Chapter 3 Aircraft accident and serious incident investigations

1 Aircraft accidents and serious incidents to be investigated

<Aircraft accidents to be investigated>

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

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

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

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

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

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

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

<Aircraft serious incidents to be investigated>

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

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

◎Article 76-2 of the Civil Aeronautics Act

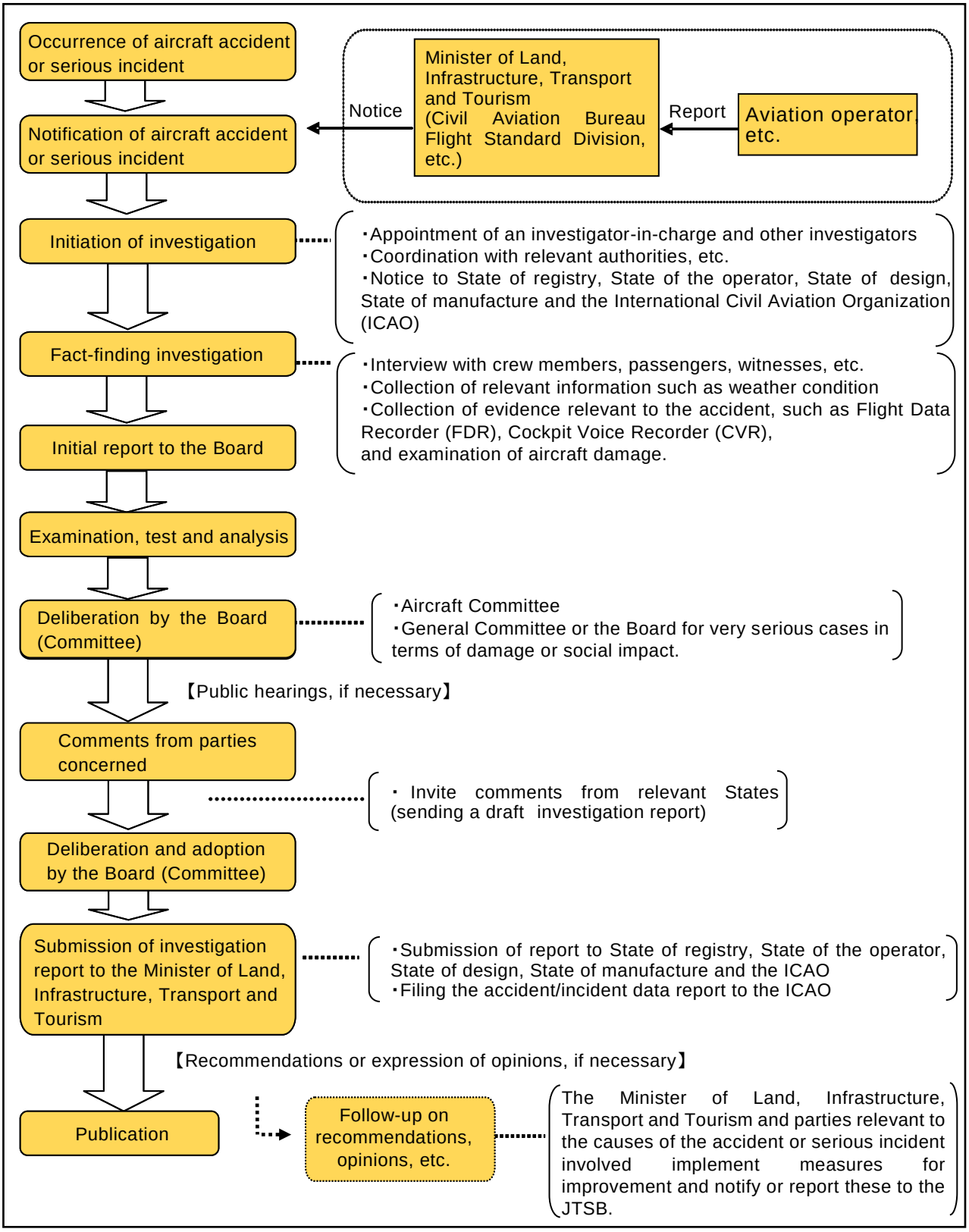
・When the pilot in command has recognized during flight that there was a danger of collision or contact with any other aircraft.

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

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

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

2 Procedure of aircraft accident/incident investigation



3 Statistics of investigations of aircraft accidents and serious incidents

The JTSB carried out investigations of aircraft accidents and serious incidents in 2015 as follows: 22 aircraft accident investigations had been carried over from 2014, and 27 accident investigations newly launched in 2015. 18 investigation reports were published in 2015, and thereby 31 accident investigations were carried over to 2016.

14 aircraft serious incident investigations had been carried over from 2014, and nine serious incident investigations newly launched in 2015. 11 investigation reports were published in 2015, and thereby 12 serious incident investigations were carried over to 2016.

Among the 29 reports published in 2015, one was issued with recommendations.

Investigations of aircraft accidents and incidents in 2015

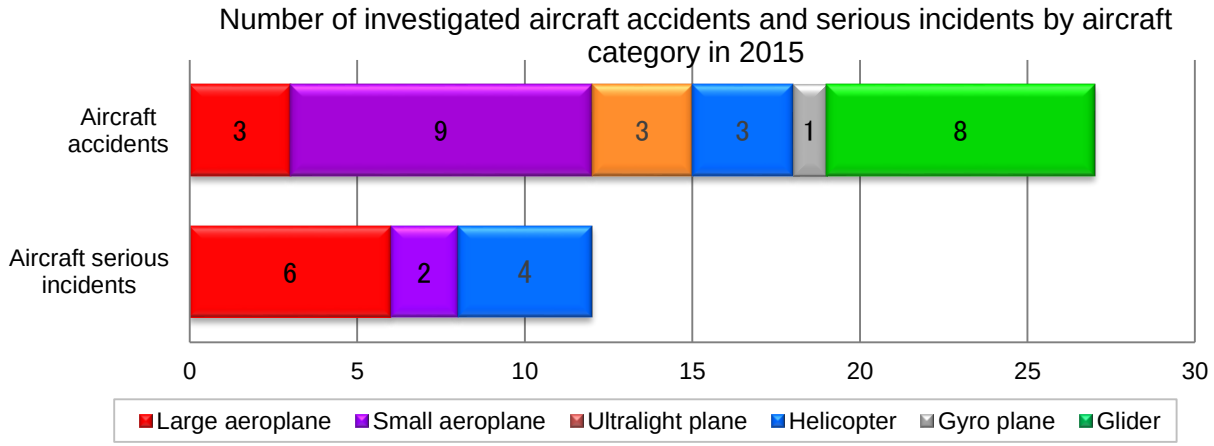
(Cases)

Category	Carried over from 2014	Launched in 2015	Total	Published investigation reports	(Recommendations)	(Safety recommendations)	(Opinions)	Carried over to 2016	(Interim report)
Aircraft accident	22	27	49	18	(0)	(0)	(0)	31	(0)
Aircraft serious incident	14	9	23	11	(1)	(0)	(0)	12	(0)

4 Statistics of aircraft accident and serious incident investigations launched in 2015

The number of aircraft accident and serious incident investigations launched in 2015 included 27 aircraft accidents, up 10 cases from 17 cases for the previous year, and nine aircraft serious incidents, up five cases from four cases for the previous year.

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



* Large aeroplane refers to an aircraft of a maximum take-off mass of over 5,700 kg.
* Small aeroplane refers to an aircraft of a maximum take-off mass of under 5,700 kg except for Ultralight plane.

In the 27 aircraft accidents, the number of casualties was 52, consisting of 10 deaths and 42 injured persons.

Statistics of number of casualties (aircraft accident)

(Persons)

2015							
Aircraft category	Dead		Missing		Injured		Total
	Crew	Passengers and others	Crew	Passengers and others	Crew	Passengers and others	
Large aeroplane	0	0	0	0	2	25	27
Small aeroplane	1	2	0	0	1	8	12
Ultralight plane	1	1	0	0	1	0	3
Helicopter	2	2	0	0	0	1	5
Glider	1	0	0	0	3	1	5
Total	5	5	0	0	7	35	52
	10		0		42		

5 Summaries of aircraft accidents and serious incidents which occurred in 2015

The aircraft accidents and serious incidents which occurred in 2015 are summarized as follows: The summaries are based on information available at the start of the investigations and therefore, may change depending on the course of investigations and deliberations.

(Aircraft accidents)

1	Date and location of accident	Operator	Aircraft registration number and aircraft type
	February 27, 2015 YOMIURI KAZO GLIDING FIELD, SHINKAWA-DORI, KAZO CITY, SAITAMA PREFECTURE, JAPAN	Private	SCHEMPP-HIRTH DISCUS b (GLIDER), JA2531
	Summary	The aircraft took off from Yomiuri Kazo Glider Field for a familiarization flight, and when landing on the same glider field, it made a hard landing and was damaged. A pilot was on board the aircraft, but no one sustained injuries.	

2	Date and location of accident	Operator	Aircraft registration number and aircraft type
	March 6, 2015 KIHOKU TOWN, KITAMURO GUN, MIE PREFECTURE, JAPAN	SHIN NIHON HELICOPTER CO., LTD.	AEROSPATIALE AS332L1 (ROTORCRAFT), JA6741
	Summary	After transportation of cargo suspending outside of the aircraft, when leaving and climbing from hovering at the loading site of forward base for fuel supply in Kii-Nagashima temporary helipad around 10:51 Japan Standard Time (JST: UTC +9 hours, all times are indicated in JST on a 24-hour clock), the helicopter collided with power transmission lines and crashed into the inclined surface of mountains. A captain and an on-board mechanic were on board and both of them were fatally injured. The Helicopter was destroyed and a fire broke out.	

3	Date and location of accident	Operator	Aircraft registration number and aircraft type

	March 13, 2015 AT AN ALTITUDE OF APPROXIMATELY 2,000 m NEAR NIIGATA AIRPORT, NIIGATA PREFECTURE	CIVIL AVIATION BUREAU OF THE MINISTRY OF LAND, INFRASTRUCTURE, TRANSPORT AND TOURISM	GULFSTREAM AEROSPACE G-IV (LARGE AEROPLANE), JA001G
	Summary	During the flight after taking off from Obihiro Airport, the aircraft was struck by lightning near the location referred to above. After this, the flight was continued and the aircraft landed at Tokyo International Airport.	
4	Date and location of accident	Operator	Aircraft registration number and aircraft type
	April 14, 2015 HIROSHIMA AIRPORT, HIROSHIMA PREFECTURE	ASIANA AIRLINES, INC.	AIRBUS A320-200 (LARGE AEROPLANE), HL7762
	Summary	When landing at Hiroshima Airport, the aircraft veered off the runway and stopped in a grass field on the south side of the runway. 25 passengers and two cabin attendants sustained injuries.	
5	Date and location of accident	Operator	Aircraft registration number and aircraft type
	APRIL 26, 2015 ON THE RUNWAY OF NIRASAKI CITY, YAMANASHI PREFECTURE NIRASAKI GLIDING FIELD	Private	SCHEIBE SF34B (GLIDER), JA2446
	Summary	The aircraft took off from Nirasaki Gliding Field, and when landing on the same gliding field, its left wing tip came into contact with the ground, causing the aircraft to spin around and came to a stop. Two persons on board sustained injuries.	
6	Date and location of accident	Operator	Aircraft registration number and aircraft type
	APRIL 26, 2015 KAGOSHIMA AIRPORT, KAGOSHIMA PREFECTURE	Private	CESSNA 172RG, (SMALL AEROPLANE), JA3857
	Summary	The aircraft took off from Iwami Airport for a familiarization flight, and when landing at Kagoshima Airport, it made a belly landing and was damaged.	
7	Date and location of accident	Operator	Aircraft registration number and aircraft type
	MAY 1, 2015 NYUKAWA-CHO, TAKAYAMA CITY, GIFU PREFECTURE, JAPAN	Private	GROB MODEL GROB G109B (MOTOR GLIDER), JA2569
	Summary	A pilot and one passenger were on board the aircraft, which took off from Hida Air Park in Takayama City for a leisure flight. When it neared Mount Norikura, the aircraft collided with a slope of the mountain ahead of it and was damaged.	
8	Date and location of accident	Operator	Aircraft registration number and aircraft type
	MAY 17, 2015 AT FUKUSHIMA SKY PARK, FUKUSHIMA CITY, FUKUSHIMA PREFECTURE	Private	HOFFMANN H-36 DIMONA (MOTOR GLIDER), JA2406
	Summary	The aircraft took off from Fukushima Sky Park for flight training, and when performing a landing roll on the runway of Fukushima Sky park, it veered off the runway into a ditch where the bolts on the belts mounting the main landing gear were ruptured, causing the aircraft to be damaged from the fairing of the main wheel. A pilot and one passenger were on board the aircraft, but no one sustained injuries. The aircraft sustained substantial damage, but there was no outbreak of fire.	
9	Date and location of accident	Operator	Aircraft registration number and aircraft type

	May 23, 2015 AT AN ALTITUDE OF APPROXIMATELY 120 m AT THE TONE RIVER BED, KASHIWA CITY, CHIBA PREFECTURE	Private	MAXAIR DRIFTER XP-R503 VERT L (ULTRALIGHT PLANE), JR0552
	Summary	During the flight after taking off from the Tone River bed temporary airfield in Moriya City, Ibaraki Prefecture, the aircraft's engine stopped at an altitude of roughly 120 m, and it made a forced landing in a thicket in the nearby Tone River bed in Kashiwa City.	
10	Date and location of accident	Operator	Aircraft registration number and aircraft type
	May 30, 2015 KIRIGAMINE GLIDING FIELD, SUWA CITY, NAGANO PREFECTURE	Private	SCHEMPP-HIRTH DUO DISCUS (GLIDER), JA07KD
	Summary	After the aircraft launched from Kirigamine Gliding Field with winch towing, its tow line was cut at an altitude near 60 m, and although it attempted to return, it crashed and was destroyed. Two people sustained injuries.	
11	Date and location of accident	Operator	Aircraft registration number and aircraft type
	MAY 30, 2015 NEAR OSATSUNAI, URAUSU TOWN, KABATO DISTRICT, HOKKAIDO, JAPAN	Private	SCHEMPP-HIRTH DISCUS bT (MOTOR GLIDER), JA20TD
	Summary	After the aircraft took off from Takikawa Sky Park, there was no subsequent contact from it and so a call was made to it by radio, but there was no reply and contact could not be established. After this, a search found the aircraft in a destroyed condition in the location referred to above. One person on board suffered fatal injuries.	
12	Date and location of accident	Operator	Aircraft registration number and aircraft type
	May 30, 2015 SENDAI AIRPORT, MIYAGI PREFECTURE	JAPAN COAST GUARD	BOMBARDIER DHC-8-315 (LARGE AEROPLANE), JA727B
	Summary	When landing at Sendai Airport, the touchdown of the aircraft was slightly strong, and the external skins on both sides in the front of the fuselage were damaged.	
13	Date and location of accident	Operator	Aircraft registration number and aircraft type
	June 7, 2015 GREEN-PIA MIKI, MAKIYAMA, HOSOKAWA TOWN, TARUHO, MIKI CITY, HYOGO PREFECTURE	Private	SCHWEIZER 269C－1 (ROTORCRAFT), JA7926
	Summary	The aircraft took off from Maishima Heliport and landed at the location referred to above for passengers to get on and off. After other passengers had been boarded, the attitude of the aircraft became unstable while hovering and the aft fuselage area came into contact with the ground, causing it to roll over and be destroyed. A passenger sustained injuries.	
14	Date and location of accident	Operator	Aircraft registration number and aircraft type
	June 10, 2015 NEAR THE WESTERN END OF THE RUNWAY OF KONAN AIRPORT, OKAYAMA PREFECTURE	Private	CESSNA 525A (SMALL AEROPLANE), JA021R
	Summary	The aircraft took off from Tokyo International Airport, and when landing at Konan Airport, it overran the runway, coming to a stop in a pond near the western end of the runway.	
15	Date and location of accident	Operator	Aircraft registration number and aircraft type
	June 16, 2015 NEAR KUGEBASHI TEMPORARY AIRFIELD, KUMAGAYA CITY, SAITAMA PREFECTURE	Private	ASC TWINSTAR - R503 (ULTRALIGHT PLANE), JR7403
	Summary	Immediately after taking off from Kugebashi temporary airfield for flight training, the aircraft crashed into the Arakawa River bed and was damaged. One person sustained serious injuries.	
16	Date and location of accident	Operator	Aircraft registration number and aircraft type
	JULY 20, 2015 BETSUKAI FLIGHT PARK, BETSUKAI TOWN, NOTSUKE-GUN, HOKKAIDO	Private	CESSNA 172P (small aeroplane), JA4005

	Summary	Immediately after taking off from Betsukai Flight Park temporary airfield for a leisure flight, the aircraft crashed and was damaged. Three persons suffered serious injuries, while one person sustained minor injuries. A fire broke out after the aircraft crashed. 	
17	Date and location of accident	Operator	Aircraft registration number and aircraft type
	July 26, 2015 1-24 FUJIMI TOWN, CHOFU CITY, TOKYO	Private	PIPER PA-46-350P (SMALL AEROPLANE), JA4060
	Summary	The aircraft took off heading south from the runway of Chofu Airfield with a pilot and four passengers on board, but crashed in a residential area near the location referred to above and caught fire. The pilot, one passenger, and one resident suffered fatal injuries, and three passengers and two residents sustained injuries. The aircraft was destroyed. 	
18	Date and location of accident	Operator	Aircraft registration number and aircraft type
	AUGUST 15, 2015 IN KANGORI GOLF COURSE (TSUKUBANE COUNTRY CLUB), TSUKUBA CITY, IBARAKI PREFECTURE	Private	ISHIJIMA MCR-01 (ultralight plane), JX0145
	Summary	The aircraft took off from Chikusei City, Ibaraki Prefecture (Akeno Sky Sport Club temporary airfield) but crashed at the golf course referred to above. Two persons on board suffered fatal injuries.	
19	Date and location of accident	Operator	Aircraft registration number and aircraft type
	August 19, 2015 ON THE RUNWAY OF SAPPORO AIRFIELD, SAPPORO CITY, HOKKAIDO	Private	PIPER PA-28R-201 (SMALL AEROPLANE), JA4193
	Summary	The aircraft took off from Sapporo Airfield, and when landing on the same airfield, it made a belly landing and was damaged.	
20	Date and location of accident	Operator	Aircraft registration number and aircraft type
	August 25, 2015 BIEI GLIDING FIELD, BIEI TOWN, KAMIKAWA DISTRICT, HOKKAIDO	Private	DIAMOND AIRCRAFT HK36TTC (MOTOR GLIDER), JA21DA
	Summary	The aircraft took off from Biei Gliding Field and landed at the same field, but it veered off the runway to the right, coming to a stop in a grass field outside of the runway. At this time, the aft fuselage broke off and the propeller and other areas were damaged.	
21	Date and location of accident	Operator	Aircraft registration number and aircraft type
	August 28, 2015 AGUNI AIRPORT, OKINAWA PREFECTURE	FIRST FLYING CO., LTD.	VIKING DHC-6-400 (SMALL AEROPLANE), JA201D
	Summary	The aircraft took off from Naha Airport and landed at Aguni Airport, but veered off the runway and came to a stop past a fence outside of the runway.	
22	Date and location of accident	Operator	Aircraft registration number and aircraft type
	September 9, 2015 KITAMI DISTRICT TEMPORARY OPERATION SITE (FOR AGRICULTURAL USE), KITAMI CITY, HOKKAIDO	Private	HOFFMAN H-36 DIMONA (MOTOR GLIDER), JA2528
	Summary	The aircraft took off from the Kitami District Temporary Operation Site (for Agricultural Use) and landed at the same field, but veered off the runway to the right, coming to a stop on a slope to the side of the field.	
23	Date and location of accident	Operator	Aircraft registration number and aircraft type
	September 22, 2015 HONDA AIRPORT, OKEGAWA CITY, SAITAMA PREFECTURE	HONDA AIRWAYS CO., LTD.	CESSNA 172S (SMALL AEROPLANE), JA31HA
	Summary	When landing at Honda Airport, the touchdown of the aircraft was slightly strong and the tail of the fuselage came into contact with the runway, so it performed a go-around and then landed at the same airport.	

24	Date and location of accident	Operator	Aircraft registration number and aircraft type
	October 13, 2015 IN ASO DUDE RANCH, YAMADA, ASO CITY, KUMAMOTO PREFECTURE	Private	AIR COMMAND ELITE R582 (GYROPLANE), JE0146
	Summary	During the flight after taking off from a temporary landing field in Aso City, the aircraft crashed in a grassy area near the location referred to above.	
25	Date and location of accident	Operator	Aircraft registration number and aircraft type
	November 16, 2015 ON RUNWAY A OF SENDAI AIRPORT, MIYAGI PREFECTURE	Private	BEECHCRAFT A36 (SMALL AEROPLANE), JA3762
	Summary	The aircraft took off from Sendai Airport and when landing at the same airport, it made a belly landing and was damaged.	
26	Date and location of accident	Operator	Aircraft registration number and aircraft type
	November 22, 2015 MATSUIDA TOWN, ANNAKA CITY, GUNMA PREFECTURE	Private	ROBINSON R22BETA (ROTORCRAFT), JA7963
	Summary	The aircraft took off from Tokyo Heliport and crashed in Matsuida Town, Annaka City, Gunma Prefecture. Two persons suffered fatal injuries.	
27	Date and location of accident	Operator	Aircraft registration number and aircraft type
	December 20, 2015 TEMPORARY LANDING FIELD IN SHIZUOKA CITY, SHIZUOKA PREFECTURE (FUJIKAWA GLIDING FIELD)	Private	PIPER PA-18-150 (SMALL AEROPLANE), JA4048
	Summary	The aircraft took off from a temporary landing field in Shizuoka City (Fujikawa Gliding Field), and when landing at the same landing field, it veered off the runway, overturning and coming to a stop in a grassy area on the western side of the runway	

(Aircraft serious incidents)

1	Date and location of accident	Operator	Aircraft registration number and aircraft type
	April 5, 2015 TOKUSHIMA AIRPORT, TOKUSHIMA PREFECTURE	JAPAN AIRLINES CO., LTD.	BOEING 767-300 (LARGE AEROPLANE), JA8299
	Summary	The aircraft took off from Tokyo International Airport, and when making a landing approach at Tokushima Airport, it confirmed a work vehicle on the runway and performed a go-around. After this, it landed properly at Tokushima Airport.	
2	Date and location of accident	Operator	Aircraft registration number and aircraft type
	June 3, 2015 ON THE RUNWAY OF NAHA AIRPORT, OKINAWA PREFECTURE	JAPAN TRANSOCEAN AIR CO., LTD. (AIRCRAFT A)	BOEING 737-400 (LARGE AEROPLANE), JA8938
		ALL NIPPON AIRWAYS CO., LTD. (AIRCRAFT B)	BOEING 737-800 (LARGE AEROPLANE), JA80AN
		JAPAN AIR SELF-DEFENSE FORCE (AIRCRAFT C)	CH47 (ROTORCRAFT), 57-4493
	Summary	When Aircraft B was making a takeoff run on Runway 18 of Naha Airport, Aircraft C crossed in front of it without instructions from the air traffic controller, so Aircraft B aborted its takeoff. At this time, the air traffic controller instructed Aircraft A, which was on approach, to redo its landing, but Aircraft A landed before Aircraft B withdrew from the runway.	
3	Date and location of accident	Operator	Aircraft registration number and aircraft type
	June 30, 2015 AT AN ALTITUDE OF APPROXIMATELY 11,000 m, APPROXIMATELY 55 km EAST-NORTHEAST OF TANEGASHIMA AIRPORT, KAGOSHIMA PREFECTURE	JAPAN TRANSOCEAN AIR CO., LTD.	BOEING 737-400 (LARGE AEROPLANE), JA8525

	Summary	During the flight after taking off from Naha Airport, a malfunction occurred in the aircraft's air bleed system (system for sending air into the interior of the aircraft from the engine) near the area referred to above. Since this caused a drop in the internal air pressure of the aircraft, the aircraft declared an emergency and descended to an altitude of approximately 3,000 m. After this, the emergency was cancelled and the flight continued, landing at Kansai International Airport.	
4	Date and location of accident	Operator	Aircraft registration number and aircraft type
	July 7, 2015 AT AN ALTITUDE OF APPROXIMATELY 10,000 m, APPROXIMATELY 60 km SOUTHWEST OF AKITA AIRPORT, AKITA PREFECTURE	FUJI DREAM AIRLINES CO., LTD.	EMBRAER ERJ170-200STD (LARGE AEROPLANE), JA06FJ
	Summary	During the flight after taking off from New Chitose Airport, a malfunction occurred in the aircraft's air bleed system near the area referred to above. Since this caused a drop in the internal air pressure of the aircraft, the aircraft declared an emergency and descended to an altitude of approximately 3,000 m. It diverted to Niigata Airport and landed there.	
5	Date and location of accident	Operator	Aircraft registration number and aircraft type
	July 22, 2015 AT AN ALTITUDE OF APPROXIMATELY 90 m, IN THE AREA OF IWAKIFUKUNOMATA, YURIHONJO CITY, AKITA PREFECTURE	TOHOKU AIR SERVICE, INC.	AEROSPATIALE AS332L1 (ROTORCRAFT), JA6777
	Summary	The aircraft took off from a temporary landing field in the area of Iwakifukunomata, Yurihonjo City, with cargo (a work shed) suspended outside of the aircraft from the cargo suspension area, and during the flight toward the unloading area, part of the cargo (3 aluminum doors, approximately 180 cm x 90 cm and approximately 5 kg) dropped near the location referred to above.	
6	Date and location of accident	Operator	Aircraft registration number and aircraft type
	October 2, 2015 AT AN ALTITUDE OF APPROXIMATELY 240 m, NEAR HASHIDATE, ITOIGAWA CITY, NIIGATA PREFECTURE	AERO ASAHI CORPORATION	AEROSPATIALE AS332L1 (ROTORCRAFT), JA9678
	Summary	The aircraft took off from a temporary landing field in Itoigawa City, and during the flight toward the same landing field after transporting ready-mixed concrete to a work site in the same city, an empty bucket (approximately 1.4 m in height x 1.6 m in diameter, and approximately 210 kg in weight) dropped near the location referred to above.	
7	Date and location of accident	Operator	Aircraft registration number and aircraft type
	October 8, 2015 AT AN ALTITUDE OF APPROXIMATELY 170 m, NEAR TAKAHAMA TOWN, OI DISTRICT, FUKUI PREFECTURE	NAKANIHON AIR SERVICE CO., LTD.	AEROSPATIALE AS332L (ROTORCRAFT), JA9660
	Summary	The aircraft took off from a temporary landing field in Takahama Town, and while transporting cargo, a wooden frame (approximately 1.3 m vertically x 0.5 m horizontally, and approximately 2.6 kg in weight) dropped near the location referred to above. It was discovered near the parking area in a Kansai Electric Power Company training facility in Suimei, Takahama Town.	
8	Date and location of accident	Operator	Aircraft registration number and aircraft type
	October 10, 2015 NEAR AN AREA 3 nm (APPROXIMATELY 5.4 km) FROM THE END OF RUNWAY 34 OF KAGOSHIMA AIRPORT, KAGOSHIMA PREFECTURE, ON THE PATH OF THE FINAL APPROACH TO THE RUNWAY	JAPAN AIRLINES CO., LTD. (AIRCRAFT A)	BOEING 767-300 (LARGE AEROPLANE), JA8364
		NEW JAPAN AVIATION CO., LTD. (AIRCRAFT B)	BRITTEN-NORMAN BN-2B-20 (SMALL AEROPLANE), JA80CT
	Summary	On the path of its final approach to Runway 34 of Kagoshima Airport, Aircraft A confirmed a fixed-wing aircraft ahead of it near the area 3 nm (approximately 5.4 km) from the end of the runway, at an altitude of approximately 1,000 ft (approximately 300 m), and so it redid its landing.	
9	Date and location of accident	Operator	Aircraft registration number and aircraft type
	December 4, 2015 TEMPORARY LANDING FIELD IN KAWACHI TOWN, INASHIKI DISTRICT, IBARAKI PREFECTURE (OTONE AIRFIELD)	Private	MAULE AIR M-7-235C (SMALL AEROPLANE), JA30HT

	Summary	When the aircraft was taxiing after landing at a temporary landing field in Kawachi Town, its tail gear was damaged and it became unable to propel itself.

6 Statistics of published aircraft accident and serious incident investigation reports

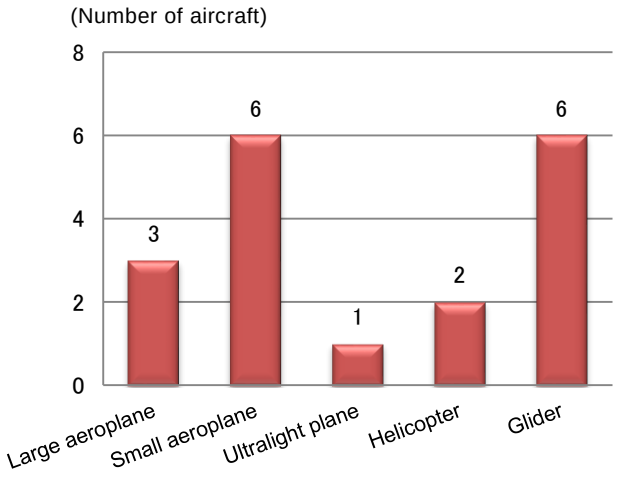
The number of investigation reports of aircraft accidents and serious incidents published in 2015 was 29, consisting of 18 aircraft accidents and 11 aircraft serious incidents.

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

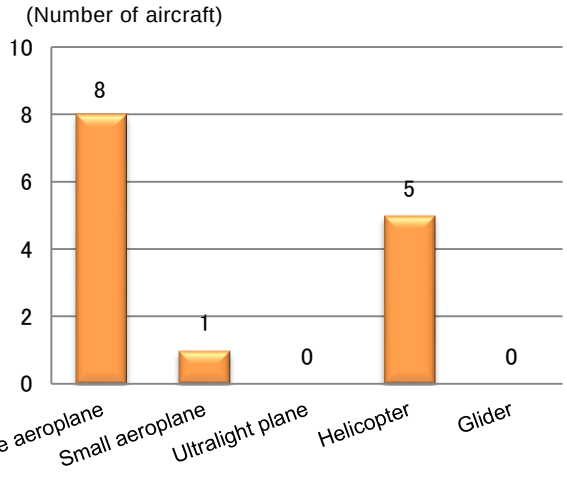
Note: In aircraft accidents and serious incidents, two or more aircraft are sometimes involved in a single case.

In the 18 accidents, the number of casualties was 24, consisting of four death, and 20 injured persons.

Number of published aircraft accident reports (18 cases) by aircraft category in 2015



Number of published aircraft serious incident reports (11 cases) by aircraft category in 2015



The investigation reports for aircraft accidents and serious incidents published in 2015 can be found on JTSB website at:

http://www.mlit.go.jp/jtsb/airrep.html

Column

Participating in Training on the Structure and Flight of Gliders

Aircraft Accident Investigator

The aircraft to which “aircraft accidents” and “aircraft serious incidents” apply also include gliders. Advanced specialized knowledge, experience, and investigation skills are needed to analyze and determine the causes of such events in their investigations, and among these, knowledge of the structures and flight characteristics of gliders are of obvious importance.

On this occasion, with the cooperation of the Japan Students Aviation League, I participated in a lecture on the structures and flight of gliders at the Menuma Gliding Field in the Tonegawa River bed in Kumagaya City, Saitama Prefecture, and here provide an introduction of its content.

First of all, I confirmed my knowledge of the different types of gliders in a classroom lecture format. Under aviation laws, these consist of motor gliders, high class gliders, middle class gliders, and primary class gliders, which are classified according to differences in their capability for acrobatic flight, and also whether they are towed by aircraft, winches, or other means.

The next topic covered was flight characteristics. Gliders fly in the same manner as airplanes, by receiving lift from the air flowing around their wings during flight. To continue flying or to gain altitude, they use the flow of rising air currents (wind blowing in an upward direction) known as thermals, ridges, waves, etc. Since these rising air currents are critical for flight but are not visible by eye, their location and strength can be estimated from terrain, weather conditions, cloud movement, and other parameters. It was also mentioned that since they can be predicted based on the temperature of the upper air, observation data from weather observation probes is used as well.

In a lecture class using actual aircraft, I was able to examine the structure of an Alexander Schleicher ASK21 glider. This aircraft is made of FRP with a monocoque structure, and is equipped with an expandable air brake at the upper surface of its main wings. Compared to an airplane, it has extremely simple instrumentation and mechanical equipment. Gliders are provided with locations to attach a tow line (release), but since the characteristics of winch-towing and airplane-towing are different, their attachment locations also differ.

Finally, I was given an opportunity to try going on board a glider. There was no noise generated by the aircraft since it has no motor of its own, with the only sounds being those of the rushing wind, and I was able to strengthen my understanding of the characteristics of glider flight, such as the importance of always having a strong understanding of the wind while flying.

Although as an aircraft accident investigator, I have undergone various types of studies and training, this glider training session was extremely valuable to me, and I believe I was able to obtain knowledge, experience, and skill that will be highly useful in accident investigations.

7 Actions taken in response to recommendations in 2015

Actions taken in response to recommendations were reported with regard to three aircraft accidents and one aircraft serious incident in 2015. Summaries of these reports are as follows.

① Aircraft accident involving a FEDERAL EXPRESS CORPORATION MCDONNELL DOUGLAS MD-11F, N526FE

(Safety Recommendation on April 26, 2013)

As a result of the investigation of an aircraft accident which occurred on the runway of Narita International Airport on March 23, 2009, the JTSB 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

On March 23 (Monday), 2009, about 06:49 local time*1, 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:

a. 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

b. 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:

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

b. Late flare with large nose-up elevator input resulted in the first bounce and

c. 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).

d. 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

a. 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.

b. 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 JTSB recommends that 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.

a. 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.

b. 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.

○ Actions Taken in Response to the Safety Recommendations

Actions to be Taken by the Federal Aviation Administration

1) The main landing gear must be designed to prepare against failure due to dominant loads, and as these dominant loads must consider the combination of upward loads and rearward loads together with loads in the horizontal direction, FAR25.721(a) was revised and made effective from December 1, 2014.

2) In addition, advisory circular (AC) 25-30 was published on October 7, 2014, in which it was noted: "Failure of the main landing gear must consider dominant loads due to an appropriate combination in the vertical direction and the direction of pull."

Measures to be Taken to Instruct the Boeing Company as a Designer and Manufacturer of the Aircraft

The FAA approved Boeing's Strut Extended Annunciation System (SEAS) on December 17, 2014.

* SEAS: A system that uses only blue lamp displayed in the cockpit to inform flight crew members if both main landing gear cushioning devices are detected by sensors to be within 0.5 inches of their fully-extended state after the aircraft touches down (indicating that the aircraft has left the ground).

* The report (original) from the Federal Aviation Administration is published on the JTSB website:
http://www.mlit.go.jp/jtsb/airkankoku/anzenkankoku6re_150715.pdf
http://www.mlit.go.jp/jtsb/airkankoku/anzenkankoku6re_160126.pdf

② Aircraft accident involving a SHIKOKU AIR SERVICE CO., LTD EUROCOPTER AS350B3 (ROTORCRAFT), JA6522

(Safety Recommendation on June 28, 2013)

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

○ Summary of the Accident

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


By courtesy of Passenger A

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.

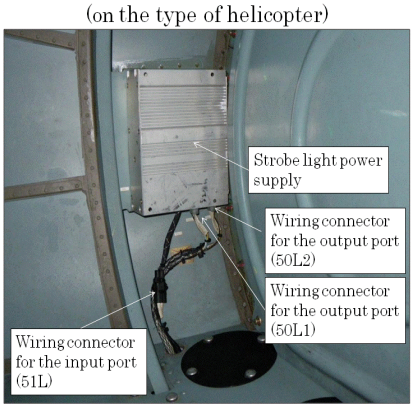
Regarding a fire in the rear hold, it could not be identified the ignition source; nevertheless it is possible that a fire occurred from the wiring connected to the strobe light power supply, which was installed in the rear hold, and that it spread to inflammables placed around the power supply.

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.

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



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

○ Safety Recommendations

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

The EASA should make it mandatory to modify the rear hold of the Eurocopter 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 the Flight Manual of the Eurocopter AS350 Series, the EASA should urge the designer and manufacturer of the helicopter to specify the memory items among emergency procedures so that they can be performed immediately.

○ Actions Taken in Response to the Safety Recommendations

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

(Report on February 19, 2014)

(2) Re-investigation of the aviation service record and "Case Occurrence Database" indicated no previous cases where there were safety concerns related to omission of memory items. Therefore, it was determined that there was no need to revise the flight regulations.

(Report on March 6, 2015)

*The report (original) from the European Aviation Safety Agency is published on the JTSB website: http://www.mlit.go.jp/jtsb/airkankoku/anzenkankoku7re_150330.pdf

③ Aircraft accident involving a OBIHIRO BRANCH SCHOOL OF THE CIVIL AVIATION COLLEGE, BEECHCRAFT A36, JA4215

(Safety Recommendation on December 20, 2013)

As a result of the investigation of an aircraft accident which occurred on the slope of Mt. Tsurugi in Memuro-cho, Kasai District, Hokkaido, on July 28, 2011, the JTSB published an investigation report and made recommendations to the Minister of Land, Infrastructure, Transport and Tourism on December 20, 2013. The Board received the following notice on the measures in response to the recommendations.

○ Summary of the Accident

On Thursday, July 28, 2011, a Beechcraft A36, registered JA4215, operated by the Obihiro Branch School of the Independent Administrative Institution Civil Aviation College, took off from Obihiro Airport for flight training at 09:11 Japan Standard Time. At around 09:22, when practicing basic instrument flight in the training and testing area, the airplane crashed into the slope of Mt. Tsurugi in Memuro-cho, Kasai District, 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 airplane conducting VFR BIF training operated by a hooded student was instructed by his instructor to fly into the mountainous area; It then flew into clouds or close to the clouds that covered the mountains, losing sight of ground references and approached the ground very close against the instructor's expectation; The instructor took the controls from the student and attempted to evade the mountains, but the airplane failed to change its course to an appropriate direction and crashed into the slope of the mountain.

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

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

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

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

○ Measures Taken by the Minister of Land, Infrastructure, Transport and Tourism in Response to the Recommendations

1. Instructions for regular on-site inspections

In order to confirm the status of initiatives for improvements to the safety management system implemented by the Independent Administrative Institution Civil Aviation College (hereinafter referred to as the "Civil Aviation College"), as well as various safety measures, it was decided for regular on-site inspections to be performed at the Civil Aviation College for the time being, and in the year 2014, a total of 4 inspections were carried out on a quarterly basis.

In the inspections performed up to this point, it was found that the construction of a safety management system and measures for its appropriate operation were being steadily implemented, and it was confirmed that the PDCA cycle was functioning with regard to safety management.

From here on as well, inspections and instructions will continue to be carried out toward the Civil Aviation College so that measures to strengthen its safety management system can be firmly established.

2. Review of medium-term goals

After receiving the applicable recommendations, the medium-term goals of the Civil Aviation College were reviewed on March 25, 2014, to strengthen its safety management system.

In the reviewed medium-term goals, a new goal of zero aircraft accidents and serious incidents was set. In order to achieve this, targets were introduced that include setting safety indicators and safety goal values in compliance with the aircraft safety program every fiscal year, enhancing the system for gathering information related to safety, and gaining a more accurate understanding of the actual educational situation in training that uses actual aircraft.

*This notice is published on the JTSB website:
http://www.mlit.go.jp/jtsb/airkankoku/kankoku4-1re_150311.pdf

④ Aircraft serious incident involving a AIR NIPPON CO., LTD. BOEING 737-700, JA16AN

(Recommended and Safety Recommendation on September 25, 2014)

As a result of the investigation of an aircraft serious incident which occurred at an altitude of approximately 41,000 ft, approximately 69 nm east of Kushimoto on September 6, 2011, the JTSB published an investigation report and made recommendations to All Nippon Airways Co., Ltd. as a party relevant to the cause of the serious incident, and safety recommendations to the Federal Aviation Administration (FAA), on September 25, 2014. The Board received the following notice on the actions to be taken in response to the recommendations (implementation plans) and the actions taken in response to the safety recommendations.

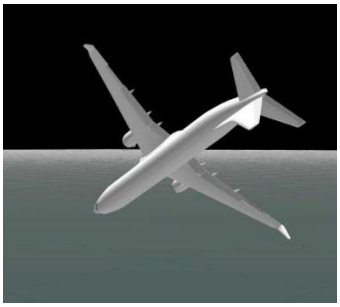
○ Summary of the Serious Incident

On September 6 (Tuesday) 2011, a Boeing 737-700, registered JA16AN, operated by Air

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

There were 117 people on board the aircraft, consisting of the captain, the first officer, three cabin attendants and 112 passengers. Of these people, two cabin attendants sustained slight injuries.
There was no damage to the aircraft.

○ Probable Causes



It is highly probable that this serious incident occurred in the following circumstances: During the flight, the first officer erroneously operated the rudder trim control while having an intention of operating the switch for the door lock control in order to let the captain reenter the cockpit. The aircraft attitude became unusual beyond a threshold for maintaining the aircraft attitude under the autopilot control. The first officer's recognition of the unusual situation was delayed and his subsequent recovery operations were partially inappropriate or insufficient; therefore, the aircraft attitude became even more unusual, causing the aircraft to lose its lifting force and went into nosedive. This led to a situation which is equivalent to "a case where aircraft operation is impeded."

It is probable that the followings contributed to the first officer's erroneous operation of the rudder trim control while having an intention of operating the door lock control; he had not been fully corrected his memories of operation about the door lock control of the Boeing 737-500 on which he was previously on duty; the door lock control of the Boeing 737-500 series aircraft was similar to the rudder trim control of the Boeing 737-700 series aircraft in their placement, shape, size and operability. It is somewhat likely that his memories of operation about the switch for the door lock control of the Boeing 737-500 aircraft had not been fully corrected because he failed to be fully accustomed with the change in the location of the switch for the door lock control. It is somewhat likely that this resulted from lack of effectiveness in the current system for determining the differences training contents and its check method, under which the Air Nippon Co., Ltd. and other airlines considered and adopted specific training programs to train pilots about how to operate the flight deck switches when their locations changed and the Civil Aviation Bureau of the Ministry of Land, Infrastructure, Transport and Tourism reviewed and approved them. It is probable that the first officer's failure to properly manage tasks contributed to his erroneous operation of the rudder trim control.

It is somewhat likely that the similarities between the switches for the door lock control and the rudder trim control in their operability contributed to the delay in his recognition of the erroneous operation. Moreover, he was excessively dependent on autopilot flight and he failed to be fully aware of monitoring the flight condition.

It is somewhat likely that the first officer's recovery operations were partially inappropriate or insufficient because he was startled and confused on the occurrence of an unexpected unusual situation in which the stick shaker was activated during the upset recovery maneuver. It is somewhat likely that the followings contributed to his startle and confusion: he had not received upset recovery training accompanied with a stall warning and in unexpected situations, thereby he lacked the experience of performing duties in such situations before the serious incident, and he had not received upset recovery training at a high altitude.

○ Recommendations to All Nippon Airways

(1) Thorough implementation of basic compliance matters for cases when the aircraft is operated by a single pilot and training to this end

The preventive measures concerned, as described in the OM information published by Air Nippon Co., Ltd. and in The Flight ANA Group, should be thoroughly implemented for all flight crew members as specific and permanent basic compliance matters and they should be continuously trained to this end.

(2) Implementation of high altitude upset recovery training accompanied with stall warning and other

events.

Airlines should implement "upset recovery training" at a high altitude upon considering defined flight envelope validated region of flight simulators. If necessary, they should also introduce a system to examine whether the recovery process is made outside the validated region. Moreover, scenarios in which a stall warning and others will be simultaneously activated or in which an upset cannot be expected by trainees should be prepared for such training.

○ Safety Recommendations to Federal Aviation Administration (FAA)

The aircraft designer and manufacturer shall study the need to reduce or eliminate the similarities between the rudder trim control and the switch for the door lock control of the Boeing 737 series aircraft, in terms of the shape, size and operability as mentioned in this report. In particular, it shall consider the effectiveness of changing the shape and size of the rudder trim control to the design adopted for the rudder trim control for Boeing models other than those of the Boeing 737 series, in which the switch has a cylindrical shape about 50mm in diameter without a brim, so that the difference of the size and shape can be recognized only with a touch.

○ Actions to be Taken by All Nippon Airways Co., Ltd. in Response to the Recommendations (Implementation Plans)

(1) Thorough implementation of basic compliance matters for cases when aircraft is operated by a single pilot and training to this end

When All Nippon Airways Co., Ltd. (hereinafter referred to as "our company") succeeded the transportation operations of Air Nippon Co., Ltd., we reflected content equivalent to the OM Information issued by Air Nippon Co., Ltd. after the occurrence of this incident as a measure to prevent its recurrence in our Policy Manual, issued "The Flight ANA Group" to all flight crew members of our company's group once again, and made plans to thoroughly implement basic compliance matters, but the following items shall also be implemented as additional actions.

Action already taken

1) By reflecting the basic compliance matters for cases when an aircraft is operated by a single pilot (content to be discussed and agreed on before leaving one's seat, prioritization of items while away from one's seat, visual confirmation of switches when entering the cockpit, etc.) once again in the OM Supplement, the system was made to enable thorough implementation of more specific and permanent compliance with those matters.

Action to be taken from here on

2) Education consisting of regular training (academic subjects) shall be held once every 3 years starting from fiscal year 2015 on the basic compliance matters for cases when an aircraft is operated by a single pilot, and a QMS Bulletin on this was issued.
(January 15, 2015)

[Training completion report scheduled for April 2016]

(2) Implementation of high altitude upset recovery training accompanied with stall warning and other events.

1) Previously, upset recovery training using a flight simulator was implemented based on IOSA (IATA Operational Safety Audit) Standards, etc. in training when obtaining aircraft type restrictions and in regular training (once every 3 years). However, based on various information obtained from relevant organizations, aircraft manufacturers, and other parties in studies on international trends carried out in

association with this serious incident, efforts are being made to implement the training measures described below.

Action already taken

(a) Prepare training materials to provide education on the causes of upsets and the methods of upset recovery, with reference to training materials issued by aviation-related groups. Completed by all flight crew members. (March 1, 2013 – April 30, 2014)

Action already taken

(b) Since delays in recognizing conditions can further the occurrence of incidents, special measures were taken when carrying out recovery training using simulators, such as having participants close their eyes to delay the recognition of surrounding conditions, and such training has also been implemented for high-altitude situations where there is little margin for recovering from stalls. (March 1, 2013 – April 30, 2014)

Action already taken

(c) Items (a) and (b) above were implemented in the fiscal year 2013 regular training, ahead of their standard implementation once every 3 years. (March 1, 2013 – April 30, 2014)

Action already taken

(d) Instruction guides for flight instructors have been prepared, additional knowledge on methods of upset recovery has been provided, the defined flight envelope validated region of flight simulators has been made known, and the knowledge and education level of flight instructors have been improved and standardized (implemented in September 2014 instructor meeting).

Action to be taken from here on

(e) Since many of the fatal accidents caused by upsets are accompanied by the occurrence of stalls, educational materials providing additional knowledge on stalls and giving instructions on the methods of stall recovery will be prepared.
Scheduled for completion by all flight crew members in fiscal year 2015 regular training.
(Preparation of educational materials completed in February 2015, completion by all members is scheduled for the period of March 2015 - April 2016. Comprehensive evaluation is scheduled in UPRT training using FFS after fiscal year 2016.)

[Completion report scheduled for April 2016]

A “Completion Report on Measures to be Taken” shall be submitted regarding items (1) 2) and (2) 1) (e) described above, with an approximate target of April 2016.

Items to continue to be investigated in the future

In the future, studies on international trends shall be continued, and continuous investigations shall be conducted on improvements regarding: the introduction of aerodynamic models faithfully simulating aircraft behavior after stalls by actively working with manufacturers and other relevant organizations, the introduction of systems to judge whether recovery processes are made outside of the defined flight envelope validated regions of simulators, the development of scenarios for training in which a stall warning and others will be simultaneously activated or in which an upset cannot be expected by trainees, and the provision of additional knowledge involving aerodynamic characteristics at high altitudes and control for upset recovery.

End

*The implementation plan is published on the JTSB website.
http://www.mlit.go.jp/jtsb/airkankoku/kankoku5-2re_150311.pdf

○ Actions Taken in Response to the Safety Recommendations

Regarding improvements to the shape of door opening switches on flight decks, the following conclusions were obtained as a result of analysis conducted jointly with Boeing Corporation in order to prevent erroneous operation.

1) From the perspective of the "human factor", the arrangement of switches is more important than the shape of switches.
2) It was confirmed that there are cases where the arrangement of switches is not uniform among aircraft types even from the same airline, so it would be preferable for differences in their arrangement to be minimized.
3) Companies operating in the USA use a procedure where if a flight crew member leaves the cockpit during operation, another crew member is instructed to enter, and when the flight crew member enters the cockpit again, the door lock is released manually, with the door opening switch on the flight deck not being used. Therefore, it was concluded that this problem would not have any impacts.

The information in these analysis results was submitted from the FAA to airlines in the USA and to overseas aviation authorities.

*The report (original) from the Federal Aviation Administration is published on the JTSB website: http://www.mlit.go.jp/jtsb/airkankoku/anzenkankoku9re_150623.pdf

⑤ Aircraft serious incident involving a ALL NIPPON AIRWAYS CO., LTD. BOEING 787-8, JA804A

(Safety Recommendation on September 25, 2014)

As a result of the investigation of a serious aircraft incident which occurred at Takamatsu Airport on January 16, 2013, the JTSB published an investigation report and made safety recommendations to the Federal Aviation Administration (FAA), on September 25, 2014. The Board received the following report on the actions taken in response to the safety recommendations.

○ Summary of the Serious Incident

On January 16 (Wednesday), 2013, a Boeing 787-8, operated by All Nippon Airways Co., LTD., registered JA804A, took off from Yamaguchi Ube Airport for Tokyo international Airport at 08:11 local time as its scheduled flight 692. When it was climbing through 32,000 ft over Shikoku Island, an EICAS message of battery failure came on at 08:27 accompanied by unusual smell in the cockpit. The airplane diverted to Takamatsu Airport and landed there at 08:47. An emergency evacuation was executed using slides on T4 taxiway at 08:49.

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

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

○ Probable Causes

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

Interior of main battery

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

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

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

○ Safety Recommendations to Federal Aviation Administration (FAA)

1. Actions to be taken by the Federal Aviation Administration
   a. Provide instruction to airplane manufactures and equipment manufactures to perform equipment tests simulating actual flight operations.
   b. Review the technical standards for lithium ion battery to ensure that the electric environment is appropriately simulated, and if necessary, amend the standards.
   c. Review the lithium ion battery failure rate estimated during the 787 type certification, and if necessary, based on its result, review the lithium ion battery safety assessment.
   d. Review the type certificate for its appropriateness on heat propagation risk.
   e. Assess the impact of contactor opening after the cell vent on the flight operation and take appropriate actions, if necessary.
2. Measures to Be Taken to Instruct The Boeing Company as a Designer and Manufacturer of the 787
   a. Continue the study of internal short circuit mechanism considering the effects of non-uniform winding formation and other factors deriving from manufacturing process; and continue efforts to improve lithium ion battery quality and its reliability, reviewing the LIB operational conditions, such as temperature.
   b. Improve BCU and contactor operations which are outside the design envelop.

○ Actions Taken in Response to the Safety Recommendations

Actions to be Taken by the Federal Aviation Administration

(1), (2) New LIB standards shall be formulated, and tests shall be conducted on aircraft equipment simulating actual operation.

(3), (4), (5) Battery systems have been redesigned and approved based on new LIB safety evaluations, and measures have been specifically taken to address the risks of thermal propagation.

Measures to be Taken by Boeing Corporation as a Designer and Manufacturer of the Aircraft

(1), (2) In processes to continually review the design of battery cells, Boeing Corporation is continuing

to study internal short circuit mechanisms and investigate the LIB production processes. This includes improvements to the BCU and contactor operation.

* The report (original) from the Federal Aviation Administration is published on the JTSB website: http://www.mlit.go.jp/jtsb/airkankoku/anzenkankoku10re_150623.pdf

⑥ Aircraft serious incident involving a HOKKAIDO AIR SYSTEM CO., LTD. SAAB 340B, JA03HC
(Recommended on November 27, 2014)

As a result of the investigation of a serious aircraft incident which occurred over Okushiri Airport, Hokkaido, on June 4, 2011, the JTSB published an investigation report and made recommendations to Hokkaido Air System Co., Ltd. as a party relevant to the cause of the serious incident, on November 27, 2014. The Board received the following report (completion report) on the actions taken in response to the recommendations.

○ Summary of the Serious Incident

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

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

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

○ Probable Causes

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

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

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

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

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

Moreover, it is probable that the FO's operation of engaging an autopilot and changing the vertical mode to make the Aircraft climb by using the Autopilot/Flight Director System eventually became a factor to delay avoiding maneuvers against ground proximity.

It is probable that the Company didn't create a standard procedure, reflecting the contents of Aircraft

Operating Manual, for its crewmembers to confirm and call out the changes mode, without noticing its importance and didn't carry out adequate training. Furthermore, it is probable that the PIC and the FO excessively relied on the autoflight system.

○ Recommendations to Hokkaido Air System Co., Ltd.

(1) Calling out and confirming the mode change for sure

Hokkaido Air System Co., Ltd. should make its flight crewmembers comply with the specifics of Airplane Operating Manual (confirmation and callouts of mode changes upon using the Autopilot/Flight Director system or on progress of automatic mode changes), as described in 2.13.4 without fail, and it should consider that Flight Training Guide shall be revised in some related matters.

(2) Appropriate use of autoflight system and management of pilots' skill

It is important for the Hokkaido Air System Co., Ltd. to increase the opportunities for training as well as utilizing simulator's session to improve raw data instrument skills. The Hokkaido Air System Co., Ltd. also should clarify the problems caused by excessive reliance on the autoflight system and consider to fully inform its flight crewmembers of specific countermeasures against them.

○ Actions Taken by Hokkaido Air System Co., Ltd. in Response to the Recommendations (Completion Report)

(1) Calling out and confirming the mode change for sure

In the basic procedures of the past AOM, when mode changes were made during use of AP/FD systems, both the PF and PM confirmed the EADI mode and the operator PF called out the mode, with instructions for this given in training when acquiring type restrictions. However, during the execution of a go-around, there is a high concentration of tasks to be performed and it was recognized that it is extremely difficult to call out go-around modes, which change in short periods of time. Therefore, the FTG was made to indicate that "Callouts shall generally be performed by the person in control of the MSP."

The following actions were taken in view of the occurrence of this serious incident.

In accordance with the intention of the AOM, in order for confirmation and callouts to be reliably implemented when modes are changed or change automatically during use of AP/FD systems, including during go-arounds, an FTG which had been standardized to a version reflecting the AOM and revised to eliminate any discrepancies was used in the skill improvement meeting (*1) held in November 2014 for all flight crew members, and its content was thoroughly communicated.

Also, its thorough establishment shall be confirmed by continued regular training using monitor flights (*2) and simulators.

(Implemented from December 1, 2014)

(*1) Skill improvement meetings

Held generally once a month in accordance with the following objectives, with the intention of improving the skill of crew members.

- Provide and study information on various issues (operating guidelines) for line operation.
- Provide and study information valuable to improving operation-related knowledge and ability.
- Provide and study various types of other information for personal growth.

(*2) Monitor flights

Flights for confirmation by an instructor on whether everyday line operation is being conducted in accordance with the operating guidelines and principles.

(2) Appropriate use of autoflight system and management of pilots' skill

As a result of investigation on increasing opportunities for training to improve raw data instrument skills, it was determined that training items for instrument weather conditions are necessary, and so topics for approaches and go-arounds using raw data instrument skills were added to the topics for regular training using simulators.
(Addition of topics: February 1, 2015; start of regular training with added topics: February 16, 2015)

Also, regarding problems caused by excessive reliance on the autoflight system, analysis revealed that these consist of direct problems related to operation, and indirect problems involving regulations, etc., and so the following response measures were taken with consideration for identifying and analyzing each respective problem.

(2)-1 Direct problems related to operation, and their response measures

As a result of closely examining the content reported in the "Aircraft Serious Incident Investigation Report (AI2014-5)" (dated November 27, 2014), the following situations are considered to be examples of problems caused by excessive reliance on the autoflight system, with the potential for a pilot to shift to unintended flight operation without realizing it, ultimately leading to a malfunction.

- Significant lack of basic confirmation or monitoring when using the autoflight system.
- Attention is focused on following the FD command bar, and callouts of mode changes are not performed, causing both the PF and PM to fail to recognize situations.
- An operator does not confirm that the horizontal and vertical modes are both set properly despite operation to change HDG/IAS modes, causing flight to become such that it is against the intention of the PF/PM.
- Following the instructions of the FD command bar even while having a sense of incongruity, without confirming information other than the EADI or basic instruments such as the velocimeter, altimeter, and vertical speed indicator.
- Even though it is recognized that the aircraft is in an abnormal condition, the inappropriate use of automatic systems is continued, or recovery is attempted by turning the automatic system on.

As a result of investigations into methods for responding to the problems identified above in instructor meetings, from the two viewpoints of "important points when using the autoflight system" and "the importance of monitoring", it was determined that it is not possible to address all of the identified problem points with education based on the FTG in its current form, and so the following actions were taken.

Items related to the autoflight system, such as important points particular to SAAB aircraft autoflight systems (Autopilot Switch Position, Mode Annunciation display) and flight phases for which monitoring is easily neglected, were added to the FTG. This was distributed to all flight crew members, and plans were made to instill all flight crew members with a thorough understanding of the content based on the applicable materials in skill improvement meetings held in March 2015, with their implementation to be continued in the future.

(2)-2 Indirect problems involving regulations, etc., and their response measures

In the AOM chapter on Normal Operation, there was only a description stating "The Autopilot shall be actively utilized." with no explanation of specific methods for its utilization. This leads to excessive adherence to the idea of "actively utilizing" the system, and as a result, it is probable that erroneous use has the potential to cause malfunctions. No special instructions were provided regarding this point either, and so the following actions were taken.

With consideration for the operating environment of our company, where non-precision approaches and visual approaches are common, it is believed to be necessary for flight crew members to have a full understanding of systems when utilizing autopilot functions, and to sufficiently recognize the importance of monitoring such as during mode changes, and so instruction based on these points is being implemented. Specifically, the important points, etc. involving use of the Auto Flight System were reflected in the FTG on March 20, 2015, and instruction regarding that content began in monitor flights from March 25, 2015.

* The completion report is published on the JTSB website:
http://www.mlit.go.jp/jtsb/airkankoku/kankoku7re_150408.pdf

⑦ Aircraft serious incident involving a J-AIR CORPORATION BOMBARDIER CL-600-2B19, JA206J

(Recommended on February 26, 2015)

See "Chapter 1: Summary of Recommendations and Opinions Issued in 2015 – 1: Recommendations" (page 2)

8 Provision of factual information in 2015

The JTSB provided factual information on one case (one aircraft accident) to relevant administrative organs in 2015. The contents are as follows.

① PRIVATELY OWNED CESSNA 172RG, JA3857

(Disseminated on May 1, 2015)

The JTSB provided factual information regarding the aircraft accident which occurred on April 26, 2015, as follows to the Japan Civil Aviation Bureau, the Ministry of Land, Infrastructure, Transport and Tourism.

(Summary of the Accident)
A privately owned Cessna 172RG, registered JA3857, took off from Iwami airport for an familiarization flight, and made a belly-landing when landing on Kagoshima Airport on Sunday, April 26, 2015. The

Aircraft sustained damage.

(Provision of factual information)

The following items were discovered regarding gear warnings as a result of the investigation.

(1) One of the two screw bolts used to mount the microswitches installed in the throttle control linkage component was missing, and the microswitch ground wire was disconnected.

(2) A gear warning was not activated even when the throttle (engine output) was in a condition for landing, with the gear in a raised condition.

* This information dissemination is published on the JTSB website.
http://www.mlit.go.jp/jtsb/iken-teikyo/JA385720150426.pdf

Column

The 3rd ICAO Asia Pacific Accident Investigation Group Conference

Aircraft Accident Investigator

The 3rd ICAO (International Civil Aviation Organization) Asia Pacific Accident Investigation Group Conference was held for 2 days starting on June 23, 2015, in Colombo, Sri Lanka.

The ICAO currently has 7 regional offices, with its Asia Pacific regional office located in Bangkok, Thailand. This office is involved in coordination with 38 officially-contracted countries, one non-contracted country, and 15 regions.

This conference was the first to be attended by India and Papua New Guinea, with participation by 17 countries, 1 region, IFALPA (The International Federation of Air Line Pilots' Associations), IATA (The International Air Transport Association), and 2 aircraft manufacturers.

Singapore acted as the host country, and began by confirming the current status of matters adopted in the 2nd conference, which was held in Hong Kong in 2014.

After this, active discussions were held regarding recent ICAO trends, which was one of the conference topics, on the necessity of becoming able to track data over a wider range than is possible currently due to past experiences including the inability to obtain flight information from the Malaysia Airlines Flight 370 accident, and on threats to civil aviation in regions of conflict related to Malaysia Airlines Flight 17, which was shot down in the Ukraine.

Furthermore, detailed reports regarding the undersea recovery of flight recording equipment and voice recording equipment from the AirAsia Flight 8501 accident were provided as well.

Participants also gave presentations on the importance of accident investigation-related training and studies, and voluntary reporting systems.

Through the series of conference topics and reports, a strong sense of the importance of international cooperation could be felt. We fully realized that in order to accomplish such cooperation, it will be essential to actively participate in international conferences like this one, so that we can recognize the current situations of various countries, and build relationships between countries even in the time between meetings.

The final content of the conference included presenting requests to the ICAO Asia Pacific Regional Office and announcing that the 4th conference will be held in Japan in 2016, after which the proceedings were then approved and the conference was adjourned.

During the 2 days after the conference from June 25, the participants who had attended up to the previous day joined aviation-related parties from Sri Lanka to participate in an ICAO Asia Pacific Regional Aviation Accident Workshop, where 20 presentations were given on accident investigations, accident investigation technology, and initiatives related to accident investigations. The JTSB gave a presentation on "Preventing Accidents Caused by Turbulence" which was also covered in the JTSB Digests. This presentation received comments from several groups stating that its content was fascinating, and invited questions about the JTSB Digests which were its foundation.

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

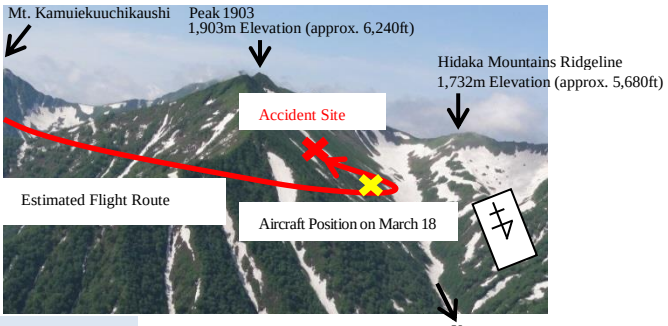
Collision with the slope of a mountain during a leisure flight

Privately Owned Hoffman H-36 Dimona, JA2405

Summary: On Friday, March 15, 2013, a privately owned Hoffmann H-36 Dimona, registered JA2405, took off from Memanbetsu Airport at 09:08 Japan Standard Time (JST: UTC+9hr, unless otherwise stated all times are indicated in JST on a 24-hour clock) for a recreational flight to Shikabe Airfield in Shikabe, Kayabe-gun, Hokkaido, and the aircraft went missing during the flight. On Monday, March 18, 2013, the aircraft was found on the northwest slope of a mountain 1,903 m in elevation, located about 1.7 km north of Mt. Kamuiekuuchikaushi, in Nakasatsunaimura, Kasai-gun, Hokkaido.
Both the pilot and the passenger on board the aircraft suffered fatal injuries.
The aircraft was destroyed but there was no outbreak of fire.

Findings

The pilot tried to climb by taking advantage of an anabatic wind generated on the windward side of Peak 1903. But the pilot failed to do it well. At around 11:00:30, the Aircraft, in a nose-up attitude parallel with the slope, eventually crashed beneath the bottom of the fuselage against a slope of approximately 1,800 m in elevation, with heading southeastward.
The slope was covered with snow. It is highly probable that the Aircraft had slid down to the position located approximately 1,600 m in elevation after the crash.



While the Aircraft decreased its ground speed against the downdraft, the pilot judged that the Aircraft would be able to maintain the altitude to safely pass over the ridgeline, and began to approach Kyunosawa Valley at an altitude of approximately 2,000 m, where the accident occurred. However, as the downdraft became stronger than the pilot had expected, he could not stop descent. It is probable that the Aircraft approached the valley at an altitude with almost no margin, in hindsight. It is probable that approaching the valley at an altitude with almost no margin was one of the reasons why the Aircraft had descended below the safe altitude.

The aircraft

Flight over Mountainous

When pilots fly over mountainous areas by visual flight rules, it is necessary to comply with the following basic points:

(1) Comprehension of Weather Conditions

The weather in mountainous areas is prone to change, which could lead to the occurrence of sharp declines in visibility, turbulence, strong downdrafts, and others. These changes in weather may affect safe flights in some cases. In addition, there are only a limited number of meteorological observation facilities in mountainous areas.

For this reason, not to mention accurately confirming weather conditions prior to flight, it is absolutely necessary to always check the conditions continuously during flight, and consider their effects on the flight.

(2) Flexibility of Flight Plans

Based on weather conditions obtained prior to flight, a flight plan should be carefully prepared. At the same time, during a flight over a mountainous area, where the meteorological environment is prone to change, it is necessary to consider safety the highest priority and to flexibly modify the flight plan according to the situation, without sticking to the initial plan.

Probable causes: It is highly probable that this accident occurred when the Aircraft, flying over the Hidaka Mountains, encountered a downdraft that was blowing down from the ridgeline of the mountains which made the Aircraft descend below the altitude needed to safely pass over the ridgeline and crash into a slope on the mountain; consequently, the aircraft was destroyed, and the pilot and the passenger suffered fatal injuries.

It is probable that the reasons that the Aircraft descended below the altitude were that while the Aircraft decreased its ground speed against the downdraft, the pilot judged that the Aircraft would be able to maintain the altitude to safely pass over the ridgeline and the Aircraft began to approach Kyunosawa Valley, where the accident occurred, at an altitude with almost no margin. Along with this, the downdraft became stronger than the pilot had expected and the pilot could not stop descent with the climb performance of the Aircraft.

For details, please refer to the investigation report. (Published on February 26, 2015)
http://www.mlit.go.jp/jtsb/eng-air_report/JA2405.pdf

Collision with a tower for high-voltage power transmission lines during a flight to take photographs

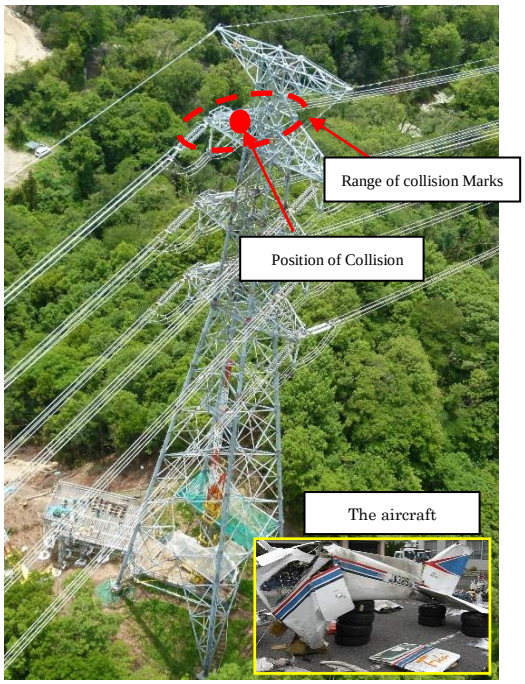
Privately Owned Cessna 172M Ram, JA3853

Summary: A privately owned Cessna 172M Ram, registered JA3853, took off from Nagoya Airfield at around 11:39 Japan Standard Time (JST: UTC+9hr: unless otherwise stated all times are indicated in JST) to take aerial photographs on Wednesday, March 5, 2014. During the flight towards the Omaezaki area, the aircraft collided with a tower for high voltage power transmission lines set up on the ridge of the hilly area of Sasahara-cho, Toyota City, Aichi Prefecture at around 11:47. The aircraft was destroyed and scattered; accordingly, post-crash fire broke out.
A captain and a passenger were on board the aircraft and both of them suffered fatal injuries.

Findings

It is highly probable that it was difficult to keep the visual meteorological conditions throughout the route during the flight because, the Officer advised that the weather on the route was quite bad, and multiple witnesses commented that it was poor visibility at the time of the accident occurred and additionally, the rain cloud covered the sky in Tokai district and the radar echo was observed from the Nagoya Airfield to the Okazaki area.

The photographing was scheduled on March 5, the maintenance of the Aircraft was planned to be started on March 7, and the planned delivery date of the ship which was the last shooting chance was the day of the airworthiness certificate inspection for the airworthiness certification. Considering these facts, it is probable that the captain forced the flight knowing that it would be difficult to make a flight maintaining the visual meteorological conditions.



《Immediately before the Collision》

The Aircraft needed to achieve an altitude of 150 m or more from the ground surface according to the requirement as it flew over from the city area to the hilly area. According to the GPS data and the ground surface elevation, it is probable that the Aircraft did not comply with the requirement of the minimum safety altitude.

《Conditions at the Time of the Collision》

According to the collision marks, it is somewhat likely that the captain lowered the left main wing on the side of the captain seat to have visual contact with the ground surface by lowering the altitude, or that the captain who had visual contact with the Tower tried to avoid the collision by suddenly lowering the left main wing and turning the Aircraft immediately before the collision.

Probable causes: It is highly probable that the Aircraft collided with the Tower for high voltage power transmission lines set up on the ridge of the hilly area because it flew below the minimum safety altitude while it flew from the Nagoya Airfield towards the Omaezaki area under the visual flight rules.

It is somewhat likely that the Aircraft tried to have visual contact with the ground surface by flying below the minimum safety altitude because the visibility was very poor, and cloud was in a low state due to the weather conditions that day.

It is highly probable that the captain forced the flight because the schedule was tight, even though the captain was aware of the difficulty to make the flight while maintaining the visual meteorological conditions.

Safety Actions Safety Actions Taken by Civil Aviation Bureau of Ministry of Land, Infrastructure, Transport and Tourism

Upon the occurrence of the accident, on March 7, 2014, the Civil Aviation Bureau issued a document entitled “Ensuring Safety for Flights with Visual Flight Rules” to the president of the Japan Aircraft Pilot Association and All Japan Air Transport and Service Association, to request that they once again to give guidance on ensuring the safety of flights under the visual flight rules to the members of their organizations. (For points of concern (excerpt), please refer to the Accident Investigation Report)

For details, please refer to the investigation report. (Published on April 23, 2015)
http://www.mlit.go.jp/jtsb/eng-air_report/JA3853.pdf

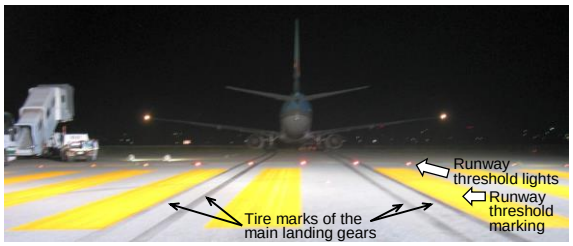
Overrun due to inability to stop within runway

Korean Air Lines Co., Ltd. Boeing 737-900, HL7599

Summary: On Monday, August 5, 2013, a Boeing 737-900, registered HL7599, operated by Korean Air as the scheduled flight KAL 763, was unable to stop within the runway 10 in Niigata Airport after landing, and came to rest with the nose gear trespassing into the grass area of the easterly end of the runway at 19:42 Japan Standard Time.
A total of 115 persons on board, including a captain, eight crewmembers, and 106 passengers did not suffer any injuries.

Findings

The aircraft



Captain had not flown to Niigata Airport for more than a year and a half, and the F/O had never experienced to land at night on RWY 10 in Niigata Airport.
It is highly probable that the Captain and the F/O had a heavy workload, such as the verifying of the exit taxiway as well as the control for reducing speed and callout after landing, since the Captain and the F/O were not familiar with Niigata Airport which had a intersecting runway, while ground objects and others which pilots could observe during a night landing were limited. It is also somewhat likely that it was difficult for the Captain and the F/O to feel how fast they are in the low speed ground roll area in which they did not count on the airspeed indicator.

According to the DFDR records, it is probable that the Captain could not take sufficient control of reducing speed with manual braking because of the following reasons:
- The Captain normally judges the runway remaining length with using runway centerline lights, which varies in color according to length, though, the Captain could not notice the remaining length of the runway.
- The F/O was also saying that the Aircraft was slightly too fast to stop short of the red lights.
- The brake pressures had dropped after the disarming of the autobrakes.

Since the Captain and the F/O had already recognized that they were not allowed to vacate from the intersecting RWY 04/22, it is highly probable that they had intended to continue rolling until TWY-B1, the end of the runway, as being conscious of the sequence that passing over the side of TWY-P3 and then crossing the intersecting runway. However, the Captain had the Aircraft continuously roll in parallel with looking for the intersection with RWY 04/22 which was assumed far ahead, having trouble to figure out the position; therefore, it is somewhat likely that those circumstances contributed that the Captain did not let the Aircraft reduce enough lower speed.

Probable causes (Excerpt): It is highly probable that this serious incident occurred when the Aircraft landed on RWY 10 in Niigata Airport, the Captain did not let the Aircraft reduce enough lower speed to approach the runway threshold lights that the Captain understood as the stop bar lights for the intersecting RWY 04/22, which the Captain was holding a doubt, and when the Captain realized there was no runway beyond the red lights, the Aircraft could not stop within the runway anymore, resulting in overrunning.
It is also somewhat likely that the following reasons contributed to the occurrence of this serious incident:
- The Captain and the F/O were not familiar with Niigata Airport which had a intersecting runway, and they had difficulty to identify the intersecting position with RWY 04/22 because ground objects and others which pilots could observe during night landing were limited. In such circumstances, it was difficult for them to judge the speed of the Aircraft in the low speed area in which they did not count on the airspeed indicator.

Safety Actions

Safety Actions Taken by the Company

In order to prevent the occurrence of similar incidents, the company revised its regulations (FOM, POM, QRH) and as a review of its training procedures, also set the number of landings with flaps at 40 to a minimum of 10 for a Captain and a minimum of 5 for a F/O in its training for the Boeing 737.

For details, please refer to the serious incident investigation report. (Published on January 29, 2015)
http://www.mlit.go.jp/jtsb/eng-air_report/HL7599.pdf

Occurrence of fire within the engine fire-prevention area

J-AIR Corporation Bombardier CL-600-2B19, JA206J

Summary: On Monday, May 6, 2013, a Bombardier CL-600-2B19, registered JA206J, operated by J-AIR Corporation, took off from Oita Airport as the scheduled flight 2362 of Japan Airlines Corporation, a code-sharing partner, and landed on runway 32R at Osaka International Airport. While the aircraft was taxiing on the taxiway after landing, a caution message was displayed for a right engine fire detection system failure at around 12:15 Japan Standard Time (JST: UTC+9hr), and subsequently a warning message was displayed for a right engine fire. While the crew responded to the engine fire warning message, the aircraft continued to taxi and entered the parking spot. During maintenance work after the flight, evidence of fire was found within the engine fire-prevention area.

A total of 55 persons were on board the aircraft, including the captain, two crew members, and 52 passengers. There were no injuries.

Findings

Details of the Outbreak of the Fire

《Identification of flammable fluid Source》

It is highly probable that the flammable materials susceptible to ignition were fuel and oil. Because fuel leakage was found and because phosphorous, a unique element contained in engine oil, was not detected in the soot composition collected, it is highly probable that the leaked fuel ignited and caused the fire to occur.

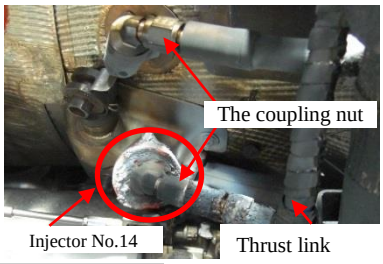
《Occurrence of Fuel Leakage》

There was loosening in the B nut connecting injector No. 14 and the manifold, which caused fuel leakage to occur.

《Ignition of the Leaked Fuel》

When the Aircraft was on the ground, the thrust reversers were used for approximately 19 seconds from 12:14:40, immediately after landing. It is highly probable that this caused both the engine RPM and internal temperature to increase and that the reduction in aircraft speed caused a reduction in the quantity of cooling and ventilation air.

Exterior view of the right engine



Evidence of fire

Probable causes: It is highly probable that the cause of this serious incident was that because the coupling nut connecting the right engine manifold and injector No. 14 was loose, fuel leaked from this area and was ignited by the heat of the engine, which caused fire within the engine fire zone.

Although it is somewhat likely that the reason why the coupling nut was loose was the insufficient tightening force of the coupling nut, resulting in gradually loosening caused by factors such as engine vibration, the JTSB couldn't determine the cause of the loosening.

Other Safety Related Findings

During this serious incident, it is certain that it took time for the flight crew members to respond to the emergency of the engine fire warning message, and that they moved the Aircraft into the parking spot as is without facing it into the wind and stopping it while the engine fire warning message was being displayed.

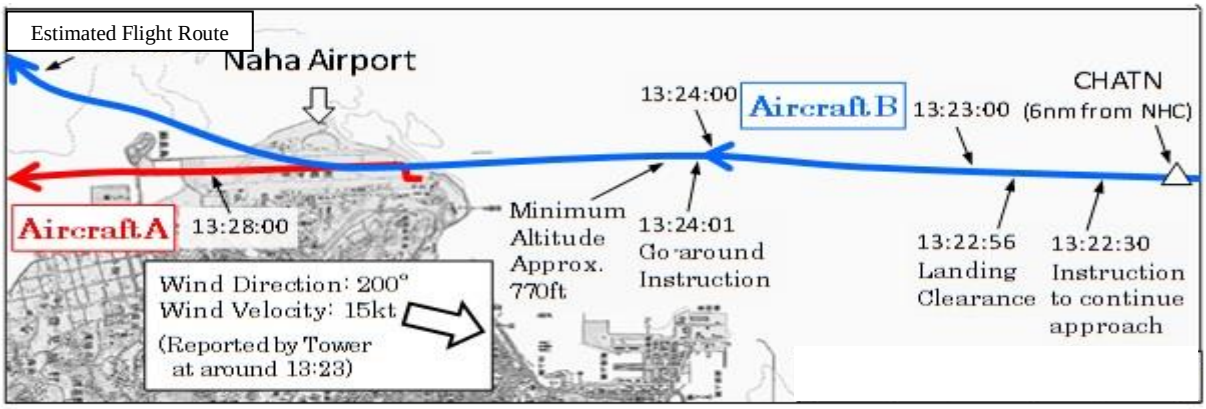
It is probable that it took time to respond to the engine fire warning message because the flight crew members suspected that it was a false alarm.

For details, please refer to the serious incident investigation report. (Published on February 26, 2015)
http://www.mlit.go.jp/jtsb/eng-air_report/JA206J.pdf

Go-around due to incursion onto Naha Airport runway

China Eastern Airlines Co., Ltd. AirAsia Japan Co., Ltd.

Summary: On July 5 (Thursday), 2012, an Airbus A319-112, registered B2332 (hereinafter referred to as "Aircraft A"), operated by China Eastern Airlines Co., Ltd., was taxiing toward Runway 18 at Naha Airport in order to depart for Shanghai (Pudong) Airport as the scheduled Flight 2046 of the company. Meanwhile, an Airbus A320-214, registered JA01AJ (hereinafter referred to as "Aircraft B"), operated by AirAsia Japan Co., Ltd., was on the final approach after receiving a landing clearance for Runway 18 at Naha Airport during the flight test required before commencing commercial transport services.
Although an air traffic controller instructed Aircraft A to hold short of the runway, the aircraft entered the runway; as a result, Aircraft B made a go-around following the instructions from the air traffic controller.



Findings

Conditions of Aircraft A

○ The flight crewmembers could not find Aircraft B, which was on approach 3 nm or thereabouts away from the threshold of the runway with its illuminated landing lights, in the weather conditions where there were no visibility restrictions, it is somewhat likely that the flight crewmembers misunderstood that they were allowed to enter the runway and minded that there was no arriving aircraft.

○ It is probable that this deceleration was to perform the Before Takeoff Checklist before entering the runway. Subsequently, the brakes were not applied, and the speed of Aircraft A was slightly increased to 8 kt as it passed the runway holding position marking; therefore, it is probable that the flight crewmembers of Aircraft A had no doubt about entering the runway.
From these points, it is probable that the flight crewmembers misheard the instruction to hold short of the runway as an instruction to hold on the runway and misunderstood that they got an approval to enter the runway.

Conditions of Aircraft B

○ Although they had the Naha Airport runway in sight from about 8 nm away, they did not sight Aircraft A, which was entering the runway, and they did not remember hearing any hold instruction issued by the Tower to Aircraft A. Therefore, it is highly probable that while Aircraft B was on the approach to Runway 18, it did not notice the presence of Aircraft A and only executed a go-around by following the instruction from the Tower.

○ Aircraft B executed a go-around without noticing the presence of Aircraft A, according to the DFDR records of Aircraft B, the radio altitude of Aircraft B when turning to climb by following the go-around instruction from the Tower was about 770 ft, and its position at the moment was about 2.1 nm from the threshold of the runway; therefore, it is probable that Aircraft B went around without any difficulty.

Probable causes (Excerpt): It is highly probable that the serious incident occurred because the departing aircraft (Aircraft A) made an incursion onto the runway despite being instructed to hold short of the runway, causing the arriving aircraft (Aircraft B), which had already been cleared to land, to attempt to land on the same runway.

It is highly probable that Aircraft A entered the runway because the flight crewmembers of the aircraft misheard and misunderstood the instruction to hold short of the runway as an instruction to hold on the runway and could not find the arriving aircraft, as well as because the Tower Controller did not recognize that the readback from Aircraft A was incorrect and consequently did not confirm or correct the readback.

For details, please refer to the serious incident investigation report. (Published on May 28, 2015)
http://www.mlit.go.jp/jtsb/eng-air_report/B2332-JA01AJ.pdf