

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 paragraph 1 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

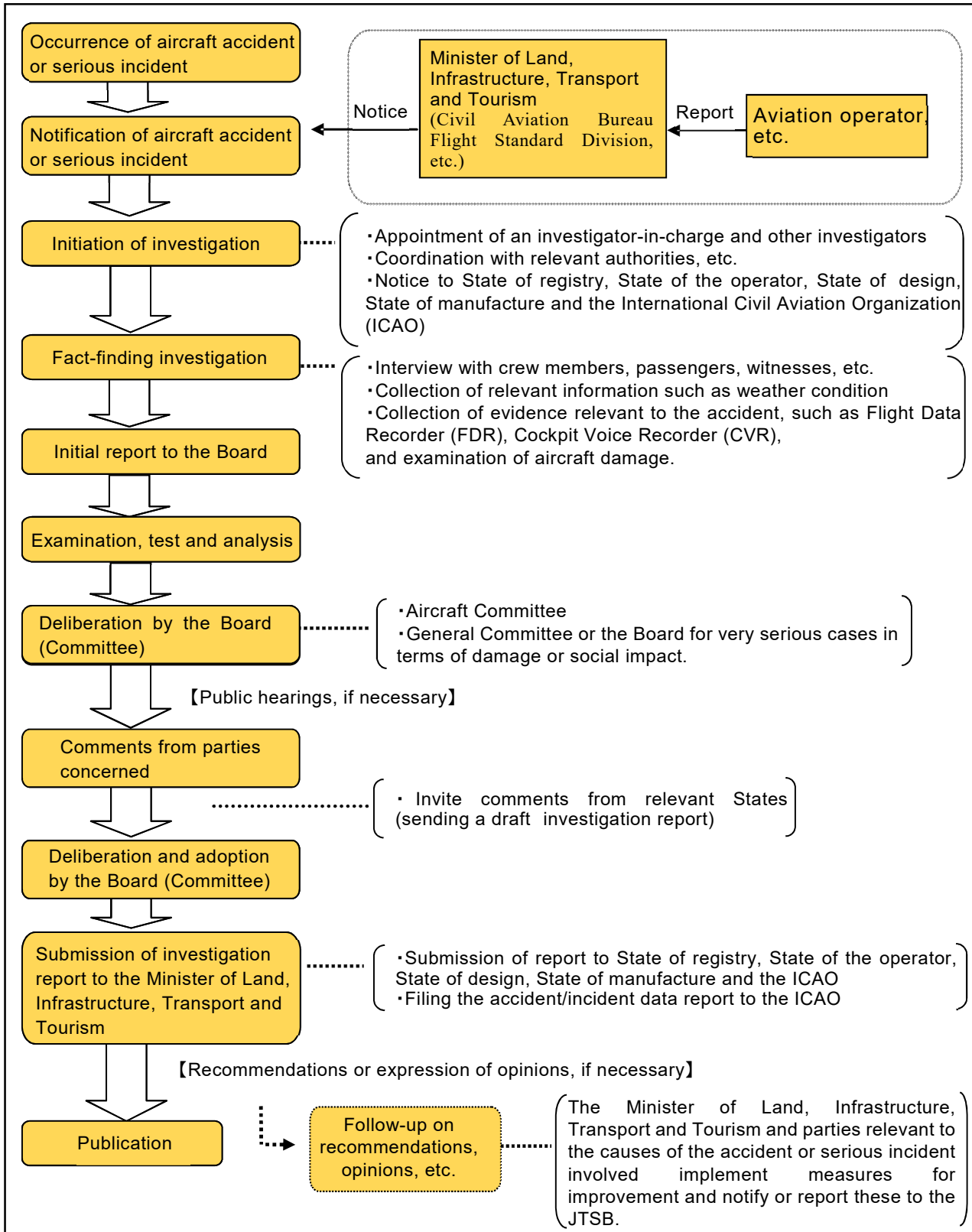
- When the pilot in command has recognized during flight that there was a danger of collision or contact with any other aircraft.

- 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 2018 as follows:

21 accident investigations had been carried over from 2017, and 14 accident investigations were newly launched in 2018. 18 investigation reports were published in 2018, and thereby 15 accident investigations were carried over to 2019.

22 serious incident investigations had been carried over from 2017, and 12 serious incident investigations were newly launched in 2018. 19 investigation reports were published in 2017, and thereby 15 serious incident investigations were carried over to 2019.

Among the 37 investigation reports published in 2018, one was issued with recommendations and one was issued with opinions.

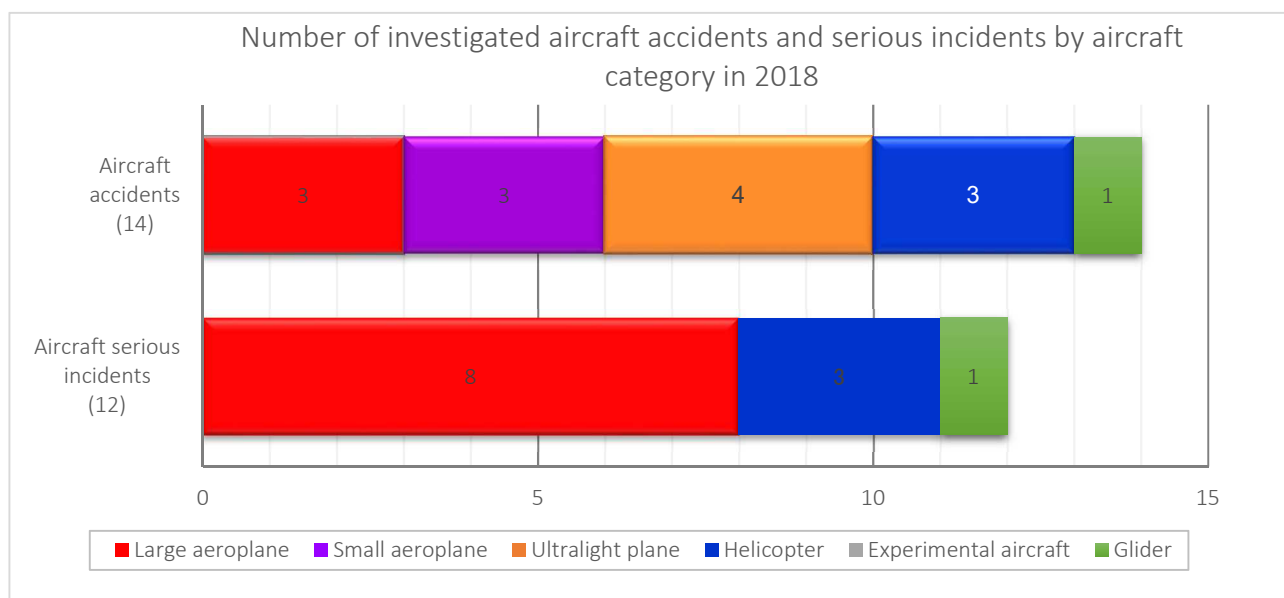
Investigations of aircraft accidents and serious incidents in 2018

Category	Carried over from 2017	Launched in 2018	Total	Published investigation reports	(Recommendations)	(Safety recommendations)	(Opinions)	(Cases)	
								Carried over to 2019	(Interim report)
Aircraft accident	21	14	35	18	(1)	(0)	(1)	17	(0)
Aircraft serious incident	22	12	34	19	(0)	(0)	(0)	15	(0)

4 Statistics of investigations launched in 2018

The aircraft accidents and serious incidents that were newly investigated in 2018 consisted of 14 aircraft accidents, down six from 20 for the previous year, and 12 aircraft serious incidents, down five from 17 for the previous year.

By aircraft category, the aircraft accidents included three cases involving large aeroplanes, three cases involving small aeroplanes, four cases involving ultralight planes, three cases involving helicopters, and one case involving gliders. The aircraft serious incidents included eight cases involving large aeroplanes, three cases involving helicopters, and one case involving glider.



* 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 14 aircraft accidents, the number of injuries was 17, consisting of 11 fatal injuries and six serious/minor injuries.

Statistics of number of injuries (aircraft accident)

(Persons)

2018							
Aircraft category	Fatal Injuries		Missing		Serious/Minor Injuries		Total
	Crew	Passengers and others	Crew	Passengers and others	Crew	Passengers and others	
Large aeroplane	0	0	0	0	2	0	2
Small aeroplane	0	0	0	0	0	0	0
Ultralight plane	2	0	0	0	1	1	4
Helicopter	1	8	0	0	1	0	10
Experimental aircraft	0	0	0	0	0	0	0
Glider	0	0	0	0	1	0	1
Total	3	8	0	0	5	1	17
	11		0		6		

*The above statistics include incidents under investigation so may change depending on the status of the investigation and deliberation. In addition, for the number listed as “passengers” on the website in the number of injuries of an aircraft accident currently under investigation, the minimum number of pilots required to fly the aircraft are counted as “crew”.

5 Summaries of aircraft accidents and serious incidents which occurred in 2018

The aircraft accidents and serious incidents which occurred in 2018 are summarized as follows: The summaries are based on information available at the start of the investigations and therefore are subject to change depending on the course of investigations and deliberations.

(Aircraft accidents)

1	Date and location	Operator	Aircraft registration number and aircraft type
	April 9, 2018 Runway B at Kansai International Airport, Osaka Prefecture	Korean Airlines Co., Ltd	HL7725 Boeing 737-900 (Large aeroplane)
	Summary	The aircraft took off from Jeju and then when it made a go-around at runway B at Kansai International Airport, the lower rear surface of its airframe made contact with the runway. There were no injuries.	
2	Date and location	Operator	Aircraft registration number and aircraft type
	April 15, 2018 On the sea at approximately 1.2 km off the coast of Sakaigahama, Urasaki Town, Onomichi City, Hiroshima Prefecture	Setouchi SEAPLANES Inc.	JA02TG Quest Kodiak 100 (Small aeroplane)
	Summary	See “6. Publication of investigation reports” (Page 113 No.17)	
3	Date and location	Operator	Aircraft registration number and aircraft type
	April 22, 2018 Akitakata City, Hiroshima Prefecture (34 ° 36’28”N, 132° 43’04”E)	Privately Owned	JR1902 Quicksilver Sport 2S-R582 (Ultralight plane)
	Summary	See “6. Publication of investigation reports” (Page 111 No.13)	
4	Date and location	Operator	Aircraft registration number and aircraft type
	June 7, 2018 On the sea at approximately 40 km northwest of Naha Airport, Okinawa Prefecture (details unknown)	Excel Air Service Inc.	JA350D Eurocopter AS350B3 (Helicopter)
	Summary	The aircraft took off from Naha Airport, reported an emergency situation during flight and then crashed near the abovementioned location. One person on board suffered minor injuries.	
5	Date and location	Operator	Aircraft registration number and aircraft type
	June 24, 2018 Approximate altitude of 9,100 m, approximately 80 km north of Sendai Airport, Miyagi Prefecture	Japan Airlines Co., Ltd.	JA8944 Boeing 777-300 (Large aeroplane)
	Summary	The aircraft took off from New Chitose Airport, and when the aircraft shook during flight near the abovementioned location, one of the cabin crew fell over and suffered serious injuries.	
6	Date and location	Operator	Aircraft registration number and aircraft type
	July 8, 2018 On land at Fuseshita, Kashiwa City, Chiba Prefecture	Privately Owned	JA7980 Robinson R22Beta (Helicopter)
	Summary	Two people, the pilot in command and a passenger, boarded the aircraft. The aircraft rolled over while traveling above the ground (air taxiing) at a temporary helipad located in Kashiwa City, Chiba Prefecture resulting in damage to the airframe.	
7	Date and location	Operator	Aircraft registration number and aircraft type
	July 14, 2018 Motoishikawa Town, Mito City, Ibaraki Prefecture	Privately Owned	JR1118 Quicksilver GT400S-447L (Ultralight plane)

	Summary	The aircraft crashed at the abovementioned location during flight, One person suffered fatal injuries.		
8	Date and location	Operator	Aircraft registration number and aircraft type	
	July 25, 2018 Approximate altitude of 90 m, approximately 1 km west of Kounan Airfield, Okayama Prefecture	Okayama Air Service Co., Ltd.	JA10AZ Cessna 172R (Small aeroplane)	
	Summary	The aircraft was approaching the airfield during a training flight and collided with a bird resulting in damage to the airframe. A total of 3 people, the pilot in command and 2 students were on the plane but there were no injuries.		
9	Date and location	Operator	Aircraft registration number and aircraft type	
	August 10, 2018 In the mountains of Nakanojo Town, Agatsuma District, Gunma Prefecture	Gunma Disaster Prevention Air Corps	JA200G Bell 412EP (Helicopter)	
	Summary	The aircraft took off from Gunma Heliport and crashed in the mountains of Nakanojo Town, Agatsuma District, Gunma Prefecture during flight. Nine persons on board suffered fatal injuries in the crash.		
10	Date and location	Operator	Aircraft registration number and aircraft type	
	August 21, 2018 On East Runway (Runway 18L) of Chitose Airport, Hokkaido	Japan Coast Guard	JA395A Textron Aviation 172S (Small aeroplane)	
	Summary	The aircraft took off from Chitose Airport for a pilot practical test. When the pilot attempted to land on the east runway (runway 18L) of the airport, the aircraft landed with too much force and damaged the airframe. There were no injuries.		
11	Date and location	Operator	Aircraft registration number and aircraft type	
	August 27, 2018 Approximate altitude of 9,100 m, approximately 60 km east of Miyazaki Airport, Miyazaki Prefecture	Vanilla Air	JA14VA Airbus A320-214 (Large aeroplane)	
	Summary	The aircraft took off from Kansai International Airport and when the aircraft shook near the abovementioned location during flight, one of the cabin crew fell over and suffered serious injuries.		
12	Date and location	Operator	Aircraft registration number and aircraft type	
	November 3, 2018 Near Namiki, Namegata City, Ibaraki Prefecture	Privately Owned	JR1749 Kit-Fox MODEL IV-R532L (Ultralight plane)	
	Summary	The aircraft took off from a temporary airfield in Mito City, Ibaraki Prefecture and crashed at the abovementioned location around 1:40 PM during flight. Two persons on board suffered minor injuries.		
13	Date and location	Operator	Aircraft registration number and aircraft type	
	November 11, 2018 Yamaga, Ubuyama, Aso District, Kumamoto Prefecture	Privately Owned	JR7366 BOGDOLA JANOS BB-02SERPA BENCE/R-R503 (Ultralight plane)	
	Summary	The aircraft took off from a temporary airfield in Ubuyama, Aso District, Kumamoto Prefecture and crashed at the abovementioned location during flight. One person on board suffered fatal injuries.		
14	Date and location	Operator	Aircraft registration number and aircraft type	
	December 9, 2018 Menuma Glider Airstrip, Kumagaya City, Saitama	Privately Owned	JA2152 Alexander Schleicher ASK 13	

Prefecture		(Glider)
Summary	After taking off from Menuma Glider Airstrip the aircraft was unable to ascend and landed nose-first into the ground, resulting in damage to the airframe. One passenger suffered serious injuries.	

(Aircraft serious incidents)

1	Date and location	Operator	Aircraft registration number and aircraft type
	March 18, 2018 On Naha Airport Runway 18, Okinawa Prefecture	Juneyao Airline Co, Ltd. (Aircraft A)	B8236 Airbus A320-214 (Large aeroplane)
		Japan Coast Guard (Aircraft B)	JA8570 Dassault Falcon 900 (Large aeroplane)
Summary	See “6. Publication of investigation reports” (Page 120 No.19)		
2	Date and location	Operator	Aircraft registration number and aircraft type
	March 24, 2018 On the Fukuoka Airport runway, Fukuoka Prefecture	Peach Aviation Limited	JA805P Airbus A320-214 (Large aeroplane)
		Summary	After the aircraft landed at Fukuoka Airport, the nose landing gear tires misaligned to face sideways causing the aircraft to stop on the runway.
3	Date and location	Operator	Aircraft registration number and aircraft type
	April 11, 2018 Approximate altitude of 170 m, approximately 8 km north east of Tokyo International Airport, Tokyo	Thai Airways	HSTGX Boeing 747-400 (Large aeroplane)
		Summary	The aircraft took off from Bangkok. While it was approaching runway C at Tokyo International Airport an alarm operated from the ground proximity warning system when the aircraft was near the abovementioned location. The aircraft ascended in accordance with this warning and performed a go-around. Following this, the aircraft landed on runway B at Tokyo International Airport.
4	Date and location	Operator	Aircraft registration number and aircraft type
	May 24, 2018 Approximate altitude of 1,800 m, approximately 10 km west of Kumamoto Airport, Kumamoto Prefecture	Japan Airlines Co., Ltd.	JA8980 Boeing 767-300 (Large aeroplane)
		Summary	The aircraft took off from Kumamoto Airport and while it was ascending the first (left side) engine failed near the abovementioned location. The pilot requested priority in air traffic control, turned back and landed at the airport.
5	Date and location	Operator	Aircraft registration number and aircraft type
	June 14, 2018 Approximate altitude of 300 m, approximately 5 km south from the Naha Airport runway approach end and on the Naha Airport runway, Okinawa	Ryukyu Air Commuter Co., Ltd. (Aircraft A)	JA84RC Bombardier DHC-8-402 (Large aeroplane)

	Prefecture	Japan Air Self-Defense Force (Aircraft B)	None F-15 (Large aeroplane)
	Summary	The air traffic controller ordered Aircraft B to wait in front of the runway. However, Aircraft B went past the stopping position at the front of the runway and entered the runway. The air traffic controller ordered Aircraft B to withdraw from the runway and also canceled landing permission for Aircraft A, which was in the process of approaching the runway.	
6	Date and location	Operator	Aircraft registration number and aircraft type
	June 29, 2018 On Narita International Airport taxiway, Chiba Prefecture	Korean Airlines Co., Ltd	HL7573 Boeing 777-300 (Large aeroplane)
	Summary	The aircraft took off from Seoul (Incheon). After landing on runway B at Narita International Airport and while traveling on the ground it stopped on the taxiway due to a damaged right main landing gear axle.	
7	Date and location	Operator	Aircraft registration number and aircraft type
	July 8, 2018 Approximate altitude of 4,500 m, approximately 20 km south east from Toyama Airport, Toyama Prefecture	China Airlines	B18667 Boeing 737-800 (Large aeroplane)
	Summary	The aircraft took off from Taipei. It attempted to land 3 times at Toyama Airport but was unable to land due to the effects of airflow and then changed its destination to Chubu International Airport. The aircraft's remaining fuel was low near the abovementioned location so the pilot requested priority in air traffic control, and landed at the airport.	
8	Date and location	Operator	Aircraft registration number and aircraft type
	July 9, 2018 On the Toyama Airport runway, Toyama Prefecture	Aero Asahi Corporation	JA9690 AEROSPATIALE AS332L (Helicopter)
	Summary	The aircraft landed on a runway at Toyama Airport that was being used by a runway inspection vehicle.	
9	Date and location	Operator	Aircraft registration number and aircraft type
	August 21, 2018 Approximate height of 130 m above and near Fukushima Town, Matsumae District, Hokkaido	Nakanihon Air Service Co., Ltd.	JA9660 AEROSPATIALE AS332L (Helicopter)
	Summary	The aircraft took off from a temporary helipad in Fukushima Town, Matsumae District, Hokkaido. While transporting goods suspended from the aircraft, it dropped some of the goods (2 lengths of wire weighing 52 kg and 13 kg and a single blue sheet weighing 3 kg) at the abovementioned location.	
10	Date and location	Operator	Aircraft registration number and aircraft type
	September 26, 2018 Anamizu Town, Hosu District, Ishikawa Prefecture	Japan Aviation Academy	JA2451 Valentin Taifun 17E II (Glider)
	Summary	The aircraft took off from Noto Airport to verify flight prior to an airworthiness inspection. During flight, an electrical systems fault occurred and the pilot attempted to turn back by gliding to Noto Airport but had to perform an emergency landing on grassland approximately 3 km before the airport. This resulted in the damage to the legs on the glider making it impossible to navigate.	

11	Date and location		Operator	Aircraft registration number and aircraft type
	October 20, 2018 Approximate height of 900 m above and near Minamidaio, Otoyo Town, Nagaoka District, Kochi Prefecture		Nishi Nippon Airlines Co., Ltd.	JA003W Bell 412EP (Helicopter)
	Summary	The aircraft took off from a temporary helipad in Otoyo Town, Nagaoka District, Kochi Prefecture. While transporting goods suspended outside the aircraft, it dropped the goods (ready-mixed concrete weighing 600 kg) in the mountains near the abovementioned location.		
12	Date and location		Operator	Aircraft registration number and aircraft type
	October 27, 2018 Approximate altitude of 120 m, approximately 2.4 km north east of Tokyo International Airport and on runway B at Tokyo International Airport, Tokyo		Privately Owned (Aircraft A)	B3276 Gulfstream Aerospace G650 (Large aeroplane)
			Okayama Air Service (Aircraft B)	JA123F Cessna 510 (Small aeroplane)
	Summary	Aircraft B received permission to land and was approaching runway B at Tokyo International Airport. Aircraft A, which was instructed to stop before runway B and was traveling on the ground, entered runway B. This resulted in the traffic controller instructing Aircraft B to make a go-around.		

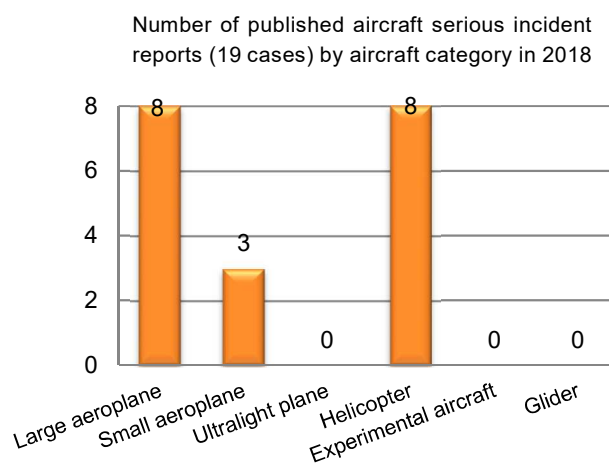
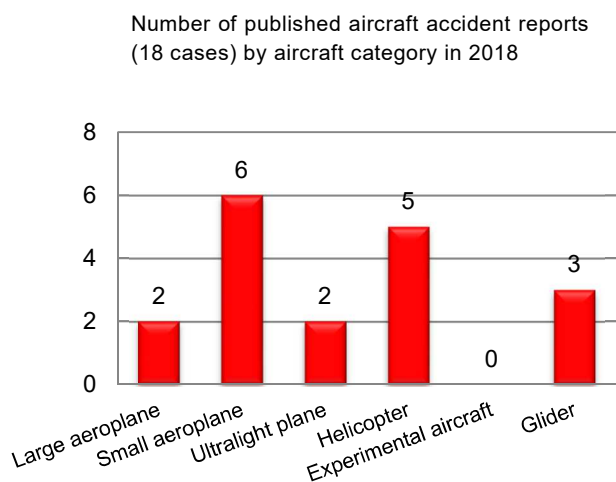
6 Publication of investigation reports

The number of investigation reports of aircraft accidents and serious incidents published in 2018 was 37, consisting of 18 aircraft accidents and 19 aircraft serious incidents.

Breaking them down by aircraft category, the aircraft accidents involved two large aeroplanes, six small aeroplanes, two ultralight planes, five helicopters, and three gliders. The aircraft serious incidents involved eight large aeroplanes, three small aeroplanes, and eight helicopters.


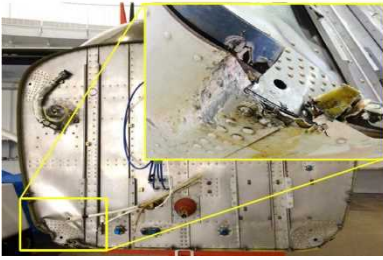
Note: In aircraft accidents and serious incidents, two or more aircraft are sometimes involved in a single case. See page 106 to 122 for details.


In the 18 accidents, the number of injuries was 61, consisting of 16 fatal injuries, and 45 serious/minor injuries.





The aircraft accidents and serious incidents which occurred in 2018 are summarized as follows.

Aircraft accident investigation reports published in 2018

1	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	January 25, 2018	April 15, 2017 Lake Shinji, Tamayu Town, Matsue City, Shimane Prefecture	Privately Owned	JA007P Cessna T206H
	Summary	<p>The aircraft suffered damage due to a collision with wave during takeoff run from water at Lake Shinji, heading to Tottori Airport for a familiarization flight.</p> 		
	Probable Causes	<p>In this accident, it is highly probable that the Aircraft suffered damage because it collided with big wave during the takeoff run from water.</p> <p>Regarding to the collision with big wave during the takeoff run from water, it is probable that because the Pilot did not check the performance to takeoff from water in POH in advance and commenced the takeoff run from water without securing the required takeoff distance from water, and because the Pilot thought that becoming airborne was imminent when approaching the rough water area, he did not reject the takeoff from water before the collision with big wave.</p>		
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA007P.pdf		
2	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	February 22, 2018	March 24, 2017 At the Sea off Beppu City, Oita Prefecture	Setouchi SEAPLANES, Inc.	JA02TG Quest Kodiak 100
	Summary	<p>The aircraft took bounces during the takeoff run from water and suffered damage to the aircraft when contacting water surface.</p>		
	Probable Causes	<p>It is highly probable that because the Aircraft bounced during the takeoff run from water and received strong impact when contacting water surface, and suffered damage to the Aircraft.</p> <p>Regarding the Aircraft bounced during the takeoff run from water, it is probable that because the Pilot conducted the takeoff run from water across the swell at the sea area existing the wind wave and swell, pitching motion was generated and the amplitude become larger along with the acceleration.</p> 		
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA02TG.pdf		
3	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	March 29, 2018	June 29, 2018 Nagasaki Airport, Nagasaki Prefecture	School Judicial Organization KIMIGAFUCHI GAKUEN (Sojo University)	JA5304 Beechcraft 58
	Summary	<p>The aircraft made a belly landing which caused damages to the aircraft at Nagasaki Airport during a training flight.</p>		
	Probable Causes	<p>It is probable that the accident occurred because the Aircraft touched down without extending the landing gears which resulted in a belly landing and suffered the damages to the Aircraft.</p>		



		<p>Regarding the reason why the Aircraft touched down without extending the landing gears, it is probable that it was caused by the followings.</p> <ol style="list-style-type: none"> 1. The Captain did not notice that the Trainee did not lower the landing gears and did not recheck the landing gear-down, because the Captain was less attentive to monitor the other handling of the Trainee than the controlling the Aircraft. 2. The trainee was distracted by the short field landing procedures and the control of the Aircraft and forgot to lower the landing gear and re-confirm it. 		
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA5304.pdf		
4	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	March 29, 2018	August 9, 2016 Shichi-ga-hama Town, Miyagigun, Miyagi Prefecture	Japan Coast Guard	JA968A Agustawestland AW139
	Summary	<p>The aircraft landed on the sandy beach at Hanabuchi-hama of Shichi-ga-hama Town, Miyagigun, Miyagi Prefecture, Japan, without extending the landing gear down and suffered damages to the rotorcraft.</p>		
	Probable Causes	<p>It is highly probable that this accident occurred as the Rotorcraft suffered damages because it had landed without extending the landing gear.</p> <p>Regarding why it had landed without extending the landing gear, it is probable that various tasks were occurred in short time span and at same time other crews on board were also focusing on their own various tasks, so that they could not carry out necessary corporation or support, and because the workload of the captain continued to be high, there were not enough time for the captain to shift his mind from the rescue operation to the landing procedure, as the result, he forgot the check prior to the landing prescribed in the flight manual and did not check the landing gear condition.</p>		
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA968A.pdf		
5	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	June 28, 2018	August 25, 2016 Sendai Airport	Independent Administrative Institution Civil Aviation College	JA5807 Hawker Beechcraft G58
	Summary	<p>The aircraft made a belly landing on the Runway 27 at Sendai Airport which caused damage to the aircraft during a training flight.</p>		
	Probable Causes	<p>In this accident, it is certain that the aircraft made a belly landing both without extending the landing gears and without the sufficient confirmation of the status during the touch-and-go training at Sendai Airport, and which caused damage to the aircraft.</p> <p>Regarding that the aircraft made a landing both without extending the landing gears and without the sufficient confirmation of the status; it is probable that the Instructor was not aware of his forgotten of both the operation to extend the landing gears and the confirmation because the grasp of flight situation by the Instructor became insufficient.</p>		
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA5807.pdf		





6	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	June 28, 2018	August 27, 2017 Fukushima	Fukushima Motor Glider Club	JA2406 Hoffmann H-36 Dimona (glider)
	Summary	<p>The aircraft took off from Fukushima Sky Park and the motor glider crashed while it was flying in the vicinity of Bandai-Azuma Skyline Fudosawa Bridge.</p> <p>The captain suffered fatal injuries and the passenger suffered serious injuries. The aircraft was destroyed.</p>		
	Probable Causes	<p>In this accident, it is highly probable that the aircraft entered into the valley at insufficient altitude and when it approached the mountain slope, the captain made a steep turn to avoid a collision with the slope, but with the insufficient airspeed the aircraft stalled and fell into the spin and crashed.</p> 		
Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA2406(2).pdf			
7	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	June 28, 2018	November 10, 2017 Ono Gliding Field, Ono-Cho, Ibi-Gun, Gifu Prefecture	Kwansei Gakuin University	JA05KG Schempp-Hirth V.L. Discus CS (glider)
	Summary	<p>The aircraft aborted a winch launching for a familiarization flight and collided with the winch while landing, resulting in damage of the aircraft.</p>		
	Probable Causes	<p>In this accident, it is probable that since the Glider became difficult to control after aborting the winch launching and landing was attempted, the right main wing collided with the winch, and then the Glider was damaged due to the impact force produced when it stopped upside-down.</p> <p>It is probable that the cause why the Glider became difficult to control is that the Pilot could not appropriately control the approaching angle and speed since she did not open the air brakes, and then the flare and other controls by the Pilot were overcontrolled and it caused PIOs (Pilot-Induced Oscillations).</p> 		
Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA05KG.pdf			
8	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	July 26, 2018	May 27, 2016 Runway 34R at the Tokyo International Airport	Korean Airlines Co.,Ltd	HL7534 Boeing 777-300
	Summary	<p>The aircraft as the scheduled Flight 2708 of the company, flight crew had a rejected takeoff on runway 34R at the Tokyo International Airport during a takeoff roll to Gimpo International Airport, because there was a warning to indicate a fire from the No.1 (left-side) engine activated at around 12:38, the flight crew stopped the aircraft on the runway, and conducted an emergency evacuation. There were 319 people in total on board, consisting of the PIC, sixteen other crew members, and 302 passengers. Among them, 40 passengers suffered minor injuries.</p>		

	Probable Causes	<p>It is highly probable that the causes of this accident were the fracture of the high pressure turbine (HPT) disk of the No.1 (left-side) engine during the takeoff ground roll of the HL7534, the penetration of the fragment through the engine case and the occurrence of subsequent fires.</p> <p>Regarding the cause for the 1st stage HPT disk to be fractured, it is probable that a step was machined exceeding the allowable limit when machining U-shaped groove on the aft side of the 1st stage HPT disk to manufacture the engine and from this step the low-cycle fatigue cracks were initiated and propagated during running of engine.</p> <p>Regarding why the step could not be found, it is somewhat likely that defects failed to be detected at the time of the inspection by the manufacturer during the production process. And as for the cracks that were not found, it is somewhat likely that those cracks failed to be detected at non-destructive inspection on the disk by the Korean Airlines Co., Ltd , at the time of maintenance of the engine in use.</p> <p>Regarding the fire breakout from the No.1 engine, it is probable that due to the impact forces generated by the release of the fragment from the ruptured rim part of the 1st stage HPT disk through the engine case and the engine rundown loads generated when the engine stopped suddenly, the cracks were developed in the outer case of the Fuel Oil Heat Exchanger and the fuel and engine oil leaking through these cracks contacted the hot area of engine case of the No.1 engine to be ignited.</p>		
	Report	<p>http://www.mlit.go.jp/jtsb/eng-air_report/HL7534.pdf http://www.mlit.go.jp/jtsb/aircraft/p-pdf/AA2018-5-2-p.pdf (Explanatory material) See “Feature 2: Summaries of major aircraft accident and serious incident investigation reports (case studies)”, page 38</p>		
9	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	July 26, 2018	September 10, 2017 Yamaoka Town, Ena City, Gifu Prefecture	Privately Owned	JR1925 Quicksilver MXLIITop-R582L NISHIYAMA (Ultralight plane)
	Summary	<p>The aircraft had one passenger including the pilot for a familiarization flight. It took off from a temporary airfield in Yamaoka Town, Ena City, Gifu Prefecture. While ascending and turning, the aircraft suddenly lost altitude unintentionally and made contact with nearby forest trees. After which the aircraft dropped to the ground resulting in damage to the airframe.</p>		
	Probable Causes	<p>In this accident, it is probable that when the aircraft attempted to turn at low speed and low altitude it encountered air turbulence or stalled, which caused the aircraft to suddenly lose altitude and crash.</p> <p>The reason that the pilot attempted to turn while at low speed and low altitude is probable that the pilot had no experience of the aircraft and flew the aircraft without full knowledge of its performance contributed to it.</p>		
Report	<p>http://www.mlit.go.jp/jtsb/aircraft/rep-acci/AA2018-5-1-JR1925.pdf</p>			
10	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	August 30, 2018	March 18, 2017 Odaira, Itoigawa City, Niigata	Privately Owned	JA7907 Robinson R44



		Prefecture		
	Summary	The aircraft contacted with a snowy slope upon landing at The Temporary Airfield, in Odaira, Itoigawa City, Niigata Prefecture and rolled over. Its airframe was damaged.		
	Probable Causes	<p>In this accident, it is highly probable that upon landing, the Rotorcraft touched the snowy slope short of the Helipad, rolled over and its airframe was damaged. It is probable that the reason the Rotorcraft touched the snowy slope is because the PIC tried to land by taking a steep left turn and nose-diving, neglecting the safety of flight.</p> 		
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA7907.pdf		
11	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	August 30, 2018	June 3, 2017 Ashikuraji, Tateyama Town, Nakaniikawa District, Toyama Prefecture	New Central Airservice Co.,Ltd.	JA3989 Cessna 172P
	Summary	<p>The aircraft took off from Toyama Airport, while flying to Matsumoto Airport, at around 14:50 Japan Standard Time (JST: UTC+9 hours, unless otherwise stated all times are indicated in JST), it crashed into the vicinity of the top of Mt. Shishi-dake (elevation about 2,700 m) in the Tateyama Mountain Range.</p> <p>There were four people on board the Aircraft consisting of a PIC, a pilot and two passengers and all of them suffered fatal injuries.</p> <p>The aircraft was destroyed but there was no outbreak of fire.</p> 		
	Probable Causes	<p>It is probable that as the Aircraft got into clouds during VFR flight over the mountain region, it became difficult for the PIC and the Pilot to grasp its own position and surroundings by confirming visually the terrain, then, the Aircraft approached the vicinity of the mountaintop and crashed into it.</p> <p>It is somewhat likely that the Aircraft approached the vicinity of the mountaintop and crashed into it due to loss of visual contacts making the crash unavoidable, or due to failure to maintain minimum safe altitude caused by the Aircraft icing or stalled condition, or due to encountering a severe turbulence. However, it could not be determined, since the PIC and all members on board suffered fatal injuries.</p> <p>Concerning the fact that the Aircraft came to fly into clouds, it is probable that the PIC and the Pilot had not confirmed thoroughly the weather forecast for the mountainous region before departure and they delayed in making a decision to turn back during flight.</p>		
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA3989.pdf http://www.mlit.go.jp/jtsb/aircraft/p-pdf/AA2018-6-2-p.pdf (Explanatory material) See “Feature 2: Summaries of major aircraft accident and serious incident investigation reports (case studies)”, page 40		
12	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	September 27, 2018	July 1, 2017 Approximate altitude of 15,600 feet, approximately 64 km south west of Fukushima Airport, Fukushima Prefecture	United Airlines, Inc.	N29968 Boeing 787-9 (Large aeroplane)

	Summary	The aircraft was flying towards Tokyo International Airport from San Francisco International Airport as the regular 875 flight from United Airlines. During flight the aircraft shook and a cabin crew member suffered serious injuries.		
	Probable Causes	In this accident, it is highly probable that one of the cabin crew members suffered serious injuries after falling over while working at the rear galley because the aircraft shook while the aircraft was descending inside a cloud region near a stationary weather front.		
	Report	http://www.mlit.go.jp/jtsb/aircraft/rep-acci/AA2018-7-1-N29968.pdf		
13	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	September 27, 2018	April 22, 2018 Akitakata City, Hiroshima Prefecture (north latitude of 34 degrees 36 minutes 28 seconds, east longitude of 132 degrees 43 minutes 04 seconds)	Privately Owned	JR1902 Quicksilver Sport 2S-R582 (Ultralight plane)
	Summary	The aircraft took off from a temporary airfield in Toyosaka, which is in Akitakata City, Hiroshima Prefecture, with only the pilot on board for the purpose of leisure. While flying above Misasa River, which flows through the town, the aircraft made contact with an overhead ground wire installed above electric cables, which caused the aircraft to crash into a field. The aircraft suffered fatal damage but the pilot suffered no injuries.		
	Probable Causes	In this accident, it is highly probable that the aircraft crashed after making contact with overhead ground wire because it was flying at low altitude.		
	Report	http://www.mlit.go.jp/jtsb/aircraft/rep-acci/AA2018-7-2-JR1902.pdf		
14	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	October 25, 2018	March 5, 2017 Mt. Hachibuse, Matsumoto City, Nagano Prefecture	Nagano Fire and Disaster Prevention Aviation Center	JA97NA Bell 412EP
	Summary	The aircraft took off from Matsumoto Airport and was flying toward a temporary helipad in the mountains, Shiojiri City, Nagano Prefecture to conduct rescue training. At around 13:41, it collided with trees and then crashed onto the mountain's slope on Mt. Hachibuse, Matsumoto City, Nagano Prefecture. There were nine persons on board the helicopter, consisting of a captain, eight others and all of them suffered fatal injuries. The helicopter was destroyed, but there was no outbreak of fire.		
	Probable Causes	It is highly probable that in the accident occurred, while flying in a mountainous region, the helicopter collided with trees and crashed, because the helicopter did not take avoidance maneuver even getting closer to the ground. Regarding the helicopter's not taking avoidance maneuver even getting closer to the ground while flying in a mountainous region, it is somewhat likely that the captain could not recognize the dangerous situation because the captain was in a state where the arousal level was lowered, however, it was not possible to clarify whether he actually fell into such a state.		
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA97NA.pdf http://www.mlit.go.jp/jtsb/aircraft/p-pdf/AA2018-8-1-p.pdf (Explanatory material) See "Feature 2: Summaries of major aircraft accident and serious incident investigation"		

		reports (case studies)", page 39		
15	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	October 25, 2018	March 14, 2017 Kobe Airport	HIRATA GAKUEN	JA500H Eurocopter AS350 B3
	Summary	<p>The aircraft landed on a grass area inside the landing area of Kobe Airport and attempted to lift off again for training but rolled over in the same grass area.</p> <p>There were 2 people on board the helicopter, consisting of a PIC and a pilot undergoing annual training. There were no injuries.</p> <p>The helicopter was destroyed, but there was no outbreak of fire.</p>		
	Probable Causes	<p>It is probable that this accident occurred because, when control was transferred from the pilot in the right seat to the Pilot In Commander in the left seat immediately after the helicopter made a running landing in hydraulic system failure training and the helicopter attempted to lift off again, left rotation occurred and the helicopter rolled over to the right due to dynamic rollover in which the trailing end of the right skid, which became stuck in the ground, served as the fulcrum, causing damage to the helicopter.</p> <p>Regarding the left rotation, it is probable that this occurred because the collective pitch lever rose after the transfer of control and appropriate control in response to it did not take place.</p> <p>It is probable that the fact that an operation to restore hydraulic pressure was being conducted simultaneously with the transfer of control and the fact that the collective pitch lever was not being held appropriately contributed to the collective pitch lever's rise.</p>		
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA500H.pdf		
16	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	November 29, 2018	May 14, 2017 Tabayama Village, Kitatsuru-Gun, Yamanashi Prefecture	Yamanashi Prefectural Police Headquarters	JA110Y Bell 412EP
	Summary	<p>The aircraft conducted a rescue operation when one rescuee suffered fatal injuries and three search and rescue (SAR) team members suffered minor injuries.</p>		
	Probable Causes	<p>In this accident, it is highly probable that when the helicopter made the approach to the survivor during rescue activities in the mountains, the tree branches were broken and the rockfalls occurred due to the downwash, and some of those falling trees and rocks hit the survivor and the SAR team members.</p> <p>Regarding the occurrence of falling rocks and broken tree branches, it is somewhat likely that the those facts— which the rescue site was steep and narrow V-shaped trough-like terrain and the helicopter made the approach at a slow speed and at a shallow angle toward the rescue position —may have contributed to the situation where the flow direction and speed significantly changed.</p>		
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA110Y.pdf http://www.mlit.go.jp/jtsb/aircraft/p-pdf/AA2018-9-1-p.pdf (Explanatory material)		
17	Date of	Date and location	Operator	Aircraft registration number



	Publication			and aircraft type
	November 29, 2018	April 15, 2018 At The Sea Surface About 1.2 Km Off Sakaigahama Urasaki Town, Onomichi City, Hiroshima Prefecture, Japan	Setouchi SEAPLANES Inc.	JA02TG Quest Kodiak 100
	Summary	The aircraft repeated bounce during the water landing and suffered damage to the aircraft.		
	Probable Causes	<p>It is probable that in this accident, the Aircraft touched down so hard, while repeating the bounce after the Pilot rejected the go-around, and suffered damage to the Aircraft.</p> <p>It is probable that the reason why the Aircraft touched down so hard while repeating the bounce was that the Pilot was not able to stabilize the Aircraft during bounce by increasing / reducing the power and setting the nose attitude, and continued the same control without making a go-around.</p>		
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA02TG%20(2).pdf		
18	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	December 20, 2018	October 10, 2016 Oizumi Town, Oura-Gun, Gunma Prefecture	Waseda University	JA22WP Rolladen-Schneider LS4-b (glider)
	Summary	<p>The aircraft was winch-launched from the Menuma Gliding Field at Kumagaya City in Saitama Prefecture for the gliding competition and crashed along the airfield traffic pattern while trying to land.</p> <p>The Pilot died and the glider was destroyed.</p>		
	Probable Causes	<p>It is highly probable that in spite of the control to recover from the stall at low altitude, the Glider stalled again; started spinning and crashed.</p> <p>It is somewhat likely that the Glider stalled at low altitude because of the steep turn at low speed and that the stall was attributable to the Pilot who did not fully familiarize himself with the flight characteristics of the Glider whose CG position was set to near the aft limit position.</p>		
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA22WP.pdf		



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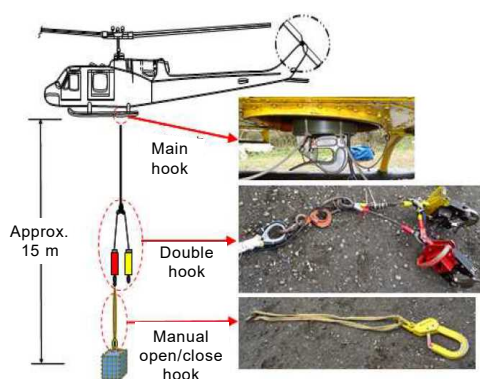
1	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	February 22, 2018	December 22, 2016 About 5 Nm East Of Tokyo International Airport, Around 480ft	Peach Aviation Co., Ltd	JA811P Airbus A320-214
	Summary	<p>The aircraft was the scheduled Flight 1028 of the company, while approaching runway 16L of Tokyo International Airport, mistakenly tried to approach for runway 23 which was closed at 00:39 JST. An air traffic controller in the control tower</p>		



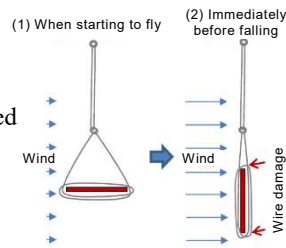
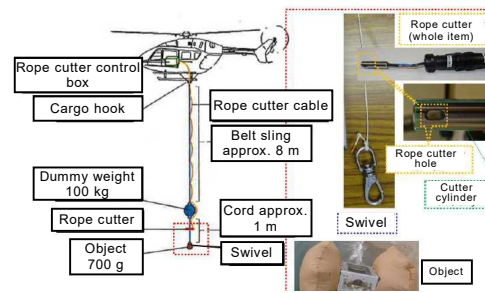
		<p>noticed the situation and instructed it to go around at the position of about 5 nm east of the airport. Afterward, the aircraft landed on runway 16L at 00:55 JST via visual approach following radar-vectored.</p> <p>There were 164 persons on board consisting of the captain, five other crewmembers and 158 passengers. There were no injuries on board and no damage to the aircraft.</p>		
	Probable Causes	<p>It is probable that the serious incident occurred because aircraft, conducting VOR-A approach to land on runway 16L of Tokyo International Airport, mistakenly tried to approach for runway 23 which was closed.</p> <p>It is probable that the aircraft mistakenly tried to approach for runway 23 which was closed because advance preparations for VOR A approach by the captain and the first officer were not sufficient, and they could not recognize the runway change instruction to land as a threat and then they failed to manage workloads, properly monitor and advise.</p>		
	Report	<p>http://www.mlit.go.jp/jtsb/eng-air_report/JA811P.pdf</p>		
2	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	February 22, 2018	January 19, 2017 Near The End Of The Runway 01R At New Chitose Airport, Hokkaido, Japan	ANA Wings CO., LTD.	JA461A Bombardier DHC-8-402
	Summary	<p>The aircraft took off from Akita Airport as a scheduled flight 1831 of ALL NIPPON AIRWAYS CO., LTD. as the joint undertaking for transport with ANA Wings, overran and came to a halt at the snow covered grassland when landing at New Chitose Airport.</p>		
	Probable Causes	<p>In this serious incident, it is highly probable that the aircraft overran the runway because the aircraft could not obtain the braking force due to the delay of braking operation start by the PIC and PL (Power Lever) was not set at the Disc position. Moreover, it is somewhat likely that the bad conditions with snow fall around the end of the runway and the overrunning zone contributed to the aircraft overrunning.</p> <p>Regarding the delay of braking operation start by the PIC, it is highly probable that because the PIC instructed from ATC to vacate from Taxiway B2 at the end of the runway tried to vacate the runway in a short time by delaying the braking operation start. Furthermore, it is probable that the PIC's misconceiving Taxiway B3 where he just started to vacate as Taxiway B4 contributed to it.</p> <p>Regarding why the PL was not set to Disc position, it is probable that because the PIC mistook the PL was already Disc position. Furthermore, it is somewhat likely that it was contributed that the co-pilot did not notice PL in different position than normal.</p>		
	Report	<p>http://www.mlit.go.jp/jtsb/eng-air_report/JA461A.pdf http://www.mlit.go.jp/jtsb/aircraft/p-pdf/AI2018-1-3-p.pdf (Explanatory material) See "Feature 2: Summaries of major aircraft accident and serious incident investigation reports (case studies)", page 41</p>		
3	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	February 22, 2018	October 27, 2016 Sakae Village, Shimominochi District, Nagano Prefecture	Akagi Helicopter Co., Ltd.	JA9374 Fuji-Bell 204B-2 (Helicopter)
	Summary	<p>The aircraft was flying towards a temporary helipad at Kiriake, Sakae Village, Shimominochi District, Nagano Prefecture. During flight the aircraft dropped the goods it was carrying in the mountains nearby.</p>		




	Probable Causes	<p>In this serious incident, it is highly probable that the aircraft dropped the goods because the double hooks opened while the aircraft was transporting the suspended goods.</p> <p>The reason the double hooks opened is because the double hook device main-switch was located at the ARM position, and the pilot in command, in an attempt to relax his body while flying the aircraft, moved his upper body forward and swung his left arm outwards in an up-down motion. This resulted in his arm making contact with the operation switch guard, causing the guard to open and the operation switch to operate.</p> <p>It is probable that the device main-switch was at the ARM position because operating procedures to turn off the main-switch to ensure the hook does not operate even when the operation switch is mistakenly operated were not specified in the company's work standards.</p>		
	Report	<p>http://www.mlit.go.jp/jtsb/aircraft/rep-inc/ai2018-1-2-JA9374.pdf</p>		
4	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	March 29, 2018	February 14, 2017 On Runway 34R At Narita International Airport	Thai Air Asia X (Aircraft A)	HS-XTC Airbus A330-343X
			China Airlines (Taiwan) (Aircraft B)	B-18361 Airbus A330-302
	Summary	<p>The Aircraft A crossed Holding Position Marking and entered onto the runway, despite an instruction to hold short of runway given by Aerodrome Control Facility. Because of this, the Aircraft B, approaching to land with the Landing Clearance, made a go-around as being instructed by Aerodrome Control Facility.</p>		
Probable Causes	<p>It is highly probable that this serious incident occurred because the Aircraft A entered the runway across the Stop Line despite the instruction given to it by the Tower to hold short of the Stop Line of the runway 34R, and the Aircraft B which had been given landing clearance attempted a landing to the same runway.</p> <p>It is somewhat likely that the Aircraft A entered the runway when the PIC and the FO failed to notice the Stop Line and the Runway Guard Lights because they were concentrating to operate the switches in the cockpit and forgot to pay attentions to the outside.</p>			
Report	<p>http://www.mlit.go.jp/jtsb/eng-air_report/HS-XTC_B-18361.pdf</p>			
5	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	March 29, 2018	July 1, 2017 Higashidori Village, Shimokita District, Aomori Prefecture	Japan Aerospace Exploration Agency	JA21RH Kawasaki BK117C-2 (Helicopter)
	Summary	<p>The aircraft was flying towards a drop site from a temporary airfield in Higashidori Village, Shimokita District, Aomori Prefecture to perform a drop test for a suspended object. During flight the aircraft dropped the object on the beach.</p>		



	Probable Causes	<p>In this serious incident, it is highly probable that the object fell down to the ground because the rope suspending the object was cut during the flight.</p> <p>It is probable that the rope was cut because the rope swung in circles and rubbed against the edge of the rope cutter hole, which had sharp edges because it was not chamfered. The rope swung in circles due to the severe shaking and rotation on the object caused by strong winds while flying.</p>		
	Report	<p>http://www.mlit.go.jp/jtsb/aircraft/rep-inc/ai2018-2-2-ja21rh.pdf</p>		
6	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	May 31, 2018	August 5, 2016 Totsugawa Village, Yoshino-Gun, Nara Prefecture	AERO ASAHI Corporation	JA9678 Aérospatiale AS332L1
	Summary	<p>The Aircraft slung a steel plate at a temporary helipad in Oto Town, Gojo City, Nara Prefecture, and as heading to a construction site in Totsukawa Village, the same prefecture, dropped the steel plate slung from the rotorcraft during this flight into mountains of the same village.</p>		
	Probable Causes	<p>It is probable that the steel plate of being held horizontally was turned up vertically due to effects of wind pressure and others, resulted in the balance loss and dropped.</p> <p>It is probable that the lashing method of this steel plate was adopted because of insufficient technical examination and overlooking the possibility of suspended load collapse.</p>		
Report	<p>http://www.mlit.go.jp/jtsb/eng-air_report/ja9678(2).pdf</p>			
7	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	May 31, 2018	April 27, 2017 Toubetsu, Tesikaga Town, Kawakami-Gun, Hokkaido	akanihon Air Service CO., LTD.	JA9743 Aérospatiale AS350B1
	Summary	<p>The Aircraft was flying toward a cargo sling point after spraying fertilizer to a pasture at Toubetsu, Teshikaga Town, Kawakami-gun, Hokkaido by a spraying device slung outside of the rotorcraft to a temporary helipad, the spraying device was dropped.</p>		
	Probable Causes	<p>It is highly probable that the serious incident occurred because when the cargo swing was shaken due to the right turn following the acceleration of the rotorcraft to cause the outer cable of the cargo swing broke, the tension was applied to the inner cable, the release unit was activated to open the hook and the spraying device slung was dropped.</p> <p>Regarding why the outer cable of the cargo swing broke and the tension was applied to the inner cable, it is highly probable that the cable routing configuration was differed from the regular routing configuration.</p>		
Report	<p>http://www.mlit.go.jp/jtsb/eng-air_report/ja9743.pdf</p>			
8	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	June 28, 2018	June 27, 2017 Fukushima Airport	Privately owned	JA4010 Piper PA-46-310P
	Summary	<p>The Aircraft damaged the nose landing gear during its landing roll on runway 01 at Fukushima Airport, therefore, the aircraft became unable to move on the Runway.</p>		
	Probable Causes	<p>In this serious incident, it is highly probable that the aircraft became unable to move on the runway during the landing roll because the rod end bearing of the nose landing gear actuator</p>		



		<p>was ruptured and consequently the nose landing gear was retracted.</p> <p>Regarding that the rod end bearing ruptured, it is somewhat likely that the compression load was applied to the actuator along its longitudinal direction because the nose landing gear strut leant backward from its normal fully extended position.</p>			
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA4010.pdf			
9	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type	
	June 28, 2018	August 13, 2017 Temporary Airfield Of Akeno Sky Sports Club, Chikusei City, Ibaraki Prefecture	Privately owned (Aircraft A)	JA3353 Cessna 172 H Ram	
			Privately owned (Aircraft B)	JX0157 Sakamoto SS-9 (experimental aircraft)	
	Summary	The Aircraft B landed on the temporary airfield of the Akeno Sky Sports Club, Chikusei City, Ibaraki Prefecture while the Aircraft A was about to start take-off roll.			
	Probable Causes	<p>It is probable that this serious incident was caused by the landing of the Aircraft B on the temporary runway where the Aircraft A was preparing for take-off.</p> <p>Regarding the fact that the Aircraft B landed on the temporary runway where the Aircraft A was preparing for take-off, it is probable that the Pilot B did not have accurate understanding of the characteristics of the temporary airfield and he considered that the Aircraft A stopped was outside of the temporary runway.</p>			
Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA3353_JX0157.pdf				
10	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type	
	August 30, 2018	August 3, 2017 Kurobe City, Toyama Prefecture (36°48' 59" N, 137°36' 12" E)	Aero Asahi Corporation	JA6512 Eurocopter AS350B3	
	Summary	The Aircraft took off from Otosawa Temporary Helipad in Kurobe City, Toyama Prefecture, slung the external cargo at the cargo loading site of the temporary helipad and flew to the cargo unloading site on the left bank of the Kuronagi-Kitamata Dam. During the flight, the suspended object dropped in the mountain forest.			
	Probable Causes	In this serious incident, it is somewhat likely that the slinging load dropped, since the lock on the sub-hook of the external cargo sling system was unintentionally released and its load beam was opened during the external cargo sling operation. However, the probable cause of opening the load beam due to unlocking the sub-hook could not be determined.			
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA6512.pdf			
11	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type	
	August 30, 2018	July 9, 2016 At an altitude of 37,000ft and approximately 96km south-southeast of Chubu Centrair International Airport	Jetstar Japan Co., Ltd.	JA04JJ Airbus A320-232	
	Summary	<p>The Aircraft was flying as a regularly scheduled 502 flight of the company, which departed from Fukuoka Airport and was heading to Narita International Airport. When the aircraft was flying at an altitude of 37,000ft and approximately 96km south-southeast of Chubu Centrair International Airport, the airspeed indication temporarily failed on the Captain's side and the Co-Pilot's side. After that, the aircraft descended to an altitude of 25,000ft and continued flight. It landed at Narita International Airport at 10:26.</p> <p>There were 156 persons on board consisting of the captain, five other crewmembers, and 150</p>			

		<p>passengers. There were no injuries. There was no damage to the aircraft.</p>		
	Probable Causes	<p>It is probable that this serious incident occurred because the icing occurred in the Pitot tube when the aircraft was flying at an altitude of 37,000ft, which led to the temporary failure of airspeed indication on the Captain's side and Co-Pilot's side.</p> <p>It is somewhat likely that the icing of the Pitot tube occurred because the aircraft flew in an ice crystal area that was existing in the vicinity of a cumulonimbus that grew to a high altitude.</p>		
	Report	<p>http://www.mlit.go.jp/jtsb/eng-air_report/JA04JJ.pdf</p>		
12	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	August 30, 2018	October 15, 2017 At an altitude of about 300 M and 4 Km northwest of Fukui Airport	Privately owned	JA3842 Beechcraft A36
	Summary	<p>The Aircraft made a forced landing and ditched in the river due to continuous loss of engine power while flying at an altitude of about 300 m about four km northwest of Fukui Airport.</p>		
	Probable Causes	<p>In this serious incident, it is probable that because the fuel quantity in the right tank being selected had been significantly reduced, the fuel was not supplied and the engine rpm dropped, the situation was not improved even after switching the fuel selector valve, and the state of loss of the power went on.</p> <p>Regarding the fuel quantity in the right fuel tank significantly reduced, it is probable that because the Pilot had not visually confirmed the fuel quantity during the exterior inspection, and the awareness for the fuel quantity indicators reduced during the flight, the right fuel tank continued to feed fuel, while the Pilot did not grasp the remaining quantity of fuel in the right tank.</p>		
	Report	<p>http://www.mlit.go.jp/jtsb/eng-air_report/JA3842.pdf</p>		
13	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	September 27, 2018	May 27, 2016 Tokyo International Airport	All Nippon Airways Co., Ltd.	JA85AN Boeing 737-800
	Summary	<p>The Aircraft took off from Tokyo International Airport as scheduled flight 561 but, as it was climbing, turned back at 08:27 because there was a warning indicating a drop in cabin pressurization and landed at 09:11. Upon detailed inspection of the same aircraft, no damage to the aircraft was observed; however, it was found that both valves for the intake of bleed air from the left and right engines into the respective air conditioning packs had temporarily malfunctioned and were closed.</p> <p>There were 170 people on board the aircraft, consisting of a Captain, five other crewmembers, and 164 passengers. One passenger suffered minor injuries.</p>		
	Probable Causes	<p>It is highly probable that this serious incident occurred when, as the aircraft was being continuously operated without a malfunction involving temporary shutdowns of the left air conditioning pack being perceived by the flight crewmembers or mechanics, the left air conditioning pack shut down at the time of the flight's take off and then the right air conditioning pack, which had the same service hours and service environment, also shut down, and as a result pressurization was not maintained.</p> <p>It is probable that the left and right air conditioning packs shut down because, in both cases, the reference regulators inside the valves that control airflow to the air conditioning packs (eFCV) were stuck, and as a result the eFCVs closed from the rising bleed pressure and air was not</p>		



		supplied to the air conditioning packs.		
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA85AN.pdf		
14	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	September 27, 2018	October 7, 2017 Over Sanjo City, Niigata Prefecture	Tohoku Air Service Co., Ltd.	JA6620 Kawasaki BK117B-2 (Helicopter)
	Summary	The aircraft was flying over the mountain forest in Sanjo City, Niigata Prefecture. During flight the bucket suspended outside the aircraft opened and dropped its content of ready-mixed concrete.		
	Probable Causes	<p>In this serious incident, it is highly probable that the ready-mixed concrete dropped to the ground because the bucket opened unintentionally while the aircraft was flying with the ready-mixed concrete loaded in the bucket.</p> <p>It is highly probable that the bucket opened unintentionally because a defect that occurred previous to this incident was not identified or repaired and instead was replaced with non-genuine reverse polarity wiring. This meant that when the operator on the aircraft operated the bucket to open it at the unloading site, an electrical holding circuit used to fully open the bucket was formed inside the control circuit. However, temporary contact failure occurred in the receptacle and the bucket did not open. After this, when the aircraft was in flight, the contact recovered from the failure and energized, which caused the open/close motor to operate and drop the concrete.</p>		
	Report	http://www.mlit.go.jp/jtsb/aircraft/rep-inc/Al2018-6-2-JA6620.pdf		
15	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	September 27, 2018	September 23, 2017 Kitagawa-village, Aki-gun, Kochi Prefecture	Nakanihon Air Service Co., Ltd.,	JA6717 Aérospatiale AS332L1
	Summary	The Aircraft dropped stones being carried in a bucket that was slung external to the aircraft immediately after taking off from a cargo sling point of the Kojima temporary helipad in Kitagawa-village, Aki-gun, Kochi Prefecture.		
	Probable Causes	<p>It is certain that this serious incident occurred because the bucket opened and the stones dropped immediately after the Aircraft took off from the cargo sling point carrying stones in the bucket, in the reason why the onboard mechanic mistakenly operated the bucket's open/close switch instead of the transmit switch of the communication radio.</p>		
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA6717.pdf		
16	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	November 29, 2018	July 7, 2015 At an altitude about 33,000 Ft above sea at about 100 Km southwest of Akita Airport	Fuji Dream Airlines CO., LTD.	JA06FJ Embraer ERJ170-200STD
	Summary	The Aircraft took off from New Chitose Airport bound for Matsumoto Airport as a scheduled flight 212. While the Aircraft was climbing in airspace approximately 33,000 ft at around 100 km southwest of Akita Airport, the supply of the bleed air stopped in both of the right and left systems and the cabin pressure lowered. The Aircraft declared the emergency to the Air Traffic Control Center and after making the emergency descent until the Aircraft reached 10,000 ft, the Aircraft landed Niigata Airport, which was not the destination.		
	Probable Causes	<p>In this serious incident, it is highly probable that because the supply of the both of right and left bleed air had stopped almost at the same time, the abnormal depressurization in the Aircraft occurred.</p> <p>In the fact regarding that the supply of the both of right and left bleed air had stopped, it is probable that because the airflow for cooling would have been restricted due to malfunction on both right and left fan air valves, the bleed air was hot and the corresponding NAPRSOV's closed.</p>		



Bucket



	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA06FJ.pdf		
17	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	November 29, 2018	August 27, 2017 At about 5,300 ft over the area 28 km northeast of Otsu City, Shiga Prefecture	Takumi Enterprise Helicopter & Airplane Co., Ltd.	JA7981 Robinson R44
	Summary	<p>The Aircraft made an emergency landing at the ground of a school in Fushimi Ward, Kyoto City, as the “LOW FUEL” warning light came on while flying at about 5,300 ft over the area 28 km northeast of Otsu City, Shiga Prefecture.</p> <p>Only a pilot was on board. There were no injuries.</p>		
	Probable Causes	<p>It is highly probable that this serious incident occurred because the helicopter took off without carrying the sufficient onboard fuel, as reported in its flight plan, to reach the destination and the pilot did not continuously monitor the fuel gages during the flight, which resulted in an emergency landing due to insufficient quantity of remaining fuel.</p> <p>It is also highly probable that the helicopter did not carry the onboard fuel as reported in the flight plan because the pilot did not fully confirm the quantity of fuel onboard at that time before its departure, even though he had consumed some onboard fuel during other flights up to this flight after refueling the helicopter.</p>		
	Report	http://www.mlit.go.jp/jtsb/eng-air_report/JA7981.pdf		
18	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	November 29, 2018	September 23, 2017 Osaka City, Osaka	KLM Royal Dutch Airline	PH-BQC Boeing 777-200
	Summary	<p>The Aircraft took off from Kansai International Airport for Amsterdam Schiphol International Airport on a scheduled Flight 868 of the Operator. A right aft wing-to-body fairing panel was dropped from the aircraft climbing while accelerating over Osaka city. The dropped fairing panel collided with a vehicle driving on a road in Kita-ku, Osaka City.</p>		
	Probable Causes	<p>It is certain that this serious incident occurred when the departed right aft wing-to-body fairing panel struck and damaged a moving vehicle, while the aircraft was climbing and passing over the city of Osaka after takeoff.</p> <p>Regarding the departure of the Panel, it is highly probable that the Bracket that secured the Panel’s forward upper corner by holding it to the Aircraft’s side broke, a gap was occurred between the Panel’s forward upper corner and the fuselage, and the Panel departed due to the pressure of inflowing air and vibration.</p>		
	Report	<p>http://www.mlit.go.jp/jtsb/eng-air_report/PHBQC.pdf See “Feature 2: Summaries of major aircraft accident and serious incident investigation reports (case studies)”, page 42</p>		
19	Date of Publication	Date and location	Operator	Aircraft registration number and aircraft type
	December 20, 2018	March 18, 2018 Runway 18 at Naha Airport	Juneyao Airlines Co., Ltd. (Aircraft A)	B8236 Airbus A320-214
			Japan Coast Guard (Aircraft B)	JA8570 Dassault-Breguet Mystère Falcon 900
	Summary	<p>The Aircraft A commenced a take-off roll and took off from Runway 18 at Naha Airport without receiving a take-off clearance before the Aircraft B, which had landed earlier, vacated Runway 18.</p>		
	Probable Causes	<p>It is highly probable that this serious incident occurred as follows: Without receiving a takeoff clearance from the Tower, the Aircraft A commenced a take-off roll on the runway where the</p>		



Dropped panel

	<p>Aircraft B, which had landed earlier, was still present on the runway; furthermore, although the Aircraft A had failed to hear the Tower's instructions to stop immediately, it continued take-off roll.</p> <p>As for the reason that the Aircraft A commenced a take-off roll without a take-off clearance from the Tower, it is somewhat likely that the PIC failed to make mutual confirmation of whether to receive the take-off clearance among the flight crew members and made a hasty judgment that they would have received it.</p>
Report	http://www.mlit.go.jp/jtsb/eng-air_report/B8236_JA8570.pdf

7 Actions taken in response to recommendations in 2018

Actions taken in response to recommendations were reported with regard to three aircraft accidents and one aircraft serious incident in 2018. Summaries of these reports are as follows.

(1) Aircraft accident involving a privately owned Piper PA-46-350P (small aeroplane), registered JA4060

(Safety recommendations on July 18, 2017)

In view of the result of the investigation of aircraft accident that occurred at Chofu City, Tokyo on July 26, 2015, the Japan Transport Safety Board published an investigation report and recommended to the Minister of Land, Infrastructure, Transport and Tourism on July 18, 2017. The JTSB received the following notice concerning safety actions taken in response to the recommendations.

○Summary of the Accident

On Sunday, July 26, 2015, at around 10:58 Japan Standard Time (JST: UTC + 9 hrs: unless otherwise stated, all times are indicated in JST using the 24-hour clock), a privately owned Piper PA-46-350P, registered JA4060, crashed into a private house at Fujimi Town in Chofu City, right after its takeoff from Runway 17 of Chofu Airport. There were five people on board, consisting of a captain and four passengers.



The captain and one passenger died and three passengers were seriously injured. In addition, one resident died and two residents had minor injuries.

The aircraft was destroyed and a fire broke out. The house where the aircraft had crashed into were consumed in a fire and neighboring houses sustained damage due to the fire and other factors.

○Probable causes

It is highly probable that this accident occurred as the speed of the aircraft decreased during takeoff and climb, which led the aircraft to stall and crash into a residential area near Chofu Airport.

It is highly probable that decreased speed was caused by the weight of the aircraft exceeding the maximum takeoff weight, takeoff at low speed, and continued excessive nose-up attitude.

As for the fact that the captain made the flight with the weight of the aircraft exceeding the maximum takeoff weight, it is not possible to determine whether or not the captain was aware that the weight of the aircraft exceeded the maximum takeoff weight prior to the flight of the accident because the captain is dead. However, it is somewhat likely that the captain had insufficient understanding of the risks of making the flight under such a situation and had insufficient safety awareness of observing relevant laws and regulations.

It is somewhat likely that taking off at low speed occurred because the captain decided to take a procedure to take off at such a speed; or because the Captain reacted and took off due to the approach of the Aircraft to the runway threshold.

It is somewhat likely that excessive nose-up attitude was continued in the state that nose-up tended to occur because the position of the C.G. of the Aircraft was close to the aft limit, the Captain maintained the nose-up attitude as he prioritized climbing over speed.

Adding to these factors, exceeding maximum takeoff weight, takeoff at low speed and continued excessive nose-up attitude, as the result of analysis using mathematical models, it is somewhat likely that the decreased speed was caused by the decreased engine power of the Aircraft; however, as there was no evidence of showing the engine malfunction, it was not possible to determine this.

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

In this accident, small private aircraft crashed into a residential area and caused injury to residents as well as damages to houses, however the Aircraft was flying with exceeding the maximum takeoff weight and without satisfying the requirements for performance prescribed in the flight manual, and over the past five years, there have been two fatal accidents involving small private aircraft affected by inappropriate weight and position of the center of gravity of the aircraft ((i) Mooney M20C, JA3788, which crashed when landing at Yao Airport in March 2016, and (ii) Cessna 172N Ram, JA3814, which veered off the runway of Otone Airfield, Kawachi Town, Inashiki-gun, Ibaraki Prefecture, and made a fatal contact with a ground worker in August 2012). In view of the result of these accident investigations, as operation safety of small private aircraft needs to be improved, the Japan Transport Safety Board recommends the Minister of Land, Infrastructure Transport and Tourism pursuant to Article 26 of the Act for Establishment of the Japan Transport Safety Board to take the following measures:

- (1) Promote pilots of small private aircraft to understand the importance to confirm that requirements for performance prescribed in the flight manual are satisfied, in addition to the importance to comply with maximum takeoff weight and limit for the position of the center of gravity, as confirmation before departure, at the occasions like specific pilot competency assessments and aviation safety seminars.

Enforce instructions and trainings to pilots of small private aircraft to plan the actions in advance including to follow the emergency procedure prescribed in the flight manual and confirm these actions thorough self-briefing by a pilot himself at the time of preparation before departure. along with compliance with the speed and procedure prescribed in the flight manual, as for the actions to the situation of degraded flight performance due to lack of acceleration or decrease in speed during takeoff.

- (2) Study and compile the cases of effective measures connecting entrance taxiways to runway thresholds in order to make maximum use of runway length and inform aerodrome providers and administrators of these case studies as maximum use of runway length at takeoff, will allow

a pilot to have a margin to make a decision during takeoff roll and contribute to improving safety.

○ Safety Actions taken in response to the recommendations

To improve the safety of small private aircraft, we have been conducting initiatives to prevent recurrence by such as distributing safety awareness leaflets, holding aviation safety courses, and issuing warning documents that include re-inspection of checking procedures performed prior to departure for such as takeoff weight immediately following an accident. Additionally, the following action was newly performed based on the recommendations.

1. (i) We issued Japan Air Navigation No.1261 and Japan Aircraft No.1155 “Maintaining safety for small aircraft services” dated July 18, 2017 for small private plane service operators and relevant organizations. This was to remind them to work towards maintaining safety more than ever and disseminate this information to their affiliated members and other parties to ensure that the maximum weight based on the aircraft’s performance is checked before flying and that also checks are always performed so that pilots know how to deal with situations such as re-landing when the aircraft’s performance drops during takeoff.

(ii) With the cooperation of relevant organizations and the committee, we newly created leaflets about preparing for emergencies and complying with the flight manual in addition to reliably implementing check prior to departure for such as takeoff weight. We also revised oral guidance and detailed rules for implementation of the specific pilot skill review, and decided to review this information with a focus on the content of the leaflet.

We requested pilot skill examiners to ask the people being examined if they understood the content of the leaflet prior to the specific pilot skill review and also hand over the leaflet to the people being examined during the briefing after the review is complete or similar such time. We also requested the examiners make their review with a focus on the revised detailed rules of implementation and oral guidance.

In addition, we also requested regional civil aviation bureaus to use the opportunity of regular training and certifying pilot skill examiners as conducted by the bureaus to disseminate the information contained in the above request to their examiners, and to also distribute the leaflet to pilots at every opportunity even at airport offices and such locations under the control of the regional civil aviation bureaus.

Additionally, we issued Japan Air Navigation No.1548 and Japan Aircraft No.1557 “Revision of safety maintenance for small aircraft services and specific pilot skill review detailed rules of implementation” for small aircraft service operators and relevant organizations. We also requested that these operators reliably disseminate the content of the leaflet to affiliated members and such as well as promote understanding of the content, while at the same time we requested the operators to disseminate information concerning the reliable implementation of the specific pilot skill review based on the revised detailed rules of implementation and oral guidance to affiliated pilot skill examiners.

In addition, in view of small aircraft accidents being prominent in the media in recent years, this matter was implemented based on opinions received from experts and relevant organizations, etc., at the 3rd committee meeting (held on September 25, 2017) of “The Safety Promotion Committee Concerning Small Aircraft” established on December 2016.

(iii) At the “Safe Flight Seminar” held at all major airports nationwide from October 17 to November 10, 2017, we distributed leaflets once again and also promoted understanding of responses relating to the content of the recommendations, which included the safety

measures used at aviation bureaus so far. We also explained about the detailed rules of implementation and oral guidance relating to the revised specific pilot skill review together with the content of the leaflet.

(iv) We have made the leaflet created in response to the recommendations, and the revised detailed rules of implementation and oral guidance available on the MLIT website, and further promoted safety awareness.

2. We collected case examples of fully using the length of existing runways during aircraft takeoff based on the layout of turning pads and attached taxiways, and issued and disseminated information contained in the “Case examples of fully using airport takeoff runway length” report Japan Aircraft Safety Planning No.92 dated July 18, 2017 to the airport facilities and management.

Documents relating to the above information are attached.

*The original text of the notification from the Minister of Land, Infrastructure, Transport and Tourism can be found on the JTSB website.

http://www.mlit.go.jp/jtsb/airkankoku/kankoku10re_300123.pdf

8 Provision of factual information in 2018 (aircraft accidents and serious incidents)

The JTSB provided factual information for 2 cases in 2018. The content is as follows.

(1) Aircraft serious incident involving an Airbus A320-214, registered JA805P, operated by Peach Aviation

(Information provided on March 30, 2018)

The Japan Transport Safety Board provided the following information on the serious incident that occurred on March 3, 2018, to Civil Aviation Bureau, the Ministry of Land, Infrastructure, Transport and Tourism.

(Summary of the serious incident)

JA805P (Airbus A320-214) belonging to Peach Aviation landed at Fukuoka Airport around 8:11 AM on March 24, 2018 and then stopped on the runway because its nose landing gear tires misaligned to face sideways.

(Content of investigation)

The following facts were identified as a result of the investigation to date.

- The pin connecting the top and bottom torque links on the nose landing gear fell off and was found on the runway.

- The nut, locking plate, washer and bolt fastened onto the landing gear along with this pin has not been found at Fukuoka Airport or Kansai International Airport, where the aircraft departed.
- The state of the pin that fell off the landing gear is as shown in the attachment. (See attachment)

(Attachment)

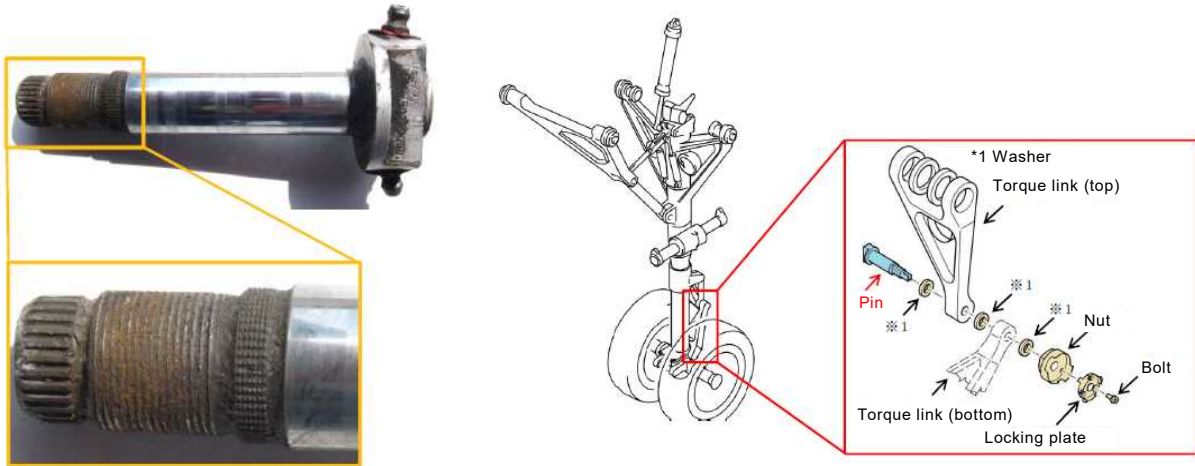


Photo of pin

Drawing of nose landing gear

* The information provided can be found on the JTSB website.

<http://www.mlit.go.jp/jtsb/iken-teikyo/JA805P20180324.pdf>

(2) Aircraft serious incident involving Boeing 777-300, registered HL7573, operated by Korean Air

(Information provided on July 24, 2018)

The Japan Transport Safety Board provided the following information on the serious incident that occurred on June 29, 2018, to Civil Aviation Bureau, the Ministry of Land, Infrastructure, Transport and Tourism.

(Summary of the serious incident)

Boeing 777-300, registered HL7573, operated by Korean Air, landed at Narita International Airport at 12:37 PM on June 29 (Friday) as the regular KAL703 flight from Korean Air. While traveling along the ground, the aircraft's main right landing gear was damaged causing it to stop on the taxiway.

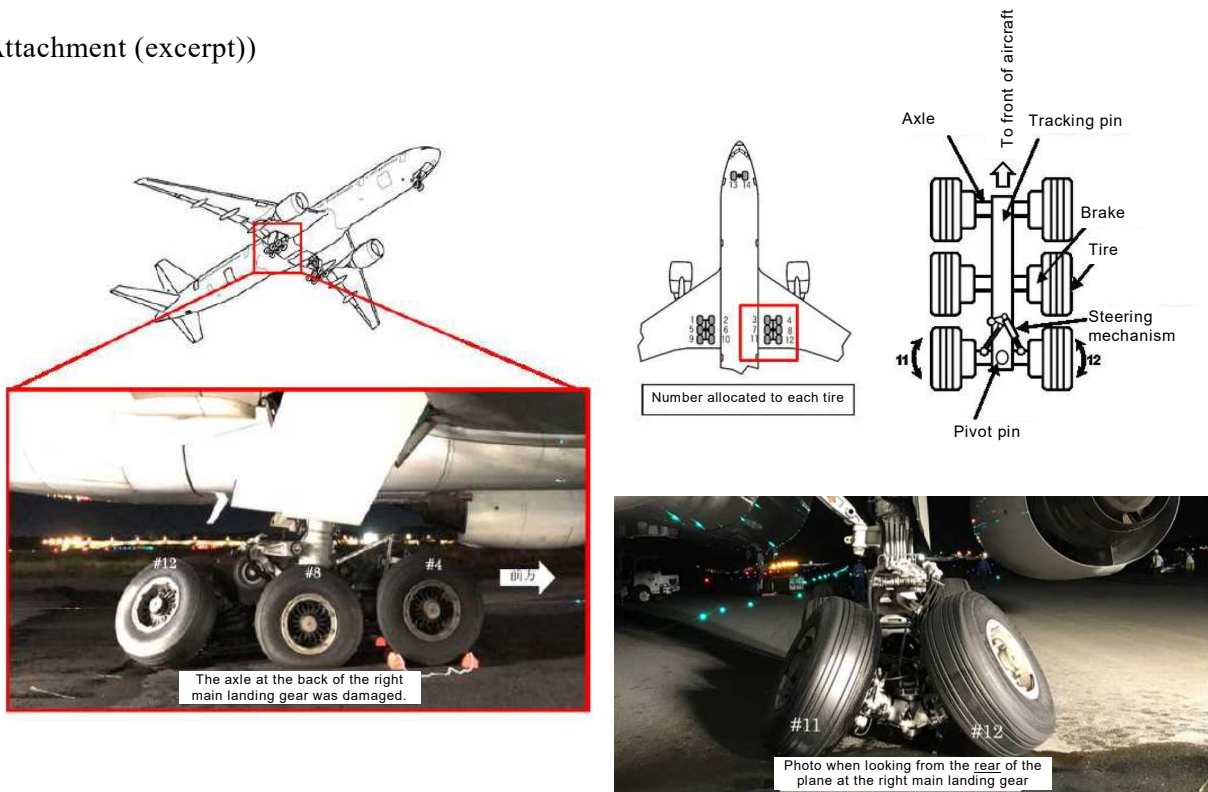
(Content of investigation)

The following facts were identified as a result of the investigation to date. (See attachment)

- The axle on the main right landing gear was broken.
- Part of the fractured surface on the damaged section was discolored black.
- The axle had been installed as a replacement on the main right landing gear in July 2009.

A detailed investigation is scheduled in the near future concerning the reason the axle broke, etc.

(Attachment (excerpt))



* The information provided can be found on the JTSA website.
<http://www.mlit.go.jp/jtsb/iken-teikyo/HL757320180629.pdf>

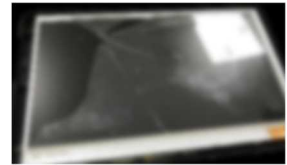
Column

Acquiring data recorded on damaged electronic devices

Aviation Accident Investigator

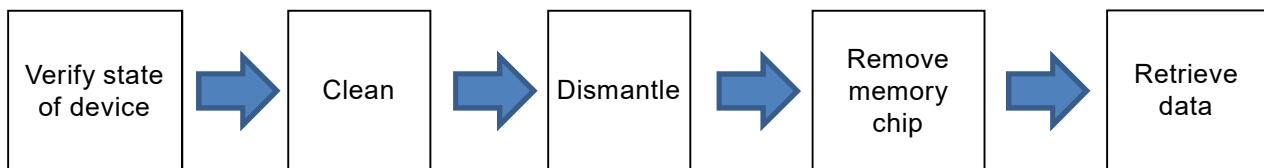
In recent years, many electronic devices (GPS receivers, smartphones, tablet computers, etc.) are carried onto aircraft, and now record various data in the form of GPS data, photos and video.

During aviation accident investigations, data recorded on these type of electronic devices is retrieved for analysis purposes to check the flight status such as the flight path of the aircraft involved in the accident and whether the aircraft experienced a failure. However, many electronic devices carried on board the aircraft are damaged during the accident making it impossible to acquire data with a data retrieval method that connects a standard cable to the damaged electronic device. Therefore, the memory chip mounted on the internal circuit board is removed and the data is retrieved directly using dedicated equipment.



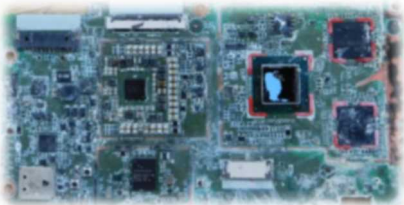
Damaged electronic device

Data is retrieved from a damaged electronic device using the following procedure.



Damaged electronic devices are most often damaged due to factors such as damage due to impact, water penetrating inside the device, heat damage due to fire, and contamination due to fire extinguishing agents so it is necessary to check the state of damage, contamination and other such factors before cleaning them.

After this, the device's case is removed, the circuit board removed, and then the memory chip that stored the data is removed. The memory chip is removed using a soldering iron, heat gun or rework equipment depending on the type of memory chip.



Contaminated circuit board



Cleaning

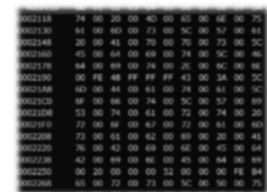


Removing the memory chip



Retrieving data

Recorded data is retrieved from the removed memory chip using dedicated equipment. Data recorded on a memory chip usually disappears after several years under normal conditions. Data on a contaminated memory chip usually disappears after several days or months. Therefore, it is necessary to quickly retrieve this data. Data retrieved using dedicated equipment is retrieved in binary format as an image of the recorded region. This binary data is converted using dedicated software to a format that can be used with standard software.



Data in binary format

Many modern electronic devices encrypt data when it is stored on the memory chip, and the data may not be converted correctly in this case.

One of the action guidelines of the Japan Transport Safety Board mention the implementation of scientific and objective accident investigations. The JTSB is collecting information and maintaining equipment on a daily basis and also improving investigation techniques, while also compiling factual information to analyze the cause of accidents so that we can support the latest technology, in addition to existing methods, to respond to technology that is evolving every day.