

Chapter 3 Aircraft accident and serious incident investigations

1 Aircraft accidents and serious incidents to be investigated

<Aircraft accidents to be investigated>

◎Article 2, paragraph (1) of the Act for Establishment of the Japan Transport Safety Board

The term “Aircraft accident” as used in this Act means the accident prescribed as follows:

- (i) an accidents prescribed in Article 76, paragraph (1), each of the items of the Civil Aeronautics Act (Act No. 231 of 1952), regarding the aircraft.
- (ii) an accidents prescribed in Article 132-90, paragraph (1), each of the items of the Civil Aeronautics Act, which are serious ones as may be specified in Order of the Ministry of Land, Infrastructure, Transport and Tourism (Article 1 of Regulation for Enforcement of the Act for Establishment of the Japan Transport Safety Board), regarding the unmanned aircraft

1. Accidents related to aircraft

○Article 76, paragraph (1) of the Civil Aeronautics Act

- (i) crash, collision, or fire of aircraft
- (ii) injury or death of any person, or damage of any object caused by aircraft
- (iii) death (except those specified in Order of the Ministry of Land, Infrastructure, Transport and Tourism) or disappearance of any person on board the aircraft
- (iv) contact with other aircraft
- (v) other accidents relating to aircraft specified in Order of the Ministry of Land, Infrastructure, Transport and Tourism

▪Article 165-3 of the Regulation for Enforcement of the Civil Aeronautics Act

Accidents related to aircraft prescribed in Order of the Ministry of Land, Infrastructure, Transport and Tourism referred to in Article 76, paragraph (1), item (v) of the Act are cases (excluding cases where the repair of the aircraft does not fall under the major repair work among the work classifications listed in the Table of Article 5-6) where aircraft in flight is damaged (except the sole damage of engine, cowling, propeller, wing tip, antenna, tire, brake or fairing).

2. Accidents related to unmanned aircraft

○Article 132-90, paragraph (1) of the Civil Aeronautics Act

- (i) injury or death of any person, or damage of any object caused by unmanned aircraft
- (ii) collision or contact with an aircraft
- (iii) other accidents relating to unmanned aircraft which are serious ones as may be specified in Order of the Ministry of Land, Infrastructure, Transport and Tourism (*Currently, there is no order)

· Article 1 of the Regulation for Enforcement of the Act for Establishment of the Japan Transport Safety Board

- (i) injury or death of any person caused by unmanned aircraft
- (ii) damage of any object caused by an unmanned aircraft prescribed below.
 - (a) damage of buildings for which a person is actually present or movable facilities such as vehicles, ships, etc.
 - (b) case where electricity supply facilities, telecommunications facilities, transportation facilities, educational facilities, medical facilities, government facilities, or other public facilities operations are disrupted.
 - (c) other cases which are recognized as particularly exceptional in addition to those listed in (a) and (b)
- (iii) collision or contact with an aircraft

< Aircraft serious incidents to be investigated >

◎ Article 2, paragraph (2), item (ii) of the Act for Establishment of the Japan Transport Safety Board (serious incidents involving aircraft and unmanned aircraft)

A case recognized a risk of aircraft accident as may be specified in the Order of the Ministry of Land, Infrastructure, Transport and Tourism (Article 2 of the Regulation for Enforcement of the Act for Establishment of the Japan Transport Safety Board).

○ Article 2 of the Regulation for Enforcement of the Act for Establishment of the Japan Transport Safety Board

3. Serious incidents related to aircraft

- (1) The following cases*. However, item (viii), (xi) and (xii) are limited to the cases occurred to an aircraft during flight.
- (i) case where a pilot in command of an aircraft, during a flight, recognized a risk of collision or contact with any other aircraft
 - (ii) takeoff from a closed runway, a runway being used by other aircraft, a runway which is different from the instructed one or a taxiway, or aborted takeoff
 - (iii) landing on a closed runway, a runway being used by other aircraft, a runway which is different from the instructed one or a location where an aircraft is not normally supposed to land such as a taxiway or a road
 - (iv) case where engine cowling, wingtip or component other than landing gear is contact with ground surface during landing
 - (v) overrun, undershoot and deviation from a runway (limited to when an aircraft is unable to perform taxiing)
 - (vi) case where emergency evacuation was conducted by using the emergency evacuation slide
 - (vii) case where aircraft crew executed an emergency operation during flight in order to avoid crash into water or contact with the ground
 - (viii) damage to the engine (limited to a case where fragments penetrated the casing of the engine or a major damage occurred inside the engine)
 - (ix) the engine is stopped continuously or loss of power or thrust thereof (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

- (x) case where any of aircraft propeller, rotary wing, landing gear, rudder, elevator, aileron or flap is damaged and thus flight of the aircraft may not be continued
- (xi) multiple malfunctions in one or more systems installed on aircraft impeding the safe flight of aircraft
- (xii) occurrence of fire or smoke inside an aircraft and occurrence of fire within an engine fire-prevention area
- (xiii) abnormal decompression inside an aircraft
- (xiv) shortage of fuel requiring urgent measures
- (xv) 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
- (xvi) case where aircraft crew was unable to perform normal duties due to injury or disease
- (xvii) case where an object which attached to the exterior of the aircraft, suspended, or towed dropped unintentionally or it dropped as an emergency operation from the aircraft.
- (xviii) case where parts fell from aircraft collided with persons
- (xix) case equivalent to those listed in the preceding items

* Item (ii) through (xix) are the cases listed in Article 166-4 of the Regulation for Enforcement of the Civil Aeronautics Act, which are cited in Article 2 of the Regulation for Enforcement of the Act for Establishment of the Japan Transport Safety Board.

(2) The following cases, and an unusual case in particular:

- (i) case listed in item (viii), (xi) and (xii) of 1 above occurring with an aircraft other than during flight
- (ii) case where an aircraft other than during flight is damaged^{*1*2}
 - *1 except the sole damage of engine, cowling, engine accessories, propeller, wing tip, antenna, tire, brake or fairing
 - *2 case which refers to the case corresponding to “major repair.” “Major repair” means a repair that has a significant effect on airworthiness.
- (iii) case where any of aircraft propeller, rotary wing, landing gear, rudder, elevator, aileron or flap is damaged and thus flight of the aircraft may not be started
- (iv) case equivalent to those listed in the preceding items

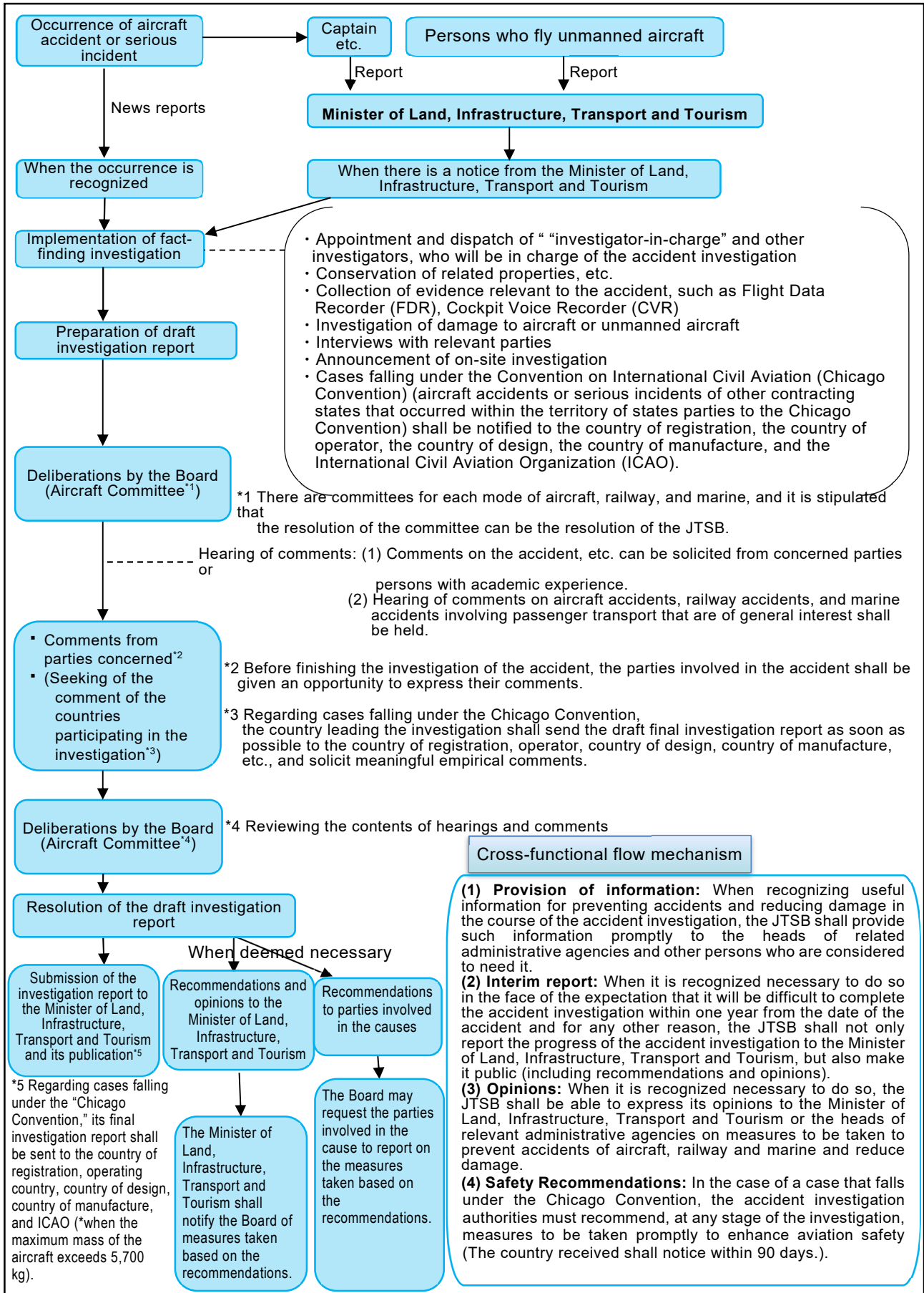
4. Serious incidents related to unmanned aircraft

(1) case where a pilot in command of an unmanned aircraft, during a flight, recognized a risk of collision or contact with any other aircraft

(2) The following cases, and an unusual case in particular :

- (* cases listed in each items of Article 236-86 of the Regulation for Enforcement of the Civil Aeronautics Act)
- (i) injury to persons caused by an unmanned aircraft (excluding serious injuries)
- (ii) case in which an unmanned aircraft becomes uncontrollable
- (iii) case in which an unmanned aircraft ignites (restricted to that occurred during flight)

2 Procedure of aircraft accident/serious incident Investigation



3 Statistics of investigations of aircraft accidents and serious incidents

The JTSB carried out investigations of aircraft accidents and serious incidents as follows:

In 2022, 17 accident investigations were carried over from 2021 and 21 accident investigations were newly launched. Besides, five investigation reports were published, and thereby 33 accident investigations were carried over to 2023.

Moreover, 21 serious incident investigations were carried over from 2021, and 15 serious incident investigations were newly launched in 2022. Furthermore, 14 investigation reports were published in 2021, and thereby 22 serious incident investigations were carried over to 2023.

Among the 19 investigation reports published in 2022, none was issued with recommendations and none was issued with opinions.

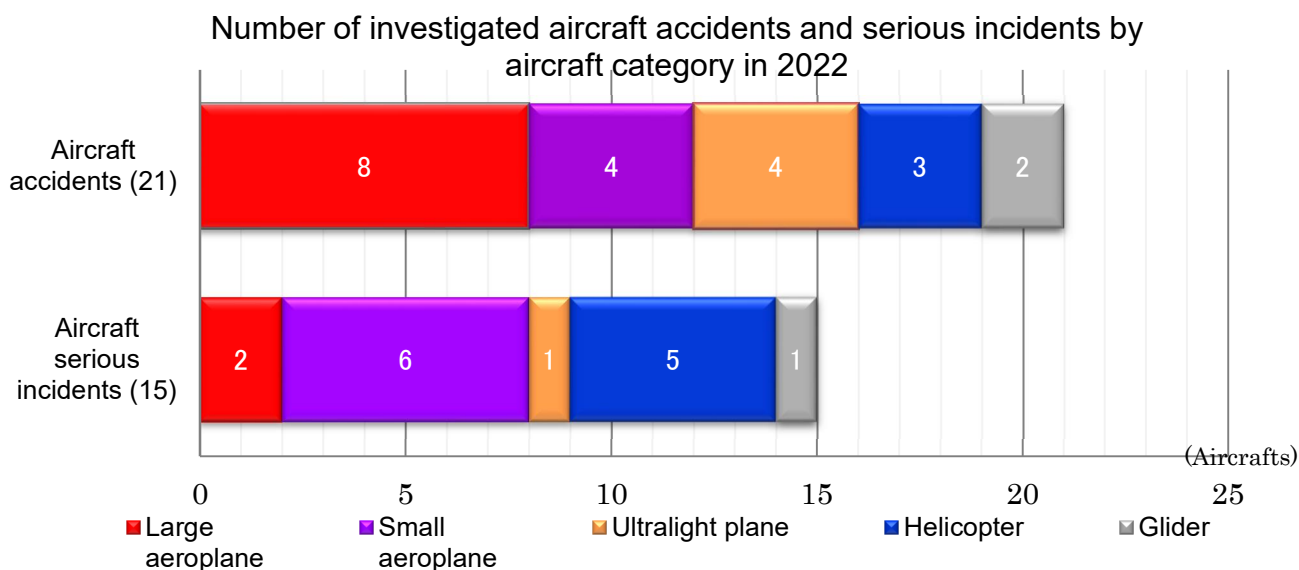
Investigations of aircraft accidents and serious incidents in 2022

Category	Carried over from 2021	Launched in 2022	Total	Published investigation reports	(Recommendations)	(Safety recommendations)	(Opinions)	(Cases)	
								Carried over to 2023	(Interim report)
Aircraft accident	17	21	38	5	(0)	(0)	(0)	33	(9)
Aircraft serious incident	21	15	36	14	(0)	(0)	(0)	22	(4)

4 Statistics of investigated aircraft accidents and serious incidents in 2022

The aircraft accidents and serious incidents that were newly investigated in 2022 consisted of 21 aircraft accidents, which increased by 10 from 11 for the previous year, and 15 aircraft serious incidents, which increased by five from 10 for the previous year.

By aircraft category, the aircraft accidents included eight cases involving large aeroplanes, four cases involving small aeroplanes, four cases involving ultralight planes, three cases involving helicopters, and two cases involving gliders. The aircraft serious incidents included two cases involving large aeroplanes, six cases involving small aeroplanes, one case involving ultralight plane, five 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 and self-made aircraft.

* Ultralight planes include self-made aircraft in the form of ultralight planes.

The number of deaths, missing and injured were 23 in 21 cases, including nine deaths and 14 injuries.

The number of casualties (aircraft accident)

(Persons)

2022							
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	5	3	8
Small aeroplane	2	2	0	0	0	0	4
Helicopter	1	0	0	0	0	2	3
Ultralight plane	1	1	0	0	3	0	5
Glider	1	1	0	0	1	0	3
Total	5	4	0	0	9	5	23
	9		0		14		

*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 2022

The aircraft accidents and serious incidents which occurred in 2022 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
	January 16, 2022 In the sky over near Okayama City, Okayama Prefecture, at an altitude of about 8,500 m	Star Flyer Inc.	JA24MC Airbus A320-214 (Large aeroplane)
	Summary	During the flight after taking off from the Tokyo International Airport, one passenger was seriously injured when the aircraft shook near the above location. The aircraft continued its flight and landed at the Kitakyushu Airport.	
2	Date and location	Operator	Aircraft registration number and aircraft type
	February 15, 2022 About 55 km north-northwest of the Osaka International Airport, at an altitude of about 2,700 m	Japan Air Commuter, Co., Ltd.	JA04JC ATR 42-500 (Large aeroplane)
	Summary	During the flight after taking off from the Tajima Airport, one passenger was injured when the aircraft shook near the above location. The aircraft continued its flight and landed at the Osaka International Airport.	

3	Date and location	Operator	Aircraft registration number and aircraft type
	March 12, 2022 On the premises of the Ie Island Airport	(NPO) MESH Support	JA4577 Beechcraft A36 (Small aeroplane)
	Summary	While the aircraft was undergoing the training of continuous takeoff and landing at the Iejima Airport, it crashed on its premises.	
4	Date and location	Operator	Aircraft registration number and aircraft type
	March 21, 2022 Kisogawa Gliding Field	The General Incorporated Association Tokai/Kansai Student Aviation League	JA2151 Alexander Schleicher ASK13 (Glider)
	Summary	When the aircraft landed at the Kisogawa Gliding Field, it bounced and stopped on the runway.	
5	Date and location	Operator	Aircraft registration number and aircraft type
	March 26, 2022 About 90 km east of the Nagoya Airfield, at an altitude of about 8,500 m	Japan Airlines Co., Ltd.	JA603J Boeing 767-300 (Large aeroplane)
	Summary	During the flight after taking off from the Tokyo International Airport, one cabin attendant was injured when the aircraft shook near the above location. The aircraft continued its flight and landed at the Oita Airport.	
6	Date and location	Operator	Aircraft registration number and aircraft type
	April 3, 2022 In the sky over near Iwaizumi-cho, Shimohei-gun, Iwate Prefecture, at an altitude of about 30 m	Iwate Prefectural Disaster Prevention Aviation Corps	JA10TE Agusta Model AW139 (Rotorcraft)
	Summary	When the aircraft was spraying water to extinguish a forest fire near the above location, the water sprayed hit a firefighter working on the ground and injuring him.	
7	Date and location	Operator	Aircraft registration number and aircraft type
	April 18, 2022 Ariake Sea, about 10 km west of Miike Port, Omuta City, Fukuoka Prefecture	Privately owned	JA3803 Fuji-FA-200-160 (Small aeroplane)
	Summary	The aircraft ditched into the Ariake Sea.	
8	Date and location	Operator	Aircraft registration number and aircraft type
	June 23, 2022 On the runway of the Kochi Airport	Jetstar Japan Co., Ltd.	JA05JJ Airbus A320-232 (Large aeroplane)
	Summary	When the aircraft landed at the Kochi Airport after taking off from the Narita International Airport, a cabin attendant was injured.	
9	Date and location	Operator	Aircraft registration number and aircraft type
	June 25, 2022 About 40 km west-southwest of the Tokushima Airport, at an altitude of about 5,200 m	ANA WINGS CO., LTD.	JA854A Bombardier DHC-8-402 (Large aeroplane)

	Summary	While the aircraft took off from Kumamoto Airport and was cruising around the above location, a cabin attendant who was working at the rear galley fell and hit her hips on the floor strongly and got injured. The aircraft landed at the Osaka International Airport.	
10	Date and location	Operator	Aircraft registration number and aircraft type
	July 16, 2022 About 120 km southwest of the Naha Airport, at an altitude of about 7,800 m	Solaseed Air Inc.	JA807X Boeing 737-800 (Large aeroplane)
	Summary	While the aircraft was climbing after taking off from the Naha Airport, the aircraft shook near the above location, injuring one cabin attendant. The aircraft continued its flight and landed at the New Ishigaki Airport.	
11	Date and location	Operator	Aircraft registration number and aircraft type
	August 15, 2015 At Jinseki Kogen Town, Jinseki District, Hiroshima Prefecture	Privately owned	JA9727 Aerospatial AS350B (Rotorcraft)
	Summary	The aircraft was found near the above location. One passenger was later confirmed that got fatal injury.	
12	Date and location	Operator	Aircraft registration number and aircraft type
	August 28, 2022 Near the off-field airfield in Ubuyama Village, Aso District, Kumamoto Prefecture	Privately owned	JX0135 Rans S-6 Coyote II-R582L modified (Self-made aircraft)
	Summary	Immediately after taking off from the Ubuyama Auxiliary Airfield, the aircraft crashed and burst into flames at the location mentioned above.	
13	Date and location	Operator	Aircraft registration number and aircraft type
	September 10, 2022 At the Tone River riverbed in Tamamura-cho, Sawagun, Gunma Prefecture	Privately owned	JR0878 Kolb Twinstar MKIIR503L (Ultralight plane)
	Summary	While flying after taking off from the Isesaki Auxiliary Airfield and crashed near the above location during flight.	
14	Date and location	Operator	Aircraft registration number and aircraft type
	September 22, 2022 Around the apron of the Yao Airport	Privately owned	JA3969 Cessna 172P (Small aeroplane)
	Summary	While the aircraft was taxiing after landing at the Yao Airport, its left wing touched the apron floodlighting (light for illuminating the parking apron).	
15	Date and location	Operator	Aircraft registration number and aircraft type
	October 3, 2022 In the sky over near the Miho Airport, at an altitude of about 11,300 m	Japan Transocean Air Co., Ltd.	JA07RK Boeing 737-800 (Large aeroplane)
	Summary	During the flight after taking off from the Naha Airport, one cabin attendant was injured when the aircraft shook near the above location. The aircraft landed at the Komatsu Airport.	
16	Date and location	Operator	Aircraft registration number and aircraft type
	October 9, 2022 Rice fields in Nanporo-cho, Sorachi-gun, Hokkaido	Privately owned	JR1039 Quicksilver GT400SR447L (Ultralight plane)

	Summary	During the flight after taking off from the auxiliary airfield in Nanporo-cho, Sorachi-gun, Hokkaido, the aircraft made an emergency landing near the above location because the engine stopped.		
17	Date and location	Operator	Aircraft registration number and aircraft type	
	October 26, 2022 Near Ikegahora, Takane Town, Takayama City, Gifu Prefecture	Privately owned	JA2177 Scheibe SF28A Tandem Falke (Power glider)	
	Summary	The aircraft was found crashed near the above location.		
18	Date and location	Operator	Aircraft registration number and aircraft type	
	November 7, 2022 A runway at Kagoshima Airport	Japan Air Commuter Co., Ltd.	JA06JC ATR 72-212A (Large aeroplane)	
	Summary	One passenger was seriously injured when the aircraft took off from Tanegashima Airport and landed at Kagoshima Airport.		
19	Date and location	Operator	Aircraft registration number and aircraft type	
	November 20, 2022 Oyama Bando Flying Club Auxiliary Airfield, Bando City, Ibaraki Prefecture	Privately owned	JR0628 Rans S7 Courier R582L (Ultralight plane)	
	Summary	The aircraft crashed into a field about 100m from the end of the airfield runway.		
20	Date and location	Operator	Aircraft registration number and aircraft type	
	November 28, 2022 In the sky over the Kirishimayama (Ohachi), at an altitude of about 8 m	SHIKOKU AIR SERVICE CO., LTD.	JA6977 Bell Type 412EP (Rotorcraft)	
	Summary	When the aircraft hoisted the supplies slung outside of the aircraft for the purpose of transporting them and a ground worker grabbed the swaying supplies, he floated together with the supplies. Immediately after floating, he let the supplies go and got injured when he landed on the ground.		
21	Date and location	Operator	Aircraft registration number and aircraft type	
	December 10, 2022 While approaching the Kounan Airport, at an altitude of about 45 m	Okayama Air Service Co., Ltd.	JA123R Cessna 172R (Small aeroplane)	
	Summary	When the aircraft was approaching the Kounan Airport after taking off from same airport, it collided with a bird. Damage to the aircraft was confirmed in the inspection after landing.		

(Aircraft Serious Incident)

1	Date and location	Operator	Aircraft registration number and aircraft type	
	January 8, 2022 On the runway of the Kagoshima Airport	New Japan Aviation Co., Ltd. (Aircraft A)	JA4061 Cessna 172P (Small aeroplane)	
		Japan Air Commuter, Co., Ltd. (Aircraft B)	JA04JC ATR 42-500 (Large aeroplane)	

	Summary	Since Aircraft A which had been instructed by the air traffic controller to hold short of runway entered into the runway, Aircraft B which was approaching with the clearance of landing on the runway made a go-around by following instruction of the controller.		
2	Date and location	Operator	Aircraft registration number and aircraft type	
	March 6, 2022 On the runway A of the Yao Airport	Privately owned	A007Z Socata, Type TBM700 (Small aeroplane)	
	Summary	When the aircraft was landing at the Yao Airport, it redid the landing due to strong winds and its propeller contacted with the runway. The aircraft landed at the airport later.		
3	Date and location	Operator	Aircraft registration number and aircraft type	
	March 7, 2022 On the runway of the Kumamoto Airport	Kumamoto Prefectural Disaster Prevention and Firefighting Air Unit (Aircraft A)	JA90MT Airbus Helicopters AS365N3 (Rotorcraft)	
		The Educational Corporation Kimigafuchi Gakuen (Aircraft B)	JA47UK Textron Aviation 172S (Small aeroplane)	
	Summary	Since Aircraft A which had been instructed by the air traffic controller to hold short of runway at the Kumamoto Airport entered into the runway, Aircraft B which was approaching with the clearance to make a touch-and-go landing made a go-around by following instruction of the controller.		
4	Date and location	Operator	Aircraft registration number and aircraft type	
	April 18, 2022 About 200km northeast of the Fukuoka Airport, at an altitude of about 9,800 m	IBEX Airlines Co., Ltd.	JA07RJ Bombardier CL-600-2C10 (Large aeroplane)	
	Summary	During the flight after taking off from the Sendai Airport, unreliable airspeed indication occurred temporarily on both Primary Flight Displays for the Pilot in Charge (PIC) and the First Officer (FO), the PIC declared a state of emergency. Thereafter during the descent, the problem with the airspeed indication was resolved, and the aircraft landed at the Fukuoka Airport.		
5	Date and location	Operator	Aircraft registration number and aircraft type	
	April 22, 2022 About 900 m east of the takeoff and landing point for helicopters in the Kansai International Airport, at an altitude of about 150 m	Japan Coast Guard	JA687A Eurocopter EC225LP (Rotorcraft)	
	Summary	When the aircraft was approaching the take-off and landing field for helicopters in the Kansai International Airport with the clearance to land from the air traffic controller, the captain visually confirmed the presence of an inspection vehicle near the take-off and landing field. Therefore, the aircraft made a go-around following air traffic controller's instruction after notifying the air traffic controller to that effect.		
6	Date and location	Operator	Aircraft registration number and aircraft type	

	April 23, 2022 On the runway of the Fukui Airport	Privately owned	JA01KT Scheibe SF-25 (Motor glider)
	Summary	Upon landing on the runway of the Fukui Airport, the aircraft's propeller contacted with the runway surface because the aircraft bounced two times.	
7	Date and location	Operator	Aircraft registration number and aircraft type
	May 20, 2022 Near the west runway of the Hyakuri Airfield	Fuji Dream Airlines Co., Ltd.	JA10FJ Embraer ERJ 170-200STD (Large aeroplane)
	Summary	When the aircraft was entering the west runway with the clearance to land from the air traffic controller, since the controller recognized the presence of a vehicle on the runway, the controller instructed the aircraft to make a go-around. The aircraft landed at the airport after making a go-around.	
8	Date and location	Operator	Aircraft registration number and aircraft type
	June 2, 2022 Kagoshima Airport	Civil Aviation College (Aircraft A)	JA74MD Cirrus SR22 (Small aeroplane)
		Kagoshima International Aviation Co., Ltd. (Aircraft B)	JA02KG Agusta A109E (Rotorcraft)
	Summary	At the Kagoshima Airport, Aircraft A followed the air traffic controller's instruction to hold short of runway and stopped on the taxiway in order to take off, , the controller gave clearance to Aircraft B in flight to make a touch and go landing at the take-off and landing point for helicopters established on the taxiway. Thereafter, when the controller recognized the aircraft at a standstill on the taxiway in front of the runway for taking off, the controller ordered Aircraft B to make a go-around.	
9	Date and location	Operator	Aircraft registration number and aircraft type
	June 26, 2022 Vineyard in Kasumigaura City, Ibaraki Prefecture	Privately owned	None Details to be confirmed (Ultralight plane)
	Summary	The plane took off from an airfield in Kasumigaura City, Ibaraki Prefecture, contacted with a tree in flight, and made an emergency landing in a vineyard in Kasumigaura City, Ibaraki Prefecture.	
10	Date and location	Operator	Aircraft registration number and aircraft type
	August 15, 2022 In the sky over near the Menuma Gliding Field, at an altitude of about 150 m	Japan Students Aviation League	JA4083 Cristen Industry A-1 (Small aeroplane)
	Summary	When the aircraft was flying after taking off from the Menuma Gliding Field while towing a glider (Alexander Schleicher ASK21, JA2520, with 2 people on board), a part of the towline (about 7 mm in diameter, about 60 m in length, and about 500 g to 1 kg in weight, made of nylon) fell off from the aircraft near the above place after the glider had been released aircraft.	
11	Date and location	Operator	Aircraft registration number and aircraft type
	October 15, 2022 On the runway of the Noto Airport	JANET CORPORATION (Aircraft A)	JA6113 Bell Type 206B (Rotorcraft)

		Japan Coast Guard (Aircraft B)	JA871B Textron Aviation Type B300C (Small aeroplane)
	Summary	When Aircraft B landed at the Noto Airport and was taxiing on the runway towards the parking apron, Aircraft A that had received the information meaning that the runway was clear from the remote flight information officer to provide remote air-ground communication service took off from the runway.	
12	Date and location	Operator	Aircraft registration number and aircraft type
	October 18, 2022 On the runway A of the Yao Airport	Asahi Airlines Co., Ltd.	JA80AP Cessna 172S (Small aeroplane)
	Summary	The aircraft took off from the Yao Airport for training. The aircraft landed after performing a touch-and-go on the runway A of the airport. During the inspection after landing, Scratches were found underside of the aft fuselage.	
13	Date and location	Operator	Aircraft registration number and aircraft type
	October 24, 2022 In the mountains of Ono City, Fukui Prefecture, about an altitude of 210m	Nakanihon Air Service Co., Ltd.	JA02AH Eurocopter AS350B3 (Rotorcraft)
	Summary	During the flight to return to the work base (loading place) after transporting supplies suspended outside the aircraft and unloading them at the transport destination (unloading place), the wire used for sling cargo which was suspended outside the aircraft was brought into contact with the power transmission line, and a part of the wire and the hook at the tip (length: about 5m, weight: about 25kg) were dropped from the aircraft.	
14	Date and location	Operator	Aircraft registration number and aircraft type
	December 12, 2022 While approaching the Saga Airport, at an altitude of about 150 m	SGC Saga Airlines Co., Ltd.	JA4121 Cessna 172P (Small aeroplane)
	Summary	When the aircraft was approaching the Saga Airport after receiving the information from the flight information officer that the runway was clear (there is neither an aircraft in operation nor an obstacle on the runway), since a bird-sweep vehicle which had been instructed by the flight information officer to hold short of runway entered the runway by crossing the stop line, the aircraft made a go-around for landing following the instruction from flight information officer.	
15	Date and location	Operator	Aircraft registration number and aircraft type
	December 26, 2022 On the runway of Amakusa Airport	Japan General Aviation Service Co., Ltd.	JA01TC Cirrus SR20 (Small aeroplane)
	Summary	When the aircraft took off from the Kagoshima Airport and at the Amakusa Airfield for continuous take-off and landing training, it stopped on the runway due to damage to the propeller and nose landing gear.	

6 Publication of investigation reports

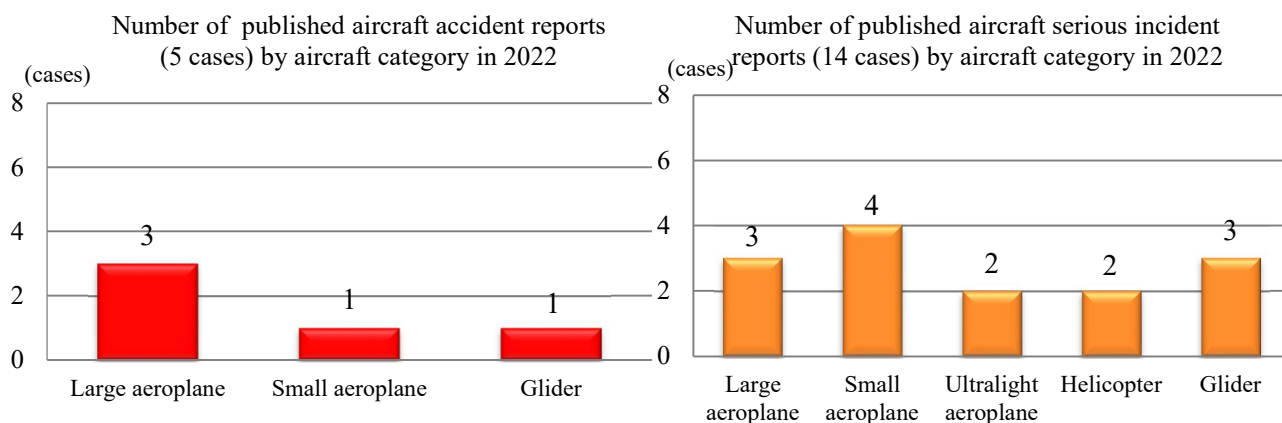
The number of investigation reports of aircraft accidents and serious incidents published in 2022 was 19, consisting of 5 aircraft accidents and 14 aircraft serious incidents.

Breaking them down by aircraft category, the aircraft accidents involved 3 large aeroplanes, 1 small aeroplane, and one glider. The aircraft serious incidents involved 3 large aeroplanes, 4 small aeroplanes, 2 helicopters, 2 ultralight planes, and 3 gliders.

Note: In aircraft accidents and serious incidents, two or more aircraft are sometimes involved in a single case. See page 61

to 76 for details.


In the 5 accidents, the number of casualties was 4, consisting of 4 injuries.


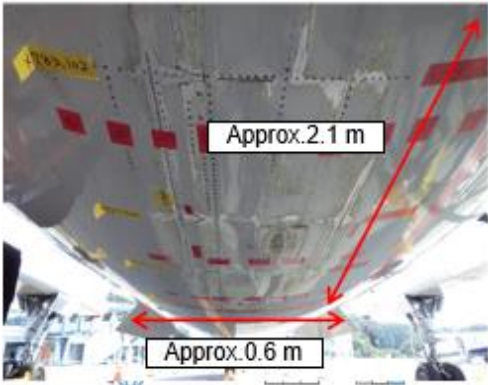


The aircraft accidents and serious incidents which occurred in 2022 are summarized as follows.

Aircraft accident investigation reports published in 2022



1	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	March 24, 2022	December 25, 2019 At FL300 over approximately 100 km north-northeast of Miyazaki Airport	Tigerair Taiwan	B50001 Airbus A320-232 (Large aeroplane)
	Summary	<p>During the flight from the Hakodate Airport to the Taiwan Taoyuan International Airport as the scheduled flight 237 of the company, the aircraft shook and one cabin attendant was seriously injured, and one passenger and two cabin crew members were slightly injured, respectively.</p>		
	Probable causes	<p>It is highly probable that the accident occurred because when the aircraft was greatly shaken when it encountered wind shear near the jet stream, causing cabin crew member who was moving on the aisle in the passenger cabin to fall and sustain serious injury.</p>		

	Safety Actions	Measures taken by the company to prevent recurrence (1) FOM ^{*1} was revised to incorporate that flight crew conduct a short briefing on flight time and weather conditions through crew in charge or passenger address system even in return flight of the round flight (2) As the Operation Control Center duty, they were decided to receive by system SIGMET ^{*2} released any time by the Japan Meteorological Agency and automatically transfer such information to flight crew in flight using ACARS ^{*3} . *1 “FOM” is an abbreviation of Flight Operation Manual that defines basic policy, practical maneuvering, procedures, and criteria, etc. that persons engaged in flight operations follow in executing their duties when the company undertakes aviation transport businesses. *2 SIGMET (Significant meteorological information) is released by the Japan Meteorological Agency on all the altitudes in the entire Fukuoka flight information region (Fukuoka FIR) when any significant weather phenomenon is observed or predicted to impair aircraft operations. *3 “ACARS” is an abbreviation of Aircraft Communication Addressing and Reporting System that enables information necessary for flight operations to be exchanged between aircraft and the ground station as air-ground digital data link system via communication networks of ARINC. Data such as departure and arrival times, departure and destination aerodromes, flight number, and fuel loaded are transmitted to ACARS radio station on the ground via radio communication system of data link.		
	Report	https://www.mlit.go.jp/jtsb/eng-air_report/B50001.pdf		
2	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	March 24, 2022	August 29, 2020 About 17 km east-northeast of the Tokyo International Airport, at an altitude of 8,500 ft	Skymark Airlines Inc.	JA73NM Boeing 737-800 (Large aeroplane)
	Summary	The aircraft, with 76 persons on board, consisting of the captain, 5 crew members, and 70 passengers, took off at Tokyo International Airport to Fukuoka Airport as its scheduled flight 21 and sustained damage to the airframe from bird strike in climbing.		
	Probable causes	It is highly probable that the aircraft collided with the bird in take-off climb from Tokyo International Airport and sustained damage to the airframe at an altitude of 8,500 ft over approximately 17 km east-northeast of the airport.		
	Report	https://www.mlit.go.jp/jtsb/eng-air_report/JA73NM.pdf		
3	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	June 30, 2022	April 14, 2021 About 2 nm west of the Yao Airport, at an altitude of about 500 ft	Privately owned	JA001T Cessna 525A (Small aeroplane)
	Summary	During the take-off climb from the airport, the aircraft collided with a bird and sustained damage to the airframe. The captain and six passengers were onboard, and there were no injuries.		
	Probable causes	It is most likely that the aircraft collided with the bird approximately 2 nm west of Yao Airport at an altitude of approximately 500 ft during the take-off climb from the airport that caused damage to the airframe.		
	Safety Actions	Measures taken by the Yao Airport Office of the Osaka Civil Aviation Bureau to prevent recurrence To clarify bird strike preventive measures in the surroundings of Yao Airport, the Airport Office amended the Yao Airport wild animal collision prevention procedures (dated October 28, 2021), surveyed the ecology of the birds' environment in the surroundings of the airport (situation of lakes		


		and wildlife sanctuary) and its maintenance program in collaboration with personnel and organizations concerned, on top of that to consider measures to reduce the risk of bird strike.		
	Report	https://www.mlit.go.jp/jtsb/eng-air_report/JA001T.pdf		
4	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	June 30, 2022	October 10, 2021 Aso Temporary Airfield, Aso City, Kumamoto Prefecture	Kita-Kyushu Glider Club	JA2189 Alexander Schleicher ASK13 (Glider)
	Summary	<p>When the aircraft with solo trainee onboard for training flight landed at the Aso Temporary Airfield in Aso City, it deviated from the runway, collided with shrub. The aircraft sustained substantial damage, but the pilot was not injured.</p> 		
	Probable causes	<p>When the aircraft attempted the crosswind landing, the attitude was disturbed due to the wind just before the touchdown, the probable cause of the accident was the trainee could not correct appropriately. Therefore the aircraft touched down with the nose facing the leeward left direction deviated the runway, collided with shrub and sustained damage.</p>		
	Report	https://www.mlit.go.jp/jtsb/eng-air_report/JA2189.pdf		
5	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	August 25, 2022	October 23, 2021 Fukue Airport, Nagasaki Prefecture	ORIENTAL AIR BRIDGE CO., LTD.	JA845A Bombardier DHC-8-402 (Large aeroplane)
	Summary	<p>When the aircraft landed on Runway 03 at Fukue Airport, the lower side of its tail contacted the runway and sustained damage to the airframe. With 54 persons in total on board, consisting of the captain, three crew members, and 50 passengers, there were no injuries.</p> 		
	Probable causes	<p>It is probable that the Aircraft was most likely in an excessive nose-up attitude and the lower side of its tail contacted the runway because the captain continued the nose-up operation until moments before the touchdown since the Aircraft did not stop descending due to the airspeed reduction caused by turbulence during the landing flare.</p>		
	Safety Actions	<p>Measures taken by the company to prevent recurrence</p> <p>(1) Relevant flight crewmembers The Company implemented retraining regarding procedures for the items possibly caused by the crewmembers' operations and knowledge and made an extraordinary examination.</p> <p>(2) All flight crewmembers The Company made the outline of the accident well known to all flight crewmembers and issued the relevant instructions to reconfirm precautions for landing in turbulence generated due to strong winds.</p> <p>(3) Development of rules and regulations i. In order to take advantage of the PM*1's monitoring and assertion, the Company revised the AOR*2 (Airplane Operations Reference) and specified that the PM should</p>		



	<p>call, “PITCH” when the pitch angle exceeds 5° after passing the runway threshold.</p> <p>ii. The Company analyzed the meteorological characteristics at remote islands airports where its service is provided and documented precautions for aircraft operations.</p> <p>iii. In regard to flight operations for the same type of aircraft, the Company documented precautions for landing and approaching including technological considerations.</p> <p>(4) Education and training</p> <p>To the flight crewmembers who have few experiences in flights to and from remote islands in service of the Company, metrological characteristics according to each airport were made known again.</p> <p>*1 The PM abbreviates Pilot Monitoring and mainly monitors the flight status of the aircraft, cross checks operations of the PF, and undertakes other non-operational duties.</p> <p>*2 The “AOR” of the Company is a reference material for the flight of the same type of aircraft and gives addendum and explanation to the Aircraft Operation Manual.</p>
Report	https://www.mlit.go.jp/jtsb/eng-air_report/JA845A.pdf



Aircraft serious incident investigation reports published in 2022

1	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	January 20, 2022	December 21, 2019 Matsuyama Airport	Privately owned	JA36HK Diamond aircraft HK36R Super Dimona (Motor glider/two seat)
	Summary	<p>Due to the reduced engine power during takeoff climb from Matsuyama Airport, Ehime Prefecture, the aircraft returned to the airport and landed back on parallel taxiway. The captain and one passenger were on board and there was no injury to them.</p> 		
	Probable causes	<p>The probable cause of this serious incident was that the engine malfunction occurred during takeoff due to the failure in appropriate supply of the fuel from the left carburetor of the engine that led to continuous loss of the engine power.</p> <p>From the deformed insert of the float inside the carburetor, the failure in appropriate supply of the fuel from the left carburetor is likely to have been caused by the faulty motion of the float.</p>		
	Report	https://www.mlit.go.jp/jtsb/eng-air_report/JA36HK.pdf		
2	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	January 20, 2022	February 3, 2021 On the runway of the Kitakyushu Airport	Japan Coast Guard	JA393A Textron Aviation 172S (Small aeroplane)
	Summary	<p>The aircraft executed go-around due to an instable attitude in landing during solo flight training, and the lower part of the aft fuselage contacted on the runway surface at Kitakyushu Airport.</p> <p>A trainee who was alone on board the incident aircraft was not injured.</p> 		

	Probable causes	<p>It is considered highly probable that this serious incident occurred because when the aircraft made a go-around due to its unstable posture at a low altitude during the landing approach, the underside of the aft fuselage touched the runway surface before starting to rise.</p> <p>It is considered probable that the fact that the unstable posture of the aircraft at a low altitude was caused not only the turbulence encountered immediately before touchdown, but also a significant nose-up operation was performed under its influence.</p>		
	Safety Actions	<p>Recurrence prevention measures implemented by the Kitakyushu Aviation Training Center, Miyagi branch school of the Japan Coast Guard School</p> <p>(1) Revision of the Solo flight supervising procedures</p> <p>(i) Reviewing the procedures whether to conduct solo flight or not</p> <p>In the case that forecasted wind direction is between 270° and 280°, crosswind component of the runway is computed by assuming that wind velocity with 20 % increment is a virtual wind velocity. Besides, a monitoring aircraft conducts weather conditions survey (including air current conditions in approach landing) beforehand as needed to decide to conduct training or not.</p> <p>(ii) Modification of the Supervising procedures</p> <p>Instructors supervise overall training at the Center, let a monitoring aircraft with other instructor on board to fly prior to a solo flight aircraft, report weather conditions and aircraft conditions to the Center, and provide necessary advice to the solo flight aircraft. When the monitoring aircraft judged that training is to be suspended due to aggravated weather conditions, etc., it reports the situations to the Center and instructs the solo flight aircraft to return to the airport.</p> <p>(iii) Clarifying response at the time of aggravated weather conditions, etc.</p> <p>When crosswind component of the runway is expected to exceed the Safety Criteria, a solo flight aircraft in approach landing executes go-around and a monitoring aircraft first performs approach landing to determine landing of the solo flight aircraft.</p> <p>When crosswind component of the runway does not exceed the Safety Criteria and approach landing is determined to be practicable, the monitoring aircraft provides necessary advice (confirmation of go-around procedures and air stream conditions, etc.) with the solo flight aircraft.</p> <p>When approach landing is judged to be impracticable, the monitoring aircraft instructs the solo flight aircraft to hold in the air or divert to an alternate aerodrome for landing.</p> <p>(2) Wind direction and wind velocity in takeoff and landing are recorded in the training instruction sheet to grasp educational situations of crosswind takeoff and landing of trainees.</p> <p>(3) Education on landing to all trainees</p> <p>(i) Education on the ground</p> <ul style="list-style-type: none"> • Reeducated situations where go-around is to be executed and attention to be paid in executing go-around. • Reeducated procedures for go-around using a simulator. <p>(ii) Training on board aircraft</p> <ul style="list-style-type: none"> • Additional training (continuous takeoff and landing training) was planned and conducted to evaluate skill for takeoff and landing and go-around. • Takeoff and landing or go-around training was additionally conducted in navigation training after trainees, who had had a blank period, had resumed training although a syllabus of navigation training does not include a takeoff and landing course. <p>(4) Others</p> <p>Reviewing suitable airports as alternatives for the Cross Country Solo Flights, and coordinating familiarization flight training using the same airports with an instructor on board before the Cross Country Solo Flights.</p>		
	Report	https://www.mlit.go.jp/jtsb/eng-air_report/JA393A.pdf		
3	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	March 24, 2022	January 8, 2020 Amami Airport	Japan Air Commuter, Co., Ltd.	JA07JC ATR 42-500 (Large aeroplane)


	Summary	<p>The aircraft ran off the side of Runway 03 at landing and was disabled to perform taxiing. There were 21 persons on board consisting of the captain, two flight crew members and 18 passengers, and no one was injured.</p> 		
	Probable causes	<p>The JTSB concludes that the probable cause of this serious incident was the delay in correcting the deviation to the left immediately after the touchdown at landing in a crosswind from the left, which resulted in the Aircraft running off the side of the runway, halting in the grass area and being disabled to move on its own.</p>		
	Safety Actions	<p>Recurrence prevention measures taken by the company and the designer/manufacturer</p> <p>(1) The Company</p> <ol style="list-style-type: none"> 1) Revised Manuals <ol style="list-style-type: none"> a. Regarding landing performed when a gust is reported, it is stipulated in Operations Manual (OM) Supplement that judgment, whether to continue approach or halt for a go-around, is made based on the guide that crosswind component of the gust is 1.5 times the maximum crosswind in addition to that the crosswind component of the mean wind velocity satisfies the maximum crosswind stipulated in Airplane Operating Manual (AOM). b. AOM is revised to incorporate the revisions of Flight Crew Operating Manual (FCOM) by the Design and Manufacturer in terms of normal procedures in landing roll. c. "OPERATIONS IN WIND CONDITIONS" is newly incorporated in AOM that reflects what is described in FCOM. d. Descriptions in FTG*1 regarding takeoff and landing in crosswind are revised. 2) Relevant Flight Crew <ol style="list-style-type: none"> a. Captain Ground school training, simulator training, and check and line flight training and check. b. FO Ground school training, simulator training, and line flight training and check. 3) Other Flight Crew Member Holding Type Rating for ATR Aircraft <ol style="list-style-type: none"> a. Conducting ground school training and simulator training to establish knowledge and technique of crosswind landing maneuver recommended by the Design and Manufacturer. b. Conducting ground school training for appropriate operations of Stabilized Approach. <p>(2) The Design and Manufacturer</p> <p>Reviewed the procedures for normal operation in landing roll to revise FCOM.</p> <ol style="list-style-type: none"> 1) Clarified that braking was a primary role in deceleration after touchdown. 2) Clarified to set power levers to ground idle at the time of touchdown of a nosewheel and use the reverse as required. <p>*1 "Flight Technical Guide (FTG)" is to supplement for the AOM regarding basic procedures that the Company aims to standardize actual operations, education, and training.</p> <p>*2 According to OM Supplement and AOM of the Company stipulate, that Stabilized Approach means an aircraft is in the position where it can land safely while conducting an approach normally until starting a flare maneuver since passing 1,000 ft AGL to eliminate any unsafe factors in an approach and a landing and to ensure a safe and stable landing.</p>		
	Report	<p>https://www.mlit.go.jp/jtsb/eng-air_report/JA07JC.pdf</p>		
4	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type

	March 24, 2022	August 28, 2020 Nagaoka City, Niigata Prefecture	Tohoku Air Service Co., Ltd.	JA332T Eurocopter AS332L1 (Rotorcraft)
	Summary	<p>While transporting a cargo (removed materials from a steel tower weighing approximately 790 kg) by cargo sling after take-off from the Chuetsu substation temporary helipad in Nagaoka City, Niigata Prefecture, the helicopter dropped the cargo on a grassy area in the vicinity of the temporary helipad. There was no damage to the helicopter, or no injury to persons onboard or on the ground.</p> 		
	Probable causes	<p>In the serious incident, it is probable that the sling cargo dropped during the external cargo sling operation since the load beam was suddenly unlocked and open. The probable cause of the unlocked load beam could not be determined.</p>		
	Safety Actions	<p>Recurrence prevention measures taken by the Company After the serious incident, the company suspended the use of the subject external cargo sling system, and external cargo sling operations were performed by other existing equipment (manual hook) that was allowed to be equipped to the subject helicopter until improvements in fail-safe of the system operation and enhanced information function to flight crew are implemented.</p>		
	Report	<p>https://www.mlit.go.jp/jtsb/eng-air_report/JA332T.pdf</p>		
5	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	March 24, 2022	July 18, 2021 Niigata Airport	Privately owned	JA201M Piper type PA28RT-201T (Small aeroplane)
	Summary	<p>When landing at Niigata Airport, the aircraft halted after deviating to the grassy area on the north side of the runway and was disabled to perform taxiing. The captain and two persons were on board and none of them was injured. The tire of the right main landing gear sustained air leakage. There was no other damage to the airframe.</p> 		
	Probable causes	<p>It is highly probable that the serious incident occurred by the captain's own steering, who recognized that the tire of the right main landing gear had punctured during landing roll, to deviate to the grassy area in the north side of the runway.</p>		
	Report	<p>https://www.mlit.go.jp/jtsb/eng-air_report/JA201M.pdf</p>		
6	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	April 28, 2022	September 23, 2021 Nagasaki Airport	Privately owned (operated by OGAWA AIR Co., Ltd.)	JA76EL Robinson R44 II (Rotorcraft)

	Summary	When taking off from Nagasaki Airport, the aircraft was cleared for take-off from the runway by the air traffic controller, but took off from a taxiway.		
	Probable causes	The probable cause of this serious incident was more likely the captain's misinterpretation that, when cleared by the Tower for take-off from T2 intersection at Runway 32, the aircraft was cleared for take-off from Taxiway T2 that led to the take-off from the Taxiway T2.		
	Safety Actions	Recurrence prevention measures taken by the company On the day of the serious incident, the company reminded all employees for their thorough understanding that take-off from any area other than runway or helipad is not authorized.		
	Report	https://www.mlit.go.jp/jtsb/eng-air_report/JA76EL.pdf		
7	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	April 28, 2022	November 27, 2021 Menuma Gliding Field (temporary operation site), Kumagaya City, Saitama Prefecture	Privately owned	JA4083 Cristen Industries A-1 (Small aeroplane)
	Summary	The airframe leaned to the left during landing roll, and the left wingtip contacted with the ground surface. The pilot alone was onboard, and did not sustain injury.		
	Probable causes	The probable cause of this serious incident was likely that the aircraft was shaken by the gusty wind from the right direction during landing roll that caused the right wing to float and the aircraft to lean to the left, and the left wingtip contacted with the ground surface.		
	Report	https://www.mlit.go.jp/jtsb/eng-air_report/JA4083.pdf		
8	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	June 30, 2022	September 16, 2019 In the sky over near the Komatsu Airfield, at an altitude of about 150 m	Japan Students Aviation League (the League) (Aircraft A)	JA01KY Diamond aircraft HK36TTC Super Dimona (Power glider)
			Japan Students Aviation League (the League) (Aircraft B)	JA2471 Alexander Schleicher ASK21 (Glider)
Summary	When the Aircraft A (with one person onboard) took off from Fukui Airport towing the Aircraft B (with two persons onboard), and was performing demonstration flight at Komatsu Airport, part of a tow rope connecting both aircrafts (7 mm diameter, approximately 61 m long, and			

		approximate weight of 1.7 kg) dropped.		
	Probable causes	<p>The probable cause of the serious incident was most likely that, when the Aircraft A was flying towing the Aircraft B in the serious incident, the tow rope connecting both aircraft was fractured on the Aircraft A side, and the knot made within the end piece*1 on the Aircraft B side was untied almost simultaneously, which led to dropping of the tow rope on the grassy area of the Airport.</p> <p>*1 “End piece” is a fitting attached to the tip of the tow rope on glider side, that connect to the glider via a ring pair and contains a knot made at the end of the tow rope threaded thereto.</p>		
	Safety Actions	<p>(1) Measures taken by the Design and Manufacturer of the aircraft A</p> <p>Supplement Aircraft Flight Manual prepared by the Design and Manufacturer and cited in the Flight manual addendum No. 9 was revised reading “DAI-WI No. 28” from “DAI-WI No. 27.”</p> <p>In 6.9 EQUIPMENT LIST of the Flight manual addendum No. 9 “OPERATION WITH TOWROPE RETRACTION DEVICE,” the materials used in the tow rope was revised reading “polyester, PVC, or polyamide” from “PVC, or polyamide.”</p> <p>Furthermore, the Design and Manufacturer revised DAI-WI No. 28 stipulating that a knot within the stop egg*2 is to be a single knot.</p> <p>(2) Major measures taken by the League</p> <p>After the serious incident, the League decided to take safety measures as described below, and is set to review the safety measures as needed. Besides, the measures i. and ii. described below were released in association with taking the measures iii. through vi. described below:</p> <p>i. Level flight in towing and meandering flight are suspended until the cause of the serious incident is determined since towing in level flight such as demonstration flight within an airport and meandering flight are prone to generate loosened tow rope compared to towing at launching.</p> <p>ii. Tow rope retraction device is suspended until the cause of the serious incident is determined.</p> <p>iii. Tow rope used in the Aircraft A is to be a genuine one of the design and manufacturer of the tow rope retraction device, which meets the requirements of the Flight manual addendum No. 9.</p> <p>iv. Knots within the stop egg and end piece are appropriately made in accordance with DAI-WI No. 28-3.</p> <p>v. A knot within the end piece has a longer remainder of the rope after knotted so that sliding of the knot can be visually confirmed.</p> <p>vi. Latest engineering information (AFM, and WI, etc.) is confirmed for reflecting on the Flight manual. Besides, safe flight in accordance with the Flight manual is performed.</p> <p>*2 “Stop egg” is an egg-shaped fitting attached to the tow plane side of the tow rope with a knot contained therein. The stop egg is to receive a load that generates in towing when a retracted tow rope is pulled out to capacity and strikes the stop egg detent.</p>		
	Report	https://www.mlit.go.jp/jtsb/eng-air_report/JA01KY_JA2471.pdf		
9	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	June 30, 2022	September 7, 2021 Gifu Airport	Kawasaki Heavy Industries, Ltd.	7033 P-1 Fixed-wing patrol aircraft (Large aeroplane)
	Summary	The aircraft ran off to the right side (north side) of Runway 28 at Gifu Airfield when landing, and was disabled to perform taxiing after stopping in a grassy area. There were ten persons on board in total, consisting of the captain and nine other crew members, and no one was injured.		

<p>Probable causes</p>	<p>The probable cause of this serious incident was that the Aircraft most likely veered to the right (north side), ran off the runway, stopped in a grassy area, and was disabled to perform taxiing because it was not able to control the travel direction during landing roll.</p> <p>The reason why the Aircraft failed to control the travel direction, was the foreign materials mixed into the steering control valve (SCV) were more likely caught between the sleeve and the spool*1 of the SCV and then restricted the spool movement while the neutral position of the spool had remained in the position where the hydraulic oil would flow in the right steering direction.</p> <p>*1 “Spool,” which is used mainly as a direction switching valve, means an internal structure part to switch oil flow. It is skewer-shaped and the part, which largely spreads in the radial direction, is called “Land.”</p> <div data-bbox="746 197 1428 801"> <p>(1) Condition of Steering Angle of Zero</p> <p>(2) Condition of Steering Angle of Right</p> </div>			
<p>Safety Actions</p>	<p>Measures taken by the Manufacturer</p> <p>(1) Measures to protect steering systems from contamination caused by foreign objects</p> <ol style="list-style-type: none"> 1. They requested the Manufacturer of the Parts to clearly specify in the work instructions about the cleaning operation for each component performed in production job site. 2. They implemented education for persons in charge of work so as to fully enforce preventive measures against contamination by foreign objects when those related works are performed during aircraft manufacture and regular maintenance. <p>(2) Removal of foreign objects</p> <p>In order to ensure capturing of foreign objects in the function test of steering systems during the manufacturing process, they increased the number of times of steering operation with the SCV return port filter removed.</p> <p>(3) Clarification of procedures to respond to steering system failure</p> <p>They clarified the Emergency Operation Procedures to switch the steering mode using the “STEER MODE” switch to the Caster Mode*2 when a failure is found in the steering systems.</p> <p>*2 “Caster Mode” refers to the mode to make the nose landing gear steering “Free” status.</p>			
<p>Report</p>	<p>https://www.mlit.go.jp/jtsb/eng-air_report/7033.pdf</p>			
<p>10</p>	<p>Date of publication</p>	<p>Date and location</p>	<p>Operator</p>	<p>Aircraft registration number and aircraft type</p>
<p>August 25, 2022</p>	<p>December 4, 2020 About 50km north of the Naha Airport, FL170</p>	<p>Japan Airlines Co., Ltd.</p>	<p>JA8978 Boeing 777-200 (Large aeroplane)</p>	
<p>Summary</p>	<p>While the Aircraft and operated by the Company as its scheduled flight 904, was climbing after take-off from Naha Airport for Tokyo International Airport, there occurred an abnormal sound accompanied by shaking of the Aircraft, and the instrument displayed anomaly in the left engine (No. 1 engine) at an altitude of FL170*1 over the sea approximately 50 km north of Naha Airport. The captain shut down the engine and landed back at the Airport after declaring a state of emergency to the air traffic controller.</p> <p>In the post-flight inspection, it was confirmed that two fan blades of the left engine were fractured, the fan cowl door and other fragments from the nacelle had separated and departed the</p>			

	<p>airplane, and the fuselage and horizontal stabilizer were damaged from impact of fragments. There were 189 people onboard, consisting of the captain, 10 crew members, and 178 passengers. There were no injuries.</p> <p>*1 “FL” means a pressure altitude in the standard atmosphere. FL is expressed in the value obtained by dividing the reading on the altimeter (unit: ft) by 100 when the altimeter is set to 29.92 inHg. Flight altitude over 14,000 ft is generally expressed in FL in Japan. For instance, FL170 stands for an altitude of 17,000 ft.</p> <p>Damage to LH FWD fuselage Damage to LH strut and fairings Damage to LH H/STAB L/E</p>  <p>Damage to LH ENG and cowling Damage to LH flaperon Damage to LH AFT fuselage</p>
<p>Probable causes</p>	<p>This was a serious incident certainly caused by the fan blades of the left engine were fractured during take-off climb, resulting in parts and cowlings of the engine were departed, and the airframe was damaged by scattered parts.</p> <p>It is highly probable that the fracture of the fan blade had initiated from the nodule*², which bonded to the internal surface of a hollow structure during the polishing process of manufacturing of the fan blades, and the crack was generated, in addition to this, the Aircraft continued flights without detecting the crack at the subsequent regular inspections led to fatigue fracture.</p> <p>It is probable that the cracks were not detected in the subsequent regular inspections were contributed by method and intervals of the used inspection were insufficient to detect the defect in the fillet region.</p> <p>*2 In this report, “nodule” means a small lump of granular grains adhered to the base material.</p>
<p>Safety Actions</p>	<p>Safety Actions by Pratt&Whitney (P&W)</p> <p>(1) P&W reviewed the inspection method and intervals of the Fan Blade of the similar type of engine, issued Special Instruction (No. 29F-21, No.85F-21 and No.130F-21) and Alert Service Bulletin (ASB) PW4G-112-A72-361, and significantly shortened TAI inspection intervals from every 6,500 FC to every 1,000 FC. Furthermore, UT inspections were set to be conducted every 275 through 550 FC in addition to TAI inspections.</p> <p>(2) The NDIP-1065 Revision G was issued on March 4, 2021 – Revision G incorporates a change in the accept / reject criteria requiring the inspector to refer indications in the high stress area to Team Review instead of being able to accept. Added references to Foreign Material (FM) sample images were added and modified. Flowcharts were updated to reflect G revisions.</p> <p>Safety Actions by Boeing</p> <p>Boeing has developed an interim solution and issued multiple Alert Service Bulletins. The service bulletins include fan cowl inspections and modification to the inlet cowls and thrust reversers to strengthen the integrity of the engine cowling for increased protection for engine fan blade failure events on 777-200 and 777-300 Airplane(s) equipped with Pratt & Whitney PW4000 series engines.</p> <p>(1) Alert Service Bulletin 777-71A0092 issued on January 13, 2022 Fan cowl Fluid Ingression Inspections. This service bulletin provides instructions to inspect fan cowls for possible fluid ingress damage, and do on-condition action(s) to make sure fan cowls are serviceable.</p>

The work scope for the left and right fan cowl panels of Engine 1 and Engine 2 includes detailed inspection of the outer surface top coat, a general visual inspection of the upper edge, and a Thermography Inspection or X-Ray Inspection of the inner surface as well as applicable on condition action(s).

- (2) Alert Service Bulletin 777-71A0085 issued on May 16, 2022 Engine Inlet Cowl Modification.

This service bulletin gives instructions to replace affected inlet cowls with changed inlet cowls to strengthen the integrity of the engine inlet cowls for increased protection for engine fan blade failure event. The changed inlet cowls include the following features:

- Inlet aft-bulkhead reinforced with metal plates
- Ballistic shields installed additionally inside of the inlet to prevent fan blade fragments from penetrating the outer barrel.
- Inlet outer barrel panels inspected for fluid ingress and repaired if any defect found.
- Inlet outer barrel panels inspected for prior repairs near aft edge and external metal doublers installed if necessary.

- (3) Alert Service Bulletin 777-78A0103 issued on May 16, 2022 Left and Right Thrust Reverser Halves, Lower Bifurcation Wall Reinforcement Plate Installation

This service bulletin gives instructions to install metal reinforcement plates on the left and right halves of lower bifurcation wall inner surface of each thrust reverser to improve cowling durability.

Safety Actions by the Federal Aviation Administration (FAA)

- (1) The FAA issued the FAA Emergency Airworthiness Directive (AD2021-05-51) on February 23, 2021.

“Boeing 777 equipped with PW 4000 series engines must undergo a TAI inspection before further flight.”

- (2) Issued Airworthiness Directive (AD2022-06-09) on March 4, 2022.

“Boeing 777 equipped with PW 4000 series engines must undergo repetitive TAI and UT inspections in accordance with P&W ASB PW4G-112-A72-361.”

- (3) Issued Airworthiness Directive (AD2022-06-10) on March 4, 2022.

“Boeing 777 equipped with PW 4000 series engines must undergo an inspection of the fan cowl doors for fluid ingress, and a functional check of the hydraulic pump shutoff valves, and reinforcement plate on thrust reverser must be installed, in accordance with Boeing Alert Requirements Bulletin 777-71A0092RB.”

- (4) Issued Airworthiness Directive (AD2022-06-11) on March 4, 2022.

“Boeing 777 equipped with PW 4000 series engines must undergo modification of the engine inlet to withstand fan blade failure event loads.”

Safety Actions by the Civil Aviation Bureau


- (1) On February 21, 2021, the Civil Aviation Bureau instructed domestic air carriers to ground all Boeing 777 aircraft equipped with PW4000 series engines and issued NOTAM in order that those aircraft may avoid take-off, landing and overflight within Japan’s territory and airspace.

- (2) The Civil Aviation Bureau issued Airworthiness Directive (KOKUKUKI No.1158 TCD-9736-2021) on February 24, 2021 in accordance with the FAA Emergency Airworthiness Directive (AD2021-05-51): “For the purpose of preventing the in-flight failure of a fan blade that could result in the inflight blade release, damage to the engine, and damage to the airplane, the inspections and replacement, if required, are to be performed, unless already done in accordance with AD2021-05-51 issued by the FAA.”

- (3) Issued Airworthiness Directive (KOKUKUKI No. 1131 TCD-9736A-2022) on March 18, 2022 in accordance with the FAA Airworthiness Directive (AD2022-06-09): “For the purpose of preventing the in-flight failure of a fan blade that could result in the in-flight blade release, damage to the engine, and damage to the airplane, repetitive inspections and replacement, if required, are to be performed except as already done in accordance with AD2022-06-09 issued by the FAA.”

- (4) Issued Airworthiness Directive (KOKUKUKI No. 1132 TCD-9928-2022) on March 18, 2022 in accordance with the FAA Airworthiness Directive (AD2022-06-10): “For the purpose of preventing in-flight failure of a fan blade that could lead to separation of inlet

		<p>cowl, fan cowl doors and thrust lever cowl, and that could lead to engine in-flight shutdown, the damage to the empennage and the engine fire, which could result in loss of control of the airplane, forced off-airport landing and injury to passengers, the actions, repetitive inspections and replacement, if required, are to be performed in accordance with AD2022-06-10 issued by the FAA, except as already done.”</p> <p>(5) Issued Airworthiness Directive (KOKUKUKI No. 1133 TCD-9929-2022) on March 18, 2022 in accordance with the FAA Airworthiness Directive (AD2022-06-11): “For the purpose of preventing in-flight failure of a fan blade that could lead to separation of inlet cowl, fan cowl doors and thrust lever cowl, and that could lead to engine in-flight shutdown, damage to the empennage and the engine fire, which could result in loss of control of the airplane, forced off-airport landing and injury to passengers, modification is to be made in accordance with AD2022-06-11 issued by the FAA, except as already done.”</p> <p>(6) On March 18, 2022, the Civil Aviation Bureau lifted the order to suspend operations of Boeing 777s equipped with PW4000 series engines on the condition that the safety measures indicated in the airworthiness improvement reports (3) through (5) above be taken and issued NOTAM on March 22, 2022 that those aircraft should avoid take-off, landing and overflight within territory of Japan, unless already done proper corrective actions in accordance with AD2022-06-09 AD2022-06-10 and AD2022-06-11 issued by the FAA or similar documentation.</p>		
	Report	https://www.mlit.go.jp/jtsb/eng-air_report/JA8978.pdf https://www.mlit.go.jp/jtsb/aircraft/p-pdf/AI2022-5-1-p.pdf (Explanatory Materials)		
	Reference	Major activities of the previous year (Page 4)		
11	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	September 29, 2022	July 5, 2021 Nagano City, Nagano Prefecture	Privately owned	JX0167 Zenith Aircraft Company CH701 (Self-made aircraft, two seats)
	Summary	<p>When the aircraft made a jump flight*1 at the Nagano City Gliding Field in Nagano City, Nagano Prefecture, it did not only deviate from the grassy area on the north side of the runway, but also both main landing gears fell off, making it unable to perform taxiing.</p> <p>The pilot and one passenger were on board the aircraft, but no one was injured.</p> <p>*1 “Jump flight” refers to a flight category permitted as a flight in the first stage in the procedure related to flight permission, which is specified in “Permission for test flights for self-made aircraft (Ministry of Land, Infrastructure, Transport and Tourism Civil Aviation Bureau Circular No. 1-006 Partially revised December 24, 2020),” and to a flight in which the aircraft floats slightly in the air (altitude of 3 m or less) on the ground surface where takeoff and landing are performed.</p>		
	Probable causes	<p>It is probable that this serious incident occurred because the aircraft touched down on the runway in a going-down way while deviating to the left after taking off, and the momentum caused it to deviate from the runway and both main landing gears to fall off.</p> <p>It is possible that the reason why the aircraft touched down on the runway while deviating to the left in a going-down way is due to the fact that the propeller effect of the aircraft was not properly corrected, and further that the engine output was reduced while maintaining a high nose-up attitude.</p>		
	Report	https://www.mlit.go.jp/jtsb/aircraft/rep-inci/AI2022-6-1-JX0167.pdf (Japanese only)		
12	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	October 27, 2022	December 21, 2019 In the sky about .1 nm west-southwest of	Privately owned (Aircraft A)	JA3815 Beechcraft A36

		the Saga Airport		(Small aeroplane)
			Spring Airlines.Co., Ltd. (Aircraft B)	B-9940 Airbus A320-214 (Large aeroplane)
	Summary	<p>The Aircraft A was in level flight toward Fukue Airport from Yao Airport, when the Aircraft B was descending to Saga Airport after taking off from Shanghai Pudong International Airport on a scheduled Flight 8577 of the company. Then, both aircraft were closely approaching each other about 1.1 nm west-southwest over Saga Airport, and the Aircraft B took evasive action executing instructions provided by Traffic Alert and Collision Avoidance System.</p> <p>On February 21, 2020, the captain of Aircraft A submitted a Near Collision Report to the Ministry of Land, Infrastructure, Transport and Tourism (A report pursuant to the provision of Article 76-2 of Civil Aeronautics Act and Article 166-5 of 2 Ordinance of the Enforcement of the Civil Aeronautics Act). Consequently, it was classified as a serious incident on February 26, 2020.</p>		
	Probable causes	<p>The JTSB concludes that the probable cause of this serious incident was that Aircraft A in level flight on VFR*² approached Aircraft B without predicting the existence of Aircraft B, because Aircraft A did not obtain the information on Aircraft B, which was flying on IFR*¹ and descending toward Saga VOR/DME on the direct route, from ATC facility and others.</p> <p>In addition, it is probable that there was no risk of collision or contact even at the time of closest proximity.</p> <p>*1 “VFR” which stands for Visual Flight Rules are defined as any flight not predicated on the instrument flight rules. While operating in VFR, a pilot is responsible for the clearance from the terrain and obstacles in addition to the separation from other aircraft and clouds at all time.</p> <p>* 2 “IFR” which stands for Instrument Flight Rules govern the procedures for conducting flights under the ATC clearances or instructions at all time.</p>		
	Report	https://www.mlit.go.jp/jtsb/eng-air_report/JA3815_B9940.pdf		
13	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	December 1, 2022	November 3, 2020 In the sky over near Koizumi, Kitami City, Hokkaido, at an altitude of about 150-200 m	Privately owned	JR0392 Beaver RX550-R503L (Ultralight plane with two-seats)
	Summary	<p>While the aircraft was flying northwest in the sky over near Koizumi, Kitami City, Hokkaido for leisure purposes, its engine stopped causing the aircraft to make a forced landing in a nearby field.</p> <p>The pilot and one passenger on board the aircraft were not injured.</p> 		
	Probable causes	<p>It is probable that since the needle bearing*¹ that connects the connecting rod of the engine No. 2 piston and the crank pin of the aircraft was damaged, the area around the connecting part became hot due to friction and the connecting part between the connecting rod and the crank arm got tied up due to the thermal expansion, causing the engine to stop in flight in this serious incident.</p> <p>It is probable that the reason why the malfunction of the engine was not discovered until it stopped was due to the fact that the maintenance had not been carried out properly based on the maintenance manual.</p> <p>*1 A “needle bearing” is a type of rolling bearing in which an elongated cylindrical roller (needle pin) with a diameter of 5 mm or less and a length of 3 to 10 times the diameter is used as the rolling element. Iron-based bearing steel with excellent wear resistance, such as high-carbon chromium steel, is mainly used.</p>		

	Report	https://www.mlit.go.jp/jtsb/aircraft/rep-inci/AI2022-8-2-JR0392.pdf (In Japanese only)		
14	Date of publication	Date and location	Operator	Aircraft registration number and aircraft type
	December 1, 2022	September 8, 2021 On the traffic pattern on the west side of the Menuuma Glider Airfield, Kumagaya City, Saitama Prefecture	Chuo University (Aircraft A)	JA2379 Alexander Schleicher ASK21 (Glider)
			Suisan Aviation Co., Ltd. (Aircraft B)	JA3904 Cessna U206G (Small aeroplane)
	Summary	<p>The Aircraft A was performing a flight training after being launched from Menuuma Gliding Field, when the Aircraft B was flying to take aerial photos after taking off from Chofu Airfield of the Tokyo Metropolitan Government. Then, both aircraft closely approached each other over the west traffic pattern of Menuuma Gliding Field, and the pilot in command (PIC) of Aircraft A took evasive action as he was unable to predict the movement of other aircraft and felt uneasy.</p> <p>On September 9, 2021, the PIC of Aircraft A submitted a Near Collision Report to the Ministry of Land, Infrastructure, Transport and Tourism (A report pursuant to the provision of Article 76-2 of Civil Aeronautics Act and Article 166-5 of Ordinance of the Enforcement of the Civil Aeronautics Act), and consequently it was classified as a serious incident.</p>		
	Probable causes	<p>The probable cause of this serious incident was that Aircraft B, which was flying to take aerial photos, most likely entered over the Gliding Field and approached close to Aircraft A, which was launched from Menuuma Gliding Field.</p> <p>In addition, it is probable that there was no risk of collision or contact for both aircraft.</p>		
Safety Actions	<p>Recurrence prevention measures taken by Suisan Aviation Co., Ltd.</p> <p>(1) In the wake of this serious incident, Suisan Aviation Co., Ltd. decided to hold a safety promotion conference in order to share the situation of this serious incident within the company and take safety actions as follows:</p> <ol style="list-style-type: none"> 1. They should have a grasp of the current conditions of radio communication between the gliding field and gliders in the vicinity of the gliding field (such as the voice from gliders 13 cannot be received on the frequency of VHF radio in the flight service and others, depending on the gliding fields). 2. In case of flying around the gliding field, the contents of the flight should be informed in advance and a pre-coordination with the gliding field should be made as much as possible. 3. In case of flying around the gliding field, it must be thoroughly observed to transmit the messages by using the frequency of the gliding field (VHF radio frequency of flight service and others) whether there is a response or not. <p>Recurrence prevention measures taken by the Japan Student Aviation Federation</p> <p>(2) The Japan Students Aviation League to which Chuo University belongs shared the contents of this serious incident with the league member aviation club managers, instructors and training center chiefs across the country and took safety actions in Menuuma Gliding Field as follows:</p> <ol style="list-style-type: none"> 1. They created a document to ask for a pre-coordination at the time of flying around the gliding field and informed government agencies and aircraft operators with small airplanes of the document. 2. They mounted VHF receivers on gliders so that the gliders would be able to listen to the VHF radio communications between general aircraft flying around the gliding field and Menuuma Flight Service. 3. Other than in the First Gliding Field Bankside Piste*¹ that operates Menuuma Flight Service, VHF receivers were installed in the First Gliding Field Riverside Piste and the Second Piste in the Second Gliding Field so that each Piste would be able to have a grasp of the flight status of aircraft flying around the gliding field in real-time and provide the gliders with necessary traffic information by listening to the VHF radio communications. 4. They conducted an online training session of the glider radio and its communication method for the leaders and students in each school who use Menuuma Gliding Field to deepen their 			

		<p>knowledge of radio communication.</p> <p>*1 “Piste” refers to a facility that communicates with gliders and other aircraft in flight to exchange information concerning the gliding field, and air traffic in the surrounding area, in order to ensure safe and smooth operation of the gliding field. In Menuma Gliding Field, “Menuma Piste” is established to the bank side, “Riverside Piste” to the riverside in the First Gliding Field, and the “Second Piste” in the Second Gliding Field, respectively, in order for dispatchers to control glider launches and landings.</p>
	Report	https://www.mlit.go.jp/jtsb/eng-air_report/JA2379_JA3904.pdf

7 Provision of factual information in 2022 (aircraft accidents and serious incidents)

The JTSA provided no factual information in 2022.


Column

Training to Support the Technical Skills of Aircraft Accident Investigators

Aircraft Accident Investigator

This column explains the training that aircraft accident investigators conduct with the aim to improve their technical skills to carry out appropriate investigations.

The JTSB conducts investigations of accidents and serious incidents caused by aircraft. Those who have been engaged in aviation-related work for many years and who have professional knowledge of the fields of engagement (piloting, aircraft inspection, flight control, traffic control technology, airport operation, unmanned aircraft, etc.) are appointed as investigators. However, extensive knowledge related to human factors (human behavior characteristics) and to the aviation as a whole is required in addition to the knowledge of piloting and of aircraft for the investigation of accidents. In addition, the development and progress of the aviation technology have been remarkable and many cutting edge technologies have been adopted. Therefore, aircraft accident investigators undergo a variety of training while conducting investigations in order to acquire new skills and knowledge at all times.

In the recent past, a new training which was started in December, 2022 designed to acquire knowledge required for the investigation of accidents related to unmanned aircraft has been underway. In addition, since the JTSB has adopted drones for taking photographs of the scene for the investigation of accidents, accident investigators are required to learn piloting skill newly, and this is also one of the important training. A total 6 investigators have completed the training for piloting drones by the end of FY2021. In order to maintain the skills of these 6 investigators, they received training on the piloting skills necessary for photographing accident sites from the air in 2022 (Photo 1). Since the number of places where drone piloting training can be carried out is limited, dedicated training grounds in Chiba and Ibaraki Prefectures are used.

In addition, in preparation for the investigation of accidents related to unmanned aircraft, we did not only inspect the latest drones by attending at exhibitions of unmanned aircraft, but also collected information on drones and flying techniques (Photo 2). We expect that the outcome of such training will be made use of in the investigation of accidents related to unmanned aircraft to appropriately elucidate the causes and to formulate measures to prevent



Photo 1: An aspect of the training for piloting



Photo 2: Japan Drone Exhibition 2022
UTM session
(June 23, 2022, Makuhari Messe)

recurrence in the future.

On the other hand, a variety of overseas training that had been cancelled due to the spread of COVID-19 was resumed in FY2022, and the JTSB has participated in the training for the investigation of accidents caused by unmanned aircraft and the training on the technology to extract data from flight recording devices which were held in the United States. There is a high language barrier in overseas training and all investigators experience great difficulties in understanding their contents. However, it is very meaningful to take lectures directly from overseas engineers and deepen engagement with aviation authorities from other countries. Such engagement has been very useful for making communications and contacts and building a cooperative relationship with foreign investigative organizations and manufacturers in future accident investigations. Furthermore, it is one of the recent features that overseas training conducted online has been increasing and we took part in the online training on human factors organized by the Southern California Safety Institute in the United States.

In addition to the training shown so far, airline companies hold pilot training using simulators, training on aircraft structure and systems, language training, etc., every year. Nobody knows when a case of investigation will occur and there are some cases that the JTSB forced to change the plan all of a sudden like canceling participation in a training course at the last minute. However, aircraft accident investigators are endeavoring to make most of the provided training opportunities in order to improve our own knowledge and technical skills.