name, accident type: Cargo ship SCSC WEALTH (Hong Kong) Fatality of a stevedore
	April 25, 2014	
	Summary	While the cargo ship SCSC WEALTH was loading copper slag at the Public Wharf in Hibi Port, Tamano City, Okayama Prefecture, tween deck hatch covers that were placed on the inner bottom plating*2 in No.2 cargo hold moved, leading to a stevedore being caught between the hatch covers and a forward bulkhead, resulting in his death.
	Probable Causes	It is probable that this accident occurred for the following reasons: Five tween deck hatch covers were stacked up on the bow side of the inner bottom plating in No.2 cargo hold, during the loading of copper slag onto the SCSC WEALTH at the Public Wharf in Hibi Port; however, the safety bolts for the lowermost and second lowermost hatch covers were not inserted into the insertion holes in the inner hull plating. Due to this fact, the situation was such that it was impossible to prevent horizontal movement of the hatch covers. Furthermore, a driver entered No.2 cargo hold through a forward companionway to the inner bottom plating of No.2 cargo hold; and when the driver was passing through the space between the hatch covers and the forward bulkhead, the hatch covers moved in the direction of the bow after being pushed by the cargo, resulting in the driver being caught between the hatch covers and the forward bulkhead. It is probable that the reason why it was impossible to prevent horizontal movement of the hatch covers is that when the hatch covers were stacked up on the bow side of the inner bottom plating in No.2 cargo hold on the SCSC WEALTH, they were not secured as specified in the hatch cover operating manual. It is probable that the reason why the driver entered No.2 cargo hold through the forward companionway to the inner bottom plating of No.2 cargo hold is that the instructions to use the designated passage route were not heeded. 
	Safety Recommendations	**Safety Recommendation to the SHANGHAI CSC Line Co., Ltd. (April 25, 2014)** The company should provide instructions to crew members to ensure that they comply with the hatch cover operating manual and appropriate measures to prevent movement of open hatch covers are taken.
	Report	http://www.mlit.go.jp/jtsb/eng-mar_report/2014/2011tk0012e.pdf Refer to case studies (p. 142).

<table>
<tr><td rowspan="4">15</td><td>Date of Publication</td><td>Date and location</td><td>Vessel type and name, accident type</td></tr>
<tr><td>May 30, 2014</td><td>February 7, 2012
Port of Niigata Higashi Ku, Niigata City, Niigata Prefecture</td><td>Container ship KOTA DUTA (Ship A Singapore)
Cargo ship TANYA KARPINSKAYA (Ship B Russia)
Collision</td></tr>
<tr><td>Summary</td><td colspan="2">Ship A was leaving West Wharf No.3 Quay in Port of Niigata Higashi Ku, Niigata City, Niigata Prefecture with a master and 24 crew members onboard, while Ship B was navigating toward the South Wharf within the same section after leaving the Central Wharf East Quay within the same section with a master and 16 crew members onboard (Although there were 18 crew members total, one of the crew members was driving to the South Wharf with the personnel in charge of the ship’s agent for handling lines), when Ship A's bow and Ship B's forward starboard side collided where the passages crossed.
Although Ship B foundered, all of the crew members were rescued.
Ship A suffered damage to the bow, but there were no casualties.</td></tr>
<tr><td>Probable Causes</td><td colspan="2">It is probable that this accident occurred because the vessels collided with each other due to the facts that the master of Ship A and the master of Ship B agreed to the conduct of vessel for both vessels to alter to port to pass on the starboard side via VHF, that the vessels continued to navigate after the master of Ship A put the helm hard to port and the master of Ship B put the helm to port at 15° in an attempt to execute the agreement, and that they kept approaching each other in the situation that was different from the agreed conduct of vessel without being able to recognize any change in the heading when the vessels approached each other in the situation in which their courses would cross where the Dredged Passages crossed while Ship A was proceeding northeast after leaving the West Wharf No.3 Quay and while Ship B was proceeding south-southeast from the Central Wharf East Quay toward the South Wharf in Port of Niigata Higashi Ku.
It is probable that the reason the master of Ship A agreed to the conduct of vessel for both vessels to turn to port to pass on the starboard side via VHF was that the master of Ship A was convinced that Ship B was going to pass on the starboard side due to the facts that the master of Ship B re-confirmed to pass on the starboard side, that Ship B was strongly stating “starboard to starboard” via VHF, that he felt that the report by the former master of Ship A had a strong tone, saying “starboard to starboard,” and that the former master of Ship A, who was on board to hand over the master position, and the master of Ship B were stating “starboard to starboard.”
It is probable that the reason the master of Ship B agreed to the conduct of vessel for both vessels to alter to port to pass on the starboard side via VHF was that the master of Ship B offered the conduct of vessel to pass on the starboard side due to the facts that there was no enough distance and time to judge the conduct of vessel when they were called by Ship A via VHF to inquire about Ship B’s name in Russian, that it was easy for Ship B to alter to port due to the large area of waters on the port side of Ship B, and that he believed it would be safer if the two vessels’ courses did not cross in order to avoid collision because he could not anticipate where in the passage crossing Ship A would turn to port.
It is somewhat likely that the fact it took approximately 20 seconds to agree on the conduct of vessel contributed to the occurrence of this accident due to the facts that the master of Ship A and the master of Ship B took approximately 20 seconds to agree on the conduct of vessel, that the vessels had approached each other to the distance of approximately 600m, and that they had no time to take actions to avoid collision when the vessels further approached each other in the situation that was different from the agreed conduct of vessel in which they could not recognize any change in the other vessel’s heading when they tried to take actions to execute this agreement.
 
</td></tr>
<tr><td rowspan="2">Safety Recommendations</td><td colspan="2">Safety Recommendations for PACIFIC INTERNATIONAL LINES LIMITED (May 30, 2014)</td></tr>
<tr><td colspan="2">(1) Consider that supernumeraries are part of the bridge team if they are practically involved in maneuvering.
(2) Instruct crew members of vessels belonging to PACIFIC INTERNATIONAL LINES</td></tr>
</table>

		LIMITED and vessels under their management to conduct BRM education and training by learning from this accident case so that those on watch on the bridge can collect safety-related information on radar and other equipment and proactively provide it to the person conning the vessel. (3) Instruct officers of vessels belonging to PACIFIC INTERNATIONAL LINES LIMITED and vessels under their management to prepare for departure and keep look-out while correctly understanding items necessary to ensure safety navigation, such as detecting information on nearby vessels underway as early as possible by changing the radar range scale and conduct education by learning from this accident case when visiting the vessels. (4) Have masters of vessels belonging to PACIFIC INTERNATIONAL LINES LIMITED and vessels under their management re-acknowledge the following risks of using VHF by using this accident case and promote awareness by establishing items to reconfirm the risks of using VHF in a checklist to be used to navigate in narrow channels and congested waters. (i) It is possible that two vessels approach each other and have no time to take actions to avoid collision in case the agreement is not executed if those persons conning the two vessels take time to agree on the conduct of vessel and the vessels navigate in the original course at the original speed during that time. (ii) It is possible that those persons conning the vessels would believe that the other vessel would execute the contents to which they had agreed via VHF even if there is a difference between the anticipated actions of the other vessel according to the person conning the vessel and the actual actions after agreeing on the conduct of vessel and lose the opportunity to take actions to avoid collision.
		Safety Recommendation to the EAST WAY LLC. (May 30, 2014)
		(1) Instruct masters and deck officers of vessels belonging to EAST WAY LLC. and vessels under their management to carefully observe radar displays while underway to commence systematic analysis and conduct education by learning from this accident case when visiting the vessels. (2) Notify masters and deck officers of vessels belonging to EAST WAY LLC. and vessels under their management to recognize the following risks of using VHF by learning from this accident case. In addition, if they have checklists used to navigate in narrow channels and congested waters, promote awareness by establishing items to reconfirm the risks of using VHF. (i) It is possible that two vessels approach each other and have no time to take actions to avoid collision in case the agreement is not executed if those persons conning the two vessels take time to agree on the conduct of vessel and the vessels underway in the original course at the original speed during that time. (ii) It is possible that those persons conning the vessels would believe that the other vessel would execute the contents to which they had agreed via VHF even if there is a difference between the anticipated actions of the other vessel according to the person conning the vessel and the actual actions after agreeing on the conduct of vessel and lose the opportunity to take actions to avoid collision.
	Report	http://www.mlit.go.jp/jtsb/eng-mar_report/2014/2012tk0003e.pdf Refer to case studies (p. 143).

16	Date of Publication	Date and location	Vessel type and name, accident type
	June 27, 2014	July 2, 2012 Heigun-suido Channel, Yamaguchi Prefecture	Chemical tanker CHEM HANA (Korea) Fatality of crew members
	Summary	The ship, with the master, the chief officer, and the able seaman A, as well as seven other crew members onboard, had departed from Kanmon Port and was heading toward Matsuyama Port. While on passage, the able seaman A was found collapsed in the tank, through the manhole in No. 1 cargo tank (port), and the chief officer who went into the same tank also collapsed. The chief officer was sent to hospital in an ambulance, while the able seaman A was sent to hospital in a doctor's helicopter. However, the death of both members was confirmed.	

	Probable Causes	It is somewhat likely that this accident occurred when the able seaman A and the chief officer inhaled an oxygen deficient air, because oxygen concentration was not measured before entering the cargo tank and they entered the cargo tank wearing canistertype gas masks which they were not permitted to use, when the cargo tank cleaning work was implemented for the loading of a different cargo after unloading acetone, while the ship was proceeding in the Heigun-suido Channel.	
	Report	http://www.mlit.go.jp/jtsb/eng-mar_report/2014/2012tk0032e.pdf	
17	Date of Publication	Date and location	Vessel type and name, accident type
	June 27, 2014	September 24, 2012 Around 930 km, Off the East of Kinkazan, Ishinomaki City, Miyagi Prefecture	Bulk Carrier NIKKEI TIGER (Ship A, Panama) Fishing Vessel HORIEI-MARU (Ship B) Collision
	Summary	Ship A, with a master and 20 crew members, departing Shibushi Port, Shibushi City, Kagoshima Prefecture, was proceeding northeast on the North Pacific toward Vancouver, Canada. Ship B, with a master and 21 crew members, was proceeding south-southwest, for the purpose of avoiding a low pressure system, on the North Pacific. At around 930 km east of Kinkazan, Ishinomaki City, Miyagi Prefecture, NIKKEI TIGER's bow and HORIEI-MARU's port side collided with each other. Nine crew members onboard HORIEI-MARU were rescued by HORIEI-MARU's consort, but the others went missing, and the vessel sank. NIKKEI TIGER had no casualties and received no significant damage to its hull.	
	Probable Causes	It is probable that the accident of collision between Vessel A and Vessel B occurred at night at around 930 km east of Kinkazan while Vessel A was proceeding northeast and Vessel B was proceeding south-southwest, because Vessel A altered its course to port and Vessel B altered its course to starboard in a situation where the vessels came close to each other sailing on intersecting courses. It is probable that Vessel A altered its course to port for the purpose of widening the passing distance to Vessel B which was crossing ahead of Vessel A.	
	Comments	**【Reference】 Opinions to the Minister of Land, Infrastructure, Transport and Tourism (November 25, 2013 Time of Interim Report)**	
		(1) The Minister of Land, Infrastructure, Transport and Tourism should consider the necessary measures for further informing ship owners and others of the effectiveness of AISs for the prevention of collision accidents, and the necessary measures for promptly promoting the deployment of AISs on fishing vessels that, at present, are not equipped with AISs (including Simplified AISs, the same shall apply hereinafter), for example, the fishing vessels operating or navigating in the open sea (the second class fishing vessels designated by the Ship Safety Act). (2) It is necessary that, for the purpose of preventing collision accidents, the Minister of Land, Infrastructure, Transport and Tourism should guide shipping business operators to collect and utilize the information on the situations of fishing vessel operations in their ship's navigation areas, using public information including information provided by the industry associations related to fisheries or the Japan-Marine Accident Risk and Safety Information System by the Japan Transport Safety Board.	
		【Reference】 Opinions to the Director General of the Fisheries Agency (November 25, 2013 Time of Interim Report)	
		(1) The Director General of the Fisheries Agency, with regard to the fishing vessels that, at present, are not equipped with AISs, for example the fishing vessel engaged in operations or navigation in the open sea (the second-class fishing vessels designated by the Ship Safety Act), should inform the shipowners and others of the effectiveness of AIS for the prevention of collision accidents, and consider the necessary measures for promptly promoting the deployment of AISs. (2) It is necessary that the Director General of the Fisheries Agency should guide fishing vessel owners to collect and utilize the information on the situations of accident occurrences and the information on commercial vessel's voyage routes using public information, including	

		the Japan-Marine Accident Risk and Safety Information System by the Japan Transport Safety Board.	
	Report	http://www.mlit.go.jp/jtsb/eng-mar_report/2014/2012tk0037e.pdf http://www.mlit.go.jp/jtsb/ship/p-pdf/MA2014-6-5-p.pdf（Explanatory material） http://www.mlit.go.jp/jtsb/ship/p-pdf/MA2014-6-5-p2.pdf（Reference material） Refer to case studies (page 145)	
18	Date of publication	Date and location	Vessel type and name, accident type
	June 27, 2014	January 3, 2013 Lake Yamanaka, Yamanakako Village, Yamanashi Prefecture	Recreational fishing vessel LAKE FLOWER Injury to fishing passengers
	Summary	The ship, with the skipper and two crew members as well as 26 fishing passengers onboard, was at the fishing grounds on Lake Yamanaka in Yamanakako Village, Yamanashi Prefecture. The ship was anchored, and fishing passengers in the cabin was fishing for smelt when one fishing passenger suffered from carbon monoxide poisoning, after which two other fishing passengers suffered from carbon monoxide poisoning.	
	Probable Causes	 It is probable that carbon monoxide contained in the exhaust discharged from the outboard motor into the water had built up in the open U-shaped space on the stern of either side of the ship's hull, and three fishing passengers suffered from carbon monoxide poisoning inhaling carbon monoxide which leaked from this space into the passengers' cabin through the openings in the floor of the cabin used for smelt fishing while the ship was anchored at the fishing ground in Lake Yamanaka and fishing passengers in the cabin was fishing for smelt. It is probable that carbon monoxide had built up in the open U-shaped space on the stern of either side of the ship's hull because when the outboard motor was moving the ship astern, the exhaust discharged into the water had flowed into the open U-shaped gap on the stern of either side of the ship's hull under the water on the bow side, together with the flow of the water, and this exhaust had then surfaced into these spaces. It is probable that carbon monoxide had leaked into the passengers' cabin through the openings in the floor of the cabin used for smelt-fishing, from the open U-shaped space on the stern of either side of the ship's hull, because carbon monoxide is lighter than air (its ratio to air is 0.967).	
	Report	http://www.mlit.go.jp/jtsb/ship/rep-acci/2014/MA2014-6-1_2014tk0008.pdf	
19	Date of publication	Date and location	Vessel type and name, accident type
	June 27, 2014	January 8, 2013 Off the west-north-west coast of Katsumoto Port, Iki City, Nagasaki Prefecture	Recreational fishing vessel SHINKAI Injury of fishing passengers
	Summary	 The ship, crewed by the skipper alone and carrying five fishing passengers, was drifting off the west-north-west coast of Katsumoto Port in Iki City, Nagasaki Prefecture, on a recreational fishing trip. The skipeer sighted a flock of birds moving to the bow side of the ship, and was proceeding northeast to position the ship to the northern side of the flock of birds, when the ship was impacted by consecutive swells from the north. While the bow of the ship was moving up and down due to the swells, one fishing passenger standing on the port side of the deck at the bow was lifted into the air and then fell onto the deck at the bow, sustaining injuries. Other fishing passengers were uninjured, and the ship was not damaged.	
	Probable Causes	It is probable that this accident occurred as follows: The ship was proceeding northeast off the west-north-west coast of Katsumoto Port, when the skipper sighted consecutive swells with a height of about 1.5 – 2m coming from the north; After receiving the first wave diagonally, the skipper turned off the clutch on the engine and attempted to meet the second swell directly on the bow; However, as he sighted the swell right before his eyes, he was unable to warn the	

		fishing passengers of the swells; Consequently, one fishing passenger on the deck at the bow saw the wave right before his eyes, and lost his balance through the upward and downward movement of the bow due to the first swell; When the bow moved up and down as a result of the second wave, his body was lifted into the air and fell onto the deck at the bow after that, and he suffered from a burst fracture of the 12th thoracic vertebra.	
	Report	http://www.mlit.go.jp/jtsb/ship/rep-acci/2014/MA2014-6-4_2014tk0003.pdf	
20	Date of Publication	Date and location	Vessel type and name, accident type
	June 26, 2014	May 16, 2013 At the west pier of Tenpoku No.2 Wharf in the port of Wakkanai, Wakkanai City, Hokkaido	Cargo ship TAIGAN (Cambodia) Fire
	Summary	While mooring at the west pier of Tenpoku No.2 Wharf in the port of Wakkanai, Wakkanai City, Hokkaido, cargo ship TAIGAN, with the master and 22 crew members on board, caught fire. The fire on TAIGAN was extinguished at about 13:00 by a fire brigade, leaving six crew members dead and three people injured. Besides, the bridge deck, the poop deck, and the upper deck were burned out.	
	Probable Causes	It is somewhat likely that while the Vessel moored at the Pier of Tenpoku No.2 Wharf in the port of Wakkanai at night, the Ref/E smoked on the bed in the Cabin, and then his bedclothes caught fire; hence, the fire spread to surrounding flammable materials.	
	Safety Recommendations	**JTSB Safety Recommendation to the MEGANOM SHIPPING LTD.(as the management company of the vessel) (June 27, 2014)**	
		The company is recommended to ensure the onboard smoking policy in observed and to instruct the vessel to provide new crew members with training, just after they joined the vessel, on how to act in the event of a fire, which includes information about the escape routes and the location of fire extinguishers.	
		JTSB Safety Recommendation to the MEGANOM SHIPPING LTD.(as the owner of the vessel) (June 27, 2014)	
		The company is recommended to try to secure escape routes regardless where a fire breaks out, for example, by having one on the fore side and another on the aft side.	
		JTSB Safety Recommendation to the authorities of the Kingdom of Cambodia (June 27, 2014)	
		It is recommended that the authorities of the Kingdom of Cambodia should provide adequate instructions to the management companies and owners that are operating similar ships to the vessel. The management company of the vessels recommended to ensure the onboard smoking policy in observed and to instruct the vessel to provide new crew members with training, just after they joined the vessel, on how to act in the event of a fire, which includes information about the escape routes and the location of fire extinguishers. The owner of the vessel is recommended to try to secure escape routes regardless where a fire breaks out, for example, by having one on the fore side and another on the aft side.	
	Report	http://www.mlit.go.jp/jtsb/eng-mar_report/2014/2013tk0014e.pdf Refer to case studies (page 144)	
21	Date of Publication	Date and location	Vessel type and name, accident type
	August 29, 2014	July 17, 2011 Port Island North Wharf External Trade Berth R, Kobe District, Hanshin Port	Cargo Ship YUSHO SEVEN (Panama) Fatality of a stevedore
	Summary	while the cargo ship YUSHO SEVEN was loading pipes and other cargo at the Port Island North Wharf External Trade Berth R, Kobe District, Hanshin Port, pipes stacked on the starboard side of the lower deck of No. 1 cargo hold collapsed and a worker, who was on the pipes, fell to the deck with the pipes and was killed.	

	Probable Causes	It is probable that the accident occurred because while YUSHO SEVEN was loading pipes and other cargo at the Port Island North Wharf External Trade Berth R in Kobe District, Hanshin Port, a bundle of two wrapped pipes and other wrapped pipes stacked from the fifth to the seventh tier near the sidewall started sliding athwartships, and a lasher, who was on the wrapped pipes on the sixth tier, fell to the lower deck with the wrapped pipes, which fell on top of him.  It is probable that the bundle of two wrapped pipes and other wrapped pipes stacked from the fifth to the seventh tier near the sidewall started sliding athwartships due to the following facts: (i) two stevedores inserted a turnbuckle between the starboard sidewall and the bundle of two wrapped pipes stacked on the seventh tier near the sidewall, and moved the turnbuckle to create a clearance gap, (ii) YUSHO SEVEN listed to the port side at an angle of about 2.8° when YUSHO SEVEN hoisted coils from the cargo ship moored alongside the port side of YUSHO SEVEN using the aft crane, (iii) the height was not adjusted from the fifth tier and only three lines of dunnage were laid out to the fore, middle, and aft because each tier consisted of wrapped pipes and was almost even, (iv) the pipes were not lashed down because they were due to be lashed after all the pipes had been stacked on the starboard side, (v) no wedges were inserted. It is probable that two stevedores tried to create a clearance gap between the sidewall and the bundle of two wrapped pipes stacked on the seventh tier near the sidewall using a turnbuckle because No. 1 cargo hold supervisor, who heard from the leader of the lashing operation that the wire lashing rope could not be pulled out since the height of the dunnage that was put against the sidewall was so short that the bundle of pipes came into contact with the sidewall when the bundle was pushed in using the fork of a forklift truck, thought that creating a clearance gap would allow the wire lashing rope to be pulled out, and instructed two stevedores to try to move the bundle of pipes.
	Report	http://www.mlit.go.jp/jtsb/eng-mar_report/2014/2011tk0018e.pdf

22	Date of publication	Date and location	Vessel type and name, accident type
	August 29, 2014	May 15, 2012 Near the quay wall of Bandaijima Wharf of Niigata Port, Niigata City, Niigata Prefecture	Passenger ferry OSADOMARU Fatality of passenger
	Summary	The ship, with the master and 24 crew members onboard, was berthed at Bandaijima Wharf of Niigata Port and unloading vehicles, when a passenger was ran over by a vehicle on the starboard side of the center section of the vehicle deck, and died.	
	Probable Causes	It is probable that this accident occurred because Passenger A, who was suspected of suffering from Alzheimer's dementia, had entered the vehicle deck during the unloading of vehicles while the ship was berthed at Bandaijima Wharf of Niigata Port, went under the third vehicle from the stern on the starboard side, and was consequently ran over by the vehicle. 	
	Report	http://www.mlit.go.jp/jtsb/ship/rep-acci/2014/MA2014-8-2_2012tk0025.pdf	

23	Date of Publication	Date and location	Vessel type and name, accident type
	August 29, 2014	January 23, 2013 On a true bearing of approximately 116º and at a distance of 11.4 nautical miles from the Katsuura Lighthouse, Katsuura City, Chiba Prefecture	Container ship BAI CHAY BRIDGE (Ship A, Panama) Fishing vessel SEIHOU MARU No. 18 (Ship B)
	Summary	Ship A with the master, third officer and 21 other crewmembers on board was proceeding	

		southwestward to Keihin Port, and Ship B with the skipper and five other crewmembers on board was proceeding north-northeastward to Choshi Port. The two vessels collided with each other east-southeast off Katsuura Port in Katsuura City, Chiba Prefecture. All crewmembers on the Ship B, four of whom were slightly injured, were rescued by the Ship A, and the fishing vessel broke apart at around the middle of the hull and sank. No one on the Ship A was injured or killed, and the vessel sustained scratches on the bow.
	Probable Causes	It is probable that in this accident, while Ship A was proceeding southwestward and Vessel B north-northeastward, east-southeast off Katsuura Port during nighttime, The officer of Ship A was not keeping a proper look-out on the radar while the skipper of Ship B was not properly monitoring the maneuvers of Ship A and, thinking that there was a risk of collision with Ship A, turned the rudder to starboard, resulting in a collision. It is probable that the officer of Ship A was not keeping a proper look-out on the radar because he was chatting with the helmsman of ship A and listening to communications between other vessels. It is probable that the skipper of Ship B did not properly monitor the maneuvers of Ship A because instead of using the radar cursor or other means to monitor changes in Ship A's bearing, he just kept a look-out of Ship A by sight even though its navigation lights were difficult to see. It is probable that the skipper of Ship B had the rudder turned to starboard thinking that there was a risk of collision with Ship A because he believed that passing port-to-port was the norm. 
	Report	http://www.mlit.go.jp/jtsb/eng-mar_report/2014/2013tk0002e.pdf http://www.mlit.go.jp/jtsb/ship/p-pdf/MA2014-8-5-p.pdf (Explanatory material)
24	Date of Publication	Date and location / Vessel type and name, accident type
	August 29, 2014	August 13, 2013 Funabashi Chuo Wharf South B Berth in Katsunan District, Port of Chiba in Chiba Prefecture Cargo ship WELLINGTON STAR (Bahamas) Fatality of a stevedore
	Summary	On the ship, one of the stevedores on the upper deck deceased after being caught between a container and a sludge shore connector steel box while they were loading containers with a deck crane at Funabashi Chuo Wharf South B Berth in Katsunan District, Port of Chiba.
	Probable Causes	It is probable that this accident occurred when the stevedore was caught between the container and the steel box when the container swung toward the stern side while he was involved with the work to control the swinging of the container by holding the swing-prevention rope due to the facts that there was the steel box behind him and that he was toward the stern side of where the container was being moved while they were loading containers with a deck crane on the vessel at Funabashi Chuo Wharf South B Quay in Katsunan District, Port of Chiba. It is probable that the stevedore had the steel box behind him and was toward the stern side of where the container was being moved because the foreman had not given instructions on areas to avoid, etc. It is somewhat likely that the fact that the company had not stipulated a work plan to conduct safe work involving loading/unloading of containers affected the occurrence of this accident. 
	Report	http://www.mlit.go.jp/jtsb/eng-mar_report/2014/2013tk0022e.pdf
25	Date of publication	Date and location / Vessel type and name, accident type
	August 29, 2014	March 9, 2014 Near Hotokebana in Nagasaki City, Nagasaki Prefecture, approximately 2,300m, true bearing of 338° from the Nose Light Beacon located in Nagasaki City Angler tender boat TSURISHIOMARU Fatality of fishing passenger

	Summary	The ship was crewed by the operator alone. Fishing passengers were in the process of crossing from the rocky area of Butsubana in Nagasaki City, Nagasaki Prefecture, to the ship, when one fishing passenger who was crossing from the rocky area to the ship, fell from the gangplank into the water and died.
	Probable Causes	It is probable that this accident occurred as follows: While fishing passengers was crossing from the rocky area of Butsubana onto the ship, a regular fishing passenger on the ship attempted to cross the gangplank fitted onto the bow onto the ship while both hands were occupied with fishing equipment and other items; His left hand, holding the fishing rod, bait box, and other items, struck the handrail on the left, and he lost his balance toward the left direction; Hence, his right hand let go of the cooler box and temporarily grabbed hold of the handrail on the left, but could not support his body and he fell into the water. 
	Report	http://www.mlit.go.jp/jtsb/ship/rep-acci/2014/MA2014-8-1_2014tk0006.pdf
26	Date of Publication	Date and location / Vessel type and name, accident type
	September 25, 2014	March 26, 2013 Liner Berth No. 13, Central Wharf of Port Island, Section II of the Kobe Area, Hanshin Port Cargo vessel, JURONG (Panama) Death and injury of workers
	Summary	While the vessel with the master and 20 other crew members onboard was engaged in cargo loading operations at Liner Berth No. 13, Central Wharf of Port Island, Section II of the Kobe Area, Hanshin Port, large tires that had been temporarily placed on the tween deck of the vessel's No. 1 cargo hold fell down, killing one stevedore and injuring another, both of whom were carrying out their duties at the time.
	Probable Causes	It is probable that the accident occurred because the Tire, which was one of four large tires temporarily placed in an upright position on the Deck during stevedoring on the Vessel at the Berth located in Section II of the Kobe Area in Hanshin Port, fell down and caused Stevedore A to become trapped underneath the Tire and Stevedore B to be hit on his left ankle and thrown down by the Tire. It is probable that the Tire fell down because it was temporarily placed in an upright position and was not provided with any means against falling sideways. Nichiei Unyu Kabushiki Kaisha did not indicate hazardous areas involving the risk of large tires falling and did not make sure no stevedore entered such hazardous areas. It is somewhat likely that not implementing these safety measures contributed to the occurrence of the accident. 
	Report	http://www.mlit.go.jp/jtsb/eng-mar_report/2014/2013tk0008e.pdf
27	Date of Publication	Date and location / Vessel type and name, accident type
	October 30, 2014	February 7, 2013 In the area around Mariyama Minami Quay A in Tsuruga Port, Tsuruga City, Fukui Prefecture Container ship PANCON SUCCESS (Korea) Fatality of a crew member
	Summary	While the ship with the master, chief officer and 14 other crew members onboard and loaded with 128 containers (approximately 1,500 tons in weight) was moored at Mariyama Minami Quay A in Tsuruga Port, Tsuruga City, Fukui Prefecture, one of the ship's mooring lines was severed and subsequently struck the chief officer, who died from his injuries.

	Probable Causes	It is probable that while the ship was moored at Mariyama Minami Quay A in Tsuruga Port at night, this accident occurred when one of the ship's mooring lines was severed and struck the chief officer. It is probable that the mooring line was severed as a result of the longitudinal and lateral motions of the ship caused by secondary undulation present at that time in Tsuruga Port. It is probable that the severed mooring line struck the chief officer because he was in the mooring winch operating area, which was within the snap-back danger zone. It is somewhat likely that the ship remained moored at Mariyama Minami Quay A because the master had no knowledge of secondary undulation. 	
	Report	http://www.mlit.go.jp/jtsb/eng-mar_report/2014/2013tk0003e.pdf	
28	Date of Publication	Date and location	Vessel type and name, accident type
	November 27, 2014	April 30, 2013 Around 196° in true bearing, approximately 0.85 nautical miles (M) from Senboku Otsu East Breakwater Lighthouse, Izumiotsu City, Osaka Prefecture	Cargo ship FAVOR SAILING (Cambodia) Foundering
	Summary	The ship, with a master and eight other crew members on board, which listed over and foundered while moored at Shiomi Quay 4, Sakai Senboku-Ku,Hanshin Port. There were no injuries to the crew.	
	Probable Causes	It is probable that, in this accident, the Vessel, which listed to port while moored at Sukematsu Warf in Hanshin Port, Sakai Senboku-Ku and loading scraps, and, although listed to starboard while the chief officer ballasted seawater into the ballast tanks under the instructions of the master and ballast operation was undergoing, continued ballast operation and caused port list soon after leaving the wharf, and, by ballast operation after anchoring, caused starboard list and, by ballast operation after mooring to Shiomi Quay, caused port list. It is probable that, despite of continued ballast operation, as the amount of free water in the cargo hold increased by the ballast operation that had been done, port list continued to increase, seawater came into the cargo hold and accommodation space, and the Vessel listed over and foundered. It is probable that, free water occurred in the cargo load because, as the chief officer, in the recognition that the loading was started from lighter scraps, ballasted seawater in the ballast tank to prevent reduction in stability due to an increase in the height of the center of gravity of the Vessel, and there were holes on the bottom plate of the store room and the cargo hold, seawater came into the cargo hold and collect on the cargo hold floor, overflowed from bilge wells, and was retained at the bottom of the cargo hold. It is probable that, the chief officer continued ballast operation because, although the master and chief officer were aware of the bilge (free water) in the cargo hold, they did not know of the effect of free water on the stability of the ship, and because the master repeatedly instructed to reduce the list. 	
	Report	http://www.mlit.go.jp/jtsb/eng-mar_report/2014/2013tk0013e.pdf	
29	Date of Publication	Date and location	Vessel type and name, accident type
	December 18, 2014	January 30, 2013 Off the East of Yokohama District of Keihin Port Around 320° true bearing, 1,950 m from Kisarazuko Offing Light Beacon loacated in Kisarazu City Chiba Prefecture	LNG tanker PUTERI NILAM SATU (Ship A, Malaysia) LPG tanker SAKURA HARMONY (Ship B,Panama) Collision

	Summary	Ship A, with 31 crew members in addition to the master, under the pilotage of two pilots, was proceeding west-southwest toward the west marine area of Nakanose off the east of Yokohama district of Keihin port, with two escort tugboats preceded. Ship B, with 13 crew members in addition to the master, departed through Nakanose Traffic Route and was proceeding north toward a pilot station located in the vicinity of the entry of Tsurumi Passage in Yokohama district of Keihin port. Both tankers collided at around 12:19:27. Ship A received some dents and cracks on its hull around the center of the portside, and Ship B received crushes on its hull of the bow and some dents on the bulbous bow, while there were no casualties among the crew members on both tankers.
	Probable Causes	 It is probable that this accident occurred as follows: Ship A was proceeding west-southwest off the east of Yokohama district of Keihin port, piloted by 2 Pilots and led by the escort boat and others, while Ship B was proceeding north departing Nakanose Traffic Route. Ship A was proceeding, maintaining the course and speed because Pilots A1 and A2 believed that Ship B would pass astern of Ship A. Master B was proceeding in a situation to approach the bow of Ship A. It is probable that the reason why Pilots A1 and A2 kept proceeding, maintaining the course and speed and believing that Ship B would pass astern of Ship A was that they received a report from the escort boat that the speed of Ship B at about the exit of Nakanose Traffic Route was 8.5 kn and believed that Ship B would decelerate at about the exit of Nakanose Traffic Route because the speed of Ship B was slower than the speed limit of other equivalent Ships on Nakanose Traffic Route. It is probable that the reason why Master B was proceeding in a situation to approach the bow of Ship A was that Ship B, though its planned course after departing Nakanose Traffic Route was 338°, increased the speed at a heading of 006° to 349° because it had given way to Ships E and F, changed the course to about 000° at about 12:16, and proceeded, maintaining the course and speed. It is somewhat likely that the speed of Ship A was about 16 kn about 3 minutes before occurrence of the accident was involved in occurrence of the accident because, at that speed, it was difficult for Ship A to let Ships C and D go ahead to take actions to avoid collision, such as urging Ship B to turn right.
	Report	http://www.mlit.go.jp/jtsb/eng-mar_report/2014/2013tk0001e.pdf

30	Date of Publication	Date and location	Vessel type and name, accident type
	December 18, 2014	April 9, 2013 Off Fukui #4 Berth, Hamada Port, Hamada City, Shimane Prefecture Around 070º true bearing, 600m from Hamada Port West Breakwater Lighthouse	Container ship MERRY STAR (Ship A, Korea) Work boat KOUN MARU No.58 (Ship B) Capsize
	Summary	During its service to help unberth Ship A at Hamada Port, Hamada City, Shimane Prefecture, Ship B, with a captain and one worker on board, capsized. The captain died.	
	Probable Causes	It is probable that this accident occurred as follows. When unberthing from the quay to depart from Hamada Port, Ship A veered out its mooring line as a tow line to Ship B, now positioned in the port bow direction, and had Ship B tow Ship A to the port beam direction. When the master of Ship A increased speed to prevent Ship A from being drifted toward Ship C, Ship B moved to the stern direction of Ship A. Ship A tried to cast off the tow line but could not, and as a result, Ship B was pulled abeam by Ship A and capsized. It is probable that Ship A pulled abeam Ship B, because the master of Ship A did not inform Ship B that Ship A would be increasing its speed, and because after increasing its speed, the master paid more attention to preventing Ship A from being drifted toward Ship C, without checking the status of the ship.	
	Report	http://www.mlit.go.jp/jtsb/eng-mar_report/2014/2013tk0010e.pdf http://www.mlit.go.jp/jtsb/ship/p-pdf/MA2014-8-5-p.pdf（Explanatory material）	

List of published investigation reports on serious marine incidents (2014)

1	Date of publication	Date and location	Vessel type and name, accident type
	June 27, 2014	November 1, 2012 Off the eastern coast of Inubosaki, Choshi City, Chiba Prefecture	Fishing vessel KOTOKUMARU No.18 Loss of control (Engine damage)
	Summary	The ship, with the skipper, the chief engineer, and four crew members onboard, was proceeding north to reach the fishing grounds off the eastern coast of Inubosaki of Choshi City, Chiba Prefecture, when abnormal noises and vibrations emerged from the engine room. The main engine then failed to work, and the ship lost its control. The ship was towed by a consort ship that came to its assistance, and entered Katsuura Fishing Port in Katsuura City, Chiba Prefecture. The ship sustained damage to the piston and cylinder liner of cylinder No. 5 in the main engine, but no fatalities or injuries resulted from this incident.	
	Probable Causes	It is somewhat likely that this incident occurred as follows: The ship was proceeding north off the eastern coast of Inubosaki at night, when the cooling nozzle of the piston of cylinder No. 5 of the main engine became blocked; This reduced the volume of injector oil from this nozzle, and caused a decline in the cooling function of piston No. 5; Hence, this piston had overheated and expanded, and the lubrication between the piston and the cylinder liner had become obstructed; Consequently, the piston and the cylinder liner were burnt and became damaged, leading to the failure in the operation of the main engine.	
	Report	http://www.mlit.go.jp/jtsb/ship/rep-inci/2014/MI2014-6-1_2014tk0007.pdf	
2	Date of publication	Date and location	Vessel type and name, accident type
	October 30, 2014	June 11, 2013 Off the eastern coast of Mutsure Island, Kanmon Passage, Kanmon Port	Car carrier AUTO BANNER (Ship A, Panama) Training ship SHIMAYUKI (Ship B) Safety obstruction
	Summary	 Ship A, with the master and 23 crew members onboard, with the pilot engaged in the piloting of the ship, and proceeding south along the Kanmon Passage of Kanmon Port toward Sakaisenboku of Hanshin Port. Ship B, with the master and 153 crew members onboard, was proceeding north-north-east along the same passage toward Sasebo Port in Nagasaki Prefecture. When they met on reciprocal courses in the Kanmon Passage off the eastern coast of Mutsure Island in Shimonoseki City, Yamaguchi Prefecture, Ship B was sailing the left side of the passage by turning to port, navigating in a way that went against the provisions of the Act on Port Regulations by entering into the path of Ship A. It continued to approach Ship A. Ship A, sensing the risk of collision, turned to port to sail on the left of the passage. The two ships came within close quarters of one another at a distance of about 250m, passing by starboard side to starboard side, thereby obstructing safety.	
	Probable Causes	It is probable that this incident occurred as follows: Ship A was proceeding south toward the Sakaisenboku district of Hanshin Port, while Ship B was heading north-north-east toward Sasebo Port, in the Kanmon Passage off the eastern coast of Mutsure Island at night; When the two ships met on reciprocal courses, Ship A turned to starboard following the course on the right side of the passage, while Ship B on the starboard bow navigated close to the center of the passage, and turned to port just in front of the planned waypoint in order to head toward the next course, and began navigating on the left side of the passage; At the same time, it was showing the sidelights toward Ship A, and entered into the path of Ship A in a way that went against the provision of the Act on Port Regulations; It continued to approach Ship A, and Ship A navigated on the left of the passage in order to avoid a collision with Ship B. The two ships came within close quarters of one another starboard-to-starboard. It is considered probable that Ship B had navigated close to the center of the Kanmon Passage, and turned to port just in front of the planned waypoint in order to head toward the next course, because of the reasons listed in (1) and (2) below. (1) Ship B navigated close to the center of the passage as its course line had been established toward the center of the Kanmon Passage, and it had been pushed toward the center of	

		Kanmon Channel by the wind and currents. The chief navigator of Ship B was not aware that the ship was navigating close to the center of the passage, and approached the next waypoint without altering the course. As the master of Ship B granted approval for changing the course of the ship at the next waypoint, the ship maintained its course and continued to navigate. (2) The chief navigator of Ship B received reports on the change of course from the crew, and believed that the ship had arrived at the waypoint. In addition, he felt that the ship was close to the line connecting No. 5 light buoy and No. 3 light buoy, which was close to the waypoint.
	Report	http://www.mlit.go.jp/jtsb/ship/rep-inci/2014/MI2014-10-1_2013tk0016.pdf http://www.mlit.go.jp/jtsb/ship/p-pdf/MI2014-10-1-p.pdf (Explanatory material) Refer to case studies (p. 146).

9 Summaries of recommendations and opinions

The recommendations and opinions for 2014 are summarized below.

① Fatality of a stevedore on the cargo ship SCSC WEALTH

(Safety recommendation issued on April 25, 2014)

○Summary of the accident, probable causes and safety recommendations

Refer to “8 Publication of investigation reports” (No.14, page 114)

② Collision between the container ship KOTA DUTA and the cargo ship TANYA KARPINSKAYA (Ship B Russia)

(Safety recommendations issued on May 30, 2014)

○Summary of the accident, probable causes and safety recommendations

Refer to “8 Publication of investigation reports” (No.15, page 115)

③ Fire on the cargo ship TAIGAN

(Safety recommendations issued on June 27, 2014)

○Summary of the accident, probable causes and safety recommendations

Refer to “8 Publication of investigation reports” (No.20, page 119)

④ Opinions on preventing the grounding and contact with breakwater or other facility involving recreational fishing vessels and angler tender boats

(Opinions issued on March 28, 2014)

Grounding accident that occurred on August 14, 2013

○Summary of the accident

In August and September 2013, three cases of recreational fishing vessels grounding on rocky areas, colliding into breakwaters, and other such serious marine accidents occurred one after another, and 15 people including passengers sustained minor to serious injuries. Furthermore, after October the same year, three cases of similar accidents continued to occur.

The number of accidents of grounding by recreational fishing vessels and angler tender boats (hereafter, "recreational fishing vessels, etc."), collisions into breakwaters, etc., and accidents causing damage to aquaculture facilities, etc., that had been identified from October 2008 to February 2014, exceeded 63 cases. By the end of March, reports had been published about 56 cases of marine accidents.

In the analysis of these cases, the majority of the accidents had frequently resulted from failure to check the ship's position, not keeping careful lookout, or mistaken perceptions, etc. at waters that the ships were accustomed to navigating, such as routes into and out of the docking spot, or fishing points with a high frequency of use. Even in such frequented waters, it is desirable to check and obtain information on areas that are recognized as being particularly dangerous spots.

Hence, it is considered to be necessary to provide guidance to the operators of recreational fishing vessels, etc. as part of the necessary measures to be taken to ensure that ships obtain information on areas that are recognized as being particularly dangerous spots in water that they are accustomed to navigating, and to ensure the safe navigation of ships in these dangerous areas.

○Description of opinions toward the Director-General of the Fisheries Agency

The grounding of recreational fishing vessels, etc. carrying fishing passengers, and collisions into breakwaters, are giving rise to a large number of injuries. Hence, in order to raise awareness of the following matters among the operators of recreational fishing vessels, etc. or those who are responsible for carrying out work on recreational fishing vessels, etc. so as to ensure the safety of the users of recreational fishing vessels, etc., recommendations should be made to prefectural governors and other persons, and methods reviewed for the definite implementation of these matters.

It is desirable that the operators of recreational fishing vessels should examine the rocky areas, shallows, breakwaters, aquaculture facilities, etc. that are located between the boarding and alighting points of users and fishing grounds, or between two fishing grounds, and conduct risk assessments. For areas that have been identified as particularly dangerous areas, they should establish routes that enable safe navigation or safety clearance lines, check the ship's position while on passage using GPS plotter and other equipment, and navigate safely based on established routes and safety clearance lines.

10 Actions taken in response to recommendations in 2014 (Marine accidents, etc.)

The summary of actions taken in response to recommendations reported in 2014 is as follows.

① Marine accident related to the fire on the cargo ship TAIGAN

(Safety recommendations issued on June 27, 2014)

The Japan Transport Safety Board conducted an investigation into the fire on the cargo ship TAIGAN that occurred in Wakkanai Port in Hokkaido on May 16, 2013, and published the accident investigation report on June 27, 2014, as well as offered safety recommendations to the authorities of the Kingdom of Cambodia, which was the country that the ship was registered under. It received the following report on actions taken in response to the recommendations.

○Summary of the accident, probable causes, and safety recommendations given

Refer to “8. Publication of investigation reports” (p. 119, No. 20).

○Actions taken in response to safety recommendations

Actions taken by the authorities of the Kingdom of Cambodia

This Administration will instruct that the management company and the owner should take the following measures to prevent not only recurrence of similar accidents but also damage caused by them.

(1) The Management Company should ensure the onboard smoking policy is observed.

(2) The Management Company should provide new crew members with training, just after they joined the vessel, on what to do in the event of a fire, which includes information about the escape routes and the location of fire extinguishers.

(3) To avoid the situation where there is no emergency escape route available depending on where a fire breaks out, it is desirable that the ship owner should secure at least two escape routes, for example, one on the fore side and the other on the aft side.

*The original report issued by the authorities of the Kingdom of Cambodia is published on the JTSB website.

http://www.mlit.go.jp/jtsb/shiphoukoku/ship-anzenkankoku14cre_20140801.pdf

② Opinions on preventing the grounding of recreational fishing vessels and angler tender boats, and collision accidents at breakwaters, etc.

(Opinions issued on March 28, 2014)

The Japan Transport Safety Board analyzed the cases of grounding by recreational fishing vessels and angler tender boats, collisions into breakwaters, etc., and accidents causing damage to

aquaculture facilities, etc. identified from October 2008 to February 2014, expressed its opinions to the Director-General of the Fisheries Agency on March 28, 2014, and received the following report on actions taken in response to the opinions.

○Summary of the accident

Refer to "9. Summaries of recommendations and opinions" (p. 126, ④).

○Actions taken by the Director-General of the Fisheries Agency in response to the opinions

According to 25-Suikan No. 2775 dated March 31, 2014, in order to ensure that definite measures are put in place to secure the safety of the users of recreational fishing vessels, operational rules were revised and recommendations offered to the prefectural governors. In addition, the following requests were made to ensure the thorough dissemination of measures for preventing accidents to those who are responsible for conducting safety seminars for operations of recreational fishing vessels, etc. as part of the assistance projects organized by the Fisheries Agency, and to those who are responsible for conducting educational seminars for the operators of recreational fishing vessels.

It is desirable that the operators of recreational fishing vessels should examine the rocky areas, shallows, breakwaters, aquaculture facilities, etc. that are located between the boarding and alighting points of users and fishing grounds, or between two fishing grounds, and conduct risk assessments. For areas that have been identified as particularly dangerous areas, they should establish routes that enable safe navigation or safety clearance lines, check the ship's position while on passage using GPS plotter and other equipment, and navigate safely based on established routes and safety clearance lines.

*The contents of the report, including materials, etc., are published on the JTSB website.
http://www.mlit.go.jp/jtsb/shiphoukoku/ship-iken12re_20140423.pdf

③ Marine accident involving the fatality of a crew member of the chemical tanker KYOKUHO MARU No. 2

(Recommendations issued on April 26, 2013)

The Japan Transport Safety Board conducted an investigation into the fatality of a crew member of the chemical tanker KYOKUHO MARU No. 2 that occurred at the seventh district of Sakaisenboku of Hanshin Port on February 7, 2012, and published the accident investigation report on April 26, 2013, as well as offered recommendations to the Minister of Land, Infrastructure, Transport and Tourism and AST Inc. as one of the parties relevant to the cause of the accident. It received the following report on measures and actions taken in response to the recommendations.

○Summary of the Accident

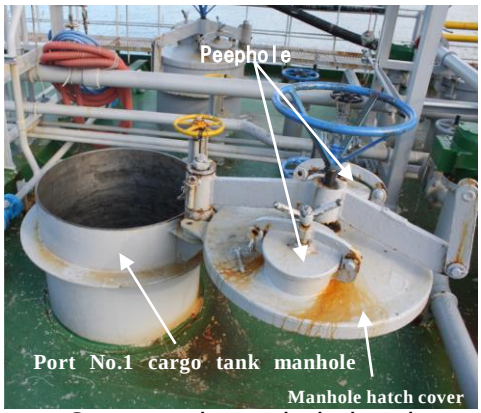
The chemical tanker KYOKUHO MARU No.2 left Komatsu Wharf, Izumi-otsu Port, Izumi-otsu City, Osaka Prefecture, with the master, the second officer and other three crewmembers onboard. On her way northward to the Umemachi Terminal in the Section 1 of Hanshin Port, at about 12:29 on February 7, 2012, the chief engineer found the second officer collapsed in the port No.1 cargo tank.

The Ship

The second officer was rescued but had been disabled to breathe by the inhaled gas, and died in oxygen deficiency.

○Probable Causes

It is probable that this accident occurred as the second officer entered the port No.1 cargo tank, where the wash water had remained with a smell of gas, and inhaled the chloroform gas when checking the inside of the tanks while the chemical tanker was heading north to the Umemachi Terminal, because AST Inc. had not made the crew well accustomed to taking careful actions when entering the cargo tank, including measurement of oxygen and other gas concentration, and also because the company had not manifestly established tank cleaning procedures in case of wash water found remaining in the cargo tank.



Cargo tank manhole hatch

○Recommendations to the Minister of Land, Infrastructure, Transport and Tourism

The Minister should give directions to coastal chemical tanker operators to ensure that they

take the following measures:

1) give their tanker crew instructions in the measurement of oxygen and other gas concentration when entering in enclosed spaces so as to make sure they implement it, and regularly visit their tankers to check that the measurement of oxygen and other gas concentration is carried out without fail;

2) instruct their masters to keep record of the measurement of oxygen and other gas concentration and, if a gas detector is used in the gas measurement, also keep record of the number of detector tubes purchased, used, and remaining, and regularly visit their tankers to check the record of gas concentration measurement and the detector tubes to ensure that the measurement and the recording are carried out without fail;

3) develop, in a simple form easy for their crew to understand, specific tank cleaning procedures, including check of wash water remains, removal of the remainder by stripping, and drying and gas-freeing operation as stated in the coastal tanker safety guidelines and P&A manual, and post them at places easy to see on work site; and

4) being aware of the importance of avoiding taking actions impulsively or on the crewmember's own judgment in an emergency, provide education and training to their crew regularly in responding to accidents and other emergencies.

In addition, the Minister should, when inspecting tankers, give their crew necessary instructions concerning 1) through 4) above and check their detector tube record to see if the measurement of oxygen and other gas concentration is properly performed, and make sure, by auditing the operators, that they have been active in the effort of assuring transportation safety and improving shipping operations.

○ Actions taken by the Minister of Land, Infrastructure, Transport and Tourism in response to the recommendations

1. The Maritime Bureau of the Ministry of Land, Infrastructure, Transport and Tourism issued the "Thorough Safety Measures for the Operation of Chemical Tankers" (Kokukaikan No. 6, Kokukaiun No. 24, Kokukaian No. 17, Kokukaisa No. 41) dated April 26, 2013, to provide guidance for the operators of chemical tankers (hereafter, "operators, etc.") on putting in place thorough safety measures when transporting toxic cargo for which guidance was called for in the recommendations to the Chairman of the Japan Coastal Tanker Association.

In response to this, the Japan Coastal Tanker Association established the Coastal Chemical Tanker Safety Measures Working Group that the Ministry of Land, Infrastructure, Transport and Tourism is also a member of. This working group compiled the following measures that should be taken by operators, etc. in light of the recommendations offered, and took steps to ensure that all chemical tankers put in place the necessary measures by March 31, 2014. The Maritime Bureau of the Ministry of Land, Infrastructure, Transport and Tourism also held a briefing session for operators, etc. about the safety measures to be taken when transporting toxic cargo.

(1) Visit the ship at least once a year, and instruct the Master and crew members on matters

such as measuring the concentration of gases when entering dangerous zones, complying with labor safety and health regulations for ship crew, and the usage methods for gas detection devices. At the same time, ensure that this is thoroughly disseminated, check the records for (3), (4), and (6) below, and draw up records indicating that these items have been checked.

(2) Display matters to be complied with when entering dangerous zones near to the dangerous zones and highly visible areas on the ship, have the Master provide guidance on these matters to crew members and ensure that they comply.

(3) Provide the Masters of ships with information pertaining to the risks of cargo, permitted concentration, types of detection device that can measure the concentration of gases, etc. Ensure that this information is thoroughly disseminated by the Masters to the crew members, and record the results of the measurement of gas concentration. Based on labor safety and health regulations for ship crew, as well as the provisions of regulations on the transportation and storage of dangerous cargo, ensure that ships are equipped with effective detection equipment corresponding to the type of cargo they carry.

(4) When using detection equipment, ensure that the Master of the ship keeps records of the number of detection tubes available for each gas that can be detected, the storage location, expiration date, date of usage, working hours in the dangerous zone, and number of tubes used.

(5) In cases where a toxic gas exceeding the baseline value is detected, restrict entry into the dangerous zone immediately, and ventilate the area, undertake tank cleaning work or take other measures to eliminate the cause for the generation of the toxic gas until the concentration of the gas has fallen below the baseline value.

(6) Display the response in the event of an accident near to the dangerous zones and highly visible areas on the ship, have the Master provide guidance on these matters to crew members and ensure that they comply. Conduct training and provide education about response in the event of an accident, and keep records on the situation of training and education.

(7) Take into consideration the time that is required to carry out tank cleaning and gas removal work safely and properly, and allocate vessels accordingly within reason.

2. In light of the aforementioned measures, the Maritime Bureau of the Ministry of Land, Infrastructure, Transport and Tourism issued the “Thorough Safety Measures for Chemical Tankers that Transport Toxic Cargo” (Kokukaian No. 117, Kokukaiin No. 188, Kokukaisa No. 399) dated January 31, 2014, and will conduct site inspections of all chemical tankers between April 1, 2014 and March 31, 2019. It will provide guidance and check the following items, relating to the status of implementation of safety measures.

(1) Conduct accurate revisions and development of safety management manuals, internal regulations, procedure manuals, etc.

(2) Ensure thorough dissemination of on-board guidance, laws and regulations, etc. every year through ship owners and operators, check records of detection and measurement, and verify

the situation of compliance with labor safety and health regulations for ship crew.

(3) Display matters to be complied with when entering dangerous zones, and ensure that crew members are guided and comply with these matters.

(4) Disseminate information about the risks of cargo, permitted concentration, etc., gain the understanding of the Masters, ensure that the Masters check safety data sheets on cargo, and disseminate information to the crew members and gain their understanding on the same.

(5) Equip ships with detection equipment based on labor safety and health regulations for ship crew, as well as the provisions of regulations on the transportation and storage of dangerous cargo.

(6) Understand matters such as how to handle detection equipment, record the results of detection and measurement, and record information pertaining to detection tubes.

(7) Response in the event of an accident

(8) Display/Guidance on response during an emergency, implementation of response training during an emergency, and maintenance of records

3. Furthermore, the "Implementation of Courses on Safety Measures for Chemical Tankers" (Kokukaiin No. 2015), dated February 13, 2014, was issued to registered training institutes that conduct courses for those responsible for handling dangerous substances, and guidance was provided to ensure that the proper education is provided for these persons on safety measures to be taken when transporting toxic cargo.

○Recommendations to AST Inc.

AST Inc. should take the following measures for the prevention of similar accidents:1) give their tanker crew instructions in the measurement of oxygen and other gas concentration when entering in enclosed spaces so as to make sure they implement it, and regularly visit their tankers to check that the measurement of oxygen and other gas concentration is carried out without fail;

2) instruct their masters to keep record of the measurement of oxygen and other gas concentration and, if a gas detector is used in the gas measurement, also keep record of the number of detector tubes purchased, used, and remaining, and regularly visit their tankers to check the record of gas concentration measurement and the detector tubes to ensure that the measurement and the recording are carried out without fail;

3) develop, in a simple form easy for their crew to understand, specific tank cleaning procedures, including check of wash water remains, removal of the remainder by stripping, and drying and gas-freeing operation as stated in the coastal tanker safety guidelines and P&A manual, and post them at places easy to see on work site; and

4) being aware of the importance of avoiding taking actions impulsively or on the crewmember's own judgment in an emergency, provide education and training to their crew regularly in responding to accidents and other emergencies.

○Actions taken by AST Inc. in response to the recommendations

Recommendation (1)

① Providing thorough guidance to crew members

During the ship embarkation training, the docking safety training, and the onboard training conducted once to twice during each ship month, guidance was provided on the need to measure oxygen and gas concentrations. Furthermore, of the items transported by AST Inc., for ships that transport chloroform, dichloromethane, and carbon tetrachloride, before entering tanks and pump rooms that have been cleaned, in addition to taking measurements of oxygen concentration, measurements were taken of residual gas using the detection tubes for the item in question and Kitagawa gas detection equipment, and records were kept. All of these measures were put in place by September 2013.

Based on the results of reviews conduced by the Coastal Chemical Tanker Safety Measures Working Group, in addition to the three items mentioned above (chloroform, dichloromethane, and carbon tetrachloride), measurements were taken for toxic cargo using gas detection tubes or ultra-sensitive PID gas detection equipment for chemical tankers (hereafter, gas detection equipment).

All relevant ships were equipped with gas detection equipment by March 5, 2014, and education was provided on the usage methods for the equipment.

② Checking on the implementation of oxygen and gas concentration measurement

In the checklist for recording safety and health quality activities in ships that has been used for ship visits, among items that check the measurement records of oxygen concentration and residual gas concentration, items that check the "Gas Detection Tube Management Table," which contains records of the number of gas detection tubes received, used, and remaining were newly added, and the status of implementation was checked during the ship visits carried out once to twice a month. All of these measures were put in place by September 2013.

Based on the results of reviews conducted by the Coastal Chemical Tanker Safety Measures Working Group, after equipping ships with gas detection equipment, detection work is carried out on toxic cargo using gas detection tubes or gas detection equipment. Hence, alongside with the measurement records for oxygen concentration, the status of implementation was checked during the ship visits carried out once to twice a month.

With regard to the record format, corresponding with the results of reviews conducted by the Working Group, the Gas Detection Tube Management Table was changed to the Gas Detection Tube Inventory Record Table, while the Oxygen Concentration Measurement/Residual Gas Detection Record Table was changed to the Gas Detection Record Sheet.

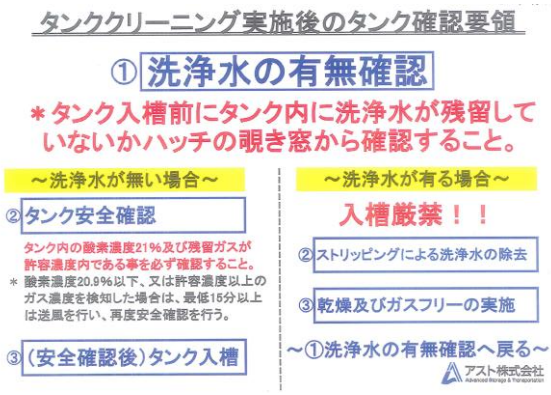
Recommendation (2)

① Recording the status of implementation for measuring oxygen and gas concentration

Of the items transported by AST Inc., with regard to the toxic gases chloroform, dichloromethane, and carbon tetrachloride, in addition to taking measurements of oxygen

concentration before entering tanks and pump rooms that have been cleaned, measurements were also taken of residual gas using the detection tubes for the item in question and Kitagawa gas detection equipment, and records were kept. All of these measures were put in place by September 2013.

The Masters of the ships were required to record measurement results in the Oxygen Concentration Measurement/Residual Gas Detection Record Table, and provided guidance on recording information pertaining to the date of receipt, number of tubes received, date of usage, number of tubes used, and number of tubes remaining, in the Gas Detection Tube Management Table.



Guidelines for Checking Tanks After Tank Cleaning

Based on the results of reviews conducted by the Coastal Chemical Tanker Safety Measures Working Group, after equipping ships with gas detection equipment, detection work is carried out on toxic cargo using gas detection tubes or gas detection equipment, and records are kept on the implementation status for measurement work in the Gas Detection Record Sheet. At the same time, guidance was provided for keeping records for ships that use gas detection tubes in the Gas Detection Inventory Record Table.

All relevant ships were equipped with gas detection equipment by March 5, 2014, and education was provided on the usage methods for the equipment.

② Checking on the implementation status, and investigating and checking records on detection tubes

During ship visits carried out once to twice a month, the aforementioned Oxygen Concentration Measurement/Residual Gas Detection Record Table and Gas Detection Tube Management Table were investigated and checked, and the results of these were recorded in the checklist.

Based on the results of reviews conducted by the Coastal Chemical Tanker Safety Measures Working Group, after equipping ships with gas detection equipment, alongside with measuring and recording oxygen concentration during ship visits conducted once to twice a month, the implementation status was checked for the Gas Detection Record Sheet and the Gas Detection Inventory Record Table for ships that use gas detection tubes.

Recommendation (3)

① Displays, and locations of displays

The "Guidelines for Checking Tanks After Tank Cleaning," which provides a simple

summary on the procedures of checking for the presence of washing water, and in the case that there is washing water, of removal through stripping, drying, and gas removal, was displayed at the entrances to pump rooms and in salons by September 2013. In addition, the "Matters for Compliance When Entering Dangerous Zones" was also displayed at the entrances to pump rooms and in salons.

② Checking of work procedures

During the meetings held prior to carrying out washing work,guidance was provided on the checking of work procedures for tank cleaning using the Guidelines on Cleaning Ships, such as checking for the presence of washing water, and in the case that there is washing water, of removal through stripping, drying, and gas removal by September 2013.

Recommendation (4)

① Measures with regard to facilities

After the occurrence of this accident, before the verification of safety and confirmation of oxygen concentration and the absence of residual gas, tiger mooring ropes were placed over the manhole hatch of the cargo tank as a precautionary warning.

② Implementation of education and training

With regard to methods for responding to an emergency such as an accident, the “Points to Note During an Emergency Such as an Accident in a Dangerous Zone,” which summarizes information such as not taking rash action, not acting on one’s individual discretion, reporting immediately to the bridge, and waiting for assistance before the necessary rescue personnel arrive, was displayed in the entrances of pump rooms and in salons. Education and training was also conducted. All of these measures were put in place by September 2013.

These education sessions were conducted as part of the ship embarkation training, safety during docking education, and on-board training. The training sessions were attended by all crew members when the ships were docked, and once a year on the ships.

*The implementation plans, including materials, are published on the JTSB website.

http://www.mlit.go.jp/jtsb/shiphoukoku/ship-kankoku13re-1_20130809.pdf

④ Marine accident involving a collision accident between the cargo ship NIKKEI TIGER and fishing vessel HORIEI MARU

(Opinions in the interim report on October 25, 2013)

With regard to the collision accident between the Panama cargo ship NIKKEI TIGER, and the fishing vessel HORIEI MARU, which occurred about 930km off the eastern coast of Kinkasan in Miyagi Prefecture on September 24, 2012, in light of the serious damage caused by this accident

and its significant social impact, and from the perspective of preventing similar marine accidents from occurring, the process of the investigation of this accident was reported and published. In addition, based on the facts established to date, opinions were offered to the Minister of Land, Infrastructure, Transport and Tourism and the Director-General of the Fisheries Agency on October 25, 2013, and a report was received on the actions taken in response to these opinions.

○Summary of the accident, probable causes, and safety recommendations given

Refer to “8. Publication of investigation reports” (p. 98, No. 20).

○Opinions to the Minister of Land, Infrastructure, Transport and Tourism

(i) The Minister of Land, Infrastructure, Transport and Tourism should consider the necessary measures for further informing ship owners and others of the effectiveness of AISs for the prevention of collision accidents, and the necessary measures for promptly promoting the deployment of AISs on fishing vessels that, at present, are not equipped with AISs (including Simplified AISs, the same shall apply hereinafter), for example, the fishing vessels operating or navigating in the open sea (the second class fishing vessels designated by the Ship Safety Act).

(ii) It is necessary that, for the purpose of preventing collision accidents, the Minister of Land, Infrastructure, Transport and Tourism should guide shipping business operators to collect and utilize the information on the situations of fishing vessel operations in their ship’s navigation areas, using public information including information provided by the industry associations related to fisheries or the Japan-Marine Accident Risk and Safety Information System by the Japan Transport Safety Board.

○Safety Actions Taken by the Ministry of Land, Infrastructure, Transport and Tourism

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(1) Establishment of the liaison committee of the four ministries and agencies for the promotion of the deployment of AIS on fishing vessels The Ministry of Land, Infrastructure, Transport and Tourism, upon receiving the opinions of the Japan Transport Safety Board, immediately called upon the Fisheries Agency, the Ministry of Internal Affairs and Communications, and the Japan Coast Guard, and established “The Liaison Committee of the Related Ministries and Agencies on the Promotion of the Deployment of AISs on Fishing Vessels” (administered by the Maritime Bureau of the Ministry of Land, Infrastructure, Transport and Tourism). At present, the committee has been discussing the specific measures for the promotion of AISs.

(2) Guidance to the related parties

The Maritime Bureau of the Ministry of Land, Infrastructure, Transport and Tourism issued its notice, dated October 25, 2013, to the maritime industry associations (Japanese Shipowners’ Association and Japan Federation of Coastal Shipping Associations), requiring shipping business operators to collect and utilize the information on the situations of fishing vessel’s operations in the navigation areas of their vessels using the Japan-Marine Accident Risk and Safety Information System by the Japan Transport Safety Board. The Maritime Bureau directed each of

the District Transport Bureaus to inform such shipping business operators of the notice and its points using the seminars and other means related to safety.

In addition, the Maritime Bureau directed the District Transport Bureaus to conduct safety enlightenment campaigns for installation of AISs on board.

○Opinions to the Director General of the Fisheries Agency

(i) The Director General of the Fisheries Agency, with regard to the fishing vessels that, at present, are not equipped with AISs, for example the fishing vessel engaged in operations or navigation in the open sea (the second-class fishing vessels designated by the Ship Safety Act), should inform the shipowners and others of the effectiveness of AIS for the prevention of collision accidents, and consider the necessary measures for promptly promoting the deployment of AISs.

(ii) It is necessary that the Director General of the Fisheries Agency should guide fishing vessel owners to collect and utilize the information on the situations of accident occurrences and the information on commercial vessel's voyage routes using public information, including the Japan-Marine Accident Risk and Safety Information System by the Japan Transport Safety Board.

○Safety Actions Taken by the Ministry of the Fisheries Agency.

(1) Establishment of the liaison committee of the four ministries and agencies for the promotion of the deployment of AIS on fishing vessels The Ministry of Land, Infrastructure, Transport and Tourism, upon receiving the opinions of the Japan Transport Safety Board, immediately called upon the Fisheries Agency, the Ministry of Internal Affairs and Communications, and the Japan Coast Guard, and established "The Liaison Committee of the Related Ministries and Agencies on the Promotion of the Deployment of AISs on Fishing Vessels" (administered by the Maritime Bureau of the Ministry of Land, Infrastructure, Transport and Tourism). At present, the committee has been discussing the specific measures for the promotion of AISs.

(2) Guidance to the related parties

The Fisheries Agency issued its notice, dated October 25, 2013, to the fisheries industry associations (JF Zengyoren (the nationwide federation of Japan Fisheries Cooperatives), Japan Fisheries Association, and Center for Employment Promotion and Training of Fishermen) and Prefectural Governors, requiring the recipients of the notice to promote the deployment of AISs to fishing vessels and guide fishing business

operators to collect the situation of accident occurrences using the Japan-Marine Accident Risk and Safety Information System by the Japan Transport Safety Board.

In addition, the Fisheries Agency established the financing support system for the costs of installation of the AISs, which is virtually interest-free loan in April 2014.

*The implementation plans, including materials, are published on the JTSB website.

http://www.mlit.go.jp/jtsb/shiphoukoku/ship-iken11re.pdf

11 Provision of factual information in 2014 (Marine accidents/incidents)

The JTSB provided factual information on one case (marine accident) to relevant administrative organs in 2014. The contents are as follows.

① Collision accident involving ships with limited visibility on the bow side while on passage

(Information provided on January 31, 2014)

Based on marine accident investigation reports that were published between October 2008 and the end of October 2013, the Japan Transport Safety Board analyzed the conditions of the occurrence of collision accidents (hereafter, "accidents caused by limited visibility on the bow side") involving ships with limited visibility on the bow side, such as fishing vessels and recreational fishing vessels (hereafter, "ships with limited visibility"). The following information was provided to the Ministry of Land, Infrastructure, Transport and Tourism, and the Fisheries Agency.

(Factual information)

1. Occurrence of the accidents, etc.

(1) 68 cases of accidents caused by limited visibility on the bow side have occurred. In these accidents, five people died, while 53 people sustained injuries.

(2) The scope of limited visibility on the bow side due to factors such as an uplifted bow was about 10° to 30° in many cases, and extended to 60° and 90° in some cases.

(3) In about 90% of the accidents caused by limited visibility on the bow side, the ships with limited visibility collided with other ships on the bow side under conditions of little movement, such as during anchoring or while roving.

(4) In about 60% of the accidents caused by limited visibility on the bow side, although the person operating the ship with limited visibility was keeping a lookout on the bow side, such as keeping watch before navigating and waving the bow side while on passage, he or she would believe that there were no other ships at the bow side because other ships were not sighted during these lookouts. After that, lookouts were not carried out properly.

With regard to the factors causing limited visibility in the bow side for small fishing vessels, etc., many of these ships have a planing form, and until the ship enters the planing phase, the bow side would be lifted, thereby limiting visibility on the bow side. At the same time, depending on the fishing vessel, fishing related equipment, etc. may have been installed on the deck, further limiting the visibility on the bow side.

In addition, some of the existing ships face restrictions with regard to seaworthiness, stability, and gross tonnage. Hence, there are cases where it is difficult to completely eliminate the limitations in visibility.

2. Measures to prevent recurrence

The measures described in (1) and (2) below are measures for preventing the recurrence of accidents caused by limited visibility on the bow side.

(1) In the design and construction of new ships, as far as possible, pay attention to ensuring adequate visibility on the bow side.

(2) For ships with limited visibility, put in place measures to make up for the limited visibility on the bow side, such as ship maneuvering methods.

*Details on this provision of information are published on the JTSB website.

http://www.mlit.go.jp/jtsb/iken-teikyo/s-teikyo8_20140131.pdf

Column Collision accidents and "suspicious ships"

Marine Accident Investigator

When we speak of "suspicious ships," ships that are found near territorial waters in the night, and ships of unknown nationality or names that sometimes enter territorial waters and act suspiciously, come to mind. However, in the case of collision accidents, crew members of the ship that caused the accident often sense that the other ship is acting in a suspicious manner toward their own ship.

For example, in suspicious actions such as "Although the other vessel should be avoiding us, they are continuing to sail in the same course," "Although they can continue on and pass ahead of us, they are deliberately decelerating, turning the rudder, and coming close," and "Although we have agreed on a manner of passing each other through VHF radio, they are taking completely different actions," various reasons can be given. These include dozing off, engaging in other work and not noticing the other ship, and believing that the other ship would avoid their own ship.

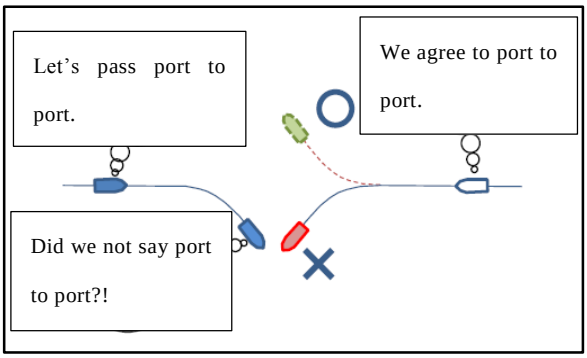
When investigating the causes of accidents, investigators conducting accident investigations reconstruct the steps leading up to the accident based on statements given by persons involved and objective data such as VDR. However, there are many times when it is impossible to understand the reasons behind why crew members undertook suspicious actions.

While there are cases where it is impossible to uncover these reasons, the reasons for being regarded as a "suspicious ship" can be summarized in the following examples: "The other ship is not aware of our presence," "The other ship is not keeping watch on our actions," "The other ship does not understand our intentions," or "Our ship is unable to move freely due to malfunction or breakdown." Specifically, these are situations where crew members had dozed off, were not keeping a lookout, failed to capture the other ship on the radar, or unable to communicate the intentions through VHF radio.

To avoid acting suspiciously, it is important to first keep proper lookout, sight the other ship, and monitor it. Next, it is important to make the other ship realize the presence of one's own ship, and act early and clearly to avoid the other ship in a way that is easy for the other ship to understand. It is also important to communicate the ship maneuvering intentions to one another. While these may seem to be obvious, they had not been carried out in many of the cases that resulted in a collision accident.

Recently, collisions between ships of significantly different sizes, such as ocean-going cargo ships and small pleasure boats, have been on the rise. These collisions had been the result of actions that appeared suspicious to one another, as these ships had failed to recognize the blind spots and maneuvering characteristics of one another, and had no means of communicating with one another such as through radio.

There is a need to put in place measures, such as having small ships avoid approaching large ships as far as possible, and to avoid crossing the route of large ships while on passage. On the other hand, large ships should monitor the movements of small ships carefully, and issue warning signals at an early stage.



In order to prevent collisions, it is important to alert the other ship to the presence and maneuvering intentions of one's own ship before the other ship beings to act suspiciously, and to recognize suspicious actions at an early stage and take the appropriate action.

12 Summaries of major marine accident investigation reports (Case studies)

Movement of hatch cover placed over inner bottom plating of the cargo hold trapped worker, resulting in the death of the worker

Fatality of worker on cargo ship SCSC WEALTH

Summary: At about 14:20 on May 10, 2011, while the cargo ship SCSC WEALTH (the ship, gross tonnage: 6,550tons) was loading copper slag at the Public Wharf in Hibi Port, Tamano City, Okayama Prefecture, tween deck hatch covers that were placed on the inner bottom plating in No.2 cargo hold moved, leading to a stevedore being caught between the hatch covers and a forward bulkhead, resulting in his death.

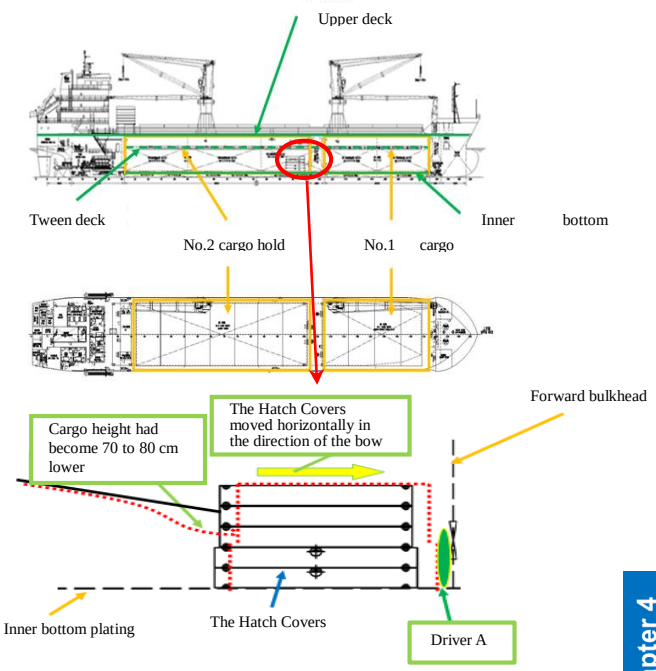
Events leading up to the accident

The ship was berthed alongside the Public Wharf in Hibi Port at about 07:45 on May 9, and commenced cargo loading work at about 10:40.
On the ship, the hatch covers were stacked up on the bow side of the inner bottom plating in No.2 cargo hold, and the safety bolts for the lowermost and the second lowermost hatch covers had not been inserted into the insertion holes in the inner hull plating.
(They were not secured as specified in the hatch cover operating manual.)

Cargo loading work was resumed at about 08:20 on May 10.
Using a bulldozer, Drivers A, B, and C were leveling the copper slag that had dropped into the cargo hold in shifts lasting about two hours.

At about 14:00, Driver C saw Driver A moving aft on the upper deck passageway on the port side of No. 1 cargo hold.
After that, Driver A used the forward companionway to No. 2 cargo hold to enter the cargo hold, and was passing between the hatch covers and the forward bulkhead.
(The work leader had instructed the workers to use the aft companionway, but the instructions were not followed.)

At about 14:20 on May 10, the hatch covers were pushed by cargo, and Driver A was caught between the hatch covers and the forward bulkhead.



Probable Causes: It is probable that this accident occurred for the following reasons: Five tween deck hatch covers were stacked up on the bow side of the inner bottom plating in No.2 cargo hold, during the loading of copper slag onto the ship at the Public Wharf in Hibi Port; however, the safety bolts for the lowermost and second lowermost hatch covers were not inserted into the insertion holes in the inner hull plating. Due to this fact, the situation was such that it was impossible to prevent horizontal movement of the hatch covers. Furthermore, a driver entered No.2 cargo hold through a forward companionway to the inner bottom plating of No.2 cargo hold; and when the driver was passing through the space between the hatch covers and the forward bulkhead, the hatch covers moved in the direction of the bow after being pushed by the cargo, resulting in the driver being caught between the hatch covers and the forward bulkhead.
It is probable that the reason why it was impossible to prevent horizontal movement of the hatch covers is that when the hatch covers were stacked up on the bow side of the inner bottom plating in No.2 cargo hold on the sihp, they were not secured as specified in the hatch cover operating manual.
It is probable that the reason why the driver entered No.2 cargo hold through the forward companionway to the inner bottom plating of No.2 cargo hold is that the instructions to use the designated passage route were not heeded.

For details, please refer to the investigation report. (Published on April 25, 2014)
http://www.mlit.go.jp/jtsb/eng-mar_report/2014/2011tk0012e.pdf

Collision between cargo ships at the intersection of a dredged passage in the port

Collision between container ship KOTA DUTA and cargo ship TANYA KARPINSKAYA

Summary : Container ship KOTA DUTA (Ship A, gross tonnage: 6,245 tons) was leaving West Wharf No.3 Quay in Port of Niigata Higashi Ku, Niigata City, Niigata Prefecture with a master and 24 crew members onboard, while cargo ship TANYA KARPINSKAYA (Ship B, gross tonnage: 2,163 tons) was navigating toward the South Wharf within the same section after leaving the Central Wharf East Quay within the same section with a master and 16 crew members onboard , when Ship A's bow and Ship B's forward starboard side collided at approximately 16:22 on February 7, 2012, where the passages crossed.
Although Ship B foundered, all of the crew members were rescued. Ship A suffered damage to the bow, but there were no casualties.

Ship A had left the wharf and was proceeding northeast, when the master of Ship A recognized the radar image of another ship, and learned that it was Ship B at 16:18:37. (Speed at the time was 5.3 – 5.5kn).

At 16:18:51, the ship put the engine on slow ahead and put the rudder to midships. At 16:18:57, it was proceeding at a speed of 4.5kn heading 057°.

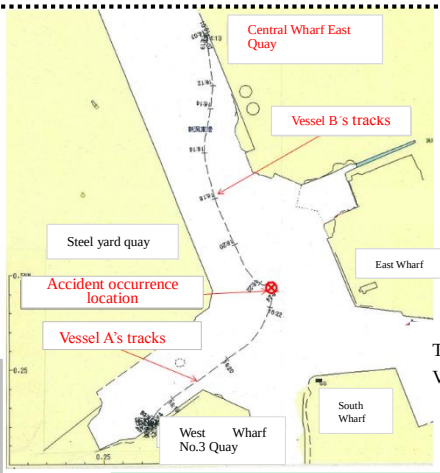
Based on an offer from Ship B and reports from the ex-master, the master of Ship A was convinced that ship B was going to pass on the starboard side, deciding not to pass on the port side.

At **16:19:58**, he communicated with Ship B via radio (VHF) to **agree** to the conduct of vessel to pass on the starboard side.
(Distance between the two ships was about 600m)

Put the rudder hard to port at 16:19:59.

It took about 20s to agree on the conduct of vessel.

The master of Ship A felt that there was a danger of colliding, and ordered to put the bow thruster full to port at 16:20:42, stop the engine at 16:20:45, and put the engine full astern at 16:21:07.



Tracks of Vessel A and Vessel B (AIS record)

Ship B had left the wharf and was proceeding south-south-east, when the master of Ship B sighted Ship A.

At **16:19:35**, the master of Ship B **offered** the conduct of vessel to pass on the starboard side via VHF to Ship A. (Speed at the time was 4kn)

The port side of Ship B was a large area of waters, and the master of Ship B was unable to anticipate where Ship A would turn to port. In order to avoid a collision, he believed that it would be safer if the two ships' courses did not cross.

After agreeing on the conduct of vessel with Ship A, he put the rudder 15° to port.

The master of Ship B believed that the heading of Ship A was not changing to port, and inquired with Ship A about the maneuvering situation using VHF at 16:20:28. He ordered to stop the engine and put the engine full astern

Collision (about 16:22)

Probable causes (excerpt): It is probable that this accident occurred because the vessels collided with each other due to the facts that Master A and Master B agreed to the conduct of vessel for both vessels to alter to port to pass on the starboard side via VHF, that the vessels continued to navigate after Master A put the helm hard to port and Master B put the helm to port at 15° in an attempt to execute the agreement, and that they kept approaching each other in the situation that was different from the agreed conduct of vessel without being able to recognize any change in the heading when the vessels approached each other in the situation in which their courses would cross where the Dredged Passages crossed while Ship A was proceeding northeast after leaving the West Wharf No.3 Quay and while Ship B was proceeding southsoutheast from the Central Wharf East Quay toward the South Wharf in Port of Niigata Higashi Ku.

For details, please refer to the investigation report. (Published on May 30, 2014)
http://www.mlit.go.jp/jtsb/eng-mar_report/2014/2012tk0003e.pdf

Spread of fire from bedding in the cabin, believed to be caused by smoking

Fire on cargo ship TAIGAN

Summary: While mooring at the west pier of Tenpoku No.2 Wharf in the port of Wakkanai, Wakkanai City, Hokkaido, the cargo ship TAIBAN (the ship, gross tonnage: 497 tons), with the master and 22 crew members on board, caught fire at around 01:30 to 01:40, May 16, 2013. The fire on the ship was extinguished at about 13:00 by a fire brigade, leaving six crew members dead and three people injured. Besides, the bridge deck, the poop deck, and the upper deck

Events leading up to the accident

The ship, with the master, refrigeration engineer (Ref/E), and chief radio officer, as well as 15 crew members on board, berthed at the pier at 08:35 on May 14, and carried out cargo discharge work (scheduled to depart on May 16).

At about 20:00 on May 15, five crew members who were scheduled to embark boarded the ship. Of these, four stayed in their cabins, and one returned to an accommodation facility in town. The master was not present on the ship.

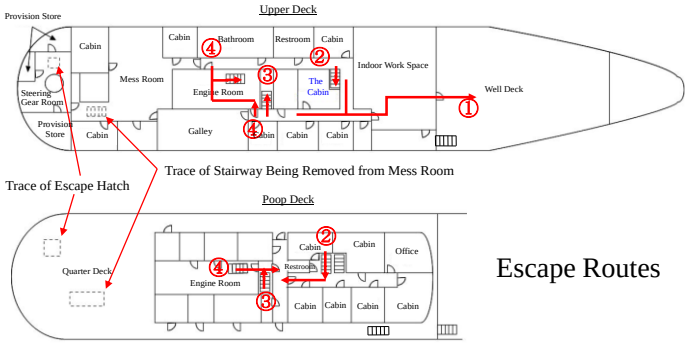
(Four out of the six crew members who died in this accident had just joined the ship, and they had not been provided with training and instruction on how to act in the event of fire, which included information about the escape routes and location of fire extinguishers.)

The chief radio officer, who was sleeping on the starboard side bed in the cabin, was awakened by the smell of smoke and breathing difficulties. He saw the Ref/E on the bed on the port side sitting up and attempting to put out the fire near his feet with both hands.

(With the exception of the indoor work space, smoking was prohibited on the ship.)

Ordinary Seaman A and some others heard the fire alarm go off past 01:30 on May 16, and Ordinary Seaman B notified the person-in-charge at the shipping agent of the fire via the shipper on mobile phone at about 01:40.

Some of the crew members took action to put out the fire, but it was not successful. The fire was eventually put out at about 13:00 on May 16 by firemen who had been activated after receiving a report from the shipping agent.



Escape Routes

Bed Location

Around Bed of Ref/E

Metal Ashtray

Ashtray Found under Stairway

When the ship was constructed in Japan in 1976, an escape hatch to the poop deck had been installed on the port side of the steering gear room. However, after the ship was sold overseas after that, the hatch became welded shut at some point, making it impossible to escape from the stern.

Full View of the Vessel

Welded Escape Hatch on Upper Deck Ceiling

Probable Causes: It is somewhat likely that while the ship moored at the Pier of Tenpoku No.2 Wharf in the port of Wakkanai at night, the Ref/E smoked on the bed in the Cabin, and then his bedclothes caught fire; hence, the fire spread to surrounding flammable materials.

For details, please refer to the investigation report. (Published on June 27, 2014)
http://www.mlit.go.jp/jtsb/eng-mar_report/2014/2013tk0014e.pdf

Collision through close-quarters approach as the other ship was not found on radar screen on a rainy night

Collision between bulk carrier NIKKEI TIGER and fishing vessel HORIEI-MARU

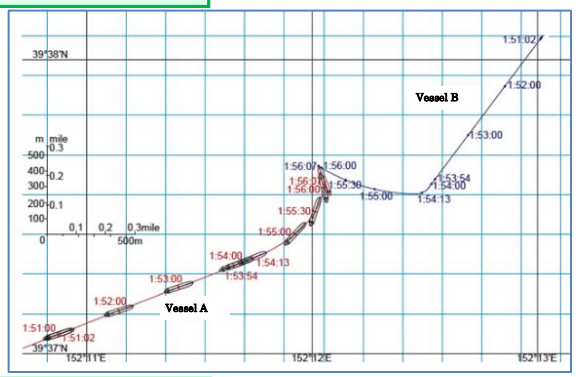
Summary: The bulk carrier NIKKEI TIGER (Ship A, gross tonnage: 25,074 tons), with a master and 20 crew members, departing Shibushi Port, Shibushi City, Kagoshima Prefecture, was proceeding northeast on the North Pacific toward Vancouver, Canada. The fishing vessel HORIEI-MARU (Ship B, gross tonnage: 119 tons), with a master and 21 crew members, was proceeding south-southwest, for the purpose of avoiding a low pressure system, on the North Pacific.
At around 01:56, September 24, 2012 (local time UTC+9), at around 930 km east of Kinkazan, Ishinomaki City, Miyagi Prefecture, Ship A's bow and Ship B's port side collided with each other.
Nine crew members onboard Ship B were rescued by Ship B's consort, but the others went missing, and the ship sank. Ship A had no casualties and received no significant damage to its hull.

Weather and sea conditions
Weather: Rain
Visibility: About 2M
Wind direction: East-south-east
Wind force: 7
Wave height: About 3m

Ship A had departed from Shibushi Port for Vancouver, Canada, heading northeast on the North Pacific.

Ship B was heading south-south-west to avoid the low pressure system.

Estimates of ship tracks



The helmsman sighted the mast lights of Ship B at 01:51:02 on the port bow, and reported to the officer.
The officer attempted to obtain information and images of Ship B on the radar and AIS (Automatic Identification System), but could not find it.

Contributing factors: no AIS installed on Ship B; rain, waves; and Ship B's size.

The officer sighted the green light of Ship B at 01:52:12, and recognized that Ship B was crossing Ship A's course at 01:53:44. At 01:53:54, he ordered to put the rudder 10° to port, and after that ordered to put the rudder 20° to port.

At 01:54:13, when Ship B was at 0.53M on Ship A's bow (0° to less than 5° on the starboard bow), it is somewhat likely that Ship B turned to starboard to avoid a collision. However, it was not possible to determine what the intention was.

The officer received a report from the helmsman at 01:54:13 and sighted the red light of Ship B. He ordered to put the rudder hard to port, and after that, continued to flash its daylight signal lights.

The chief fisherman felt the impact of a collision when communicating with the chief fisherman of the consort ship via radio.

Collision

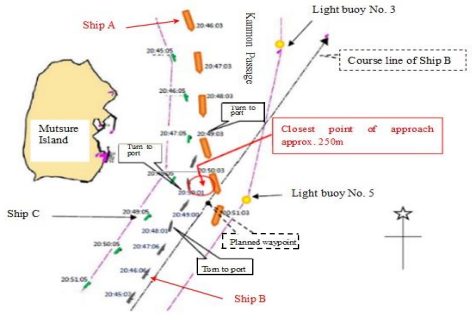
Probable causes: It is probable that the accident of collision between Ship A and Ship B occurred at night at around 930 km east of Kinkazan while Ship A was proceeding northeast and Ship B was proceeding south-southwest, because Ship A altered its course to port and Ship B altered its course to starboard in a situation where the vessels came close to each other sailing on intersecting courses.
It is probable that Ship A altered its course to port for the purpose of widening the passing distance to Ship B, which was crossing ahead of Ship A.

For details, please refer to the investigation report. (Published on June 27, 2014)
http://www.mlit.go.jp/jtsb/eng-mar_report/2014/2012tk0037e.pdf

While sailing on the left side of Kanmon Passage, came into close quarters of about 250m with a ship on a reciprocal course

Safety obstruction by car carrier AUTO BANNER and training ship SHIMAYUKI

Summary: Car carrier AUTO BANNER (Ship A, gross tonnage: 52,422 tons), with the master and 23 crew members on board, was being piloted and proceeding south along Kanmon Passage of Kanmon Port toward Sakaisenboku of Hanshin Port. Training ship SHIMAYUKI (Ship B, standard displacement of 3,050 tons), with the master and 153 crew members on board, was proceeding north-north-east along the same passage toward Sasebo Port in Nagasaki Prefecture. At about 20:48 on June 11, 2013, the two ships met on reciprocal courses in the Kanmon Passage off the east coast of Mutsure Island in Shimonoseki City, Yamaguchi Prefecture. Ship B was sailing the left side of the passage by turning to port, navigating in a way that went against the provisions of the Act on Port Regulations by entering into the path of Ship A. It continued to approach Ship A. Ship A, sensing the risk of a collision, turned to port to sail on the left side of the passage. At about 20:50, the two ships came within close quarters of one another at a distance of about 250m, passing by starboard side to starboard side, thereby obstructing safety.



About 20:40

While Ship A was navigating off the northern coast of Mutsure Island, the pilot checked the situation of Ship B on a reciprocal course based on information obtained through the radar and AIS (Automatic Identification System).

Ship B was navigating along the Kanmon Passage when its crew spotted the presence of Ship A through information obtained from the AIS and radar. This was reported to the master and the chief navigator.

About 20:43 – 20:44

The pilot recognized that Ship B was sailing close to the center of the Kanmon Passage.

Although it was sailing close to the center of Kanmon Passage, the chief navigator was not aware of that, and gained the approval of the master to change course at the next waypoint. Hence, it continued to sail maintaining the same course.

About 20:47 – 20:48

Ship A continued to turn to starboard, heading toward No. 6 light buoy in the Kanmon Passage. However, it appeared to the pilot that Ship B was turning to port through the perspective of Ship B's side lights, and became doubtful.

The chief navigator, upon receiving report on changing course from the crew, ordered to put the rudder 10° to port. However, the master assessed that it was too early to turn to port, and ordered the chief navigator to put the rudder 10° to starboard.
The course alteration was carried out about 500m before the planned waypoint.

About 20:48 – 20:49

The pilot sighted the two side lights of Ship B, and put the rudder hard to port, while sounding two short blasts on the whistle. He ordered the master to activate the emergency engine stop, and put the rudder back a little from hard to port.

The master heard the two short whistle blasts from Ship A, and believed that Ship A was attempting to pass by starboard to starboard. Hence, he ordered the chief navigator to put the rudder 30° to port and sound two short blasts.

At about 20:50, the two ships came within close quarters at about 250m starboard side to starboard side.

Probable causes (abstract): It is probable that this incident occurred as follows: Ship A was proceeding south toward Sakaisenboku of Hanshin Port, along the Kanmon Passage off the eastern coast of Mutsure Island of Kanmon Port at night; Ship B was proceeding north-north-east toward Sasebo Port in the same passage; When the two ships met on reciprocal courses, Ship A turned to starboard to follow the passage route on the right, while Ship B on the starboard bow of Ship A was sailing close to the center of the passage; Furthermore, as it turned to port before the planned waypoint in an attempt to head toward the next course, it ended up sailing on the left side of the passage; At the same time, upon showing its two side lights to Ship A, it navigated in a way that went against the provisions stipulated under the Act on Port Regulations by entering the path of Ship A; It continued to approach Ship A; in order to avoid a collision with Ship B, Ship A then navigated on the left side of the passage; The two ships came within close quarters starboard side to starboard side.

For details, please refer to the incident investigation report. (Published in Japanese on October 30, 2014)
http://www.mlit.go.jp/jtsb/ship/rep-inci/2014/MI2014-10-1_2013tk0016.pdf

Chapter 5: Efforts toward accident prevention

1 Publications

The JTSB prepares and issues various publications, as well as 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 our monthly JTSB E-Mail Magazine service (only available in Japanese).

Our e-mail magazine service is widely used by people in the aviation, railway, and shipping industries, as well as administrative agencies and educational/research organizations.

2 Issuance of the JTSB Digest

With the aim of fostering awareness of safety, and preventing similar accidents from occurring, we issue “JTSB Digests.” This publication introduces you to statistics-based analyses and must-know cases of accidents.

We also issue the English version of “JTSB Digests” as part of our efforts to disseminate information overseas.

In 2014, we released four issues of "JTSB Digests" (February, April, June and August: Issues No. 12-15) as well as two issues of "JTSB Digests" (English version, April and November).

The contents of each issue are as follows.

① JTSB Digests Issue No. 12 [Analyses of Railway and Marine Accidents] "Toward the prevention of accidents involving heavy rains, snow, or winds" (Issued on February 26, 2014)

- Circumstances of each accident
- Case study of an accident investigation (railway): "Slope collapsed due to heavy rains, causing a train to run into and derail on soil and sand built up on the tracks."
- Case study of an accident investigation (railway): "The train was impacted by spindrift due to strong winds, and the insulation resistance of the pantograph declined, resulting in a fire from the heat of the arc discharge."
- Case study of an accident investigation (marine): "A cargo ship was hit by a windswell due to a typhoon, and was pushed into a contact with a seawall."
- Case study of an accident investigation (marine): "The anchoring cable of a diving ship was cut off by sudden winds, and was pushed by the wind to become grounded on reefs."

② JTSB Digests Issue No. 13 [Analyses of Marine Accidents] "Toward the prevention of collision accidents caused by limited visibility on the bow side" (Issued on April 23, 2014)

- Circumstances of each accident
- Case study of an accident investigation: "Collision while on passage due to a blind spot of about 90° due to the lifting of the bow side"
- Case study of an accident investigation: "Mistaken perception of fishing boat that entered the blind spot on the bow side while turning to starboard, and of another fishing boat that had emerged from the blind spot, therefore sailing forward and resulting in collision."
- Case study of an accident investigation: "Motorboat that had entered the blind spot of the bow was lost in the ship's heading marker on the radar, so the ship did not notice it, resulting in a collision."
- Case study of an accident investigation: "While the bow had been lifted, the crew believed that there were no other ships on the bow and continued to sail without turning the bow of the ship, resulting in a collision."

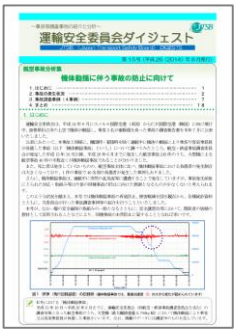
③ JTSB Digests Issue No. 14 [Analyses of Marine Accidents] "Toward preventing collision accidents in congested waters" (Issued on June 25, 2014)

- Circumstances of each accident
- Case study of an accident investigation: "Lookout was carried out only visually under hazy conditions, resulting in a collision due to the belief that there were no other ships in the vicinity"
- Case study of an accident investigation: "Navigation was carried out without keeping a proper lookout, resulting in a collision due to the belief that it was

possible to cross ahead of the other ship”

- Case study of an accident investigation: “After collision between Ships A and B, which had not been keeping a lookout, Ship A collided with Ship C while turning to starboard due to inertia.”
- Case study of an accident investigation: “Collision under conditions of intersections between the routes of ships entering and exiting the west exit of the Kurushima Strait route during the south flow”

④ JTSB Digests Issue No. 15 [Analyses of Aviation Accidents] “Toward the prevention of accidents resulting from aircraft turbulence” (Issued on August 27, 2014)



- Circumstances of each accident
- Case study of an accident investigation: “While descending in a convection cloud region, the aircraft encountered atmospheric disturbances, causing aircraft turbulence that resulted in injury among passengers and crew.”
- Case study of an accident investigation: “Aircraft turbulence caused by clear-air turbulence occurring in local areas resulted in serious injuries for one cabin crew and minor injuries for four others.”
- Case study of an accident investigation: “Aircraft that entered a cumulonimbus cloud that had developed rapidly encountered turbulence, resulting in injuries to the cabin crew.”
- Case study of an accident investigation: “Aircraft encountered violent disturbances in the atmosphere, causing major turbulence for the aircraft and resulting in minor to serious injuries for passengers.”

⑤ For Prevention of Helicopter Accidents (Issued on April 23, 2014)

⑥ For prevention of “Collision Accidents in Congested Areas” (Issued on November 25, 2014)

Chapter 5

3 Issuance of the Analysis Digest Local Office Edition

The JTSB has issued the analysis digest local office edition (only available in Japanese). It has issued this publication in order to provide various kinds of information to help prevent marine accidents. The information is based on the analyses made by our regional offices and relates to specific accidents that occurred in their respective jurisdictions. This information focuses on cases with characteristic features such as the sea area, the type of vessel, and the type of accident.

(Analysis Digest Local Office Edition in 2014)

Hakodate	Status of marine accidents as viewed from the J-MARISIS
Sendai	Marine accidents in Lake Inawashiro
Kobe	Unexpected mini boat accidents that you would wish to prevent on your own efforts
Nagasaki	Beware of the breakwater at Tabira Port for ships proceeding north in Hiradoseto at night!

Naha	Situation of grounding accidents for fishing vessels in coral reef waters

As you read these local office digests, you can not only find out the circumstances of local accidents, but can also gain some tips for accident prevention.

The local offices will make further efforts to regularly issue the analysis digest local office editions. By doing so, they will ensure that you will be provided with more satisfactory content.

4 Issuance of the JTSB Annual Report

In June 2014, we issued the JTSB Annual Report 2014. We did so in order to share the lessons learned from accidents and incidents with interested parties, by introducing our general activities in 2013.

As part of our efforts to provide information overseas, we issued the "Japan Transport Safety Board Annual Report 2014" on October 2014. We did so to let people overseas know about the topics in this Annual Report.

Column Occurrence of mini boat accidents/incidents

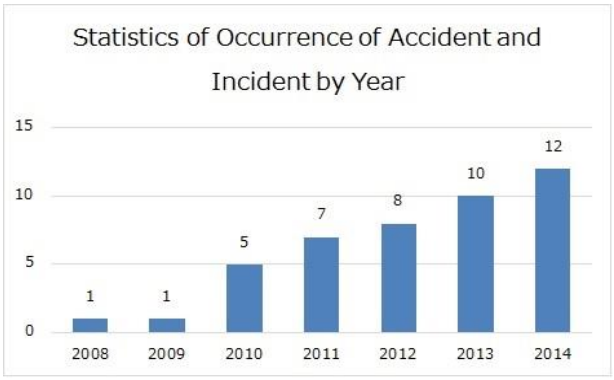
Director for Analysis, Recommendation and Opinion

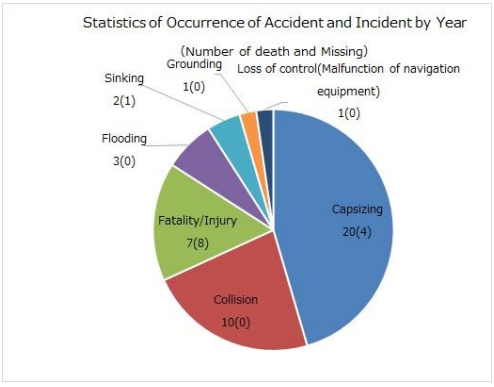
In recent years, in tandem with the growing interest in marine leisure activities, there has been rapid growth in the popularization of mini boats (small ships of length below 3m and engine output below 1.5kW) that people can take out for leisure activities easily without the need for ship inspections or a license for operating small ships. On the other hand, there has also been an increase in the number of mini boat accidents.

The Japan Transport Safety Board made the following findings about the occurrence of mini boat accidents during the target study period between October 2008 and December 2014.

1 Occurrence of mini boat accidents by year/accident type

With regard to the 44 cases that served as the study target during the aforementioned period, there is an increasing trend for the occurrence of mini boat accidents by year, as shown in the figure below. Furthermore, with regard to the number of cases for each accident type, capsizing ranks first with the highest number, followed by collision with other ships, and fatality and injury (not arising as a result of other accidents such as capsizing or collision).

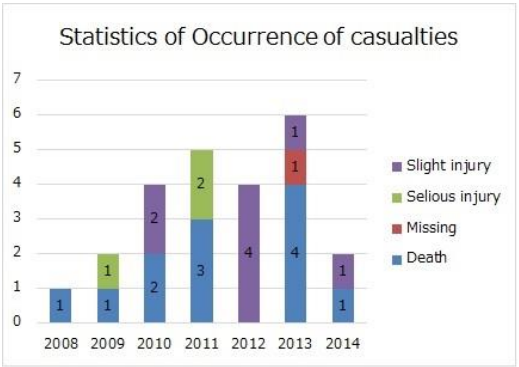


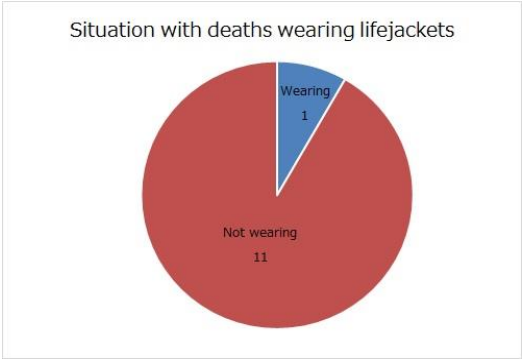


2 Fatality, missing persons, injury

As a result of these accidents, 12 people died, one went missing, and 11 sustained injuries.

With regard to the 12 fatalities, about 90% (11 people) were not wearing life jackets at the time of the accident.





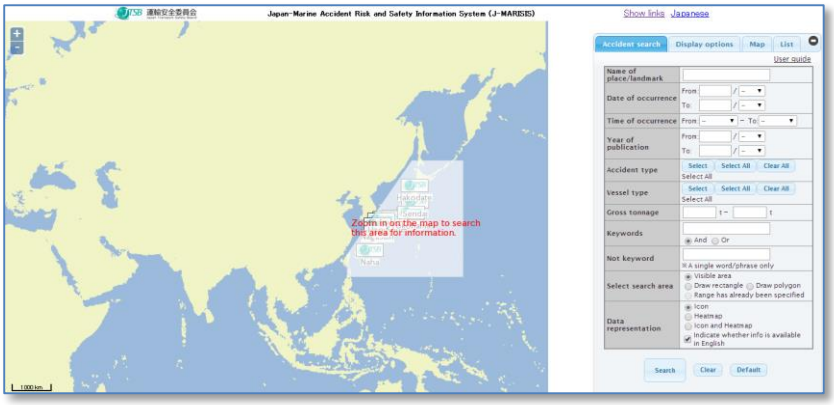
Mini boats flood and capsize easily when they are hit by waves due to their small size and light weight. Hence, please ensure that you are constantly wearing a life jacket when boarding mini boats.

5 Global version of the J-MARISIS – Sharing accident information globally

The Japan Transport Safety Board began offering the Japan-Marine Accident Risk and Safety Information System (J-MARISIS) as an online service from the end of May 2013. This service allows users to search for reports through a map, and aims to facilitate effective use of published reports on marine accidents and other topics.

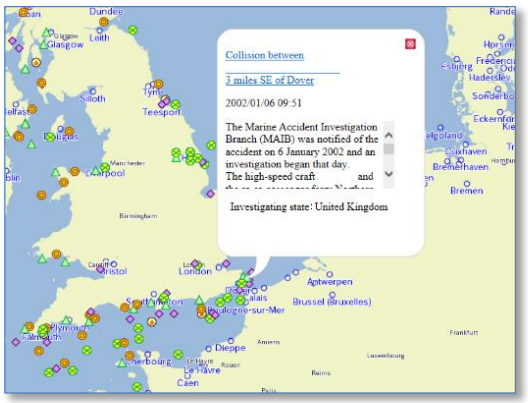
Operation of the English version commenced in September the same year. In response to requests from users for information on marine accidents that have occurred in their planned navigational waters when sailing not only in Japan, but also overseas, the global version of J-MARISIS, which enables users to search for published investigation reports from overseas marine accident investigation agencies, was launched in April 2014.

With regard to marine accident information for various countries, J-MARISIS has been introduced at various international conferences held to date, and 11 countries (United Kingdom, Canada, Australia, United States, France, New Zealand, Netherlands, Germany, Indonesia, Bahamas, and Norway) have given their consent to provide the required data. It is currently possible to search for about 600 investigation reports that have been published by the accident investigation agencies of the respective countries.

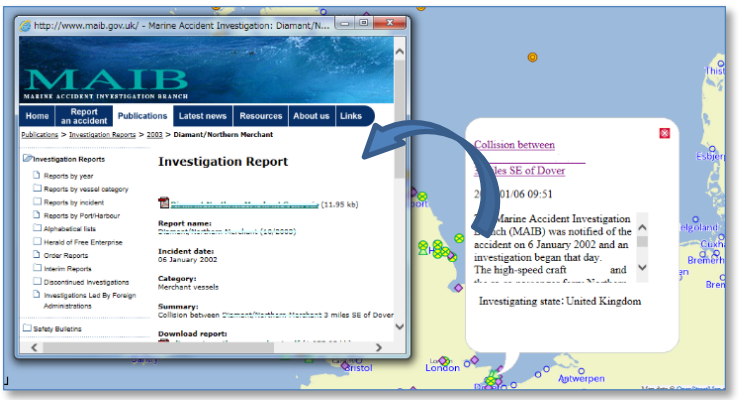


Landing page for the global version

In the J-MARISIS system, searches can be conducted based on the date of occurrence of the accident, type of accident, type of ship, gross tonnage, and keywords, among other search criteria. By clicking on the marks of accidents displayed on the screen, they are then able to view information pertaining to the accident headline, date of occurrence, summary of the accident, and investigating country. Furthermore, by clicking on the accident headline, they are then able to access the links to view the reports published by the accident investigation agency of the respective countries.



Example of a display of accident information summary



Example of the website display for an accident investigation report from the United Kingdom

Column

Launch of the mobile version of the J-MARISIS

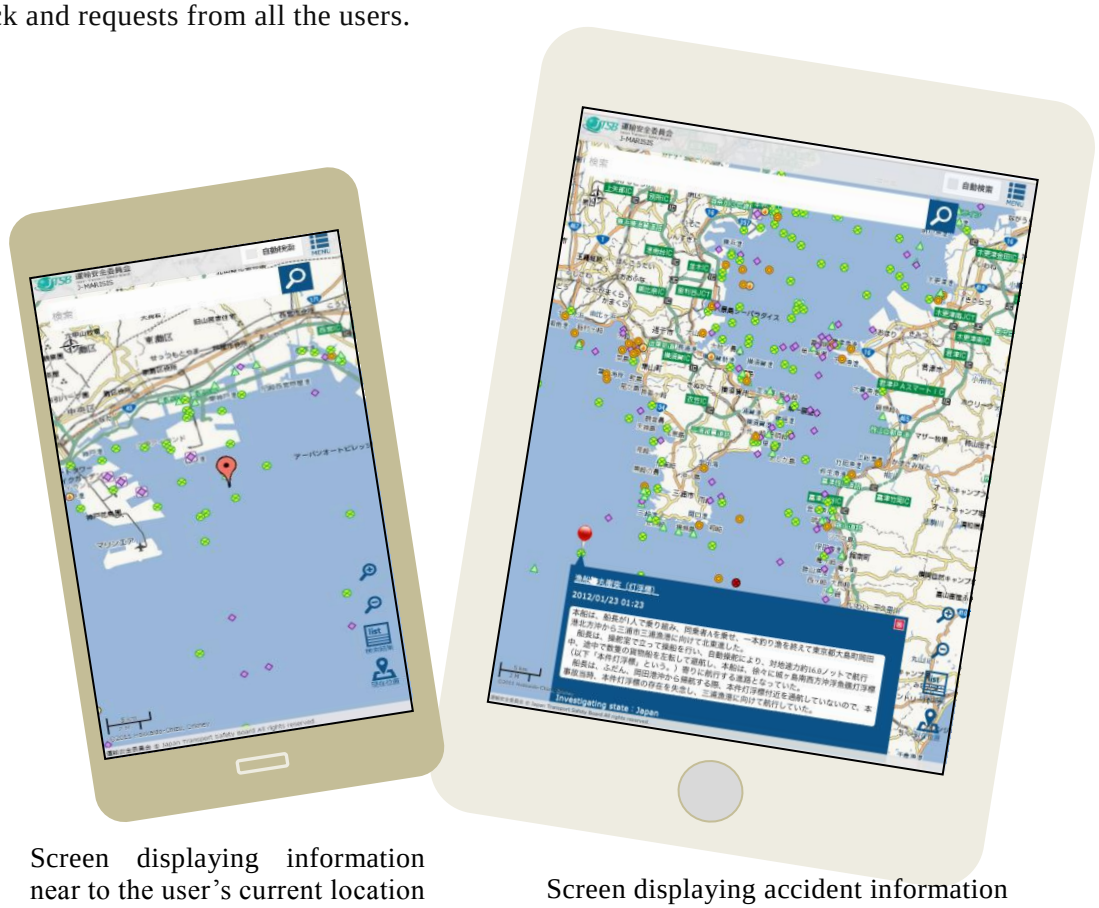
Director for Analysis, Recommendation and Opinion

Although the Japan Transport Safety Board launched the J-MARISIS in May 2013, at recent usage of the Internet site showed an increase in usage through smartphones and tablets. Hence, in response to users' demand for a website that can be viewed easily on smartphone devices, the mobile version was launched at the end of June 2015.

This was created through the development of a browser-based version for smartphones as a web application, thereby enabling users to view marine accident information that is largely similar to that on the computer version of the site.

It is also possible to make use of the GPS function on the mobile device to display information on the area near to the user's current location, thereby allowing users to check information about marine accidents, as well as information on weather and sea conditions, for the waters that they plan to navigate in before they set sail. The Japan Transport Safety Board hopes that the mobile version of the site can play a useful role in enhancing the safe navigation of ships.

Going forward, we aim to further improve on the contents of the mobile application, based on feedback and requests from all the users.



Screen displaying information near to the user's current location

Screen displaying accident information

URL: http://jtsb.mlit.go.jp/hazardmap/mobile/index.html

6 Outreach lectures (dispatch of lecturers to seminars, etc.)

The Japan Transport Safety Board launched a series of outreach lectures in April 2014, as part of its efforts to raise awareness on the work of the Board, and to create an opportunity for collecting the feedback and opinions of the general public.

Seminars that lecturers can be dispatched to cover topics that are useful in preventing or mitigating damage from aircraft, railway, and marine accidents. Members of the staff are dispatched as lecturers to various seminars and schools.

Scene of an outreach lecture

Please refer to the website of the Japan Transport Safety Board on application procedures.

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

List of outreach lectures

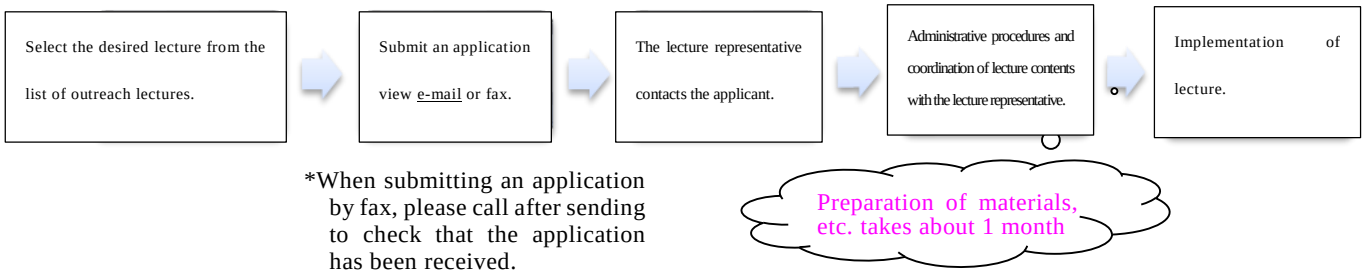
No.	Course	Main audience	Contents
1	About the Japan Transport Safety Board	General (High school students and older), transportation businesses, etc.	Easy-to-understand explanation about the organizational background, work, etc. of the Japan Transport Safety Board
2	What is accident investigation?	Elementary school students	Easy-to-understand explanation about accident investigation for elementary school students and older
3	About aircraft accident investigation	General (High school students and older), aviation businesses, etc.	Easy-to-understand explanation about aircraft accident investigations, including the background, concrete examples, etc.
4	About railway accident investigation	General (High school students and older), railway businesses, etc.	Easy-to-understand explanation about railway accident investigations, including the background, concrete examples, etc.
5	About marine accident investigation	General (High school students and older), maritime businesses, etc.	Easy-to-understand explanation about marine accident investigations, including the background, concrete examples, etc.
6	About the JTSB Digests	General (High school students and older), transportation businesses, etc.	Introduction to case studies of accidents and explanation of various statistical materials across various modes, based on the JTSB Digests that have been issued to date.
7	About the JTSB Digests (Analyses of Aircraft Accidents)	General (High school students and older), aviation businesses, etc.	Explanation about various themes taken up in the analyses of aircraft accidents in the JTSB Digests.
8	About the JTSB Digests (Analyses of Railway Accidents)	General (High school students and older), railway businesses, etc.	Explanation about various themes taken up in the analyses of railway accidents in the JTSB Digests.
9	About the JTSB Digests (Analyses of Marine Accidents)	General (High school students and older), maritime businesses, etc.	Explanation about various themes taken up in the analyses of marine accidents in the JTSB Digests.

10	Trends in the occurrence of marine accidents, and preventing recurrence	General (High school students and older), maritime businesses, etc.	Schematic explanations about risks and waters where marine accidents frequently occur using the J-MARISIS, and explanations about accident prevention methods.
11	Collision accidents between ships along the Hokkaido coastline [Hakodate Office]	General (High school students and older), maritime businesses, etc.	Easy-to-understand explanations about collision accidents between ships along the Hokkaido coastline, using the analysis digest local office edition.
12	Accidents involving fatalities of fishing vessel crew [Sendai Office]	General (High school students and older), maritime businesses, etc.	Easy-to-understand explanations about accidents involving fatalities of fishing vessel crew, using the analysis digest local office edition.
13	Pleasure boat accidents in Hamanako and Hamanako Imagireguchi [Yokohama Office]	General (High school students and older), maritime businesses, etc.	Easy-to-understand explanations about pleasure boat accidents in Hamanako and Hamanako Imagireguchi, using the analysis digest local office edition.
14	Before enjoying yourself on a personal water craft [Kobe Office]	General (High school students and older), maritime businesses, etc.	Easy-to-understand explanations for before enjoying yourself on a personal water craft, using the analysis digest local office edition.
15	Grounding accidents in the Seto Inland Sea [Hiroshima Office]	General (High school students and older), maritime businesses, etc.	Easy-to-understand explanations about grounding accidents in the Seto Inland Sea, using the analysis digest local office edition.
16	Grounding accidents in Kanmon Port [Kanmon Office]	General (High school students and older), maritime businesses, etc.	Easy-to-understand explanations about grounding accidents in Kanmon Port, using the analysis digest local office edition.
17	Grounding accidents in Hiradoseto [Nagasaki Office]	General (High school students and older), maritime businesses, etc.	Easy-to-understand explanations about grounding accidents in Hiradoseto, using the analysis digest local office edition.
18	Toward preventing the recurrence of leisure boat accidents [Naha Office]	General (High school students and older), maritime businesses, etc.	Easy-to-understand explanations toward preventing the recurrence of leisure boat accidents, using the analysis digest local office edition.

*Lectures can be delivered on other themes based on request. Please also refer to the JTSB Digests and pages on analysis digest local office edition.

*No. 11 – 18, in principle, are restricted to requests from the areas under the jurisdiction of the local office.

Flow chart from application to implementation of lecture



*When submitting an application by fax, please call after sending to check that the application has been received.

7 Activities of the Accident Victim Information Liaison Office

The Japan Transport Safety Board gives full consideration to the emotions of the victim and their families, as well as bereaved families. In addition to providing information on accident investigations in an appropriate manner at the appropriate time, a contact point for providing accident investigation information to victims, etc. was established in April 2011 with the aim of providing attentive response to opinions and feedback. Furthermore, in order to promote the provision of information, the Accident Victim Information Liaison Office was established under the directive of the organization in April 2012. Contact points for the provision of information were also set up in local offices to provide integral support alongside with Tokyo.

In 2014, information on accident investigation and other matters was provided to 55 persons, including the victims, of 24 cases of aircraft/railway/marine accidents.

The status for other activities is as follows.

○ Participation in "Memorial and Safety Meeting 2014" for the derailing accident on the JR Fukuchiyama Line

On April 25, 2014, which marks the 10th year of the derailing accident on the JR Fukuchiyama Line that occurred on April 25, 2005, the "Memorial and Safety Meeting 2014 – Summary and Achievements of the JR West Japan Safety Follow-Up Conference" was held.

Members of the bereaved families spoke about the conflict they faced in their two positions, as members of bereaved families and as members of the investigation team. In the investigation work for the accident, the bereaved families shared the common question of "Why did such an accident occur?" In response to talks about how the growing clarity of the overall picture has helped in the healing process, there was a reaffirmation on the importance of providing information in investigations, including the disclosure of accident investigation reports to the bereaved families.

○Climbing Mount Osutaka in memory of those lost

In order to raise the awareness among staff of the offices toward preventing recurrence of accidents, and to enhance understanding about the mission and work of the Japan Transport Safety Board, an activity involving the climbing of Mount Osutaka in Ueno Village, Tano District, Gunma Prefecture, which was the site of the crash of Japan Airlines flight 123, was carried out in July and September 2014 in memory of those lost in the crash.

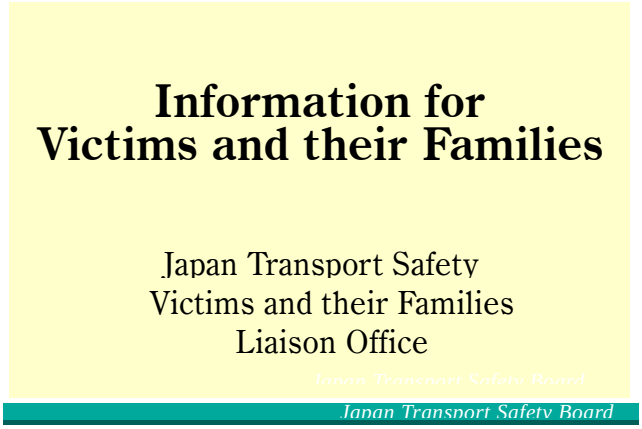
Climbing Mount Osutaka in memory of those lost

Mount Osutaka is the accident site for the most serious airplane crash that has taken place in Japan. By visiting the memorial monuments "Shokon no hi" and "Sugeno Sawa," staff empathized with the thoughts and feelings of the victims and bereaved families, who are still suffering even today, and reaffirmed the importance of standing in the position of the victims and empathizing with their feelings.

The Accident Victim Information Liaison Office hands out “Contact Information Cards” to victims of accidents.

The Office receives inquiries and consultation about the accident investigations from victims and families of accidents, as well as bereaved families. Please feel free to contact the following where necessary.

Contact Information Cards



(Front)

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Column

Disseminating information about safety
～Raising awareness among operators of small ships～

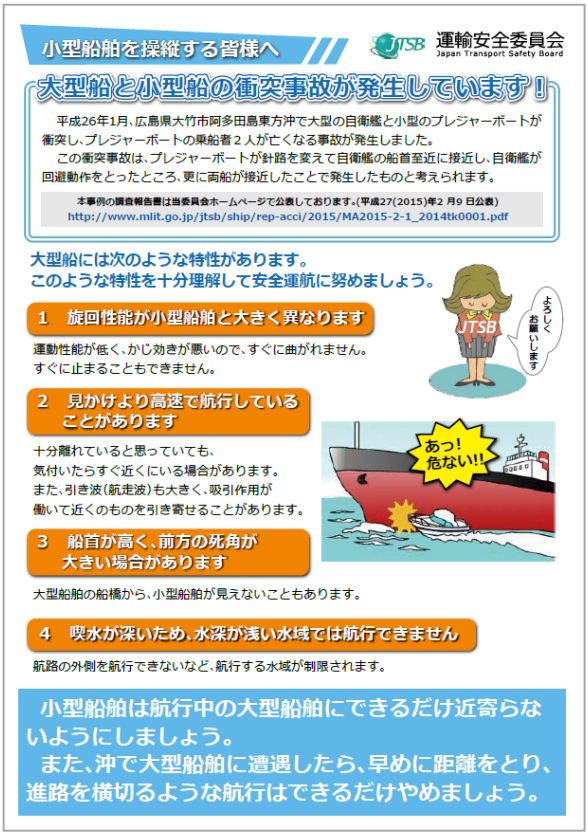
Director for Analysis, Recommendation and Opinion

The Japan Transport Safety Board undertakes various initiatives to disseminate information in order to contribute to safety.

As part of these initiatives, in light of the occurrence of collision accidents between large and small ships, it has produced a leaflet to raise awareness. Targeted at the operators of small ships, the contents summarize precautions to be taken when operating small ships, including the characteristics of large ships that small ship operators should take note of.

In order to distribute this leaflet to as many people as possible, the Japan Transport Safety Board called for the cooperation of related organizations and marinas across Japan to assist in the distribution of the leaflet, and actively raised awareness by distributing the leaflet at maritime events. This leaflet serves as a notice for those who receive it, and is anticipated to play a useful role in improving maritime safety.

Furthermore, activities to raise awareness at events also served as a valuable opportunity for observing the reactions of visitors and receiving their opinions.



Precautionary leaflet for small ships

Among those who received the leaflet, there were those who were enthusiastic in raising questions about how to obtain accident information, as well as those who provided their views on securing safety. There was a strong sense that people were not unconcerned about safety, and required information about safety. There is a need for the Japan Transport Safety Board to engage in two-way information dissemination through such opportunities, by interpreting needs based on the reactions and opinions provided by people, and by feeding that back as information.

Raising awareness at the JAPAN BOAT SHOW 2015 event

Chapter 6: International efforts for accident prevention

1 Objectives and significance of international cooperation

Aircraft and marine accidents, which are the part of Japan Transport Safety Board's investigation scope, are international in nature. Creating and operating systems for these kinds of investigations therefore involve international organizations. Also, it is necessary to cooperate and coordinate with the accident investigation authorities of the states involved during the investigation process.

In addition to the nation where the aircraft accident occurred, the aircraft accident also concerns the state of registry, the state of the operator, and the state where the aircraft was designed and/or manufactured. An annex in the Convention on International Civil Aviation (the Chicago Convention) states that the state of occurrence is responsible for starting and accomplishing an accident investigation, while the other states also have the right to appoint a representative to participate in the investigation. Proper cooperation with the accident investigation authorities of the concerned states is necessary for the accomplishment of an investigation.

Similarly, in marine accidents above a certain level, the International Convention for the Safety of Life at Sea (SOLAS) places the obligation of investigation on the flag state of the vessel. However, other concerned states, such as coastal states and the state(s) of victims are also entitled to investigate the accident. The convention defines the standard structure of marine accident investigations. The flag state and concerned states must cooperate with each other in multiple ways, such as through information sharing, when conducting accident investigations.

Based on this background, a variety of international meetings are held for each mode, which JTSB actively participates in. The meetings are for the purpose of facilitating collaboration in the case of accidents, sharing information on accidents and investigation methods on a regular basis, and achieving a high level of prevention for repeated accidents all over the world. Additionally, for the investigation of railway accidents, for which there is no international organization, various international seminars to exchange information on accident investigations are held in major countries. In regards to this, the fundamental investigation system of each state is generally standardized. Furthermore, some universities overseas have specialized training courses for accident investigations, to which JTSB is also actively dispatching investigators.

As shown above, JTSB aims to improve transport safety in Japan and all over the world. It hopes to do so through sharing of our findings worldwide, which have been acquired in individual accident investigations. Relating to this, the following sections introduce you to each of our international activities in 2014.

2 Efforts of international organization and JTSB's contributions

(1) Efforts of the International Civil Aviation Organization and JTSB's involvement

The International Civil Aviation Organization (ICAO, Headquarters: Montreal, Canada) was established as a specialized agency of the United Nations in 1947. Japan acceded to it in 1953. ICAO

is comprised of the Assembly, Council, Air Navigation Commission (a subordinate agency of the Council), Legal Committee, Air Transport Bureau, Technical Co-operation Bureau and Finance Committee, Secretariat, and Regional Offices (these and other committees are under the control of the Council), Secretariat, and regional offices. In addition, aviation meetings, regional aviation meetings, working groups, and specialist meetings, which are like panels, are called in for certain projects. As of October 2013, 191 states are members of ICAO.

The objective of ICAO is defined in Article 44 of the Convention on International Civil Aviation as being "to develop the principles and techniques of international air navigation and to foster the planning and development of international air transport." ICAO is engaging in a wide variety of activities, including the drafting of conventions regarding international air transport and aviation security such as countermeasures against hijacking. It also engages in audits of member states' security monitoring systems, and responses to environmental problems.

ICAO establishes the Annexes of the Convention on International Civil Aviation for items that must be covered by globally unified rules. The Annexes determines the rules for 19 fields, including personnel licensing, rules of the air, registration of aircraft, airworthiness, aeronautical telecommunications, search and rescue, security, and the safe transport of dangerous goods in air and safety management. Among them, Annex 13 defines the standards and recommendations for aircraft accident and incident investigations. In addition to this, the Act for the Establishment of the Japan Transport Safety Board states that: "The Board shall conduct investigations prescribed in items (i) to (ii) of Article 5 in conformity with the provisions of the Convention on International Civil Aviation and with the Standards, Practices and Procedures adopted as Annexes thereto." (Article 18).

Note that since November 2013, the 14th amendment of Annex 13, which added the definition of contributing factors, has been in effect along with Annex 19 (Safety Management), which is new.

In addition, ICAO established the Regional Aviation Safety Group, Asia and Pacific Regions, (RASG - APAC) in 2011. This group will operate as a new framework for safety in the Asia and Pacific area. Under this group, a subordinate group, the Asia Pacific Accident Investigation Group (APAC-AIG), discusses the building of a cooperative system for accident investigation in this region. JTSB dispatched an aircraft accident investigator to the meeting, which was held in May 2014 (Hong Kong).

APAC-AIG Meeting (Hong Kong)

(2) Efforts of the International Maritime Organization and JTSB's involvement

The International Maritime Organization (IMO, Headquarters: London, UK) was established in 1958 as a specialized agency of the United Nations. It was originally known as the Inter-Governmental Maritime Consultative Organization (IMCO). The IMO is comprised of the Assembly, the Council, and five committees. These are the Maritime Safety Committee (MSC), Legal Committee (LEG), Marine Environmental Protection Committee (MEPC), Technical Co-operation Committee (TC), and Facilitation Committee (FAL). In addition to this, there is a Secretariat, and the MSC and MEPC also have seven subcommittees. As of March 2012, IMO has 170 member states/regions and three associate

member regions.

IMO engages in various activities, such as the facilitation of intergovernmental cooperation and the drafting of effective safety measures and conventions that relate to technical and legal problems with maritime life safety and safe marine navigations. The Sub-Committee on Implementation of IMO Instruments (III) is a subordinate group of MSC and MEPC. It discusses how to ensure the responsibility of the flag state, including the investigation of marine accidents. III analyzes the accident investigation reports submitted from states. It does so based on SOLAS and the International Convention for the Prevention of Pollution from Ships (MARPOL) to draw lessons from, which III then makes public on the IMO website. By doing so, III promotes activities for the prevention of the repeated occurrence of marine accidents. The Correspondence Group (which implements analysis during periods outside of the session) and the Working Group (which verifies the analysis results during the session period) are comprised of volunteer investigators from the member states. They discuss these analysis tasks, which the III session then approves. Depending on the matter in question, if III determines that further discussion is required about a convention revision, it will submit recommendations or information to MSC, MEPC, and other IMO subcommittees. The III1 was held in July 2014. At this event, JTSB's marine accident investigators took part as a group member and analyzed accident investigation reports from various states. Tentative translations of these analysis results are published on JTSB website.

III1

(URL: http://www.mlit.go.jp/jtsb/casualty_analysis/casualty_analysis_top.html)

3 Cooperation and information exchange with foreign accident investigation authorities and investigators

(1) Participation in international meetings

① Chairman meeting of the International Transportation Safety Association

The International Transportation Safety Association (ITSA) was established by a group of accident investigation boards from the Netherlands, the United States, Canada, and Sweden in 1993. As of March 2015, the international organization has members from the transport accident investigation authorities of 16 states and regions. Organizations that are permitted to join must be permanent accident investigation bodies that are independent from any regulatory body.

Based on the idea that any findings from an accident investigation in one field can be used as a lesson for another field, ITSA holds annual chairman meetings where the participating accident investigation authorities present their experiences in accident investigation. These presentations are

for all the modes of aviation, railway, and marine. The parties learn about the causes of accidents and the methodologies of accident investigations, thus helping improve transport safety in general. As for Japan, the Aircraft and Railway Accidents Investigation Commission was approved for accession in June 2006. The board has participated in all the meetings held after 2007.

Participants in the ITSA chairman meeting (New Zealand)

Chairperson Goto from the Japan Transport Safety Board and another member participated in the conference held in Queenstown, New Zealand, in May 2014, and provided explanations about the current situation of accident investigations in Japan, the J-MARISIS developed by Japan, the activities that are being implemented to promote this system, and other matters.

② Board meetings of the International Society of Air Safety Investigators and the Asian Society of Air Safety Investigators

The International Society of Air Safety Investigators (ISASI) has been organized by national aircraft accident investigation authorities. The purpose of this society is to support accident investigations aimed at preventing the repeated occurrence of aircraft accidents. This aims is to be achieved by improving a cooperative system of investigation bodies, through the facilitation of communications between member states about their experience and knowledge, as well as information about the technical aspects of aircraft accident investigations.

ISASI holds annual seminars, and the Japan Aircraft Accident Investigation Commission has participated in each one of them since its establishment in 1974. In this seminar, a flight recorder workshop, an accident investigation training workshop, a cabin safety workshop, and a government investigators meeting are held in parallel with the general meeting. Japan also participates these workshops to contribute to technical improvements in these areas.

The annual seminar in 2014 was held in Adelaide, Australia, based on the theme “Accident Investigation and SMS (Safety Management Systems).” This was attended by an aircraft accident investigator and another member from the Japan Transport Safety Board. They delivered a presentation about the organizational factors in accident investigation, and participated in active exchange of opinions with accident investigation personnel from various countries.

ISASI has regional associations in Australia (ASASI), Canada (CSASI), Europe (ESASI), France (ESASI French), Latin America (LARSASI), New Zealand (NZSASI), Russia (RSASI), the United States (USSASI), and Asia (AsiaSASI). Each of these associations also holds their own seminars.

In AsiaSASI, the Hong Kong Civil Aviation Department currently serves as the Chairman, with JTSB as the Vice Chairman, and the Air Accident Investigation Bureau of Singapore as the Secretariat.

In May 2014, the AsiaSASI seminar was held in Hong Kong. An aircraft accident investigator

from the Japan Transport Safety Board participated in this seminar, and delivered a presentation about accident investigations on helicopters conducted in Japan.

③ The Accident Investigator Recorder (AIR) Meeting

The Accident Investigator Recorder (AIR) Meeting is an international conference for aircraft accident investigators who analyze digital flight data recorders (DFDR) and cockpit voice recorders (CVR). At this meeting, aircraft accident investigation analysts from all over the world share know-how by exchanging their experience, knowledge, information relating to the analysis of DFDR, and discuss the relevant technologies. Thus, the conference aims to further develop the technical capacity of accident investigation authorities around the world and to further improvement the cooperative system between them.

Established in 2004, the accident investigation bodies of each state hold a meeting every year. JTSB has participated in nearly all the conferences since 2006.

The 2014 conference was held in August in Singapore. JTSB dispatched aircraft accident investigators to acquire the latest information and know-how for the analysis of flight recorders. This was achieved through the exchange of information and ideas with foreign accident investigation analysts.

④ The Marine Accident Investigators' International Forum

The Marine Accident Investigators' International Forum (MAIIF) is an international conference held annually since 1992. It was originally based on a proposal from the Transportation Safety Board of Canada. Its purpose is to maintain and develop international cooperation among marine accident investigators and to foster and improve international cooperation for marine accident investigations. Its aim is to advance maritime safety and prevent marine pollution. In 2008, MAIIF was granted the status of an Inter-Governmental Organization (IGO) in IMO.

During this conference, marine accident investigators around the world improve their opportunities to exchange opinions and share information on marine accident investigations. Recently, there has been more demand to make use of the findings obtained from the investigations in the discussions in IMO. In 2009, MAIIF made a proposal based on the investigation results from the state investigation authorities to IMO for the first time. Japan has joined and actively contributed to it every year since the third conference and hosted the eighth conference in Tokyo in 1999.

Participants in MAIIF23 (Panama)

At the 23rd conference held in Panama City in Panama in October 2014, the director for international affairs from the Japan Transport Safety Board attended the conference and delivered a presentation on J-MARISIS and other topics.

⑤ The Marine Accident Investigators Forum in Asia

The Marine Accident Investigators Forum in Asia (MAIFA) was established by a proposal from Japan to build a mutual cooperation system for marine accident investigations in the Asia region and to assist developing countries enhance their investigation systems. From 1998 the meeting has been held annually, and Japan has played a leading role in this forum, including in the sponsorship of the 13th meeting in Tokyo in 2010. The network of investigators that has been established through the forum is now effective in its promotion of rapid and smooth international cooperation in accident investigations. Encouraged by the success of MAIFA, E-MAIIF was established in Europe in 2005. A-MAIF was then established in the Americas in 2009. These trends contribute more than ever in furthering the exchange and cooperation between marine accident investigators. In the Asia region, there are not only a lot of straits with sea traffic congestion, but also severe weather and hydrographic phenomena that often give rise to tragic marine accidents. Nonetheless, some countries have insufficient capacities or systems for accident investigations. This situation makes these regional meetings very important.

MAIFA17 (Thailand)

At the 17th conference held in Bangkok, Thailand, in June 2014, the director for international affairs and a marine accident investigator from the Japan Transport Safety Board attended the conference, and delivered a presentation about the current situation of accident investigations in Japan, as well as about the J-MARISIS.

(2) Examples of international cooperation among accident investigation agencies in individual cases

Based on the provisions in Annex 13 of ICAO, the state where an aircraft accident occurred must notify the state of registry, the state of design/manufacturing, and the state of operation. If necessary, these concerned states may appoint their own Accredited Representative (AR) to join the investigation.

With regard to the case of the batteries of the Boeing 787 aircraft, which occurred in Boston, United States, in January 2013, and a similar case that occurred in Japan immediately after that, an investigation was conducted jointly with the accident investigation agency of the United States. In addition, with regard to the case of three persons who had fallen to their deaths from a Japanese-made helicopter into the mountains in Taiwan in October 2013, an AR was appointed and assistance provided to the accident investigation agency in Taiwan. The final reports for both cases were summarized during 2014. As for the case of an injured crew member on a Japanese-registered aircraft that had been impacted by turbulence in Korea, which took place in September 2014, investigations were conducted by the Japan Transport Safety Board in response to a request from the accident investigation authority of Korea.

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) states that the concerned states, including the flag state of the ship and the coastal state of the accident, must cooperate in the marine accident investigation. Also in Japan, if a marine accident occurs that concerns more than one state, Japan's accident investigators are to collaborate with the accident investigation authorities of the other related states in order to obtain information about the accident.

Among the marine accidents that the Japan Transport Safety Board launched investigations on in 2014, with regard to the six serious accidents involving foreign ships, the accident investigation authorities of the countries that the ships were registered under were notified of the accidents. Of these, with regard to the collision between the Panamanian cargo ship BEAGLE III and the Korean container ship PEGASUS PRIME which took place on March 18, 2014, certification documents related to the PEGASUS PRIME were obtained via the accident investigation authority of Korea.

Among the marine accident investigation reports that we published in 2014, we sent 18 draft reports to the flag states upon request, in order to ask for their comments.

4 Participation in overseas training

JTSB is making efforts to advance the capacity of accident investigators through measures such as training and international information exchanges to investigate accidents properly. We also actively participate in overseas training for accident investigations.

From last year onwards, in 2014 we dispatched an aircraft accident investigator and a marine accident investigator to Cranfield University in the UK, which has a good track record in accident investigation training. They were dispatched with the aim of improving their accident investigation capabilities. The training at the university let the participants learn about a variety of topics, from the basics to expert information about accident investigations. After the training, the participating investigator made the other investigators of each mode aware of what was learned in the training, thereby helping to improve the capabilities of all of our investigators.

Column

Technical tours during business trips overseas

Director for International Affairs

Overseas business trips taken by the Japan Transport Safety Board can be broadly categorized into the following two categories: trips taken for the purpose of accident investigation, and trips taken for the purpose of collection and dissemination information at international conferences. Regardless of the type of business trip, effort is put into gaining an understanding of the situation in the country that is visited, such as traffic situation and movement while carrying investigation equipment. These efforts are made in order to contribute to the work of the Japan Transport Safety Board going forward.

Of these overseas business trips, there are cases where technical tours are conducted during the conference period for trips taken for the purpose of attending international conferences. The host countries of these conferences often organize tours for participants to facilities that are strongly related to the objective of the conference, many of which are useful for accident investigations and for gaining an understanding on the traffic situation of each country. As such, they provide invaluable opportunities for the participants.

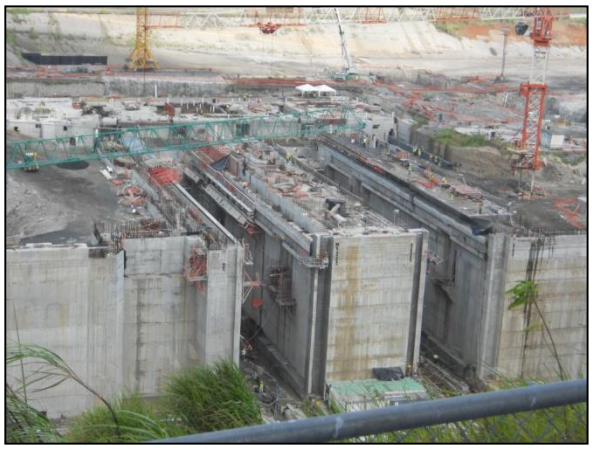
As an example, this section features a technical tour conducted as part of the 23rd Maritime Accident Investigators' International Forum (MAIIF23) held in Panama City, Panama, from July 28 to August 1, 2014.

The tour location was the world-renowned Panama Canal, which is a maritime and shipping hub. The canal was completed in 1914, and its shortest waterway width is about 36.6m, while its total length extends to about 80km. As a maritime and shipping hub that connects the Pacific and Atlantic Oceans, it has continued to play an important role from the time of its completion to the present day.

The canal, viewed in reality, was of a larger scale than imagined, and its dense structure was visible from all the different viewpoints. Described as the largest civil engineering construction project in human history, it honors the memory of the hard work put in by all the people who had been involved in the construction of the canal at the time.

Today, in light of the increasing size and speed of ships, the construction of new locks is currently underway with a target launch date in 2016.

【Locks currently in use】



【Locks under construction】

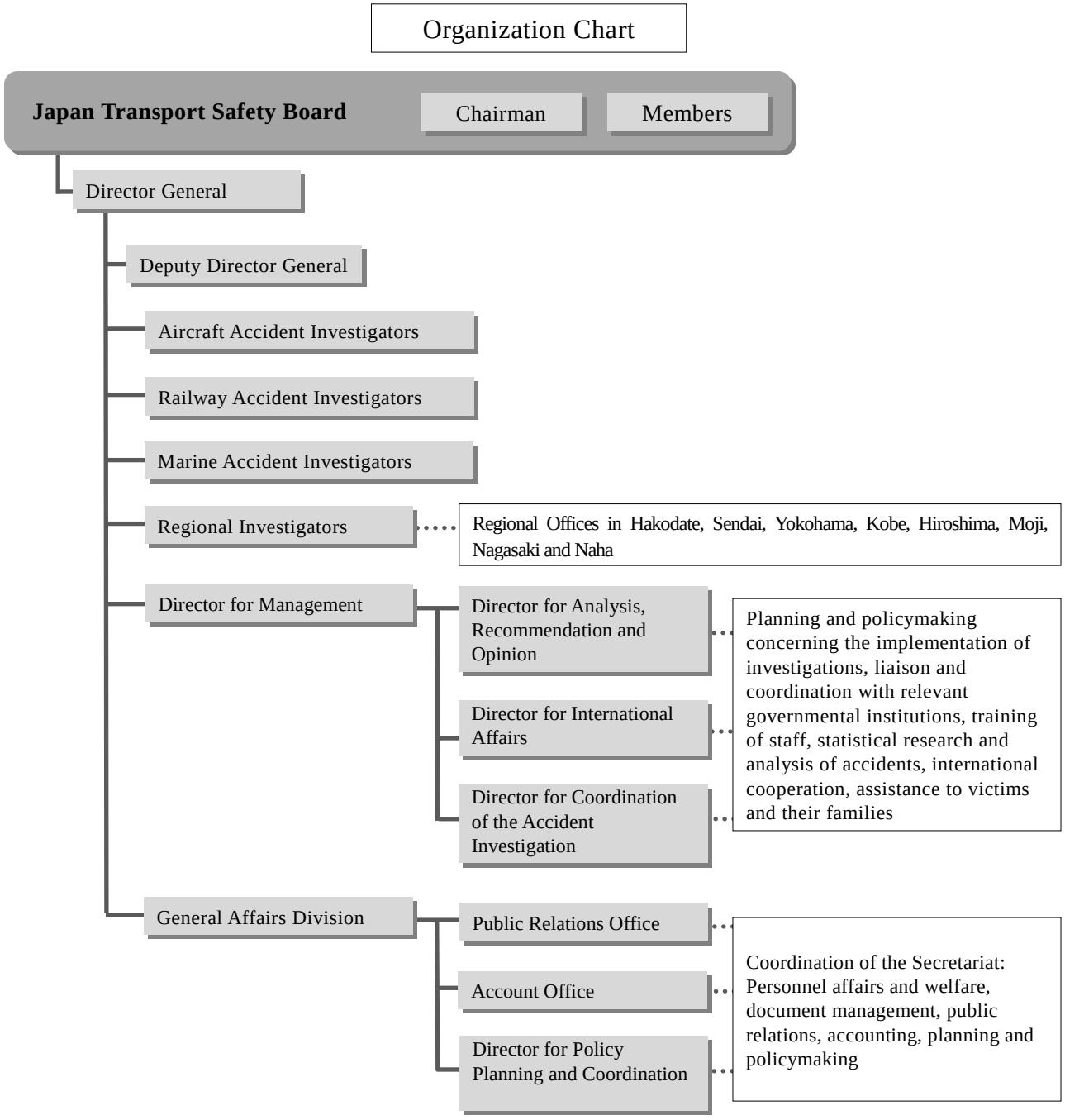
Appendixes

Japan Transport Safety Board
Annual Report 2015

Appendixes

1 Outline of the organization

The Japan Transport Safety Board consists of the Chairman, 12 members, and 178 secretariat staff (as of the end of March 2015). 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, 2015

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, JTSB has published many investigation reports concerning accidents and incidents, such as an accident in which a McDonnell Douglas MD-11F operated by Federal Express Corporation was destroyed by fire on landing at Narita International Airport, a train derailment and fire accident on the Sekisho Line of Hokkaido Railway Company, and an accident in which the cargo ship NIKKEI TIGER and the fishing vessel HORIEI MARU collided with each other.

He has also started holding a regular press conference every month from August in 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 a member 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), Vice Chairman, Deputy 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, currently in the second term of office; 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 third 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

Shigeru Yokoyama, Member (Full-time), Deputy Director of Railway Committee

Shigeru Yokoyama was appointed as member on December 6, 2013; specializes in electrical engineering and electronics; in charge of the Railway Committee

Career summary : Doctor of Engineering, Department of Electronics, Faculty of Engineering, The University of Tokyo

Former Professor for Department of Electrical and Electronic Engineering, Shizuoka University

Kuniaki Shoji, Member (Full-time), Director of Marine Committee

Kuniaki Shoji was appointed as member on October 1, 2011, currently in the second term of office; 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

Satoshi Kosuda, Member (Full-time), Deputy Director of Marine Committee

Satoshi Kosuda was appointed as member on October 1, 2014; specializes in maneuvering of ship; in charge of the Marine Committee and the Marine Special Committee

Career summary : Graduated from the Department of Navigation at Kobe University of Mercantile Marine

Former Investigator-General for Marine Accident of Japan Transport Safety Board

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 third 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; currently in the second term of office 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 third 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

Senior Consultant, Marine Technical 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 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)

2 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 second revised in April 2014.)

3 Continuous duty improvement

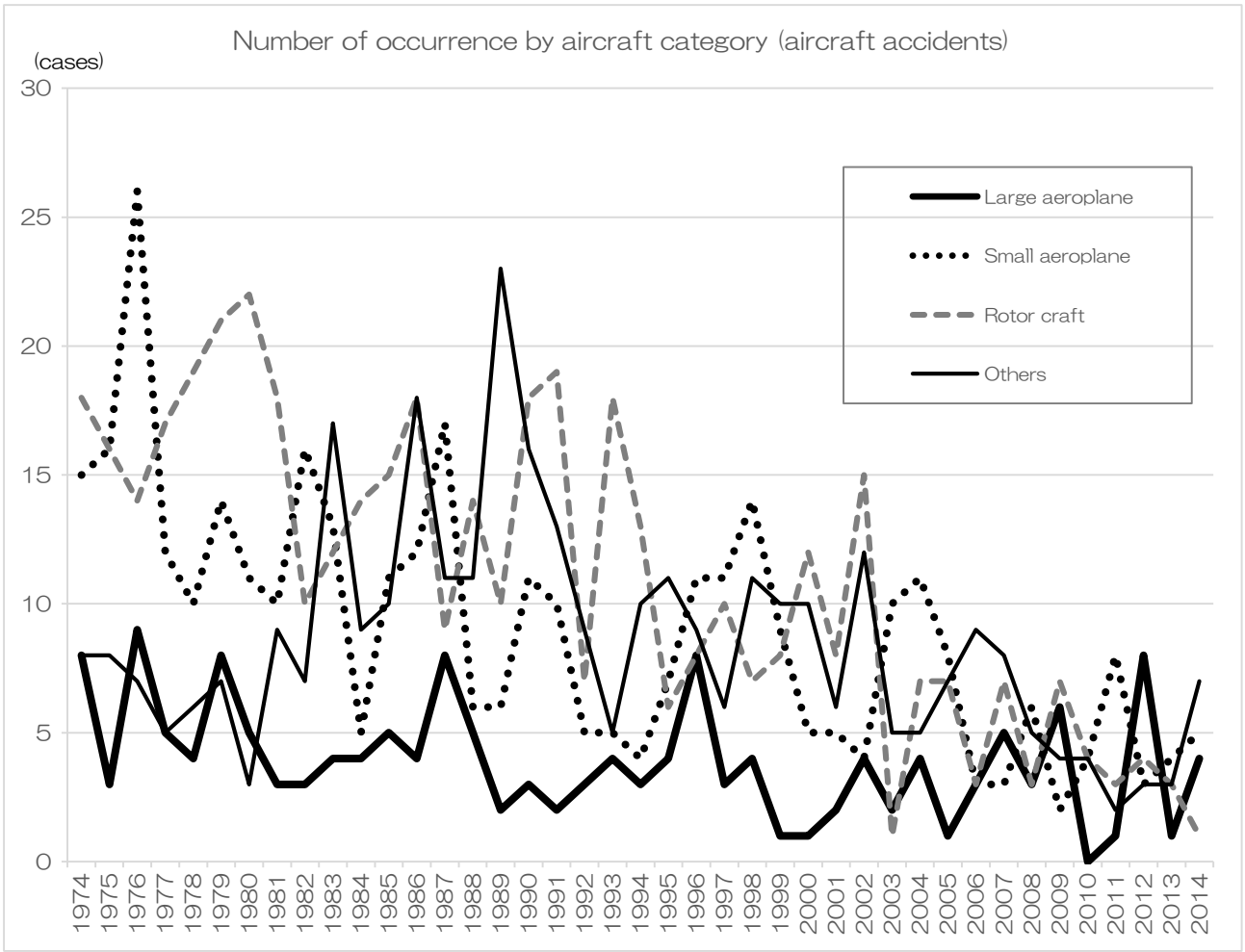
The JTSB will diligently implement the Duty Improvement Action Plan and review the plan on a timely and appropriate basis, while action items shall be followed-up during the Advisory Meeting.

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
2013	1	4	1	3	0	2	0	11
2014	4	5	2	1	0	5	0	17
Total	160	368	158	423	23	189	2	1,323

(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.

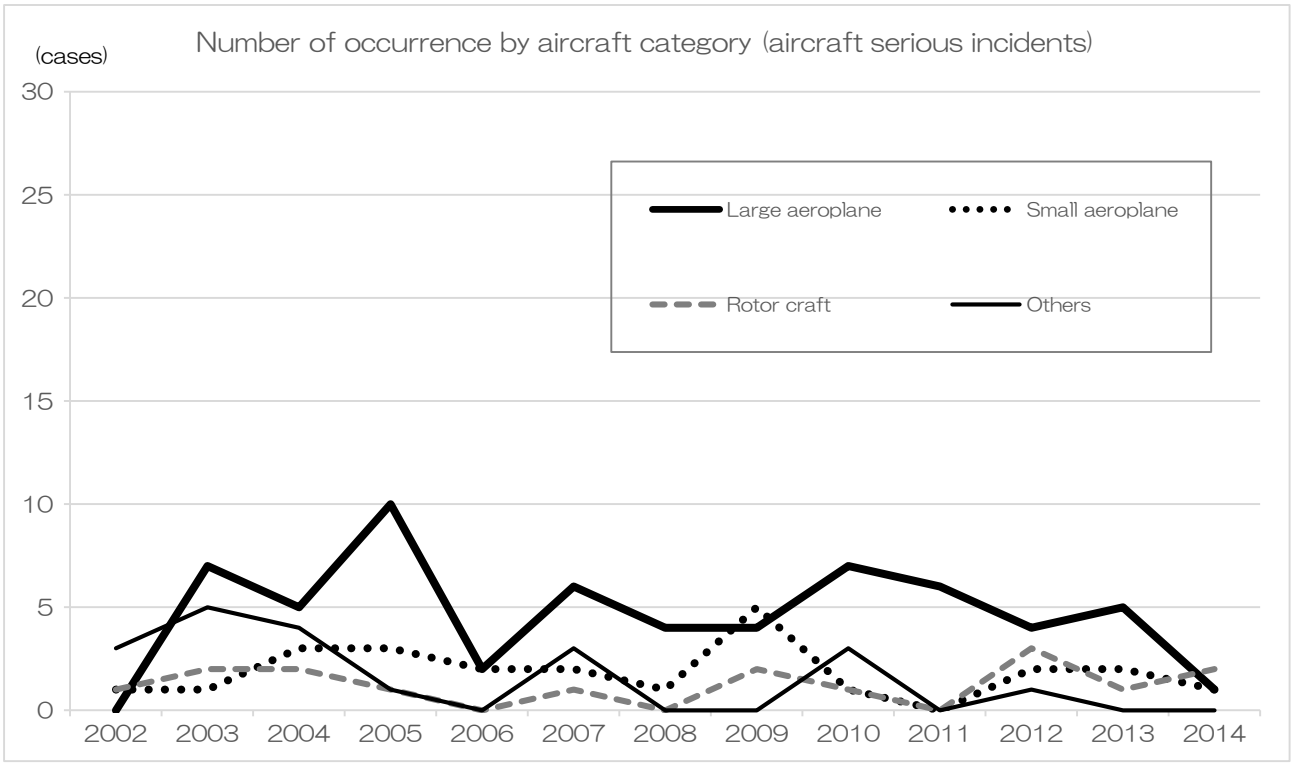


6 Number of occurrence by aircraft category (aircraft serious incidents)

(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
2013	5	2	0	1	0	0	0	8
2014	1	1	0	2	0	0	0	4
Total	64	24	16	16	0	4	0	124

(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)

Type / Year of occurrence	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
2013	0	11	1	1	0	1	0	0	1	0	0	0	0	0	15
2014	1	9	0	4	0	0	0	0	0	0	0	0	0	0	14
Total	6	164	12	17	0	11	2	1	7	0	0	3	0	0	223

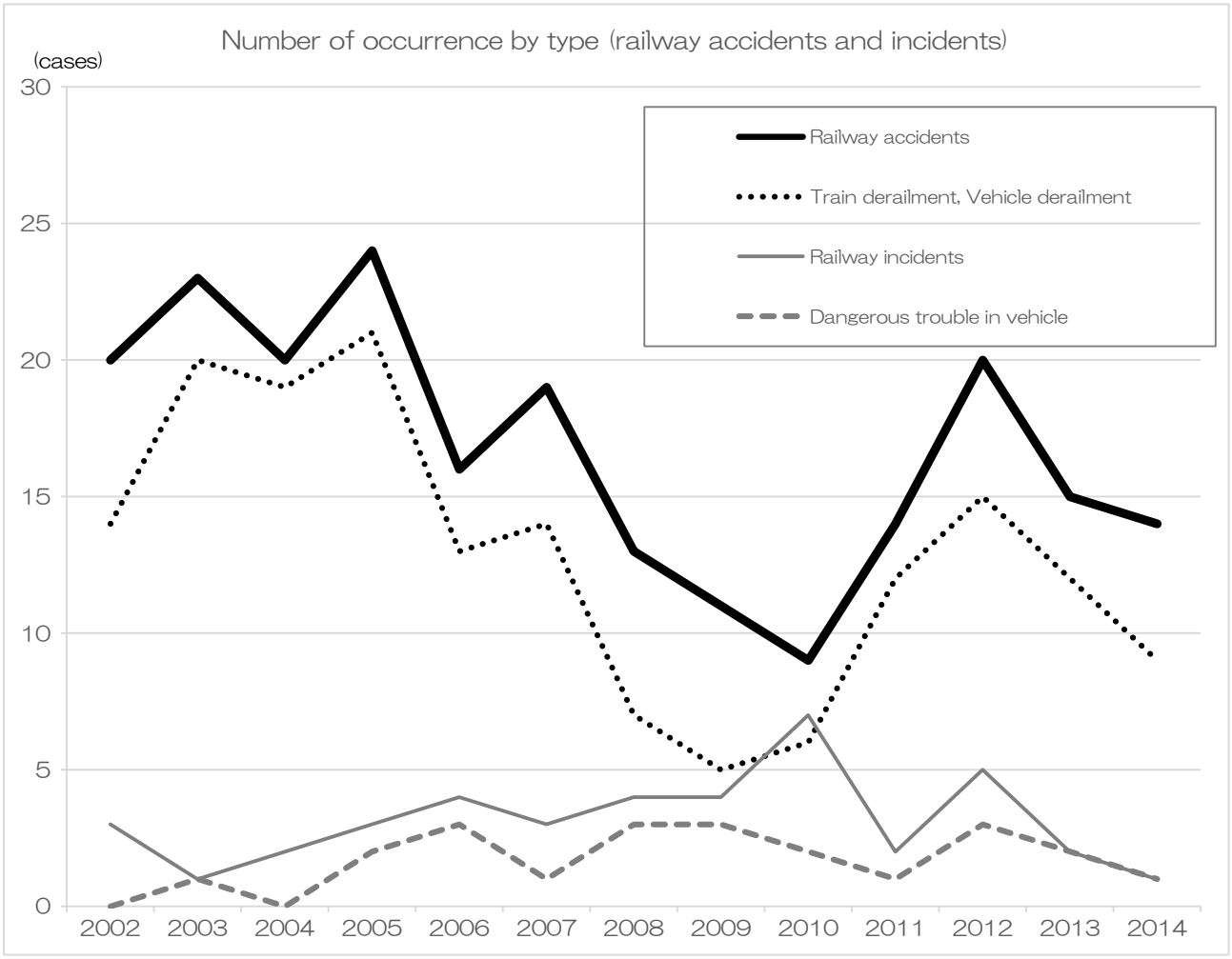
(Notes) 1. The figures include the cases handled by the Aircraft and Railway Accidents Investigation Commission.
2. The number of cases for 2001 represents those that occurred from October onward.

8 Number of occurrence by type (railway serious incidents)

(Cases)

Year of occurrence \ Type	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
2013	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
2014	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Total	1	7	0	0	6	2	1	22	0	1	1	1	0	0	0	0	0	42

(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.


Number of occurrence by type (railway accidents and incidents)
(cases)
30
25
20
15
10
5
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Railway accidents
Train derailment, Vehicle derailment
Railway incidents
Dangerous trouble in vehicle

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	0	3	0	0	3
2008	227	576	15	55	873
2009	341	1,065	34	82	1,522
2010	308	909	38	82	1,334
2011	238	781	28	79	1,126
2012	227	804	31	53	1,115
2013	220	761	35	68	1,084
2014	206	733	31	39	1,009
Total	1,767	5,629	212	458	8,066

Note: The above table shows the number of accidents and incidents into which the JTSB launched an investigation as of the end of February 2015 (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	Fatality/Infury	Others	Loss of control	Stranded	Safety obstruction	Navigation obstruction	
2007	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	3
2008	181	101	255	12	4	28	15	3	30	61	0	54	34	8	87	873
2009	325	174	431	16	19	58	42	3	38	217	2	105	33	0	59	1,522
2010	356	180	369	15	18	50	35	2	26	146	0	83	16	0	38	1,334
2011	282	145	264	12	18	57	32	1	23	142	1	103	10	1	35	1,126
2012	246	132	264	5	21	55	44	2	34	155	0	113	5	4	35	1,115
2013	265	144	211	10	25	48	33	2	38	164	2	107	7	3	25	1.084
2014	261	114	211	7	12	64	34	1	32	146	3	90	14	0	20	1,009
Total	1,916	991	2,007	77	117	360	235	14	221	1,031	8	655	119	16	299	8,066

Note 1: The above table shows the number of accidents and incidents into which the JTSB launched an investigation as of the end of February 2015 (including those carried over from the former Marine Accident Inquiry Agency).

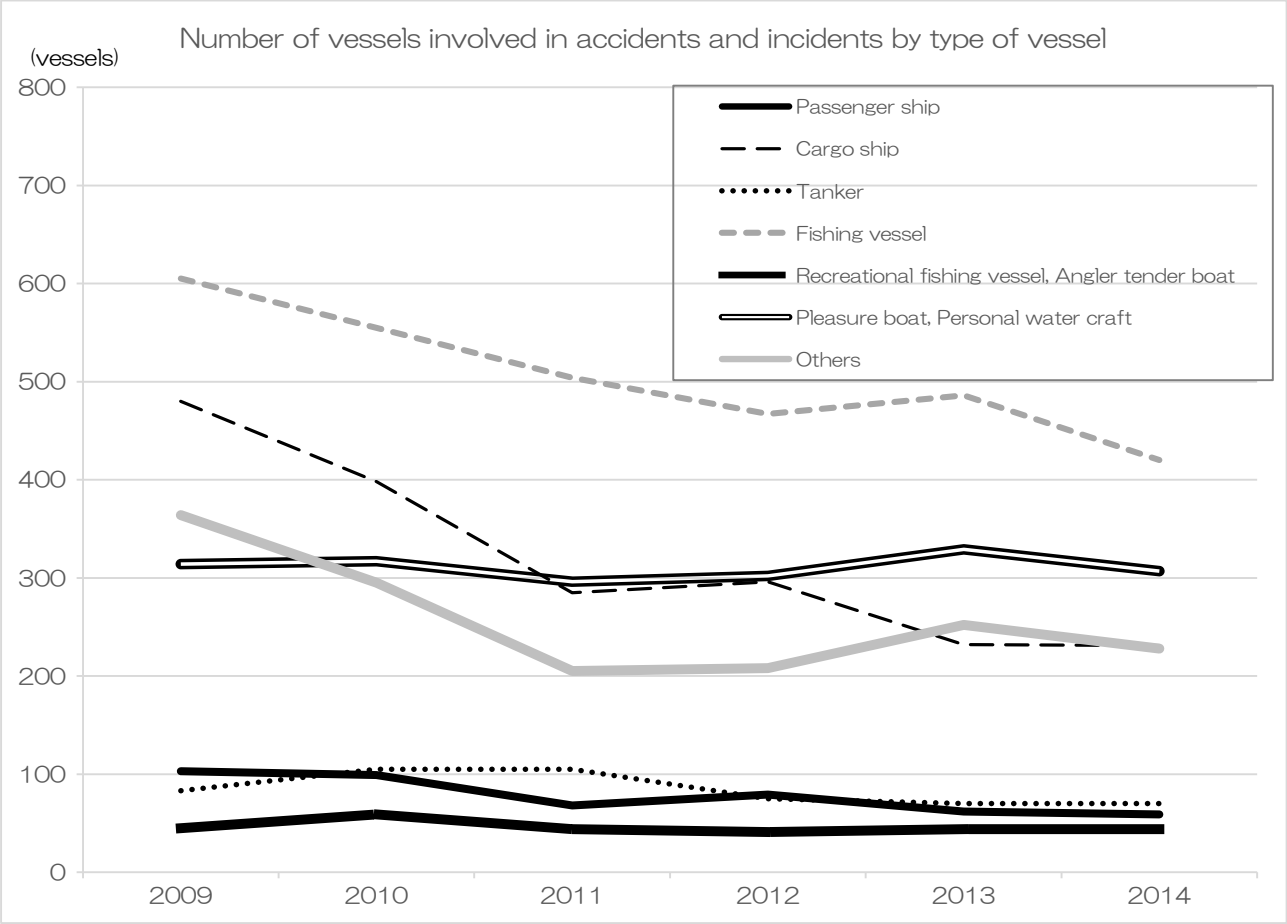
Note 2: The figures in the column “Casualty” are the number of cases involving death, death and injury, missing persons, or injury which is not a result from other types of accident.

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	0	0	0	0	0	0	0	0	0	0	0	3
2008	55	318	55	307	98	28	6	27	60	11	125	31	7	1,128
2009	103	480	83	605	163	39	6	35	104	41	249	65	21	1,994
2010	99	398	105	555	123	53	6	48	82	25	251	66	17	1,828
2011	68	285	105	504	89	38	6	29	50	16	250	46	21	1,507
2012	79	296	75	467	91	33	8	36	59	14	247	55	8	1,468
2013	62	232	70	486	100	41	3	37	72	24	265	64	19	1,475
2014	59	231	70	420	85	39	5	31	56	17	241	66	39	1,359
Total	527	2,241	563	3,344	749	271	40	243	483	148	1,628	393	132	10,762

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 February 2015 (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	0	0	1	0	0	0	0	0	0	1	3
2008	485	52	138	216	77	24	16	17	10	15	78	1,128
2009	903	89	230	288	116	42	34	49	30	14	199	1,994
2010	900	86	175	260	128	36	37	39	25	24	118	1,828
2011	823	59	142	194	101	39	18	32	21	17	61	1,507
2012	790	53	133	199	78	33	25	38	25	20	74	1,468
2013	867	44	113	143	93	47	27	36	19	17	69	1,475
2014	686	46	82	142	76	36	25	28	18	14	206	1,359
Total	5,455	429	1,013	1,443	669	257	182	239	148	121	806	10,762

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 February 2015 (including those carried over from the former Marine Accident Inquiry Agency).

13 Number of vessels involved in accidents and incidents in 2014 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	Fatality/Inj	Others	Loss of control	Stranded	Safety obstruction	Navigation obstruction	
Passenger ship	7	15	12	0	2	1	2	0	3	4	0	4	0	0	9	59
Cargo ship	104	45	36	1	3	1	8	0	7	5	0	16	4	0	1	231
Tanker	31	11	8	0	0	0	1	1	3	7	0	6	2	0	0	70
Fishing vessel	173	17	57	0	3	34	16	0	2	76	1	33	2	0	6	420
Tug boat, push boat	19	8	26	3	0	2	1	0	8	8	2	5	2	0	1	85
Recreational fishing vessel	22	4	4	0	1	0	5	0	1	2	0	0	0	0	0	39
Angler tender boat	0	0	0	0	0	2	0	0	0	3	0	0	0	0	0	5
Work vessel	5	1	13	0	2	2	1	0	2	4	1	0	0	0	0	31
Barge, Lighter	15	6	17	1	0	2	0	0	5	6	0	1	2	0	1	56
Public-service ship	6	0	6	0	0	0	1	0	2	1	0	1	0	0	0	17
Pleasure boat	100	13	43	3	1	27	0	0	6	18	0	24	3	0	3	241
Personal water craft	29	2	5	0	0	0	0	0	0	28	0	1	1	0	0	66
Others	28	2	7	0	0	1	0	0	0	1	0	0	0	0	0	39
Total	539	124	234	8	12	72	35	1	39	163	4	91	16	0	21	1,359

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 February 2014.

Note 2: The figures in the column "Fatality/Injury" are the number of cases involving death, death and injury, missing persons, or injury which is not a result from other types of accident.

~ Japan Transport Safety Board Annual Report 2015~

Japan Transport Safety Board
2-1-2, Kasumigaseki, Chiyoda-ku, Tokyo, 100-8918 Japan
Tel: +81-3-5253-8824 Fax: +81-3-5253-1680
E-mail: jtsb_international@mlit.go.jp
URL: http://www.mlit.go.jp/jtsb/english.html

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