

Feature: Information dissemination for improving transport safety

The Japan Transport Safety Board (JTSB) has been reporting on aircraft, railway and marine accidents and serious incidents via monthly press briefings by the chairperson and through publication of accident investigation reports. During 2020, JTSB published 18 reports on aircraft accidents and serious incidents, 16 on railway accidents and serious incidents, and 895 on marine accidents and incidents.

In the process of investigating accidents, collected information that the JTSB has considered is deemed factually useful for accident prevention and damage mitigation, they provide these data to relevant administrative bodies and make it available to the public, as well as factual information deemed appropriate in terms of transport safety enhancement to related parties.

Information releases by the JTSB are often picked up by the press. JTSB updates are presented in a courteous, accessible manner so that it reaches as many people as possible. However, there are cases of accidents of with greater public interest which occur due to multiple complicating factors or those that cannot be explained without using highly technical terms. In reporting these types of accident investigation reports, the JTSB makes a point to comprehensibly explain both the causes of these accidents came to pass and safety measures necessary to prevent them.



Chairperson's press briefing

This Feature explains the JTSB's information dissemination in 2020.

1. Announcement of investigation-related information

After the occurrence of an accident, the JTSB promptly appoints accident investigators, and to the extent possible announcing dispatch schedules for accident site as the investigation information. In response to these announcements, media may report that “An accident investigation by JTSB has started.” News media sometimes broadcast video footage and/or post photographs of the investigators heading for accident sites.

鉄道事故調査情報

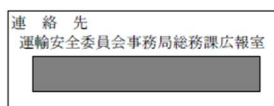
令和2年5月8日
運輸安全委員会

当委員会は、下記鉄道事故を調査するため、

(主管調査官) 鉄道事故調査官 足立 雅和 (あだち まさかず)
鉄道事故調査官 清水 惇 (しみず あつし)
を5月8日、現地に派遣することとした。

記

1. 発生日時
令和2年5月8日(金) 15時53分頃
2. 鉄道事業者
東日本旅客鉄道株式会社
3. 発生場所
外房線 安房鴨川駅～安房天津駅間(千葉県鴨川市)
4. 状況
安房鴨川駅発 千葉駅行き 280M列車(6両編成)
5. 事故種類
列車脱線事故



Information on accident investigations

航空重大インシデント調査情報

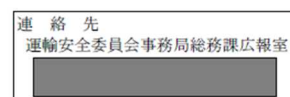
令和2年11月4日
運輸安全委員会

当委員会は、下記航空重大インシデントを調査するため、

(主管調査官) 航空事故調査官 原田 佳明 (はらだ よしあき)
航空事故調査官 西村 敬一 (にしむら けいいち)
を11月4日、担当調査官に指名した。

記

1. 発生日時/場所
令和2年11月3日(火) 10時30分頃
北海道北見市小泉付近上空、高度約150～200メートル
2. 運航者
個人
3. 航空機
国籍/登録記号 JR0392
型式 ビーパー式RX550-R503L型(超軽量動力機)



Information on serious incident investigations

By making our information available to the public, we hope to broaden public understanding of our activities.

2. Information dissemination at investigation sites

In the cases of accidents of with greater public interest, accident investigators are often interviewed by the media at the sites. In these on-site interviews, the investigator in charge of the site is there to offer real-time information about scene and the situation. At this stage, the investigator cannot speak to the cause of the accident or any conclusions based on data collected. However, even when it is difficult for the general public to understand the situation, i.e., because the site of the investigation is located deep in the mountains or designated off-limits, JTSB believes in the necessity of explain the situation, facts and our activities to the public with the greatest degree of transparency possible.



Responding to questions from media at an investigation site

With regard to the investigation of fire on a large passenger ship that occurred in June 2020, the incident attracted a high a great degree of public attention and therefore many video images of the fire were broadcast, to which the accident investigator explained the situation to the media. In this case, the media were able to report the data as confirmed in ways such as, “It is highly likely that the fire was caused by welding work being carried out in a vent pipe. No noticeable gaps or holes were found in the iron plate that isolated the vent pipe from the storage compartment.”

3. Information dissemination during an accident investigation

When it is appropriate to provide information to concerned parties at an early stage in terms of transport safety enhancement, we make it a point to promptly disseminate information that we have obtained, even if the investigation is ongoing.

- (1) Regarding the accident investigation of a helicopter that became difficult to control during flight, crash-landed and rolled onto its side in February 2020, the JTSB’s chairperson in a press briefing held in the same month, put forth the possibility that the helicopter’s main rotor blade had

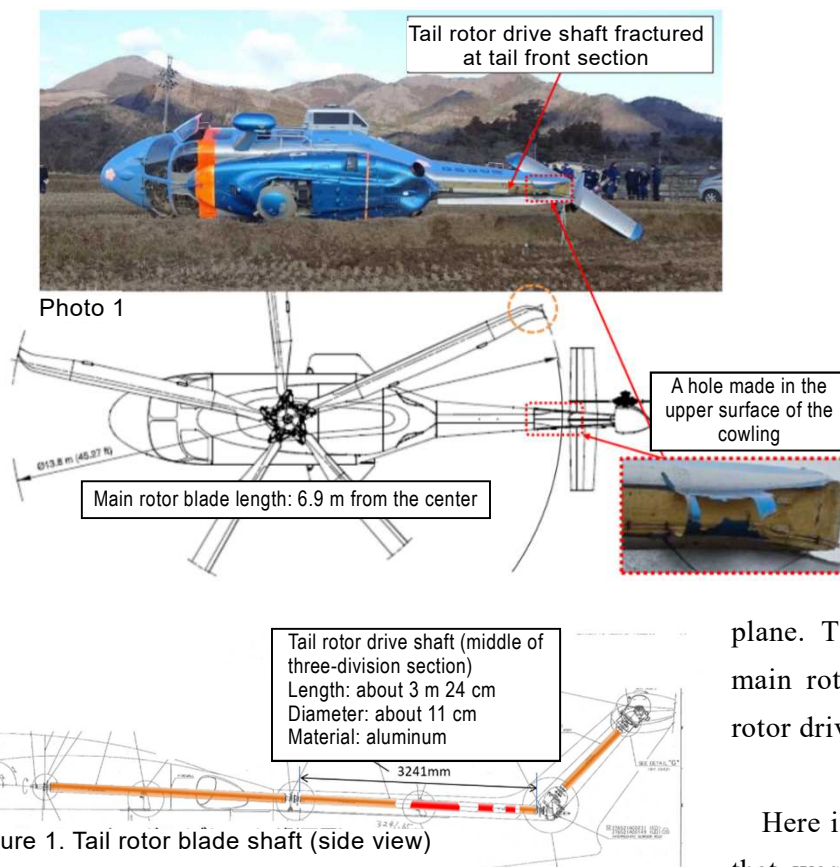


Figure 1. Tail rotor blade shaft (side view)

impacted the tail rotor drive shaft. The chairperson explained that helicopter accidents of this kind had also occurred in the past and that they occur due to a combination of the aircraft attitude and a dramatic shift in the angle of the main rotor’s rotational

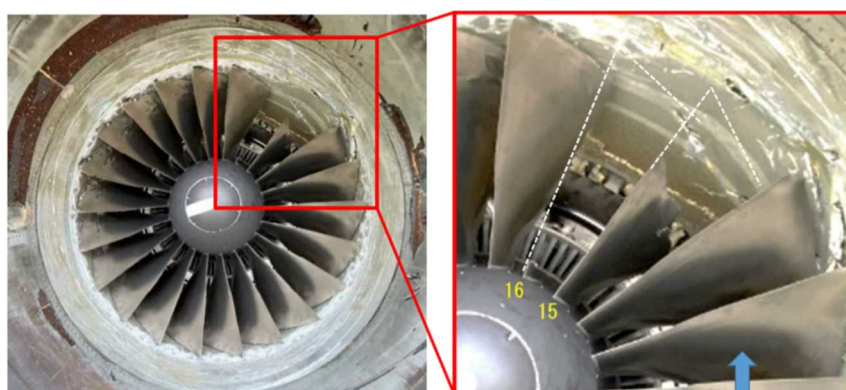
plane. These factors can cause the main rotor blade to impact the tail rotor drive shaft

Here is one example of a headline that was printed as a result of the

announcement: “Main Rotor Impact with Fuselage May Have Caused Accident,” indicating a possibility that the main rotor blade touched the rear section of the fuselage during flight.

We believe that our speedy dissemination information regarding this accident may have helped pilots of the same type of helicopters to narrow down points to remember in daily flights.

(2) Regarding the investigation of a serious incident that occurred at an altitude of about 5,000 m, about 100 km north of Naha Airport due to a defective engine on a Boeing 777-200 in December



Left-engine inlet

Fan blade

2020, the JTSB reported damages to the left engine's fan blades and to the aircraft while a beach mark and a radial marking (characteristic of fatigue fracture) were found on the fractured surfaces of the fan blades damaged nearly to their bases (see page 51, Chapter 3).

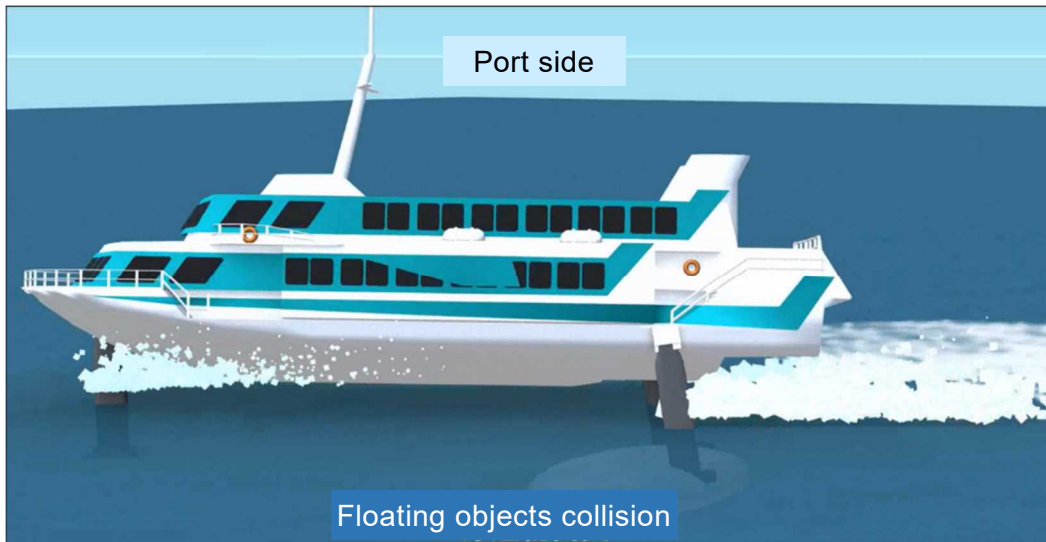
In response to the JTSB's announcement, the press explained the incident in detail with headlines such as "Engine Damage – Fatigue Fracture Suspected" and "JAL Plane Showing Fatigue Fracture Symptoms on Fractured Surfaces."

After this serious incident, the Ministry of Land, Infrastructure, Transport and Tourism's Civil Aviation Bureau immediately ordered domestic airline companies to perform enhanced inspections on operating aircraft using the same type of engines, to which they all complied. On the basis of information provided by the JTSB and to ensure aviation safety, it was decided that aged fan blades would be subject to limited non-destructive tests (NDTs) by drastically moving forward their current NDT schedule.

4. Publication of investigation reports

Each time an investigation is completed, the JTSB publishes investigation reports explaining both accident causes and measures against recurrence. To ensure broad public understanding of its these reports, the JTSB endeavors to make them clear and understandable, for example, by visualizing moving graphic representations of accident timelines or using models at press briefings.

(1) In the March 2020 investigation report on passengers injured onboard a jetfoil passenger ship that collided with objects floating on the sea surface (see page 115, Chapter 5), the JTSB prepared a computer-generated moving graphic representation reproducing the ship's motion to explain the events leading to the floating objects striking the rear hydrofoil.

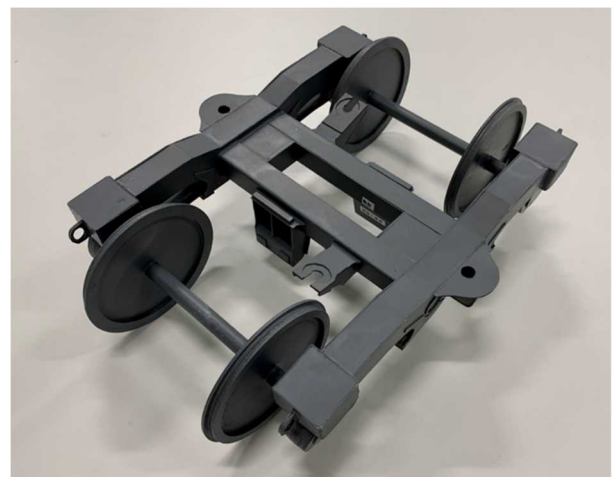


Computer graphic reproduction of ship behavior at the time of accident
(URL:<https://www.mlit.go.jp/jtsb/video/ship/2019tk0008-movie.wmv>)

This computer graphic image was intended to make those who read the investigation report easily image the accident; the report stated as follows: “It is probable that, after the rear hydrofoil collided with the floating objects, the fuse pins fractured, causing the rear hydrofoil to swivel backward at the pivot points where it was attached to the ship’s hull. Probably the lifting power of the rear hydrofoil decreased and was lost, which lowered the stern. At the same time, the rear hydrofoil probably pulled the ship’s hull into the sea due to the water resistance. As a result, It is probable that the bottom of the ship at the stern impacted the sea surface, generating significant upward and backward acceleration which generated a strong impact on passengers.”

As a result of these efforts, this accident was covered in a comprehensible manner by the media using headlines such as “Collision with Stern Hydrofoil Magnifies Damage” and “Significant Damage due to Impact of Hitting Sea Surface.”

(2) In the serious incident investigation report on a dangerous situation on a railway vehicle (a crack in a bogie) (see page 83, Chapter 4) issued in November 2020, the location where the crack formed was described as “the welded spot connecting the cross beam of a bogie frame with the backside reinforcement rib of a main-motor seat plate.” Because the crack was difficult to identify even using a plan view, railway accident investigators prepared a bogie model, which the chairperson used in a press



Model of bogie

briefing to explain the incident.

Thanks to the chairperson's clear explanation, the incident was reported by the media with the precise description of "penetration of the iron plate's welded spot connecting the bogie and the motor." Some media reported using their own image charts.

(3) Regarding the investigation report on the crashing of a firefighting & disaster prevention helicopter into a mountain slope (see page 44, Chapter 3) issued in February 2020, one of the causes considered for the accident was that the captain suffered from spatial disorientation and was unable to perform an appropriate maneuvering to maintain the attitude of the aircraft. Thus, the JTSB prepared explanatory materials explaining spatial disorientation in general and also in terms of aviation medicine.

※ Spatial disorientation does not mean a physiological abnormal condition of spatial orientation but a confused condition of spatial orientation of those who own normal sensory functions. Concretely, as in the case of losing a correct cognition of motion of aircraft against the earth similar to an illusion caused by acceleration speed, spatial disorientation includes illusions by visual sense, by somatic sense and by equilibrium sense.

“Aviation Medicine and Safety” (co-written by Kenichi Azuma and Masaoki Tsuchiya published by Houbun Shorin in 1997 pp. 41 – 55)

○ Spatial disorientation by linear acceleration speed is illusion caused by increasing speed of acceleration or deceleration during the flight. During a level flight, especially when the outside scenery is invisible, a pilot sometimes misjudges the gravity direction, feels like the aircraft is ascending and tries to lower the nose of the aircraft, which results in the descent of the aircraft and further acceleration. If a pilot continues the maneuvering as he/she is deluded, it occasionally results in abnormal ATT of nose down.

○ When the banking angle of an aircraft is slight, the pilot may sometimes fail to recognize the bank due to a lean illusion and continue to fly while angling the balance plane of the aircraft in the opposite direction.

In this way, the JTSB provided supplementary explanations to describe this accident whose causes were deemed difficult to image for the general public. Media were able to report using comprehensible language such as “losing a sense of equilibrium because of poor visibility due to clouds,” and “bad weather prevents correct situational judgment.”

5. JTSB Digest

The JTSB has been analyzing similar types of accidents and incidents and issuing “JTSB Digests” comprehensively explaining their countermeasures (see page 154, Chapter 6).

In response to a small passenger ship accident resulting in injuries regarding which the JTSB had issued an investigation report in November 2020, it analyzed anew, in December 2020, 18 similar accidents resulting in passengers’ spinal fractures. The JTSB Digest presented countermeasures (including a method of steering a ship that is encountering tidal waves), measures for ensuring safety in passenger compartments and the necessity of collecting information on weather and oceanographic phenomena.

[Illustration on the right: JTSB Digest No. 35]

“For the safe navigation of small passenger ships – Bang! Backache! For the prevention of a spine fracture accident on a small passenger ship.”

The JTSB sincerely addressed inquiries and requests from news media for more detailed information. As a result, the media covered recommendations from the JTSB Digest, stating that “small passenger ship passengers should, to the extent possible, use posterior seats with fewer shaking motions.”

6. Situation of news reporting

In this way, the JTSB endeavors to disseminate information through monthly press briefings by the chairperson while the news media understand JTSB activities and provide this information to the general public. For example, 49 investigation reports were issued by the JTSB in 2020, about which 194 articles were issued by major six media companies in Tokyo alone. Moreover, the investigation reports by the JTSB have also been widely covered by local news media located in the areas where accidents or incidents have occurred.

Technical terms are often used in our investigation reports, and in the cases of accidents or incidents



1. はじめに

旅客の脊椎骨折事故が増加！

運輸安全委員会が発足した平成20(2008)年から平成31/令和元(2019)年までの12年間に、旅客船の旅客に死傷者が発生して調査対象とした事故は115件あり、そのうち、小型旅客船^{※1}の旅客に死傷者が発生した事故が71件と約6割を占めています。

そのなかで小型旅客船において、旅客が脊椎骨折を負った事故(以下「旅客脊椎骨折事故」という。)が18件あり、平成27(2015)年から発生件数が低く推移していましたが、平成31/令和元(2019)年には、4件の事故が発生し、13人の旅客が脊椎骨折を負いました。(図1参照)



※1 本資料で「小型旅客船」とは、総トン数20トン未満の「定期旅客船」、「交通船」、「海上タクシー」、「遊覧船」等をいふ。

小型旅客船 前方の席 注意

揺れによる事故 脊椎骨折の客集中

The illustration shows a passenger sitting in a seat on a ship. The text explains that the center of gravity is behind the seat, making it easy for the passenger to fall back. It also notes that the seats in the front of the ship are more likely to shake, increasing the risk of spinal fractures. The text mentions that in 2019, 13 passengers suffered spinal fractures on small passenger ships, and that the JTSB is investigating the causes of these accidents.

小型旅客船の事故では、大けがをした乗客の約7割が腰や背中などが折れる「脊椎骨折」だった。船や飛行機の運送の事故原因を調べる国、運輸安全委員会の調査で、こんなデータが明らかにされた。脊椎骨折した人のほぼすべてが船揺りに座って

いたってわかり、運輸安全委は「波が高くなる冬場は揺れによる事故が起きやすい。小型船では、なるべく揺れにくい後ろの席に座してほしい」と呼びかける。

国土交通省の調査によると、全国には約2000の旅客船があるが、このうち約20%未満の小型船だ。

大きな船に比べて波の影響をうけやすいが、降着物や衝撃を受けて揺れた場合でも、シートベルトの設置義務がない。そのため、高波で船体が揺れて乗客が座席に尻もちをつき、脊椎を骨折する事故が後をたない。

例えば、2019年12月に鹿児島県沖であった旅客船「なんきょう」(19名)の事故では、高波で船体が大きく揺れ、乗客55人のうち14人がけがをした。このうち9人が座席に尻を強く打ちつけた脊椎骨折で、いずれも客席の8列目までに座っていたという。

運輸安全委が8・19年に起きた旅客船の死傷事故16件の調査によると、乗客以上16人がけがした小型船の事故は28件で、37人が大けがをした。このうち16件の25人は脊椎骨折の大けがをしていて、重傷者の68%が脊椎骨折だったことになる。軽傷を骨折していた28人のうち、28人が船首側の席に座っていたという。

船首側の席で脊椎骨折が多いのは、エンジンが回っている船尾側に船の重心があるから。波に揺られると、重心から遠い方の船首側の座席の揺れがより大きくなるという。運輸安全委は「冬場は高波が起きやすく、事業者は速度を下げたり、運転自体をやめたりするなども考えを欲している」といっている。(兼川俊)

Article by the Asahi Shimbun (Feb. 12, 2021)

with complicated factors, it is difficult to grasp their whole pictures, but we believe that disseminating such information widely and comprehensibly to the society is our mission.

We will also continue our efforts in the future to report to the public JTSB activities, accident/incident causes and measures for safety in a courteous and comprehensible manner.

Table: Numbers of investigation reports covered by respective media in 2020

	Reports	Newspaper	TV	Internet articles
Number	49	59	21	114

* Researched by the Secretariat of the JTSB

* The numbers under the “newspaper” and “TV” are the numbers of reports by major six companies in Tokyo.

7. Accident prevention

To disseminate information on accidents and incidents as described above, the JTSB’s website is presenting them by category, and the JTSB is distributing “JTSB E-Mail Magazines” to those who request them so that as many people as possible will have access to our information. The “Marine Accident Hazard Map” and the “Engine Trouble Search System” can be found on the JTSB website, making it possible to search marine accident/incident investigation reports from maps, engine sections and parts. These are intended to assist navigators to easily obtain information on marine accidents in sea areas where they navigate as well as engine safety information.

In order to clearly explain information we disseminate, we provide outreach lectures by accident investigators. For those who suffered in accidents and their families, we endeavor to explain accident investigation information to them in an easy-to-understand manner (see Chapter 6 for details).

Through these various activities, the JTSB hopes to raise the public’s awareness with regard to transport safety and contribute to the prevention of accidents and the mitigation of accident damage.