## Major activities in the past year

# 1. Commencement of investigation of unmanned aircraft accidents - Subjects of investigation of accidents -

In recent years, unmanned aircraft (drones, etc.) have been used for various purposes. Due to the revision of the Civil Aeronautics Act, it has become possible to fly unmanned aircraft remotely on an inhabited area in the situation of no access control measure on the ground and their fields have been increased further. As a result, in the future, they are expected to play an active role in a variety of fields, including in infrastructure inspection, logistics, grasping the damage situation in the event of a disaster, transportation of emergency supplies and others.

However, while the demand for unmanned aircraft continues to grow, accidents that have a large impact on society, such as accidents and serious incidents involving third parties (hereinafter referred to as "accidents, etc."), are also expected to occur. Therefore, the law was amended to add "serious accidents" caused by unmanned aircraft to accidents, etc., to the scope of investigation by the Japan Transport Safety Board (JTSB), and the Ordinance to define their details was revised to allow the JTSB to conduct investigations into unmanned aircraft accidents from December 5, 2022. The specific subjects of investigation of accidents related to unmanned aircraft by the JTSB are the following:

#### Accidents

- Injury or death<sup>\*2</sup> of any person<sup>\*1</sup> caused by unmanned aircraft
- Damage of any object\*3 caused by unmanned aircraft,
  - Destruction<sup>\*4</sup> of buildings in which a person is actually present, or mobile facilities, such as vehicles, ships, etc.
  - Electricity supply facilities, telecommunications facilities, transportation facilities, educational facilities, medical facilities, government facilities, and other public facilities<sup>\*5</sup> the operation of which has been disrupted<sup>\*6</sup>
  - -Other accidents which are recognized as particularly exceptional
- Collision or contact with aircraft
- $\bigcirc$  Serious incidents
- Situation where it is recognized that there was a risk of collision or contact with aircraft\*7
- Injury<sup>\*8</sup> of a person<sup>\*1</sup> caused by unmanned aircraft, loss of control<sup>\*9</sup> of the unmanned aircraft and or fire during flight<sup>\*10</sup>, which are recognized as particularly exceptional

\*1 "Person" include not only third parties but also pilots and parties relevant.

\*2 "Injury or death" means death and serious injury or more, including injuries caused by external factors such as bad weather (there is no negligence in the person flying the unmanned aircraft).

\*3 "Damage of any object" means properties (artifacts) owned by third parties, including minor damage such as cracks in roof tiles and damages to the walls of structures due to the collision.

\*4 "Destruction" means causing such harm as to cause all or part of the original functions or utility of an object to be lost.

\*5 "Public facilities" means physical facilities that benefit society in general.

\*6 "The operation of which has been disrupted" means the cause where the use of facilities is suspended or a significant use restriction with a large social impact occurs.

\*7 "Situation where it is recognized that there was a risk of collision or contact with aircraft" means the

case where aircraft in flight is observed on the flight path of the unmanned aircraft or in its surrounding airspace, and where collision avoidance measures such as causing the unmanned aircraft to land on the ground for collision prevention have been taken.

\*8 "Injury" means injuries of a person, excluding "injury or death" corresponding to accidents.

\*9 "Loss of control" means a situation in which an unmanned aircraft becomes uncontrollable due to a malfunction during flight, including cases where the unmanned aircraft is lost as a result. Provided, however, that, inability to control due to pilot error is excluded.

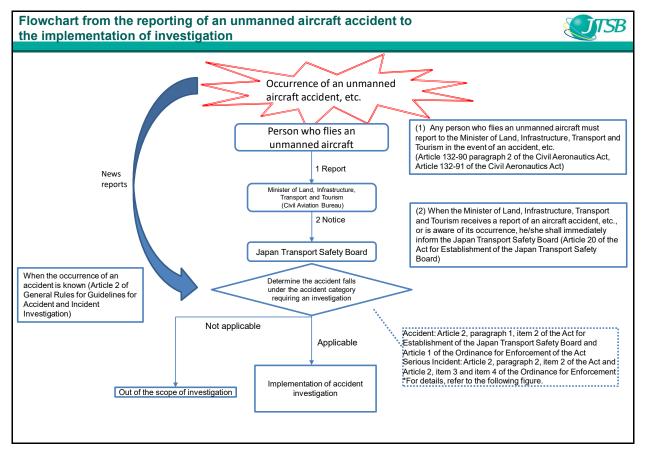
\*10 "Fire during flight" means the case which occurred when the propulsion device of the unmanned aircraft is in operation for flight. Fires that do not fall under this category (for example, fire in a stored battery of the unmanned aircraft) are excluded.

In addition, since all unmanned aircraft weighing 100 g or more that fall under the aforementioned categories, some people may be interested in how the JTSB recognizes accidents.

In this regard, the law stipulates that those who fly unmanned aircraft must report to the Minister of Land, Infrastructure, Transport and Tourism in the event of an accident, and the law stipulates that when informed of the accident, or when becoming aware of the occurrence of the accident, the Minister of Land, Infrastructure, Transport and Tourism must inform the JTSB.

Furthermore, the law stipulates that when the JTSB independently becomes aware of the occurrence of an accident, etc., it must commence an accident investigation. The mechanism is such that when the JTSB becomes aware of the occurrence of an accident, etc., by the report from the Minister of Land, Infrastructure, Transport and Tourism or through other methods, it will conduct an accident investigation.

The chart below shows the reporting procedure from the occurrence of an accident caused by an unmanned aircraft to the commencement of a fact-finding investigation by the JTSB.



In addition, the chart below lists the reporting obligations of those who fly unmanned aircraft to the Minister of Land, Infrastructure, Transport and Tourism and the investigation targets of the JTSB.

Accident	Civil Aeronautics Act (Obligation to report to the Minister of Land, Infrastructure, Transport and Tourism)	Article 1 of the Ordinance for Enforcement of the Act for Establishment of the Japan Transport Safety Board (investigation targets)
	Injury or death caused by unmanned aircraft	Same as left
	Property damage caused by unmanned aircraft	Situations listed on the left and listed below: a. Destruction of buildings in which a person is actually present or mobile facilities, such as vehicles, ships, etc. b. Electricity supply facilities, telecommunications facilities, transportation facilities educational facilities, medical facilities, government facilities, and other public facilities the operation of which has been disrupted. c. Other accidents which are recognized as particularly exceptional, in addition to what are listed in a and b
	Collision or contact with aircraft	Same as left
Serious incident	Civil Aeronautics Act and Ordinance for Enforcement of Civil Aeronautics Act (Obligation to report to the Minister of Land, Infrastructure, Transport and Tourism)	Article 2 of the Ordinance for Enforcement of the Act for Establishment of the Japan Transport Safety Board (Investigation target)
	Risk of collision or contact with aircraft	Same as left
	<ol> <li>Injury of a person caused by an unmanned aircraft (excluding those falling under the category of accidents)</li> <li>Loss of control of the unmanned aircraft</li> <li>Fire on an unmanned aircraft (only those that occurred during flight)</li> </ol>	Situations listed on the left and recognized as exceptional cases

The JTSB will devote to elucidating the causes of accidents, preventing recurrences and reducing damage by appropriately implementing accident investigations also on accidents caused by unmanned aircraft in the same manner as in the past.

#### 2. Aircraft serious incident investigation report published regarding the damage of engine

#### [Summary]

The Aircraft was climbing after take-off from Naha Airport for Tokyo International Airport on December 4, 2020, there occurred an abnormal sound accompanied by shaking of the Aircraft, and the instrument displayed anomaly in the left engine. The captain shut down the engine and landed back at the Airport. In the post-flight inspection, it was confirmed that fan blades of the left engine were fractured, the fan cowl door and other fragments from the nacelle had separated and departed the Aircraft, and the fuselage and horizontal stabilizer were damaged from impact of fragments. (See Photo 1)

There were no injuries.

#### [Probable causes]

It is certain that the fan blades of the left engine were fractured during take-off climb, resulting in parts and cowlings of the engine were departed, and the airframe was damaged by scattered parts.



Photo 1 Left engine of the Aircraft

Since traces of fatigue fracture were found on the fracture surface of the fractured fan blades in the investigation of this serious incident, the Japan Transport Safety Board provided information on the state of the fracture surface of the fan blades to the Civil Aviation Bureau on December 28, 2020 (See Photo 2). In response to this, the Civil Aviation Bureau instructed domestic operators that operate airplanes of the same type to inspect the fan blades, and it was confirmed that there were no abnormalities. However, in the wake of the occurrence of an incident in which the fan blades of an airplane of the same type of another company were fractured in February 2021 in the United States, the Civil Aviation Bureau ordered the suspension of operations of all airplanes of the same type.

In this investigation, with the cooperation of the National Transportation Safety Board (NTSB) of the United States, which designed and manufactured the engine and airframe, an analytical investigation was conducted to determine the cause of the fan blade fracture. As a result, it is highly probable that ORIGIN FA

Photo 2 Fractured surface of the fan blade

the fracture of the fan blade had started from the nodule, which bonded to the internal surface of a hollow structure during the polishing process of manufacturing of the fan blades, and the crack occurred, in addition to this, the Aircraft continued flights without detecting the crack at the subsequent regular inspections led to fatigue fracture. It was revealed that the cracks were not detected in the subsequent regular inspections were contributed by method and intervals of the used inspection were insufficient to detect the defect in the fillet region.

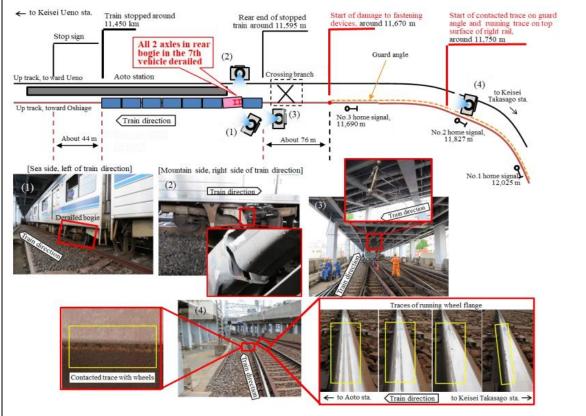
Based on the results of these investigations, the engine designers and manufacturers revised the inspection method and inspection intervals of the fan blades, while the airframe designers and manufacturers implemented recurrence prevention measures, such as the strengthening of the protection of the cowling, etc., in the event of fan blade fracture (see Chapter 3 (page 70) for details).

#### 3. Publication of investigation reports on the derailment accident caused by cracks in a bogie

#### [Summary]

On June 12, 2020, the train started from Keisei Takasago station bound for Haneda Airport No.1 and No.2 Terminal station. While the train was entering the platform of Aoto station, the emergency brake was applied and the train stopped. The conductor checked the train and found it tilted to right and derailed. After that, the staffs of the railway company checked the derailed status and found that there was the crack in the bogie.

About 100 passengers, the driver and the conductor were boarded on the train, but no one was injured.



Schematic map of the accident site

[Probable causes]

It is probable that the wheel climbed up rail and derailed because the vehicle ran in the status that the crack of the bogie was generated and expanded, the unbalance of the wheel loads in the axle of the bogie became large, and the train passed the curved track in that status.

In the investigation of this accident, an analytical survey was conducted on the occurrence of the cracks in the bogie that had caused the derailment.

As a result, it was found that it is likely that the concentration of stress on the welded parts of the bogie caused a high stress to occur locally and to generate and expand the crack.

In addition, it was found that the strength of the bogie was reduced by the cracks in the bogie, making it impossible to share the vertical load, and the increased unbalance of the load on the wheels caused the wheels to climb onto the rails, leading to derailment.

#### 4. Accident investigations related to the train derailment caused by an earthquake

As of the end of December 2022, there are two train derailment accidents possibly caused by earthquakes among the railway accidents under investigation by the JTSB.

The summary and implementation status of the investigation of these accidents are described below.

#### (1) Train derailment accident caused by the Nippori-Toneri Liner

#### [Summary]

On October 7, 2021, a train leaving from Nippori Station bound for Minumadai Shinsui Koen Station derailed at a junction within the premises of Toneri Koen Station. An earthquake with a maximum seismic intensity of upper 5 had occurred with an epicenter in the northwestern part of Chiba Prefecture immediately before the accident. Incidentally, eight passengers were injured in this accident.

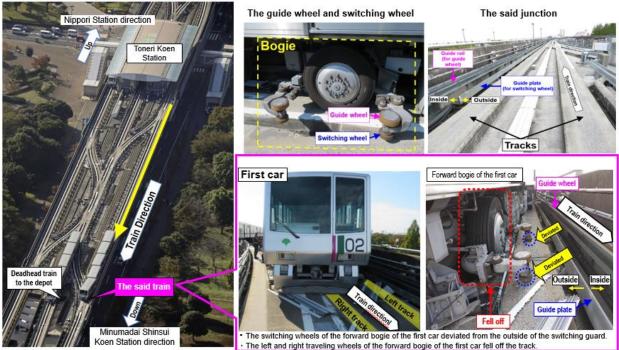
[Investigation implementation status]

The JTSB made an analysis of the relationship between the earthquake that occurred immediately before the accident and the train derailment in addition to hearing from relevant parties and checking the operation records and damage to facilities and the train.

The Nippori-Toneri Liner is a new transport system that operates unmanned by an automated operating system over 9.7 km railway business mile from Nippori Station to Minumadai Shinsui Koen Station. Each bogie of the train is equipped with guide wheels to guide the train in the train direction and switching wheels to pass through junction.

Guide rails are laid on both the left and right sides in a normal track, and the train is guided in the train direction by the contact of the guide wheels on the left and right of the train with the lateral surface of the guide rails. On the other hand, the guide rail is laid only on one side at the junction and the guide plate for the switching wheel is laid on the lower side of the guide rail close to the train. The train passes through the junction by being guided by the switching wheel inside the guide plate.

The switching wheel of the forward bogie of the first car of the derailed train deviated outside of the guide plate at the junction and the left and right traveling wheels of the bogie fell off the track to the right side in the train direction and derailed.



\*The leftmost figure was created using a photo provided by Kyodo News.

Situation of the accident site

The JTSB published an accident investigation report on this accident on February 16, 2023. The published report is posted on the website of the JTSB below.

http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2023-2-1.pdf

Incidentally, the JTSB plans to publish the summary of the accident investigation report in the next Japan Transport Safety Board Annual Report 2024.

#### (2) Train derailment accident caused by Tohoku Shinkansen

#### [Summary]

On March 16, 2022, a 17-car train (Yamabiko No. 223) departing from Tokyo Station bound for Sendai Station derailed between Fukushima Station and Shiroishi-Zao Station. An earthquake with a maximum seismic intensity of upper 6 had occurred off the coast of Fukushima Prefecture immediately before the accident. Incidentally, six passengers were injured in this accident. [Investigation implementation status]

The JTSB made an analysis of the relationship between the earthquake that occurred immediately before the accident and the train derailment in addition to hearing from relevant parties and checking the operation records and damage to facilities and the train.

It was confirmed that 60 of the 68 wheels and axles of the 17 cars were derailed in this accident. In the future, the JTSB will continue to investigate for the elucidation of the cause of the accident and prevention of recurrence including the analysis of the relationship between the earthquake that occurred immediately before the accident and the train derailment.

#### 5. Accident investigation related to the flooding accident of the passenger ship

On April 23, 2022, a passenger ship navigating the west side of the Shiretoko Peninsula in Hokkaido Prefecture was flooded and sank off the coast of Kashuni-no-taki waterfall, resulting in a tragic accident in which many passengers and crew members died or went missing.

The JTSB dispatched marine accident investigators to the site on the day after the accident to launch an investigation to elucidate the cause of the accident, not only by contacting interviews with local relevant parties, but also by collecting information on the ship's operations as well as on the ship and equipment.

In addition, since a lot of people were died and went missing in the accident and a large impact was made on society, the JTSB decided to discuss this accident as a "particularly serious accident" in the General Committee.

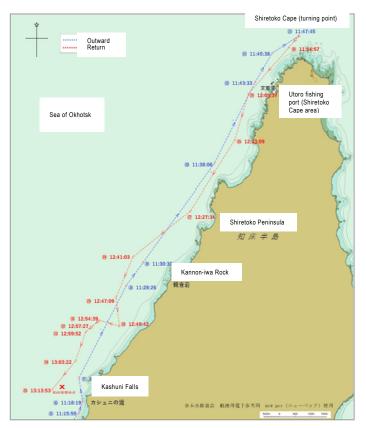
Later, the wreckage of the ship was recovered from the place of foundering and stored at Abashiri Port. In July 2022, when it was possible to conduct an investigation on the ship, the JTSB dispatched marine accident investigators to conduct investigation on the ship. At that time, three Board Members with specialized knowledge, including the Chairperson, also visited the ship.

In addition, in the course of the accident investigation, since the JTSB obtained information on the past navigation route of the



Condition of the passenger ship before the accident

ship, the JTSB provided the information to the Maritime Bureau of the Ministry of Land, Infrastructure, Transport and Tourism in August 2022 in order to contribute to safety measures for small passenger ships in the future (see Chapter 5 (page 128) for details).



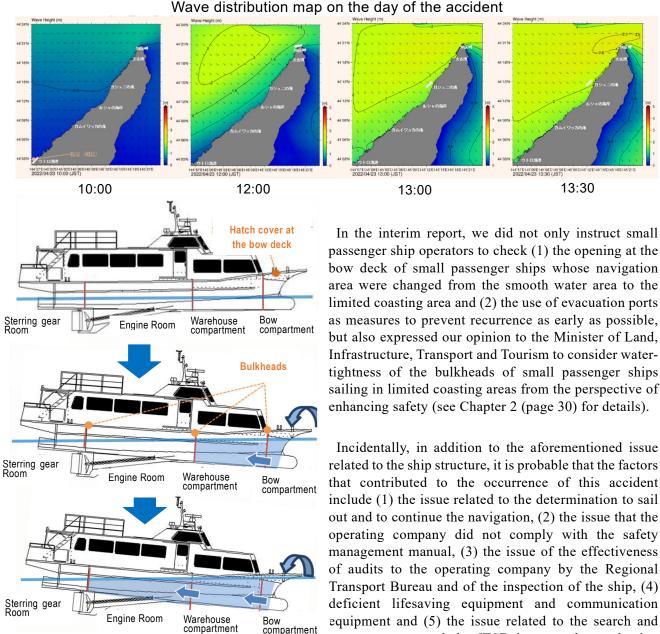
Navigation route at the time of the accident

In this accident, while it was difficult to obtain direct information on the situation when the ship sank, it was possible to understand the navigation route of the ship on that day because one of the passengers was using the mobile phone location information service.

In addition, it was found from the results of the investigation of the ship that although the bottom plating was damaged, the damage did not penetrate into its inside, that the hatch cover at the bow deck was missing due to the destruction of the hinge of the mounting part, and that there was an opening in the bulkheads of the ship and the seawater that flooded from the hatch in the bow spread to each compartment under the upper deck.

Based on these facts, the JTSB did not only entrust the analysis of the weather conditions in the sea area west of the Shiretoko Peninsula on the day of the accident to the Japan Weather Association for its estimation, but also entrusted analysis to the National Maritime Research Institute to calculate the state of the trim of the ship with respect to the amount of water flooding into the ship based on the flooding of water from the hatch at the bow deck section, in order to clarify the navigation conditions of the ship on the day of the accident and the mechanism from flooding to foundering.

Based on this, from the perspective of preventing accidents and reducing damage to small passenger ships of the same type, the JTSB provided an interim report on the factual information so far verified with the focus on these findings along with the progress of this accident investigation on December 15, 2022 (see Chapter 1 (page 18) for details).



Mechanism from flooding to foundering It is probable that the hatch cover at the bow deck which was not firmly closed was opened due to pitching motions in the situation where the weather and hydrographic conditions were deteriorating, thereby allowing sea water to flood into the bow compartment from the hatch and the flooding to spread to the warehouse compartment and engine room through the opening in the bulkhead.

passenger ship operators to check (1) the opening at the bow deck of small passenger ships whose navigation area were changed from the smooth water area to the limited coasting area and (2) the use of evacuation ports as measures to prevent recurrence as early as possible, but also expressed our opinion to the Minister of Land, Infrastructure, Transport and Tourism to consider watertightness of the bulkheads of small passenger ships sailing in limited coasting areas from the perspective of

related to the ship structure, it is probable that the factors that contributed to the occurrence of this accident include (1) the issue related to the determination to sail out and to continue the navigation, (2) the issue that the operating company did not comply with the safety management manual, (3) the issue of the effectiveness of audits to the operating company by the Regional Transport Bureau and of the inspection of the ship, (4) deficient lifesaving equipment and communication equipment and (5) the issue related to the search and rescue system, and the JTSB is currently conducting further investigation and analysis.

The JTSB is working toward the early publication of an accident investigation report summarizing the causes of this accident and measures to prevent recurrence.

# 6. Publication of the accident investigation report in which a pleasure boat caused fatality and injuries on the surface of the lake

### [Summary]

On September 6, 2020, when the pleasure boat (Vessel A) with the master and nine passengers including his/her friends on board was heading northeast near the training buoy for small boats laid off the west coast of Nakatahama at Lake Inawashiro, Aizuwakamatsu City, Fukushima Prefecture, and the four people who were waiting for their turn to board the floating body to be towed by the personal watercraft were floating near the training buoy for small boats, Vessel A collided with the waiting floating people and the propulsion equipment, etc., came into contact with them.

One of the four waiting people was died and two were injured.

#### [Probable causes]

It is probable that the accident occurred in the situation in which Nakatahama was very congested with pleasure boats, which sailed at various speeds, when Vessel A headed northeast and came close

to the waiting people near the buoy, and the four people were in floating waiting for their turn to board the floating body to be towed by the personal watercraft near the buoy, the master did not notice the presence of the waiting people near the buoy and caused Vessel A to collide with them and the propulsion equipment, etc., also came into contact with them.



Aspect around the accident site

This is a tragic accident occurred in Lake Inawashiro compared to "Tenkyoko (sky-mirror lake)" in which, while many people were enjoying marine sports, the master of Vessel A did not notice the four people floating on the surface of the lake and caused Vessel A to approach them. In the unique environment of water where no trace of navigation is left unlike on land, the investigators visited the site many times to gradually accumulated facts to wrap up the report.

Regarding the process leading to the accident why the master of Vessel A did not notice the presence of the waiting people, the JTSB clarified the reason why by actually conducting real sailing tests to perform a variety of measurements and by comparing the analyzed measurement results with the statements of parties involved.

On the other hand, regarding the state of safety and order which is the most important factor for enjoying marine sports as the background of the accident at Lake Inawashiro, the JTSB will find out and clarify by hearing from the local government and relevant parties as well as users of the lake.

The number of people who enjoy marine sports is increasing year by year, and the number of new license holders for sailing small boats is also increasing nationwide to probably enjoy leisure time by avoiding crowded places in the midst of COVID-19. In such an environment, users are required to comply with the rules even further. The publication of the investigation report of this accident has enabled the local government and related groups to recognize and understand the current situation in which consistent response to ensuring safety of users is required from the perspective of ensuring safety of users. The JTSB expects that the report will provide the opportunity to significantly improve the environment for marine sports at Lake Inawashiro (see Chapter 5 (page 124) for details).

#### 7. Publication of investigation reports on the collision between a cargo ship and a submarine

#### [Summary]

On February 8, 2021, off the south-southeast coast of Cape Ashizuri-misaki, Tosashimizu City, Kochi Prefecture, a cargo ship heading northeast toward Mizushima Port, Kurashiki City, Okayama Prefecture, and a submarine heading south-southeast while navigating by ascending to the periscope depth (to navigate underwater with a part of the periscope over the sea surface) collided with each other.

Three crew members of the submarine were injured and the submarine rudder (a single rudder installed on both sides of the hull upper structure) was bent, etc., while the cargo ship sustained dent damage with cracks in the bulbous bow plating.





Cargo ship

Submarine

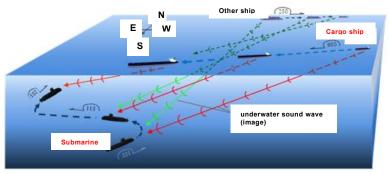
#### [Probable causes]

It is probable that the direct cause of the collision lies in the fact that the officers of the submarine determined that there was a sufficient distance to the ship detected by the passive sonar and there was no vessel that would interfere with the navigation at the periscope depth and started the work to navigate at the periscope depth work (work to change the depth of the submarine to the periscope depth) towards the sea surface on the course of the cargo ship.

In the investigation of this accident, in order to identify the source (ship) of the underwater sound wave detected by the submarine's passive sonar, the JTSB conducted analysis by taking into consideration the characteristics of underwater sound whose speed varies depending on the underwater environment in order to analyze the detection status of underwater sound waves, and in light of the work procedure before the ascension to the periscope depth and the implementation status of education and training based on the lessons learned from similar accidents in the past, the JTSB analyzed the factors leading to the

determination by the submarine that there was no ship to interfere with the ascension to the periscope depth at that time.

As a result, it was found that a variety of factors occurred in a combined situations, such as that it was difficult for the submarine to recognize the cargo ship until it was decided to start the work to navigate at periscope depth, and that a complex event occurred such that the heading of



Situation at the time of the accident (image)

the cargo ship and other were overlapped and the hearing in the heading changed from the sound radiation of the other ship to that of the cargo ship.

Based on these results of the investigation, in order to contribute to the prevention of recurrence of similar accidents and the reducing of damage, the JTSB expressed our opinion to the Minister of Defense to establish an on-board system in which submarine operators, etc. can timely and appropriately recognize and determine the presence of surrounding ships and the risk of collision and to strengthen the monitoring system for passive sonar, as well as to consider revising the guidelines for detection operation with sonar and reporting (see Chapter 2 (page 28) and Chapter 5 (page 125) for details.).

#### 8. Implementation of the IMO Member State Audit Scheme (IMSAS)

In the wake of the occurrence of many accidents in the world by ships that do not meet the international standards stipulated in the SOLAS Convention (International Convention for the Safety of Life at Sea), such as the Nakhodka accident occurred in 1997, it has become clear that flag state administrations are not fully fulfilling their obligations to monitor and supervise their own flagged ships to ensure that they comply with international standards.

In response to this, the IMO Assembly in December 2003 approved the creation of a "Voluntary IMO Member States Audit Scheme", and in December 2005, the implementation of audits under this scheme was adopted. Under the scheme, a team of auditors selected by the IMO will audit member states with respect to six international conventions, including SOLAS and MARPOL (International Convention for the Prevention of Pollution from Ships), etc. Although the scheme was voluntary at the time of approval of its creation as stated above, it has become mandatory in 2016 and remains so to this day.

Japan has not been subject to audit since 2007 when the scheme was voluntary. And then, it was decided in 2020 that Japan would be audited. Since the JTSB was established, it is the first time that we would be audited, and we proceeded with the preparations for the audit. However, the implementation in 2020 was postponed due to the global pandemic of COVID-19, and it was eventually implemented online from September 26 to October 11, 2022.

The audit was conducted by an IMO audit team consisting of three auditors selected from third countries and one staff member of the IMO Secretariat during the aforementioned period, and relevant Japanese governmental organizations including the JTSB were in charge of Q&A of the areas related to affairs under their respective jurisdiction.

The JTSB was audited on September 30 in areas related to accident investigations, and the auditors mainly asked the following questions.

- Whether the contents stipulated in the Casualty Investigation Code and IMO Instruments Implementation Code are properly implemented.
- When an accident involving an another flag state ship occurs in Japanese territorial waters, whether the necessary information for the accident investigation agencies of the flag state and other interested countries is properly notified.
- Whether training for marine accident investigators is properly implemented.

• Whether the final accident investigation report required to be submitted to the IMO is properly submitted. The audit response team of the JTSB explained the implementation status thereof by appropriately submitting related evidence to these questions.

As a result, the IMO audit team did not indicate any deficiencies regarding the implementation status of the JTSB in areas related to accident investigations, and the audit was successfully completed. Since the scheme is to go through all the member countries in seven years, the next audit of Japan will be roughly seven years from now.

### 9. Signing of the Declaration of Intent to promote cooperation with the Argentine Transport Safety Board (JST: Junta de Seguridad en el Transporte)

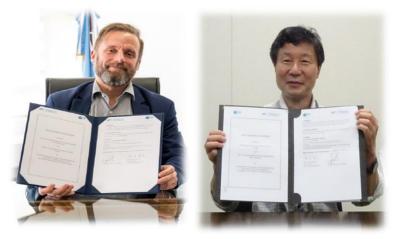
On September 6, 2020, the JTSB signed the Declaration of Intent (DOI) with the Argentine Transport Safety Board (JST) to cooperate on accident and incident investigations related to transportation (aircraft, marine and railway). This Declaration of Intent to promote cooperation was concluded in response to a request to conclude a memorandum of cooperation with the JST on the occasion of its establishment in May 2020.

To date so far, the JTSB has concluded the DOI to promote cooperation in accident investigations with eight countries. All of them related to one or two modes of aircraft, marine and railway. The DOI to cooperate with Argentina relates to all three modes for the first time for Japan.

The declaration is to confirm that the accident investigation authorities of both countries will cooperate to assist transportation safety by exchanging information on general methods of investigating accidents and incidents and cooperating in areas of human resource development and capacity building of accident investigators. We expect that this cooperation will greatly contribute to the improvement of transportation safety in both countries.

Argentine is far away from Japan. However, Japanese-made vehicles, both second-hand<sup>\*1</sup> and newlybuilt<sup>\*2</sup>, in the railway sector, have been exported traditionally, and even today, many Japanese-made vehicles are used in Argentine. Therefore, the JTSB expects that the establishment of this cooperative relationship will contribute to the further development of the relationship of trust between the two countries by contributing to the reduction of accidents.

- \*1 Total of more than 200 second-hand vehicles of the Tokyo Metro Marunouchi Line, the Transportation Bureau City of Nagoya Higashiyama Line and Meijo Line has been exported, and some are still in operation.
- \*2 These vehicles were manufactured and exported by Kawasaki Heavy Industries, Kinki Sharyo, Nippon Sharyo, Tokyu Car Corporation, Toshiba, etc. Since the electric equipment was exclusively manufactured by Toshiba, they are commonly called Toshiba. More than 600 vehicles were exported in the 1970s and 1980s and many of them are still in operation on both national and private routes.



Mr. Obaid, Chairperson of JST, and Mr. Kashiwagi, Director General of the JTSB

#### 10. Improvement of functions for searching accident investigation reports on the website

The JTSB has published more than 16,000 reports on its website, including those published by its predecessors, the Aircraft Accident Investigation Commission and the Aircraft and Railway Accidents Investigation Commission. We provide a report search function to allow you to find what you want to read and what you need from among such a large number of reports.

In order to make the search function easier to find the desired report, we have improved the search functions by adding search conditions and started the operation on November 25, 2022.

Information such as the reports accumulated by the JTSB is an important resource for reducing safety risks. In order to make the most of this information resource, we will continue to make improvements to more effectively and appropriately disseminate information.

#### Overview of the functional improvements

(1) Addition of the multi-mode cross search function

In addition to the conventional search by field of aviation, railway, and marine, we have added a new function that allows you to search across multiple fields.

(2) Expanding the scope of keyword searches to include the full text of reports

In addition to the "Summary" and "Probable causes" columns on the summary page of accidents eligible for search so far, the full text of reports (\*) are now eligible for search.

\*Reports published since 1999 are eligible for search in the aviation sector. We will expand the scope of search gradually.

(3) Addition of "NOT" search to the keyword search function

In addition to the existing "AND" and "OR" searches, a new "NOT" search has been added.

(4) Addition of the search result download function

It is now possible to download search results in CSV format.

(Contents that can be downloaded)

Date of occurrence, type of accident, location of occurrence, type of aircraft and vessel,

casualties, gross tonnage of vessel, category of railway operator, etc.

- (5) Enhancement of the search function by mode
  - 1. Aviation mode
    - "Accident classification (36 types)," "Flight stage (13 types)," and "Casualties" have been added to the search conditions.
  - 2. Railway mode
    - "Classification of level crossing (4 types)" and "Casualties" have been added to the search conditions.
    - Selection of multiple search conditions from the pull-down menu is now possible, where only one could be selected in the past.
  - 3. Marine mode
    - "Casualties" have been added to the search conditions.
    - Selection of multiple search conditions from the pull-down menu is now possible, where only one could be selected in the past.