# Chapter 2 Aircraft accident and serious incident investigations

## 1 Aircraft accidents and serious incidents to be investigated

**<Aircraft accidents to be investigated>**

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

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

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

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

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

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

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

**<Aircraft serious incidents to be investigated>**

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

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

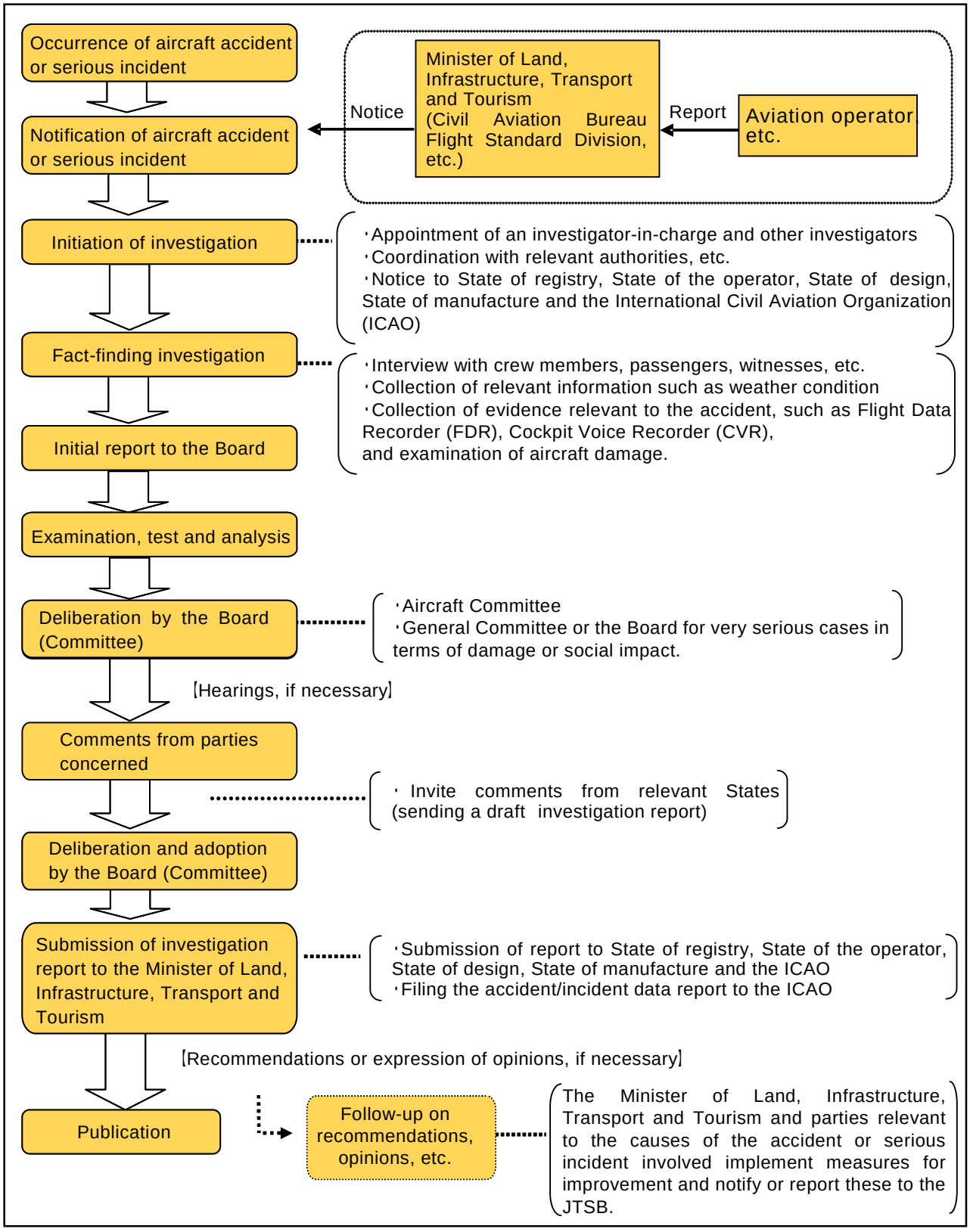
◎ **Article 76-2 of the Civil Aeronautics Act**

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

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

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

## 2 Procedure of aircraft accident/incident investigation



## 3 Statistics of investigations of aircraft accidents and serious incidents

The JTSB carried out investigations of aircraft accidents and serious incidents in 2013 as follows: Twenty-four aircraft accident investigations had been carried over from 2012, and 11 accident investigations newly launched in 2013. Seventeen investigation reports were published in 2013, and thereby 18 accident investigations were carried over to 2014.

Sixteen aircraft serious incident investigations had been carried over from 2012, and 8 serious incident investigations newly launched in 2013. Six investigation reports were published in 2013, and thereby 18 serious incident investigations were carried over to 2014.

Among the 23 reports published in 2013, four were issued with recommendations and three with safety recommendations.



Number of investigations of aircraft accidents and serious incidents in 2013

(Cases)

| Category | Carried over from 2012 | Launched in 2013 | Total | Published investigat-ion reports | (Recom-menda tions) | (Safety recom-mendat ions) | (Opinio-ns) | (Remar-ks) | Carried over to 2014 | (Interim report) |
|---|---|---|---|---|---|---|---|---|---|---|
| Aircraft accident | 24 | 11 | 35 | 17 | (4) | (2) | (0) | (0) | 18 | (0) |
| Aircraft serious incident | 16 | 8 | 24 | 6 | (0) | (1) | (0) | (0) | 18 | (0) |

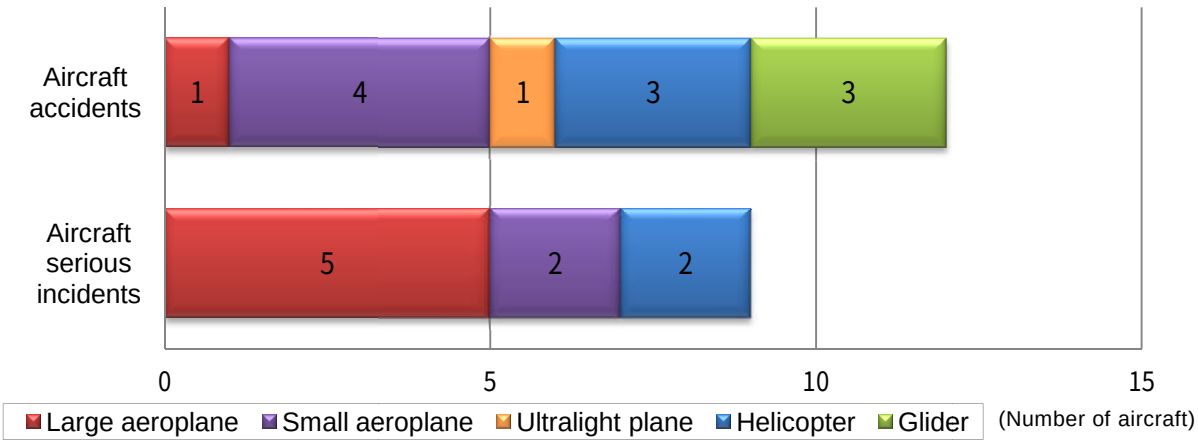
## 4 Statistics of aircraft accident and serious incident investigations launched in 2013

The number of aircraft accident and serious incident investigations launched in 2013 included 11 aircraft accidents, down seven cases from 18 cases for the previous year, and 8 aircraft serious incidents, down two cases from ten cases for the previous year.

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

Note: In aircraft accidents and serious incidents, two or more aircraft are sometimes involved in a single case. See details on Pages 15-19.

Number of investigated aircraft accidents and serious incidents by aircraft category in 2013



In the 11 aircraft accidents, the number of casualties was 16, consisting of two deaths and 14 injured persons.

Statistics of number of casualties (aircraft accident)

(Persons)

| 2013 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Aircraft category | Dead | | Missing | | Injured | | Total |
| | Crew | Passengers and others | Crew | Passengers and others | Crew | Passengers and others | |
| Large aeroplane | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Small aeroplane | 0 | 0 | 0 | 0 | 1 | 7 | 8 |
| Ultralight plane | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| Helicopter | 0 | 0 | 0 | 0 | 2 | 3 | 5 |
| Glider | 1 | 1 | 0 | 0 | 0 | 0 | 2 |
| Total | 1 | 1 | 0 | 0 | 4 | 10 | 16 |
| | 2 | | 0 | | 14 | | |

## 5 Summaries of aircraft accidents and serious incidents which occurred in 2013

The aircraft accidents and serious incidents which occurred in 2013 are summarized as follows: The summaries are based on information available at the start of the investigations and therefore, may change depending on the course of investigations and deliberations.

(Aircraft accidents)

| No. | Date and location | Operator | Aircraft registration number and aircraft type | Summary |
|---|---|---|---|---|
| 1 | March 15, 2013<br>In the mountains on the south side of Mt. Satsunai in Nakasatsunai Village, Kasai-gun, Hokkaido Prefecture | Private | JA2405<br>Hoffman H-3 Dimona<br>(motor glider) | The aircraft took off from Memanbetsu Airport, but it did not arrive there even after the estimated arrival time at Shikabu Airport and went missing. As a result of the following search, part of the aircraft was found crashed near the location refered to the left column.<br>Two people on board sustained fatal injuries. |
| 2 | March 16, 2013<br>Yamamoto-kou 129-1, Asanamihara, Matsuyama City, Ehime Prefecture | Private | JA23TN<br>Robinson R22 Beta<br>(rotorcraft) | The aircraft took off from a temporary helipad in Fukuyama City, Hiroshima Prefecture. It made an emergency landing due to an engine failure near the location refered to the left column, and the aircraft turned to its right side.<br>The pilot sustained injuries. |

| No. | Date and location | Operator | Aircraft registration number and aircraft type | Summary |
|---|---|---|---|---|
| 3 | June 9, 2013<br>Yanagita Town 1405-1, Utsunomiya City, Tochigi Prefecture | Private | JR1003<br>Ultralight Aircraft Challenger II-R503L<br>(ultralight plane) | While flying after taking off from a temporary air field in Utsunomiya City, Tochigi Prefecture, the aircraft hit a power pole near the location refered to the left column and crashed.<br>One pilot sustained injuries. |
| 4 | July 21, 2013<br>Near Tajima Airport | Private | JA4175<br>Gulfstream Aerospace AG-5B<br>(small aeroplane) | While flying after taking off from Fukui Airport, the pilot changed the destination to Tajima Airport due to the fact that he felt that the engine was malfunctioning. During the landing, the aircraft hit the guardrail on the south side of the airport and crashed on the slope.<br>Three passengers sustained injuries. (One was seriously, and two were slightly injured) |
| 5 | August 18, 2013<br>Near Ami Airport in Ami Town, Inashiki-gun, Ibaraki Prefecture | Private | JA4152<br>Beechcraft A36<br>(small aeroplane) | The aircraft took off from Matsumoto Airport and was approaching Ami Airport from the east side. When it performed a go-around due to the fact that its engine thrust went down too much, it crashed on the south side of a runway.<br>The pilot and three passengers sustained injuries. |
| 6 | September 14, 2013<br>At approximately 300m above Menuma Glide Field, Kumagaya City, Saitama Prefecture | Private<br>(Aircraft A) | JA22WP<br>Rolladen-Schneider LS4-b<br>(glider) | Aircraft A that left Menuma Gliding Field Runway 1 in winch tow and Aircraft B that left Menuma Gliding Field Runway 2 in winch tow hit each other in the air. Both aircraft landed in the said gliding field afterwards. |
| | | Private<br>(Aircraft B) | JA22RW<br>Alexander Schleicher ASK21<br>(glider) | |
| 7 | September 16, 2013<br>Nishiyoshino Town Nishino, Gojo City, Nara Prefecture | Nara Disaster Prevention Air Corps | JA20NA<br>Bell 412EP<br>(rotorcraft) | While executing rescue activities with hoist near the location refered to the left column, a rescuee sustained injuries in her left index finger during hoisting. |
| 8 | September 23, 2013<br>Osaki 158, Yachiyo City, Chiba Prefecture | Private | JA3492<br>Fuji Heavy Industries FA-200-160<br>(small aeroplane) | While flying after taking off from Otone Airport, the engine power of the aircraft went down over Yachiyo City, Chiba Prefecture, leading to an emergency landing in the location refered to the left column.<br>One passenger sustained injuries. |
| 9 | October 26, 2013<br>On runway of Matsuyama Airport | Private | JA4159<br>Beechcraft A36<br>(small aeroplane) | The aircraft bounced upon landing in Matsuyama Airport and the nose landing gear sustained substantial damage and the propeller was deformed. Due to this, it became immobile on the runway. |

| No. | Date and location | Operator | Aircraft registration number and aircraft type | Summary |
|---|---|---|---|---|
| 10 | November 29, 2013<br>At approximately 1,100m high approximately 20km northeast of Fukue Airport | ANA WINGS CO.,LTD. | JA462A<br>Bombardier<br>DHC-8-402<br>(large aeroplane) | The aircraft took off from Fukuoka Airport for Fukue Airport. While approaching Fukue Airport, the aircraft was struck by lightning near the location refered to the left column. However, it continued to fly afterwards and arrived at the said airport. |
| 11 | December 31, 2013<br>Above the sea approximately 100m east of the point approximately 880m on the Kouri Bridge in Nago City, Okinawa Prefecture, from Yagaji Island<br>toward Kouri Island | ILAS Air Service Co., Ltd. | JA106Y<br>Robinson R44<br>(rotorcraft) | While the aircraft was flying at low altitude for sightseeing after taking off from a temporary helipad in Nakijin Village in Kunigami-gun, Okinawa Prefecture, part of the aircraft hit the water surface. The aircraft crashed near the location refered to the left column.<br>The pilot and two passengers sustained injuries. |

(Aircraft serious incidents)

| No. | Date and location | Operator | Aircraft registration number and aircraft type | Summary |
|---|---|---|---|---|
| 1 | January 16, 2013<br>At approximately 32,000ft high near Takamatsu Airport | All Nippon Airways | JA804A<br>Boeing 787-8<br>(large aeroplane) | While the aircraft was climbing after taking off from Yamaguchi Ube Airport for Tokyo International Airport, its instruments indicated main battery failure over Shikoku, and a strange odor within the cockpit occurred. Therefore, the aircraft diverted to Takamatsu Airport and landed in the said airport.<br>The aircraft executed emergency evacuation over taxiway T4 of the airport.<br>There were a total of 137 persons on board the aircraft, consisting of the pilot, seven crewmembers and 129 passengers, and three passengers sustained injuries.<br>The main battery of the aircraft sustained substantial damage. |
| 2 | May 6, 2013<br>Above taxiway A4 in Osaka International Airport | J-AIR Corporation | JA206J<br>Bombardier<br>CL-600-2B19<br>(large aeroplane) | After landing on runway A in Osaka International Airport, the instruments of the aircraft indicated that there was a fire in the No.2 (right) engine on taxiway A4. The right engine was shut down while the fire-extinguishing system was activated. Afterwards, the aircraft taxied to the apron. |

| No. | Date and location | Operator | Aircraft registration number and aircraft type | Summary |
|---|---|---|---|---|
| 3 | June 30, 2013<br>Ryugasaki Airfield in Handa Town, Ryugasaki City, Ibaraki Prefecture | Private | JA3919<br>Piper PA-28-161<br>(small aeroplane) | When the aircraft landed at the airport refered to the left column, it overran the runway and stopped on the overrun area (grassy area). |
| 4 | August 5, 2013<br>East end of runway B in Niigata Airport | Korean Airlines Co.、Ltd. | HL7599<br>Boeing 737-900<br>(large aeroplane) | When the aircraft landed on runway 10 in Niigata Airport, it ran off the runway and stopped with the nose landing gear sticking out on the grassy area on the east side of the runway. The 115 passengers and crewmembers did not suffer any injuries. |
| 5 | September 10, 2013<br>Vicinity of approximately 3km west-southwest of runway A in Kansai International Airport and on runway A in Kansai International Airport | All Nippon Airways(Aircraft A)<br>Aero Asahi Corp.<br>(Aircraft B) | JA605A<br>Boeing 767-300<br>(large aeroplane)<br>JA06NR<br>Bell 430<br>(rotorcraft) | Aircraft B entered runway A despite instructions by an air traffic controller to hold short of the runway. Therefore, Aircraft A, which had obtained a landing clearance, performed a go-around on instructions from the air traffic controller. |
| 6 | October 14, 2013<br>In front of Kumamoto Air Rescue Team hangar attached to Kumamoto Airport | Kumamoto Air Rescue Team | JA15KM<br>Aerospatiale AS365N3<br>(rotorcraft) | During a hoist training executing at a height of 60 ft (about 18m) above the location refered to the left column, the aircraft encountered close proximity to another aircraft. Reported distance between two aircraft was 50 ft (about 15 m) horizontally. |
| 7 | November 16, 2013<br>Araya Town Shitakawara, Akita City, Akita Prefecture | Honda Airways Co., Ltd. | JA4000<br>Cessna TU206G<br>(small aeroplane) | While flying after taking off from Honda Airport, the lubricating oil pressure for the engine reduced above the vicinity of Noshiro City. Therefore, the pilot changed the destination to Odate-Noshiro Airport, but the weather was bad. He changed the destination again to Akita Airport and continued to fly, but the engine began to vibrate. The pilot decided to make an emergency landing on a runway of the old Akita Airport refered to the left column. The engine stopped during approach to the old Akita Airport but the aircraft successfully landed. |
| 8 | December 13, 2013<br>Approximately 9,900m high approximately 110km west of Tokyo International Airport | All Nippon Airways | JA701A<br>Boeing 777-200<br>(large aeroplane) | While the aircraft was climbing after taking off from Tokyo International Airport, its instrument showed that No.2 engine thrust declined and that there was an increase in the exhaust gas temperature near the location refered to the left column. The engine was then shut down. The pilot declared an emergency and the |

| No. | Date and location | Operator | Aircraft registration number and aircraft type | Summary |
|---|---|---|---|---|
| | | | | aircraft turned back and landed at the airport. |



## 6 Statistics of published aircraft accident and serious incident investigation reports

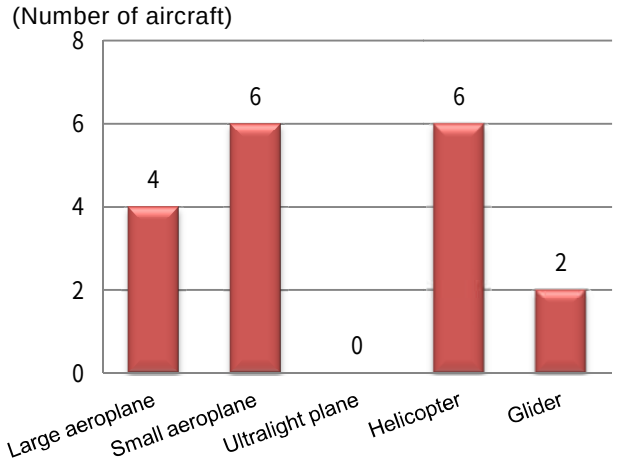
The number of investigation reports of aircraft accidents and serious incidents published in 2013 was 23, consisting of 17 aircraft accidents and six aircraft serious incidents.

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

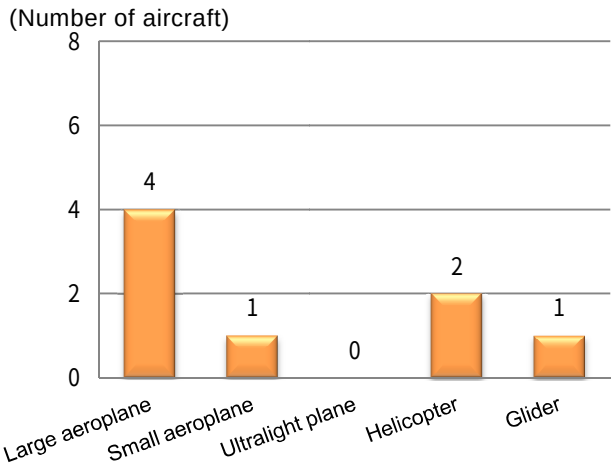
Note: In aircraft accidents and serious incidents, two or more aircraft are sometimes involved in a single case. See details on Pages 20-25.

In the 17 accidents, the number of casualties was 18, consisting of 8 deaths, one missing person and 9 injured persons.

Number of published aircraft accident reports (17 cases) by aircraft category in 2013




Number of published aircraft serious incident reports (six cases) by aircraft category in 2013




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

List of published investigation reports on aircraft accidents (2013)

| No. | Date of publication | Date and location | Operator | Aircraft registration number and aircraft type | Summary |
|---|---|---|---|---|---|
| 1 | January 25, 2013 | September 26, 2010<br>In the mountains near the Kigensugi cedar in Yakushima Town, Kumage-gun, Kagoshima Prefecture | Aero Asahi Corp. | JA9635<br>Aerospatiale AS332L<br>(rotorcraft) | Refer to “7. Summaries of recommendations and opinions” (Page 25-①) |
| 2 | January 25, 2013 | July 24, 2011<br>Inside of Tajima Airport apron | Private | JA4123<br>Socata TB21<br>(small aeroplane) | When the aircraft was taxiing on the apron for flying from Tajima Airfield to Nagoya Airport, its left-hand main landing gear was retracted and the left wing contacted with the ground surface and sustained damage.<br>There were the pilot and one passenger on board the aircraft, but they did not sustain any injuries.<br>The aircraft was damaged; however, no fire broke out. |
| 3 | January 25, 2013 | January 18, 2012<br>At approximately 1,000 ft above sea near Kitakojima Island, Ishigaki City, Okinawa Prefecture | Japan Coast Guard | JA720A<br>Bombardier DHC-8-315<br>(large aeroplane) | The aircraft took off from Naha Airport for Ishigaki Airport for marine patrol flight over the East China Sea. Just after making a left turn near Kitakojima Island, the aircraft had a bird-strike. |
| 4 | January 25, 2013 | February 19, 2012<br>Karifuridake Temporary Helipad, Minami-Furano Town, Sorachi-gun, Hokkaido Prefecture | HELL-SYS Japan, Inc. | JA710H<br>Eurocopter EC120B<br>(rotorcraft) | The aircraft rolled over during takeoff from Karifuridake Temporary Helipad and sustained substantial damage.<br>There was only the pilot on board the aircraft, and the pilot suffered no injury.<br>The aircraft was damaged; however, no fire broke out. |
| 5 | January 25, 2013 | April 28, 2012<br>On Yoshii River adjacent to Oku Gliding Field, Setouchi City, Okayama Prefecture | Private<br>(Aircraft A) | JA21KA<br>Sheibe SF25C<br>(motor glider, two-seater) | Aircraft A with a pilot in the left seat took off from Oku Gliding Field in Setouchi City, Okayama Prefecture, while towing Aircraft B with a trainee pilot on board. But both gliders ditched in Yoshii River adjacent to the gliding field immediately after the takeoff and sustained substantial damage. |
| | | | Private<br>(Aircraft B) | JA2376<br>Shempp-Hirth Discus b<br>(glider, single-seater) | |

| No. | Date of publication | Date and location | Operator | Aircraft registration number and aircraft type | Summary |
|---|---|---|---|---|---|
| 6 | February 22, 2013 | October 3, 2011<br>On runway in Chofu Airport | Kyoritsu Air Survey Co., LTD. | JA3959<br>Cessna TU206G<br>(small aeroplane) | The aircraft took off from Chofu Airfield for aerial photo mission. After the photo mission, its nose gear sustained substantial damage upon landing at Chofu Airfield, veered off the runway and stopped. There were a total of two persons on board the aircraft, consisting of the pilot and the cameraman, but they did not sustain any injuries. The aircraft was damaged; however, no fire broke out. |
| 7 | March 29, 2013 | June 18, 2012<br>At approximately 200 ft, above Ryugasaki Airfield, Ryugasaki City, Ibaraki Prefecture | IBEX Aviation Co., Ltd. | JA4135<br>Cessna 172P<br>(small aeroplane) | When the aircraft was conducting consecutive touch-and-go training on runway of Ryugasaki Airfield with two persons on board, consisting of the instructor and a student pilot, a bird climbed up to the height of the aircraft wing after take off and collided into the front edge of the left main wing. |
| 8 | March 29, 2013 | July 5, 2012<br>At approximately 23,000ft high approximately 150km north of Narita International Airport | United Airlines | N224UA<br>Boeing 777-200<br>(large aeroplane) | When the aircraft was flying toward Narita International Airport after taking off from Incheon International Airport (Republic of Korea), pitch oscillations occurred near the location refered to the left column. One flight attendant was seriously injured, and three other flight attendants suffered slight injuries.<br>There was no damage to the aircraft. |
| 9 | March 29, 2013 | October 16, 2012<br>Above runway at Aguni Airport, Okinawa Prefecture | First Flying Co., Ltd. | JA5324<br>Britten Norman BN-2B-20<br>(small aeroplane) | Immediately after starting to run in preparation for the take off from Aguni Airport for Naha Airport, they noticed a bird-like object approaching from ahead on the right side. When they landed in Naha Airport and parked the aircraft, a mechanic noticed that the the right wing leading edge was deformed (dented).<br>Death or injuries: None. Degree of the aircraft damage: Substantial damage. |
| 10 | April 26, 2013 | March 23, 2009<br>Runway A of Narita International Airport | Federal Express Corporation | N526FE<br>McDonnell MD-11F<br>(large aeroplane) | Refer to “7. Summaries of recommendations and opinions” (Page 29-④) |

| No. | Date of publication | Date and location | Operator | Aircraft registration number and aircraft type | Summary |
|---|---|---|---|---|---|
| 11 | April 26, 2013 | October 3, 2011 Kiyokawa Village, Aiko-gun, Kanagawa Prefecture | Toho Air Service Co., Ltd. | JA508A Eurocopter AS350B3 (rotorcraft) | The aircraft took off from a Karasawa temporary helipad in Kiyokawa Village, Aiko-gun, Kanagawa Prefecture, to transport cargos. During the flight, the aircraft sustained substantial damage and crashed at Choja-Yashiki Campground in the village.<br>There were a total of two persons on board the aircraft, consisting of the pilot and the mechanic. The pilot sustained fatal injuries, and the mechanic was seriously injured.<br>The aircraft was destroyed, and a fire broke out. |
| 12 | June 28, 2013 | September 22, 2011 Hiketa, Higashikagawa City, Kagawa Prefecture | Shikoku Air Service Co., Ltd. | JA6522 Eurocopter AS350B3 (rotorcraft) | Refer to “7. Summaries of recommendations and opinions” (Page 26-②) |
| 13 | June 28, 2013 | June 29, 2012 Nagashima Dam temporary helipad in Kawanehon Town, Haibara-gun, Shizuoka Prefecture | Chubu Regional Bureau, Ministry of Land, Infrastructure, Transport and Tourism (Operated by contracted Nakanihon Air Service Co. ,Ltd.) | JA6817 Bell 412EP (rotorcraft) | When landing on the Nagashima dam temporary helipad, the aircraft made a hard landing. The pilot was seriously injured, and one of the passengers was slightly injured.<br>There were a total of eight persons on board the aircraft, consisting of the pilot and 7 passengers.<br>The aircraft was slightly damaged, but no fire broke out. |
| 14 | August 30, 2013 | November 19, 2012 Shakadake loading/ unloading site in Kitahira, Otsu City, Shiga Prefecture | Nakanihon Air Service Co. Ltd. | JA9965 Aerospatiale AS332L1 (rotorcraft) | When the aircraft was hoisting and transporting a work shed from the location refered to the Mt.Shaka Loading Site in Kitahira, a worker on the ground fell on the valley side and was seriously injured with a broken wrist. |

| No. | Date of publication | Date and location | Operator | Aircraft registration number and aircraft type | Summary |
|---|---|---|---|---|---|
| 15 | September 27, 2013 | February 5, 2012<br>Above Runway 27 of Sendai Airport | Air Nippon Co., Ltd. | JA8384<br>Airbus Industry A320-200<br>(large aeroplane) | After the aircraft performed a go-around over the runway after approaching Runway 27 at Sendai Airport, the aircraft had the lower part of its rear fuselage contacted with the runway. The aircraft sustained substantial damage. There were a total of 166 persons on board the aircraft, consisting of the pilot, five crewmembers, and 160 passengers. They did not sustain any injuries. |
| 16 | October 25, 2013 | July 26, 2011<br>Suruga Bay between Okitsu River mouth in Shimizu District, Shizuoka Prefecture, and off the coast of Fuji River mouth | Private | JA22DB<br>Extra EA300/200<br>(small aeroplane) | Only the pilot boarded the aircraft for flight test before the airworthiness inspection. The aircraft took off from Fujigawa Glider strip, but it did not arrive there even after the estimated arrival time at Fujigawa Glider strip and went missing. As a result of the search, some parts of the aircraft were collected at the location refered to the left column. However, the pilot was not found. |
| 17 | December 20, 2013 | July 28, 2011<br>In Mt. Tsurugi in Memuro, Kasai-gun, Hokkaido Prefecture | Obihiro Branch School of the Civil Aviation College | JA4215<br>Beechcraft A36<br>(small aeroplane) | Refer to “7. Summaries of recommendations and opinions” (Page 28-③) |

List of published investigation reports on aircraft serious incidents (2013)

| No. | Date of publication | Date and location | Operator | Aircraft registration number and aircraft type | Summary |
|---|---|---|---|---|---|
| 1 | February 22, 2013 | June 27, 2011<br>Approximately 6,700ft high approximately 13km southwest of Osaka International Airport | ANA WINGS CO.,LTD. | JA805K<br>Bombardier DHC-8-314<br>(large aeroplane) | While the aircraft was climbing after taking off from Osaka International Airport, a strange noise came from No.1 engine and its engine thrust went down. The engine was then shut down, and the aircraft turned back to Osaka International Airport.<br>In an post-flight engine inspection, they confirmed substantial damage around the entire turbine blade on several stages of the said engine.<br>There were a total of 34 persons on board the aircraft, consisting of the pilot, three crewmembers, and 30 passengers. No one sustained any injuries. |

| | | | | | |
|---|---|---|---|---|---|
| 2 | April 26, 2013 | July 8, 2012<br>On Runway 34 of Fukuoka Airport | Private<br>(Aircraft A) | JA4178<br>Cessna 172RG<br>(small aeroplane) | While Aircraft A was approaching Runway 34 of Fukuoka Airport after receiving a landing clearance from an air traffic controller, Aircraft B, which was scheduled to take off from the said runway, approached the said runway after being instructed to wait on the runway from the air traffic controller. The air traffic controller instructed Aircraft A to perform a go-around.<br>There were a total of three persons on board Aircraft A, consisting of the pilot and two passengers, and there were a total of 75 persons on board Aircraft B, consisting of the pilot, three crewmembers, and 71 passengers. No one sustained any injuries on either of the aircraft, and neither aircraft sustained substantial damage. |
| | | | Japan Air Commuter Co. ,Ltd.<br><br>(Aircraft B) | JA847C<br>Bombardier DHC-8-402<br>(large aeroplane) | |
| 3 | September 27, 2013 | March 28, 2009<br>Approximately 6nm (approximately 11km) above the sea northwest of the Kerama Islands in Okinawa Prefecture | Hirata Gakuen | JA135E<br>Eurocopter EC135T2<br>(rotorcraft) | Refer to “7. Summaries of recommendations and opinions” (Page 32-⑤) |
| 4 | October 25, 2013 | July 8, 2011<br>Approximately 8,500m high approximately 79km northwest of Tokyo International Airport | All Nippon Airways | JA8674<br>Boeing 767-300<br>(large aeroplane) | The aircraft took off from Tokyo International Airport for Toyama Airport, and a strange noise and vibration occurred in No.1 (left) engine near the location refered to the left column. The engine was then shut down, and the aircraft turned back to Tokyo International Airport. |
| 5 | October 25, 2013 | April 7, 2012<br>Fujigawa Gliding Field, Shizuoka City, Shizuoka Prefecture | Fuji Glider Club | JA109B<br>Globe G109B<br>(motor glider/ two-seater) | The aircraft took off from the Fujigawa Glider Strip for the familiarization flight. When it landed on the said gliding field for continuous touch-and-go training, the aircraft veered to the right, went off the runway, and stopped. Although the aircraft sustained minor damage, no one was injured. |

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|---|---|---|---|---|---|
| 6 | December 20, 2013 | October 31, 2012 On runway of Yakushima Airport | Noevir Aviation Co., Ltd. (Aircraft A) | JA35BB Eurocopter AS350B3 (rotorcraft) | Aircraft A approached Runway 32 of Yakushima Airport to take off for a familiarization flight and took off from the said runway before Aircraft B, which had already landed and was taxiing on the runway to vacate the runway. There was one pilot on board Aircraft A, and there were a total of 38 persons on board Aircraft B, consisting of the pilot, three crewmembers, and 34 passengers. No one sustained any injuries on either of the aircraft, and neither aircraft sustained damage. |
| | | | Japan Air Commuter Co., Ltd (Aircraft B) | JA849C Bombardier DHC-8-402 (large aeroplane) | |

## 7 Summaries of recommendations and opinions

Summaries of recommendations and opinions for 2013 are as follows.

① Aircraft accident involving Aerospatiale AS332L (rotorcraft), registered JA9635, operated by Aero Asahi Corporation.

(Recommended on January 25, 2013)

○ Summary of the Accident

On Sunday, September 26, 2010, an Aerospatiale AS332L, registered JA9635, operated by Aero Asahi Corporation, took off for sling load cargo transport from Yakusugi Land temporary helipad located in Yakushima-Town, Kumage-Gun, Kagoshima Prefecture, and crashed into the mountain slope near Kigensugi cedar tree in Yakushima-Town at about 07:50 local time.

Onboard the helicopter were a pilot and a loadmaster, and both of them suffered fatal injuries.

The helicopter was destroyed and consumed by fire.

○ Probable Causes

In this accident, it is probable that the helicopter, while flying in the mountain valley with underslung external cargo, made a left turn to turn back, crashed after nearing the slope with its underslung cargo caught in ground objects during the maneuver. The post-crash fire consumed the helicopter and the pilot and loadmaster suffered fatal injuries.

The following are possible reasons why the helicopter came close to the slope during the left turn, and the underslung cargo came to be caught in ground objects: executable OGE hovering for turn-around was not carried out; en route altitude was well below minimum safe altitude; the climbing was restrained during the left turn as the opening under the cloud base was small; and the

miss judgement on clearance between the cargo and the ground objects.

○ Recommendations to Aero Asahi Corporation.

Review flight operations whether there were non-compliance activities against laws and regulations.

Remind all employees engaged in safety-related works including pilots and mechanics of the importance of observing fundamental safety standards such as minimum safe altitudes.

Review internal emergency communication procedure.



② Aircraft accident involving Eurocopter AS350B3 (rotorcraft), registered JA6522, operated by Shikoku Air Service Co., Ltd.

(Safety recommendation on June 28, 2013)

○ 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.

○ 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, the ignition source could not be identified; 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 the fire spreaded to flammable materials 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 cargo and to preclude the risk of a fire when 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.

○ Recommendations to Shikoku Air Service Co., Ltd.

(1) Embarkation on board

In this accident, it is possible that since measures were not taken to prevent the movement of embarkation in the rear hold using a floor tie-down net, the embarkation moved during the flight, and then damaged the wiring of electrical equipment in the hold, causing a fire.

When having embarkation in the rear hold of Eurocopter AS350B3, the Company should take measures to prevent its movement using a net as provided in the Flight Manual in order to prevent an unforeseen event due to such movement. In addition, when transporting items that fall into the category of explosives and other dangerous goods, the Company should confirm the content of the public notification and comply with the standards specified therein when transporting such items.

(2) Establishment of a system that enables pilots to perform emergency procedures of aircraft without failure

In this accident, when smoke arose in the cabin, the pilot attempted to perform emergency procedures, but could not do so as stipulated in the Flight Manual because he had not enough time to confirm procedures with the emergency procedure checklist inserted into the knee board and because he did not remember necessary emergency procedures.

The Company should establish a system that enables pilots, when operating aircraft, to perform appropriate emergency procedures of aircraft swiftly and reliably in a state of emergency mainly by memorizing those which must be performed immediately.

○ Safety Recommendations to the European Aviation Safety Agency (EASA)

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

In this accident, the wiring connected to the strobe light power supply, installed in the rear hold of the helicopter where a fire occurred, were not protected in a cage or rigid housing.

The airworthiness standards: FAR 27.855(b) stipulates as follows:

*(b) No compartment may contain any controls, wiring, lines, equipment, or accessories whose damage or failure would affect safe operation, unless those items are protected so that:*

*(1) They cannot be damaged by the movement of cargo in the compartment; and*

*(2)Their breakage or failure will not create a fire hazard.*

Therefore, the EASA should make it mandatory to modify the rear hold of the Eurocopter AS 350 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 this accident, when smoke arose in the cabin, the pilot attempted to perform emergency procedures of aircraft, but failed to do so as provided in the Flight Manual because he had not enough time to confirm procedures with the emergency procedures checklist inserted into the knee board and because he did not remember necessary emergency procedures. The Flight Manual did not manifest the emergency procedures that must be dealt with immediately.

Therefore, 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.

③ Aircraft accident involving Beechcraft A36 (small aeroplane), registered JA4215, operated by Obihiro Branch School of the Civil Aviation College

(Recommended on December 20, 2013)

○ 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.

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 hooded student conducting VFR Basic Instrument Flight
training 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 of 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 implemented surely and continuously, including reviewing in timely manner, based on that 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 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.

④ Aircraft accident involving McDonnell Douglas MD-11F (large aeroplane), registered N526FE, operated by Federal Express Corporation

(Safety Recommendation on April 26, 2013)

○ Summary of the Accident

On March 23 (Monday), 2009, about 06:49 local time, a McDonnell Douglas MD-11F, registered N526FE, operated by Federal Express Corporation as the scheduled cargo flight FDX80, bounced repeatedly during landing on Runway 34L at Narita International Airport. During the course of bouncing, its left wing was broken and separated from the fuselage attaching point and the airplane caught fire. The airplane rolled over to the left being engulfed in flames, swerved off the runway to the left and came to rest inverted in a grass area.

The Pilot in Command (PIC) and the First Officer (FO) were on board the airplane, and both of them suffered fatal injuries.

The airplane was destroyed and the post-crash fire consumed most parts.

○ Probable Causes

In this accident, when the airplane landed on Runway 34L at Narita International Airport, it fell into porpoising. It is highly probable that the left wing fractured as the load transferred from the left MLG to the left wing structure on the third touchdown surpassed the design limit (ultimate load).

It is highly probable that a fire broke out as the fuel spillage from the left wing caught fire, and the airplane swerved left off the runway rolling to the left and came to rest inverted on the grass area.

The direct causes which the airplane fell into the porpoise phenomenon are as follows:

(1) Large nose-down elevator input at the first touchdown resulted in a rapid nose -down motion during the first bounce, followed by the second touchdown on the NLG with negative pitch attitude. Then the pitch angle rapidly increased by the ground reaction force, causing the larger second bounce, and

(2) The PF‘s large elevator input in an attempt to control the airplane without thrust during the second bounce.

In addition, the indirect causes are as follows:

(1) Fluctuating airspeed, pitch attitude due to gusty wind resulted in an approach with a large sink rate,

(2) Late flare with large nose-up elevator input resulted in the first bounce and

(3) Large pitch attitude change during the bounce possibly made it difficult for the crewmembers to judge airplane pitch attitude and airplane height relative to the ground (MLG height above the runway).

(4) The PM‘s advice, override and takeover were not conducted adequately.

It is somewhat likely that, if the fuse pin in the MLG support structure had failed and the MLG had been separated in the overload condition in which the vertical load is the primary component, the damage to the fuel tanks would have been reduced to prevent the fire from developing rapidly.

It is probable that the fuse pin did not fail because the failure mode was not assumed under an overload condition in which the vertical load is the primary component due to the interpretation of the requirement at the time of type certification for the MD-11 series airplanes.

○ Safety Recommendations to the Federal Aviation Administration (FAA)

1 Actions to be Taken by the Federal Aviation Administration

(1) Although the MD-11 airplane was certified to the requirement 14 CFR 25.721(a) under the interpretation at the time of certification, its design would not meet the present interpretation of the requirement since the design allows the possibilities of causing severe damage to the airplane structure in the failure mode under an overload condition where the vertical load is the primary component, resulting in the fire due to fuel spillage. As this kind of design should not be certified from now on, the airworthiness regulation rather than the guidance material should be revised to mandate the assumption of the overload condition in which the vertical load is the primary component.

(2) Heat and smoke from the fire reached the cockpit at an early stage after the accident, making it difficult to initiate quick rescue activities from outside. In order to increase the crew survivability, studies about ways to separate the flight crew compartment from heat, smoke and toxic gas should be made, and if there are any effective solutions, the FAA should consider their application to in-service airplanes.

2 Measures to Be Taken to Supervise the Boeing Company as the Airplane Manufacturer

The Federal Aviation Administration require the Boeing Company to study the possibility of design change for the MLG support structure and matters mentioned below in order to prevent the recurrence of similar accidents and minimize damage to be caused by such accidents.

(1) In order to reduce the occurrence of MD-11 series airplanes‘ severe hard landing and bounce in which an overload is transferred to the MLGs and their supporting structure, the Boeing Company should improve the controllability and maneuver characteristics by improving the LSAS functions, reducing the AGS deployment delay time and other possible means.

Possible improvement on LSAS functions may include: a function to limit large nose-down elevator input during touchdown phase, which is a common phenomenon in severe hard landing cases accompanied by structural destruction for MD-11; and a function to assist bounce recovery and go-around in case of bounce.

(2) In order to help pilots to conduct recovery operation from large bounces and judge the necessity of go-around, studies should be made to install a visual display and an aural warning system which show gear touchdown status on MD-11 series airplanes.

⑤ Aircraft serious incident involving Eurocopter EC135T2 (rotorcraft), registered JA135E, operated by Hirata Gakuen

(Safety Recommendation on September 27, 2013)

○ Summary of the Serious Incident

A Eurocopter EC135T2, registration JA135E, operated by an academic corporate body HIRATAGAKUEN, took off from Kumejima Helipad at 10:07 local time on March 28, 2009 for emergency patient transportation. When the helicopter was flying over the sea enroute to Shuri Helipad on the main island of Okinawa, its left engine stopped around 10:20 at about 800 ft (about 240 m) about 6 nm (about 11 km) northwest of the Kerama Islands. It changed the destination to Naha Airport and landed there at 10:46.

There were six persons on board, consisting of the pilot in command (PIC) and a mechanic, a doctor and a nurse as medical personnel, and an emergency patient and an attendant, but no one was injured.

The inside of the left engine of the helicopter was destroyed, but there was no outbreak of fire.

○ Probable Causes

It is very likely that in this serious incident, the clogged injectors located relatively lower part of the left engine combustion chamber caused uneven fuel injection and combustion limited in the upper part, lead to a heat concentration to the Upper Structure resulting in engine interior damage.

Sea salt accumulation on fungicide with increased viscosity by heat probably clogged the fuel nozzles. Improper use of fungicide is probable. The route of the sea salt penetration could not be determined.

○ Safety Recommendations to the European Aviation Safety Agency (EASA)

It is recommended that the European Safety Agency directs Eurocopter and Turbomeca to cooperatively study the helicopter operational environment and the effects of fungicide to inform helicopter customers of the proper dosing instructions and precautions.

Column

## Training after being employed as an aircraft accident investigator

**Aircraft accident investigator**

It has been a year since I was employed as an aircraft accident investigator. Since investigations of aircraft accidents require a broad range of knowledge and a high level of expertise, we continuously undergo various kinds of training.

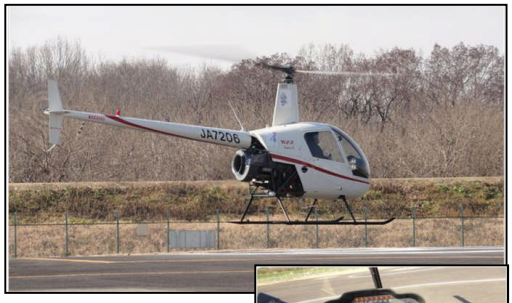
In this column, I would like to introduce how we learn the necessary knowledge as investigators while introducing the training that I have taken before I actually started conducting investigations after being employed as an aircraft accident investigator.

The first training is called the initial training for newly appointed investigators. In this training, we learn a broad range of knowledge and techniques from conventions/laws and regulations involving investigations of aircraft accidents to investigation methods and handling of special investigation equipment in approximately 3 months.

After this, OJT and specialized training start. In OJT, we go to actual accident and serious incident sites and experience the field investigations. In addition, specialized training is determined based on the experience and skills, etc. of each investigator.

In my case, I was involved with operation maintenance work as an aircraft mechanic for an airline before being employed as an investigator. I also have experience operating small aeroplanes in a company as a pilot for a short period. Because of this background, I was assigned to take the simulator training for rotorcraft and twin-engine plane turboprop aircraft, training involving maintenance of rotorcraft, training for rotorcraft operation, etc.

In this column, I would like to introduce the operation training using rotorcraft (helicopter) Robinson R22 among such training.




In fiscal 2013, two investigators with no experience in rotorcraft operations received this training. (They previously served as an aircraft mechanic and an air traffic controller.) This training is aimed at deepening trainees' knowledge about aircraft operations in order to facilitate their jobs as investigators, rather than having them obtain licenses. The training has curriculums which enable participants to not only learn operations but also obtain a broad range of experience in a short period of time.

Training using actual aircraft is simultaneously conducted with classroom training. In the training using actual aircraft, trainees repeatedly undergo the basic air works, the hovering training which can said to be a special skill of helicopters, and consecutive touch-and-go training while flying along a traffic pattern.

Since I had the experience as an airplane pilot in addition to a mechanic, I expected that my flight operation experience would work to a certain degree and have a smooth flight before I started the training. However, this confidence (?) was crushed quickly on the first day. The helicopter shifted to the right and left while suddenly dipping forward and tilting backward. I tried to comfort myself, telling myself that it was because of the wind. However, when I looked around, the smoke was going straight up, and the instructor next to me said that it was the best day to fly because there was no wind. I quickly gave up my status as "someone with the operation experience" on the first day.

Trainees experience operations that respond to emergency situations that are unique to rotorcraft as well as operations using auto rotation with simulating an engine failure as we continue the training.

Although I learned complex structures and flying characteristics through textbooks, I was able to experience the sense of operation that I would never have been able to learn by studying and understanding the theory.

I feel that the fact that I was able to learn many aspects in this rotorcraft operation training from rotorcraft structure to operations and pilot psychology will be extremely effective when I conduct accident and serious incident investigations involving rotorcraft in the future.

## 8 Actions taken in response to recommendations in 2013

Actions taken in response to recommendations were reported with regard to three aircraft accidents and two aircraft serious incidents in 2013. Summaries of these reports are as follows.



① Aircraft accident involving Aerospatiale AS332L, registered JA9635, operated by Aero Asahi Corpration.

(Recommended on January 25, 2013)

As a result of the investigation of an aircraft accident which occurred in the mountains near the Kigensugi cedar in Yakushima Town, Kumage-gun, Kagoshima Prefecture on September 26, 2010, the Japan Transport Safety Board published an investigation report and made recommendations to the Company as one of the parties relevant to the cause of the accident, on January 25, 2013. The Board received the following report (completion report) on the implementation of measures in response to the recommendations.

○ Summary of the Accident, Probable Causes, and Description of the Recommendations

Refer to “7. Summaries of recommendations and opinions” (Page 25-①)

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

1 Conducting the “Review flight operations whether there were non-compliance activities against laws and regulations”

Operation general manager and maintenance general manager reviewed all the works of every unit of Operation/Maintenance of Air Operation Department from the perspective of compliance with laws and regulations.

Based on the result of this review, they took improving measures as necessary.

2 “Remind all employees engaged in safety-related works including pilots and mechanics of the importance of observing fundamental safety standards such as minimum safe altitudes”

Held a safety meeting for all the employees of Air Operation Department.

Thoroughly and continually enforce the significance and importance of observing the fundamental safety standards through Aviation Safety Event, safety education, CRM, etc. in the future.

3 “Review internal emergency communication procedure”

Investigated and considered the current internal emergency communication procedure and implemented the following corrective measures.

① Current situation of the internal emergency communication procedure

As a result of the investigation of the current status, it was confirmed that there existed a few working sites where no on-demand communication was available between heliport and cargo loading/unloading site.

② Review of the communication procedure and consideration of supplemental communication means

As a result of reviewing the communication procedure and considering the supplemental communication means, Aero Asahi Corporation decided to establish the on-demand communication procedures by also asking for the cooperation of ordering agent.

When ordering agents are not able to provide necessary communication equipment, etc., Aero Asahi Corporation loans satellite mobile phones to them.

Aero Asahi Corporation newly purchased 6 sets of satellite mobile phones to be loaned and placed a set at each of their branch offices

③ Clarification of Communication Procedures between Heliport and Cargo Loading/Unloading Site

As a result of considering the clarification of communication procedures between heliport and cargo loading/unloading site, Aero Asahi Corporation decided to take the following measures and notified the concerned personnel of them.

- Make a separate chart of site communication procedures at the site where no emergency communication procedures is mentioned in a construction plan, etc. on work order.
- Add a check item for emergency communication procedures on the pre-work meeting sheet, and confirm it before work by work-crews.
- Added a description on emergency communication procedures in “Study Guide of Cargo Transport” of Aero Asahi Corporation.

* The completion report is posted on the JTSB website:
http://www.mlit.go.jp/jtsb/airkankoku/kankoku2re_130426.pdf

② Aircraft accident involving Eurocopter AS350B3, registered JA6522, operated by Shikoku Air Service Co., Ltd.

(Recommended 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 Japan Transport Safety Board published an investigation report and made recommendations to the Company as one of the parties relevant to the cause of the accident, on June 28, 2013. The Board received the following report (completion report) on the implementation of measures in response to the recommendations.

○ Summary of the Accident, Probable Causes, and Description of the Recommendations

Refer to “7. Summaries of recommendations and opinions” (Page 26-②)

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

1 “Take measures to prevent its movement using a net as provided in the Flight Manual”

Flight division general manager made the following matters more thoroughly known to relevant personnel belonging to the flight division:

- When having embarkation in the rear hold of Eurocopter AS350B3, the Company should take measures to prevent its movement using a net as provided in the Flight Manual
- Pilot is to open the rear hold door and check the net fixation situation before flight

2 "When transporting items that fall into the category of explosives and other goods, the Company should confirm the content of the pronouncement and meet the standards specified therein when transporting such items"

Flight division general manager made the following matters more thoroughly known again to relevant personnel belonging to the flight division:

- Reconfirm the compliance situation of "the pronouncement that laid down standards and other guidelines for transport of explosives and so on by aircraft" (Ministry of Transport Pronouncement No. 572 of November 15, 1983) involving the said explosives, etc. regarding the technical standards
- When transporting explosives and other goods., do so after taking required measures according to the said standards

3 "Shikoku Air Service Co., Ltd. should establish a system that enables pilots, when operating aircraft, to perform appropriate emergency procedures of aircraft swiftly and reliably in a state of emergency mainly by memorizing matters which must be performed immediately"

The board, including the safety general manager, decided on the original measure to confirm the swift and thorough performance of appropriate procedures in case of emergency involving this matter as a review item in the regular review conducted each year.

The operation manager thoroughly instructed this decision to all pilots, and the flight general manager instructed the designated technical review personnel to implement this measure in the regular review.

* The completion report is posted on the JTSB website :
http://www.mlit.go.jp/jtsb/airkankoku/kankoku3re_130925.pdf

③ Aircraft accident involving McDonnell MD-11F, registered N526FE, operated by Federal Express Corporation

(Safety Recommendation on April 26, 2013)

As a result of the investigation of an aircraft accident which occurred on a runway at Narita International Airport on March 23, 2009, the Japan Transport Safety Board published an investigation report and made safety recommendations to the Federal Aviation Administration (FAA), on April 26, 2013. The Board received the following responding report on the actions taken in response to the safety recommendations.

○ Summary of the Accident, Probable Causes, and Description of the Recommendations

Refer to "7. Summaries of recommendations and opinions" (Page 29-④)

○ Actions Taken in Response to the Safety Recommendations

Actions taken by the Federal Aviation Administration

(1) FAA judged that the revision of FAR25.721 (a) and Advisory Circular (AC) issuance ensure that the gear will be appropriately separated on aircraft, which will be designed in the future, under an overload condition in which the vertical load is the primary component. They are scheduled to issue the revisions on December 31, 2014, and the said AC is scheduled to include the statement "Destruction of gears due to overload must be considered based on the assumption that overload can occur in all logical combinations of weight in the vertical direction as well as toward the rear direction."

(2) FAA takes sufficient measures to prevent smoke and gas occurrence in case of a fire as well as their expansion in the current standards. In addition, it is considered that it is not required that these measures fulfill their functions to the extent of a major destruction, such as this accident. Therefore, no additional action is scheduled to be taken regarding this matter.

Actions to be instructed to the Boeing Company, which is the designer/manufacturer of this aircraft

(1) LSAS is a longitudinal stability increasing system, which was developed to provide MD-11 with the same level of operability as DC-10.

FAA thinks that further function change to LSAS may have harmful effects on the Flight Control Computer and the Automatic Flight System, and they are not scheduled to add functions to LSAS.

(2) FAA agrees with the direction of designing and approving of a visual display device that displays bounces. The Boeing Company has launched the development of a system that displays whether or not the aircraft has touched the ground with the target approval date being January, 2014.

* The report (original) from the Federal Aviation Administration is shown on the home page of the Board.

http://www.mlit.go.jp/jtsb/airkankoku/anzenkankoku6re_130925.pdf

④ Aircraft serious incident involving Bombardier DHC-8-402, registered JA847C, operated by Japan Air Commuter Co. Ltd.

(Safety Recommendation on August 27, 2010)

As a result of the investigation of an aircraft serious incident which occurred approximately 6km north-northwest of Tanegashima Airport on March 25, 2009, the Japan Transport Safety Board published an investigation report and made safety recommendations to the Transport Canada Civil Aviation (TCCA), on August 27, 2010. The Board received the following responding report on the actions taken in response to the safety recommendations.



○ Summary of the Serious Incident

On March 25 (Wednesday), 2009, at 9:33 Japan Standard Time (JST: unless otherwise stated, all times are indicated in JST (UTC+9h)), a Bombardier DHC-8-402, registered JA847C, operated by Japan Air Commuter as regularly scheduled Flight 3760, took off from Tanegashima Airport. At about 9:34, while the aircraft was climbing in airspace approximately 6 km north-northwest of Tanegashima Airport bound for Kagoshima Airport, an abnormal noise emanated from the No. 1 engine and instrument indications showed the occurrence of engine failure. The engine was then shut down and the aircraft requested emergency landing clearance from the Kagoshima Radar Approach Control Facility. The aircraft landed at Kagoshima Airport at 10:26.

There were 42 persons on board: the Pilot in Command, the First Officer, two cabin attendants and 38 passengers. No one was injured in the serious incident.

○ Probable Causes

It is highly probable that this serious incident occurred through the following series of events:

While the Aircraft was climbing after takeoff, the RGB helical input gearshaft of the No. 1 engine sustained fatigue fracture and was detached from its position; the fragments of the broken shaft then flew off, damaging the engine case and breaking the blades of the HPT and the blades and vanes of the LPT and PT at the downstream stages, and this resulted in breakdown of the engine.

With regard to the fatigue fracture of the RGB helical input gearshaft, it is considered probable that fatigue cracks had started from the impurity inclusion present in the metal stock of the helical gear developed in the shaft, and after undergoing repetitive application of stress, the shaft was finally fractured.

○ Description of the Safety Recommendations to the Transport Canada Civil Aviation (TCCA)

(1) Considering the detrimental effect on safety brought about by the inclusion of impurities in the RGB helical input gearshaft of the engine involved in this serious incident, P&WC, the manufacturer of the engine, should make company-wide efforts including the management of the metal stock supplier and component manufacturer serving P&WC, towards improved quality control concerning the production of the RGB helical input gear shaft.

(2) P&WC assigned a hazard severity of "Significant – Level 3" to this serious incident by considering only the occurrence of an IFSD as the basis for the risk level determination, but the actual conditions included the loss of all functions of the feathering system for the propeller of the shutdown engine in addition to the engine in IFSD. The risk assessment of this serious incident should not be made only on the engine necessitating an IFSD, but instead the incident must be reassessed from the viewpoint of the safety of the entire aircraft, and safety improvement actions should be taken if the results of the reassessment indicate this to be necessary.

○ Actions Taken in Response to the Safety Recommendations

Actions Taken by the Transport Canada Civil Aviation

(1) As a result of the consideration, they have already reinforced the procurement procedure to minimize the inclusion of impurities. Due to the fact that the Transport Canada Civil Aviation is satisfied with the new procedure, in which the recurrence risk has been reduced, they do not intend to take further measures at this point.

(2)
- The Transport Canada Civil Aviation conducted a review on the impact of failure of the feathering system for the propeller on operation safety based on the risk assessment submitted by the aircraft manufacturer and related information from the propeller manufacturer.
- The propeller of this aircraft includes counterweight. If the hydraulic pressure is reduced to change the pitch, the propeller automatically shifts to a higher pitch direction. The impact of this on the operability of the aircraft is minimal, and the windmill drag is not hazardous.
- In addition, if the feathering system pump fails, although the pitch cannot be changed to the full feathering position, the drag difference is only approximately 0.5% compared to full feathering. The aircraft manufacturer revised the aircraft operation manual and added this entry. In addition, the propeller manufacturer made it known to users that the impact of auxiliary feathering pump failure on safe operation is minimal.
- Since inoperable feathering system is not an unsafe event, they consider that no corrective action is required at this point.

* The report (original) from the Transport Canada Civil Aviation is shown on the home page of the Board.
http://www.mlit.go.jp/jtsb/airkankoku/anzenkankoku4re_130329.pdf

⑤ Aircraft serious incident involving McDonnell Douglas MD-90-30 operated by Japan Airlines International Co., Ltd.

(Safety Recommendation on June 29, 2012)

As a result of the investigation of an aircraft serious incident which occurred approximately 11km west of Sendai Airport on August 15, 2010, the Japan Transport Safety Board published an investigation report and made safety recommendations to the Federal Aviation Administration (FAA), on June 29, 2012. The Board received the following responding report on the actions taken in response to the safety recommendations.



○ Summary of the Serious Incident

On Sunday August 15, 2010, at 16:08 Japan Standard Time (JST: UTC+9hr, unless otherwise stated all times are indicated in JST on a 24-hour clock), a McDonnell Douglas MD-90-30, registered JA002D, operated by Japan Airlines International Co., Ltd. took off from Sendai Airport for Fukuoka Airport as a scheduled flight 3538. Around 16:10, while climbing, it declared a state of emergency upon the activation of the right engine fire warning alarm at about 5,500 ft. The right engine was shut down while the fire-extinguishing system was activated; consequently, the aircraft returned to Sendai Airport and it landed at 16:23. Heat damage inside the cowling of the right engine was confirmed after landing.

There were 111 people on board, consisting of the Pilot in Command (PIC), 4 other crewmembers, and 106 passengers, but no one was injured.

○ Probable Causes

It is probable that this serious incident occurred as follows: The Aircraft No. 4 Bearing Scavenge Tube of the right engine fractured during takeoff, resulted in the Tube breaking loose from the Diffuser Case letting the engine oil blow out through an opening where it broke loose, and subsequently the oil contact with the engine high temperature section developed into an engine fire.

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

○ Description of the Recommendations to the Federal Aviation Administration (FAA)

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

○ Actions Taken in Response to the Safety Recommendations

Actions Taken by the Federal Aviation Administration

The Federal Aviation Administration agreed with the safety recommendations of JTSB and reviewed the data regarding tube fracture. As a result, they decided that it was necessary to make Airworthiness Directives (AD) to mandate the replacement of the interior tubes with new tubes at the time of overhauls and issued the directives.

In addition, the Federal Aviation Administration mandated in the said AD to inspect whether or not the outer tubes are installed appropriately and to replace them if they are not installed appropriately.

The engine manufacturer is currently reviewing the possibility of changing the tube design.

* The report (original) from the Federal Aviation Administration is shown on the home page of the Board.
http://www.mlit.go.jp/jtsb/airkankoku/anzenkankoku5re_130726.pdf

## 9 Information dissemination in the process of investigations in 2013

The JTSB disseminated information on the following two cases (one aircraft accident and one aircraft serious incident) in 2013. The information is summarized below.

① Aircraft serious incident involving a Bombardier CL-600-2B19, registered JA206J, operated by J-Air Co., Ltd.

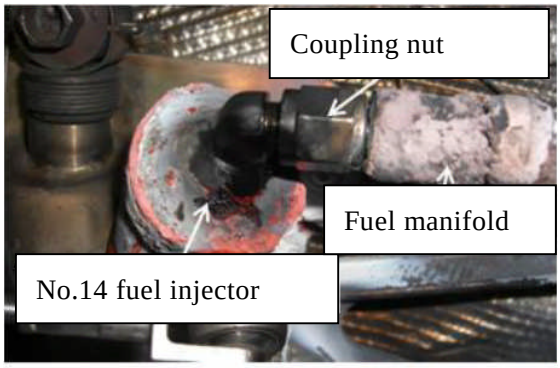
(Disseminated on June 6, 2013)

The JTSB disseminated information regarding the aircraft serious incident (fire within an engine fire-prevention area) involving Bombardier CL-600-2B19, which occurred on May 6, 2013, as follows to the Civil Aviation Bureau, the Ministry of Land, Infrastructure, Transport and Tourism:

(Information dissemination)

As a result of the investigation up until now, the following point has been clarified with regard to the right engine:

Wet motoring check discovered that there was a fuel leak around the coupling nut installed on the fuel manifold used to joint with No.14 fuel injector. On further detailed investigation, it was confirmed that the said coupling nut was loose. When the said coupling nut was tightened according to the specified torque, fuel leak was no longer confirmed.




Nut area where a leak was confirmed

* This information dissemination is shown on the home page of the Board.
http://www.mlit.go.jp/jtsb/iken-teikyo/JA206J20130606.pdf

② Aircraft accident involving a privately owned Fuji Heavy Industries FA-200-160, registered JA3492

(Disseminated on October 29, 2013)

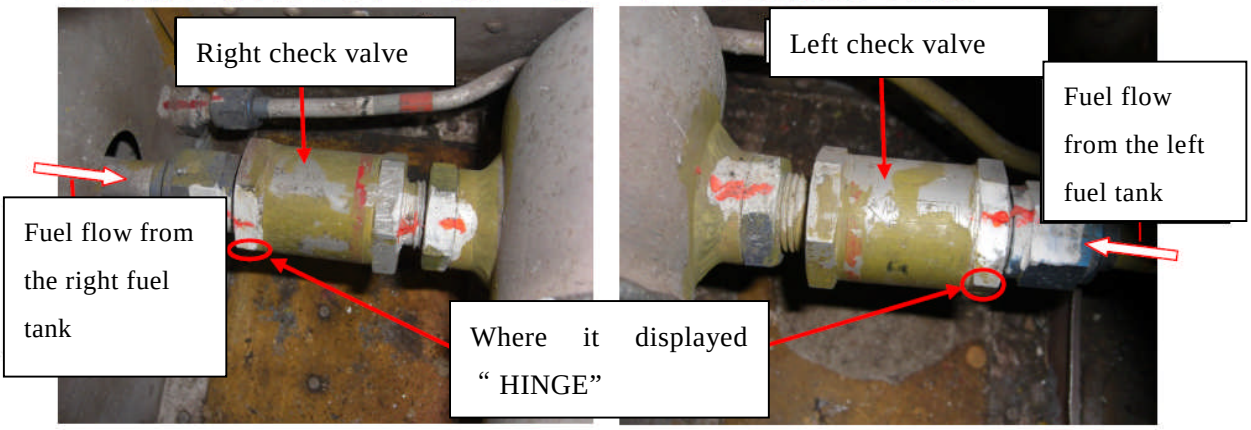
The JTSB disseminated information regarding the aircraft accident involving a privately owned Fuji Heavy Industries FA-200-160, which occurred on September 23, 2013, as follows to the Civil Aviation Bureau, the Ministry of Land, Infrastructure, Transport and Tourism:

(Information dissemination)

As a result of the investigation up until now, the following point has been clarified with regard to part installation:

The service manual of this aircraft states "When installing the check valve at the exit of the fuel injection nozzle in models up to #100, install the valve so that the side which indicates 'HINGE' is installed on top" as a caution. However, the said check valves on the left and right were installed sideways, which were shifted by approximately 90 to 120 degrees from the specified position. Investigation to determine whether or not this matter directly affected this accident is in progress.

- Check valve that was actually installed (photos taken from the front)

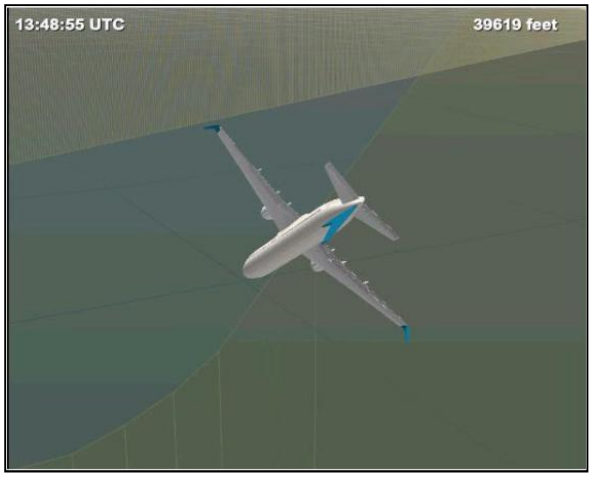



* This information dissemination is shown on the home page of the Board.
http://www.mlit.go.jp/jtsb/iken-teikyo/JA349220131029.pdf

Column

## Accident Investigator Recorder (AIR) Meeting

**Aircraft accident investigator**




I think some of you may have seen the image on the right in a video form on TV news. The video was released to the press by JTSB regarding the incident of the aircraft sudden nosedive occurred over the Pacific on September 6, 2011.

This video was prepared by an aircraft accident investigation charge of analysis in JTSB. In this column, I would like to introduce the “Accident Investigator Recorder (AIR) Meeting”, in which officers in charge of analysis participate every year.

Needless to say, the video that you saw was not prepared with the skills and intuitions of officers in charge of analysis. The video was prepared by using special software based on the data that was recorded/stored in the aircraft. The data was recorded/stored in the flight recorder (generally referred to as “black box”). Flight recorder records the attitude/altitude/speed of the aircraft, pilot operations, conversations inside of the cockpit, etc.

It is the duty of officers in charge of analysis to analyze the course of events before the accident based on these records and communicate the accident occurrence mechanism and the probable causes of the accident to the public as accurately as possible.

In recent years, manufacturers have been developing new types of flight recorders every year. Not only flight recorders but also GPS receivers and smartphones carried by pilots sometimes contain data that would inform us of the course of aircraft involved in the accident with cases of small aeroplanes, etc. Such devices are often collected broken in crash accidents, etc.

Since there are not many accidents that require us to extract data from such devices to analyze, it is sometimes extremely difficult to respond to all of the aspects, extract as much data as possible, and analyze the data accurately with the experience and technologies of one country alone.

The AIR Meeting is held to address such issues. Officers in charge of analysis from all over the world get together, share topics from accident investigations in their countries, introduce the analysis performance of new flight recorders and acquisition of data from broken flight recorders and smartphones, etc. We strive to share information on our experiences and technologies. Furthermore, officers in charge of analysis from all over the world deepen relationships through these meetings, reinforcing the cooperative system.

In 2013, the meeting was held in Braunschweig, Germany. A total of 28 people from accident investigation organizations and aircraft manufacturers, etc. from 15 countries and regions gathered and had educational presentations on data extraction in the semiconductor chip level from a broken flight recorder, etc. We hope to utilize the shared information and human connections to swiftly conduct accurate analysis when similar accidents occur in Japan. The meeting is scheduled to be held in Singapore in 2014.

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

# Crashed in mountains while flying with hoisted external cargo

## Aerospatiale AS332L, registered JA9635, operated by Aero Asahi Corporation

**Summary of the accident:** On Sunday, September 26, 2010, The aircraft took off for sling load cargo transport from Yakusugi Land temporary helipad located in Yakushima-Town, Kumage-Gun, Kagoshima Prefecture, and crashed into the mountain slope near Kigensugi cedar tree in Yakushima-Town at about 07:50 Japan Standard Time. Onboard the helicopter were a pilot and a loadmaster, and both of them suffered fatal injuries. The helicopter was destroyed and consumed by fire.



### Findings

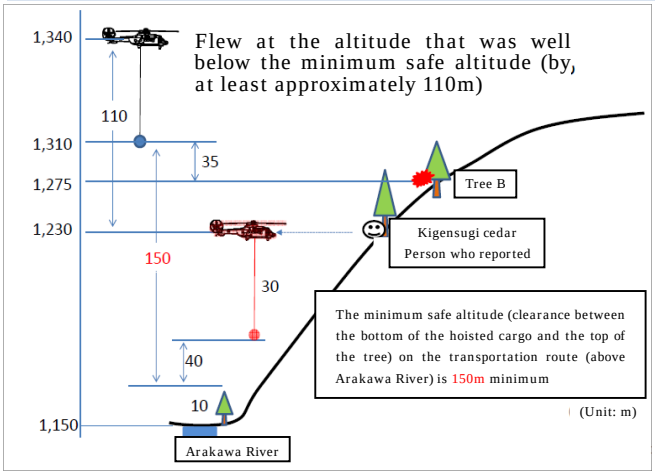
It was possible to change the direction above the Arakawa River if they had carried out OGE hovering (*1), which requires a significant power change, but it is probable that the pilot selected a left turn, which was more easily operated. As a result, the aircraft approached the slope, resulting in the hoisted cargo being caught in ground objects, such as tree B branches or rock A, etc. Below are probable reasons.

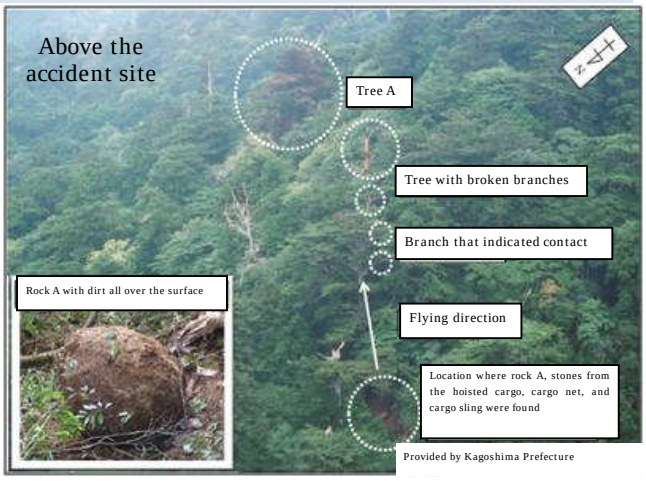
※1 Out of Ground Effect hovering (hovering at an altitude approximately larger than half the length of a main rotor diameter where the ground reaction force created by the main rotor downwash is unavailable)

① It is highly probable that the aircraft was flying at the altitude that was well below the minimum safe altitude on the transportation route for this cargo.

② It is somewhat likely that the pilot restrained the climbing during the turn to avoid the cloud because the opening between the flying altitude and the cloud base was small when they started the left turn, despite the fact that the aircraft at the time of the accident had sufficient climbing capability could avoid collision with ground objects.

③ It is somewhat likely that the pilot misjudged the clearance between the bottom of the hoisted cargo and the top of the tree because it was difficult to watch left downward since the aircraft turned left, whereas the pilot was sitting on the right seat and became the turning was made, an approximately 30m long hoisted cargo.




Probable causes: In this accident, it is probable that the helicopter, while flying in the mountain valley with underslung external cargo, made a left turn to return back, crashed after nearing the slope with its underslung cargo caught in ground objects during the maneuver. The post-crash fire consumed the helicopter and the pilot and loadmaster suffered fatal injuries. The following are possible reasons why the helicopter came close to the slope during the left turn, and the underslung cargo came to be caught in ground objects: executable OGE hovering for turn-back was not carried out; en route altitude was well below Minimum Safety Altitude; the climb rate was restrained during the left turn as the clearance under the cloud base was small; and the miss judgment on clearance between the cargo and the ground objects.

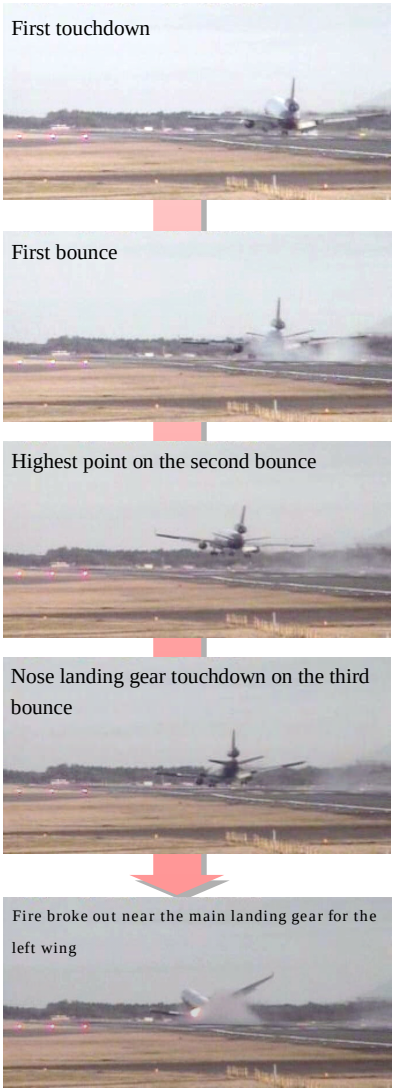
For details, please refer to the investigation report. (Published in Japanese on January 25, 2013)
http://www.mlit.go.jp/jtsb/eng-air_report/JA9635.pdf

# Cargo aircraft repeatedly bounced at the time of landing, and the aircraft sustained substantial damage and had a fire

## McDonnell Douglas MD-11F, registered N526FE, operated by Federal Express Corporation

Summary of the accident: On March 23 (Monday), 2009, about 06:49 Japan Standard, a McDonnell Douglas MD-11F, operated by Federal Express Corporation as the scheduled cargo flight FDX80, bounced repeatedly during landing on Runway 34L at Narita International Airport. During the course of bouncing, its left wing was broken and separated from the fuselage attaching point and the airplane caught fire. The airplane rolled over to the left being engulfed in flames, swerved off the runway to the left and came to rest inverted in a grass area. The Pilot in Command (PIC) and the First Officer (FO) were on board the airplane, and both of them suffered fatal injuries. The airplane was destroyed and the post-crash fire consumed most parts.

There were the pilot and one F/O on board the aircraft, and both suffered fatal injuries.


## Findings

It is highly probable that the aircraft bounced after the touchdown due to the facts that it received strong ground reaction force due to the sink rate (approximately 7 fps) that was greater than usual and that the lift at the time of touchdown was great enough to bounce the aircraft (vertical acceleration rate immediately before the touchdown was approximately 1.24G)

It is somewhat likely that it was difficult for the PF (*1) to understand that the aircraft bounced since the pilot's view continuously approached the ground, due to the fact that the pitch angle for the aircraft reduced as it bounced.

*1 Pilot that is mainly in charge of operations

It is somewhat likely that it was difficult for the PF to accurately determine the pitch angle and altitude during the bounce, resulting in the PF judging that the PF can operate only with the control stick without feeling the necessity of operating the thrust lever.

Probable causes: In this accident, when the airplane landed on Runway 34L at Narita International Airport, it fell into porpoising (*2). It is highly probable that the left wing fractured as the load transferred from the left MLG to the left wing structure on the third touchdown surpassed the design limit (ultimate load). It is highly probable that a fire broke out as the fuel spillage from the left wing caught fire, and the airplane swerved left off the runway rolling to the left and came to rest inverted on the grass area.

*2 A phenomenon in which the airplane repeats bounces with increasing with increasing oscillatory pitch motions.

For details, please refer to the investigation report. (Published in Japanese on April 26, 2013)
http://www.mlit.go.jp/jtsb/eng-air_report/N526FE.pdf

# A fire broke out in the rear hold during a power transmission lines inspection flight, and the aircraft was engulfed in flames after an emergency landing

## Eurocopter AS350B3, registered JA6522, operated by Shikoku Air Service Co., Ltd.

Summary of the accident: On Thursday, September 22, 2011, the aircraft took off from Takamatsu Airport at around 09:23 Japan Standard Time 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.



## Findings

The strobe light power supply (*1) was installed behind the right side of the rear hold, and the input/output wiring extended from the device toward under the floor. However, the wiring was not protected from contacting cargo with rigid housing, etc.

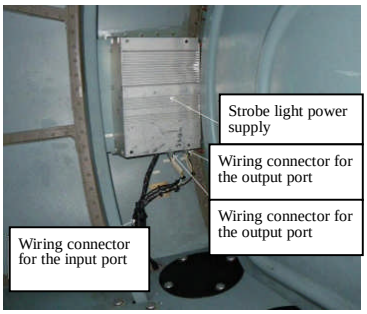
*1 Device that supplies power source to strobe light that is installed on the either side of the horizontal stabilizer to prevent collision

It is highly probable that the wiring was in contact with the cargo when the cargo was moved or stored/removed

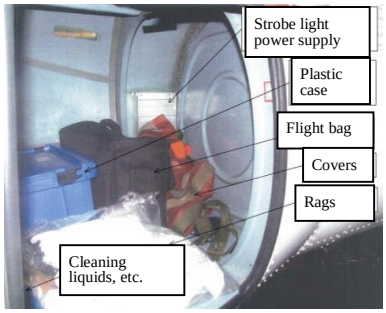
It is somewhat likely that the cargo moved depending on aircraft vibration or acceleration speed. It is also highly probable that the fire spreaded to the cargo after it broke out.

[Situation of the emergency landing]
Flame and grey smoke came from near the rear hold, and the tail boom fell off

[Situation of the strobe light power supply]




[Situation of the embarkation in the rear hold]




### Other safety-related matters that came to light

[Transporting explosives and other dangerous goods]
There were 4 pieces of cargo that fell under to “explosives and other dangerous goods” specified by Article 194 of the Ordinance for Enforcement of the Civil Aeronautics Act in the rear hold. It is probable that one of them was not being transported according to the method specified by the standards.

[Description of emergency procedures in the flight manual]
It is probable that the pilot had not memorized the emergency procedures in case of an uncertain smoke source because he had thought that it would be sufficient to follow procedures as he read the checklist. In addition, the flight manual of the aircraft had not manifested the emergency procedures that must be dealt with immediately by

Probable causes: In this accident, it is highly probable that a fire occurred in the rear hold of the Helicopter. 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.

For details, please refer to the investigation report. (Published in Japanese on June 28, 2013)
http://www.mlit.go.jp/jtsb/eng-air_report/JA6522.pdf

# Aircraft approached clouds covering the mountain and collided into the slope during flight training of a student

Beechcraft A36, registered JA4215, operated by Obihiro Branch School of the Independent Administrative Institution Civil Aviation College

Summary of the accident: On Thursday, July 28, 2011, The aircraft 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. 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.



## Findings

The instructor who was the pilot had conducted the unsafe behavior of illegally entering clouds for training before, but the matter was not comprehended by the organization.

⇩

Approaching clouds under VFR (*1) is a violation

□1 Flight method in which the pilot operates the aircraft while maintaining the senses between ground surface, ground objects, and clouds, etc. by vision

⇩

Approached clouds covering the mountain and collided into the slope during flight training operated by a hooded student under VFR

⇩

It is somewhat likely that the safety management system of the Civil Aviation College was not appropriately functioning and that the working environment/organizational culture allowed unsafe behaviors

※ This accident occurred in the year after aircraft substantial damage accidents in 2 consecutive years
- November 5, 2010 Miyazaki Airport (coming to rest upon landing)
- October 30, 2009 Kagoshima Airport (fuselage landing)

Same model aircraft as the accident aircraft


Training at the time of the accident

* “Hood” here refers to a cover, which is used for instrument flight training, that a trainee wears on his head to only see the instruments and restrict his field of view from outside ground reference

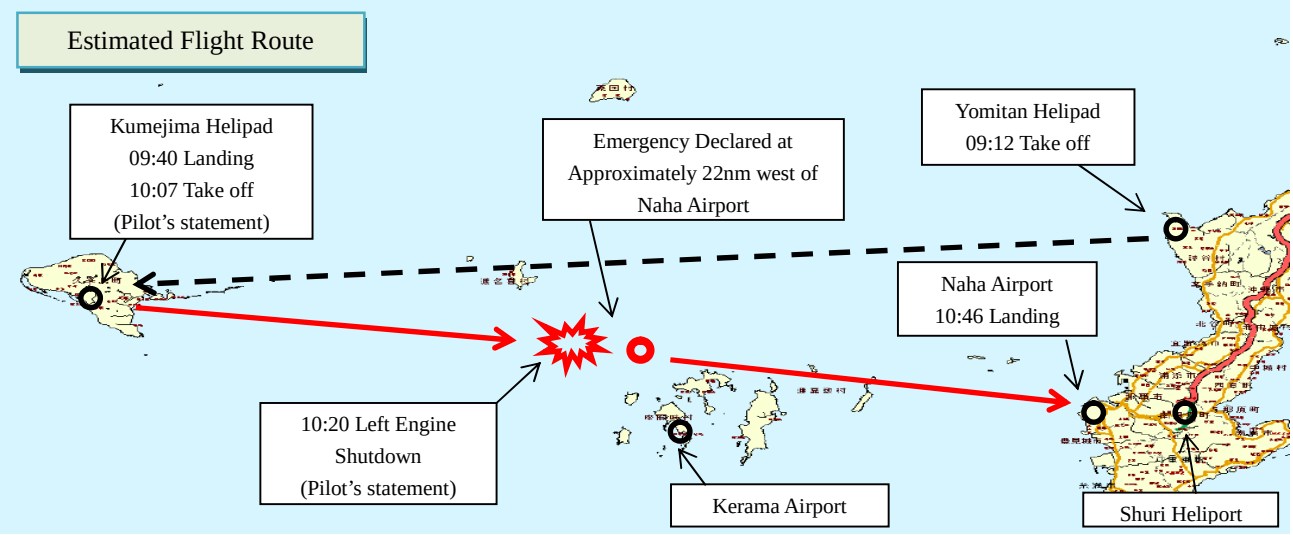
Probable causes: It is highly probable that the accident occurred as follows: The airplane conducting VFR BIF training operated by a hooded student was instructed by his instructor to fly into the mountainous area; It then flew into clouds or close to the clouds that covered the mountains, losing sight 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.

For details, please refer to the investigation report. (Published in Japanese on December 20, 2013)
http://www.mlit.go.jp/jtsb/eng-air_report/JA4215.pdf

# Engine damage while flying over the sea for emergency patient transportation

## Eurocopter EC135T2, registered JA135E, operated by Hirata Gakuen

Summary of the accident: The aircraft took off from Kumejima Helipad at 10:07 Japan Standard Time on March 28, 2009 for emergency patient transportation. When the helicopter was flying over the sea enroute to Shuri Helipad on the main island of Okinawa, its left engine stopped around 10:20 at about 800 ft (about 240 m) about 6 nm (about 11 km) northwest of the Kerama Islands. It changed the destination to Naha Airport and landed there at 10:46. There were six persons on board, consisting of the pilot in command (PIC) and a mechanic, a doctor and a nurse as medical personnel, and an emergency patient and an attendant, but no one was injured. The inside of the left engine of the helicopter was destroyed, but there was no outbreak of fire. .

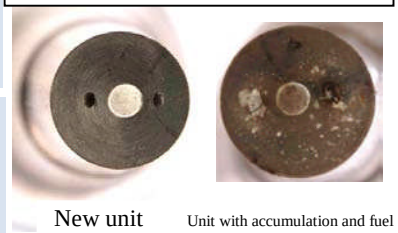



### Findings

Due to the facts that salt ingredient in the accumulation on the fuel filter and injector was consistent with the ingredients of sea salt and that a trace of viscous sulfur was detected, etc., it is probable that the accumulation in the fuel filter is sea salt and that the accumulation in the injector is fungicide and sea salt.

Due to the facts that the fuel filters are filled with fuel from the fuel tank regardless of fuel pump operation and that fuel that has passed the fuel filters is injected by the injector, it is somewhat likely that sea salt that was mixed with the aircraft's fuel tank flowed with the fuel and accumulated in the fuel filters and injectors.

Injectors (2 fuel injection mouths)



New unit

Unit with accumulation and fuel injection mouth clogged

It is probable that the injectors located in the relatively lower part of the combustion chamber clogged because part of the fuel remaining in the fuel line (fuel that was not returned to the fuel tank) flowed into the injectors located in the relatively lower part of the combustion chamber as the air pressure in the combustion chamber decreased, and sea salt accumulated on the fungicide with increased viscosity by heat near the fuel injection mouth.

Probable causes: It is very likely that in this serious incident, the clogged injectors located relatively lower part of the left engine combustion chamber caused uneven fuel injection and combustion limited in the upper part, lead to a heat concentration to the Upper Structure resulting in engine interior damage. Sea salt accumulation on fungicide with increased viscosity by heat probably clogged the fuel nozzles. Improper use of fungicide is probable. The JTSB could not determine the route of the sea salt penetration.

For details, please refer to the investigation report. (Published in Japanese on September 27, 2013)
http://www.mlit.go.jp/jtsb/eng-air_report/JA135E.pdf