AIRCRAFT SERIOUS INCIDENT INVESTIGATION REPORT

May 16, 2025
Adopted by the Japan Transport Safety Board
Chairperson RINOIE Kenichi
Member TAKANO Shigeru
Member MARUI Yuichi
Member SODA Hisako
Member TSUDA Hiroka
Member MATSUI Yuko

Company	Corporate body
Type, Registration Mark	Cessna 172P JA4101
Incident Class	Dragging during landing of any other part of the aircraft other than the landing gears Item (iii), Article 166-4 of the Regulation for Enforcement of the Civil Aeronautics Act
Date and Time of the Occurrence	At about 10:14 Japan Standard Time (JST: UTC+9 hours), July 7, 2024
Site of the Serious Incident	Fukushima City Temporary Operation Site (for agricultural use) (Fukushima Sky Park), Fukushima City, Fukushima Prefecture (37' 49" 24N, 140' 23" 26E)

1. PROCESS AND PROGRESS OF THE SERIOUS INCIDENT INVESTIGATION

Summary of the Serious Incident	On Sunday, July 7, 2024, when the aircraft landed at Fukushima Sky Park, the lower aft section of the fuselage touched the runway. There were three people on board, the captain, a student pilot and a passenger, but no one was injured.
Outline of the Serious Incident Investigation	The Japan Transport Safety Board (JTSB) designated an investigator-in-charge and an investigator to investigate this serious incident. An accredited representative of the United States, as the State of Design and Manufacture of the aircraft involved in this serious incident, participated in the investigation. Comments on the draft Final Report were invited from the parties relevant to the cause of the serious incident and the Relevant State.

2. FACTUAL INFORMATION

Aircraft Information

Aircraft type: Cessna 172P
Serial number: 17274771 Date of manufacture : March 11, 1981
Airworthiness certificate: No.Tou-2024-040, Validity : May 8, 2025

Personnel Information

(1) Captain: Age: 65

Commercial pilot certificate (Aeroplane)	February 25, 1991
Pilot competence assessment/confirmation	
	Expiration date of piloting capable period: September 27, 2025
Rating and limitation: Land single-piston, Land multi-piston	December 11, 1981
Flight instructor rating	August 3, 1994
Class 1 aviation medical certificate	Validity: March 3, 2025
Total flight time	5,713 hours 43minutes
Flight time in the last 30 days	1 hour 00 minute
Flight time on the type of the aircraft	Approximately 5,200 hours 00 minute
Flight time in the last 30 days	1 hour 00 minute
(2) Student Pilot: Age: 56	
Student pilot certificate	Validity: March 28, 2025
Solo flight certificate (local flight)	November 26, 2023
Total flight time	64 hours 31mimutes
Flight time on the type of the aircraft	64 hours 31mimutes
Flight time in the last 30 days	0 hour 00 minute

Meteorological Information

The observations from the meteorological observation system installed at Fukushima Sky Park were as follows:

09:00 Wind direction: 140°, Wind velocity: 4 kt
Temperature: 25.5°C
Altimeter setting (QNH): 29.79 inHg

10:00 Wind direction: 360°, Wind velocity: 8 kt
Altimeter setting (QNH): 29.77 inHg

At Fukushima Sky Park, wind direction indicators (windsocks)*1 are installed in the grass area on the left side of runway approach ends (sides of Runway 14 and Runway 32) so that pilots are able to check the approximate wind direction and velocity during take-off and landing. And Fukushima Sky Park staff can check the movement of the windsock on the side of Runway 32 captured by the surveillance camera on the monitor in the control office, and provide wind information to aircraft landing on Runway 32 via the Fukushima Flight Service*2using the windsock conditions as needed.

According to Fukushima Sky Park staff, on the day of the serious incident, a south wind was blowing from the morning, but about 10:00, changes in wind conditions were observed in the wind vane/anemometer values and the movement of the windsock, and it temporarily changed to a north or west wind. They provided the wind information to the aircraft four minutes before landing by radio, stating that the wind direction was not stable but "variable" (unstable wind direction).

According to the surveillance camera video provided by Fukushima Sky Park, from the movement of the windsock on the side of Runway 32, it was confirmed that the wind direction frequently changed to the south or north.

Event Occurred and Relevant Information

(1) History of the flight

On July 7, 2024, at around 9:22, the aircraft took off from Fukushima Sky Park's Runway 14

*1 A “wind direction indicator (windsock)” is a device used to check the wind direction when an aircraft is determining the flight course for the take-off and landing. The wind speed is indicated by the angle of the windsock relative to the mounting pole and the windsock. If the windsock flutters sideways, it can be determined that the wind is blowing at about 20 kt.

*2 “Fukushima Flight Service” refer to the Flight Service Station at Fukushima Sky Park and its staff radios using runway, wind conditions, traffic information to the aircraft taking off and landing or flying vicinity of the field.

(with a heading of 14/32, 800 m long and 25 m wide) for training, piloted by a student pilot, with the captain as an instructor in the right pilot's seat, the student pilot in the left pilot's seat, and the passenger in the right rear seat.

At about 10:10, the student pilot established communication with Fukushima Flight Service about 5 nm (about 9 km) southeast of Fukushima Sky Park for the landing, obtained the information about the meteorological observation values and their active Runway 32, and then began to approach for the landing from the right base leg of Runway 32.

Checking the windsock to the left side of the runway from the final approach course, the captain confirmed that the wind direction was directly towards the runway, the wind velocity was about 5 kt, and the wind over the runway was stable, and judged that the aircraft would be able to land without difficulty with the student pilot at the controls, allowing the student pilot to continue the landing maneuver.

At about 10:14, the aircraft passed the south end of the overrun area*3 short of Runway 32 at a velocity of about 65 kt*4 (about 111 km/h) with flaps 30° in a generally stable state. Based on the appearance of the windsock, the student pilot recognized that the wind direction was from the front and that the wind velocity was about 3 to 5 kt (1.5 to 2.6 m/s). The student pilot set the engine power to idle as usual before the aircraft crossed over the runway marking indicating "32" on the runway, and began to flare*5. Immediately afterwards, the three people on board the aircraft felt a loud bang and a strong impact, different from a normal landing, as the rear of the aircraft lowered, therefore, the captain took control of the aircraft from the student pilot. After the bounce*6, the aircraft, piloted by the captain, landed, taxied to the apron under its own power and came to a stop. After the aircraft stopped, the captain and the student pilot visually inspected the aircraft and confirmed that there

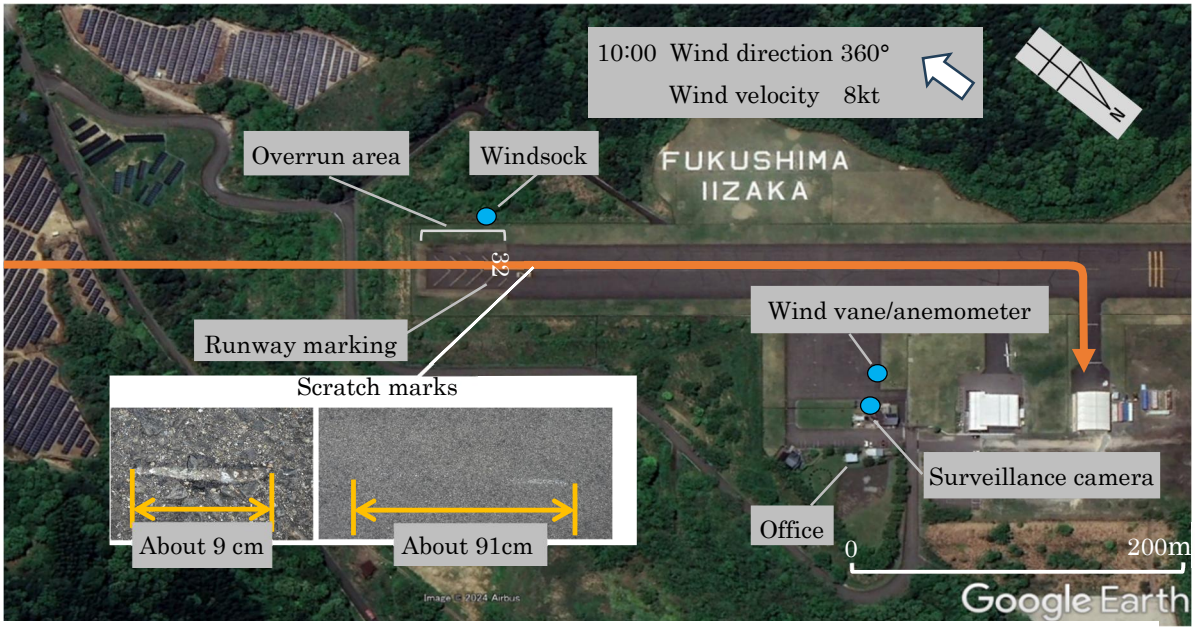

Figure 1: Estimated Flight Route (Orange Line) of the Aircraft and Layout of Fukushima Sky Park

*3 An "overrun area" refers to the area established to mitigate damage to aircraft caused by deviation from the runway. At Fukushima Sky Park, it is located at both ends of the runway (60 m long X 25 m wide, asphalt surface).
*4 The aircraft's flight manual states that for a normal approach (with flaps 30°), the landing approach shall be made at 60 to 70 kt. installed on the apron and aircraft body used to moor small aircraft, etc. to the apron.
*5 "Flare" is a maneuver in which the nose of the aircraft is pulled up before touchdown on the runway in order to reduce the airspeed and the rate of descent to reduce the impact of the landing。
*6 The "bounce" refers to the phenomenon where the aircraft bounces up after touchdown for landing.

were the scratch marks on the lower aft section of the fuselage and the tie-down ring[*7] was broken.

(2) Damage to the Aircraft and Other Objects

Damage to the aircraft: There were scratch marks on the lower aft section of the fuselage and on the underside of the rudder, and the tie-down ring was broken at its root.

Damage to other objects: There were scratch marks of about 9 cm (about 7 mm at the deepest point) and about 91 cm on the runway.

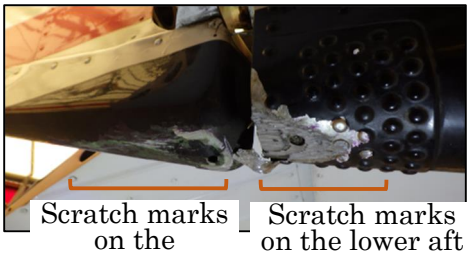

Figure 2: Scratch Marks on the Airframe

(3) Record of this Serious Incident.

The surveillance camera recorded the landing of the aircraft. The movements of the aircraft and the windsock from five seconds before the aircraft touched down until it touched down were as follows:

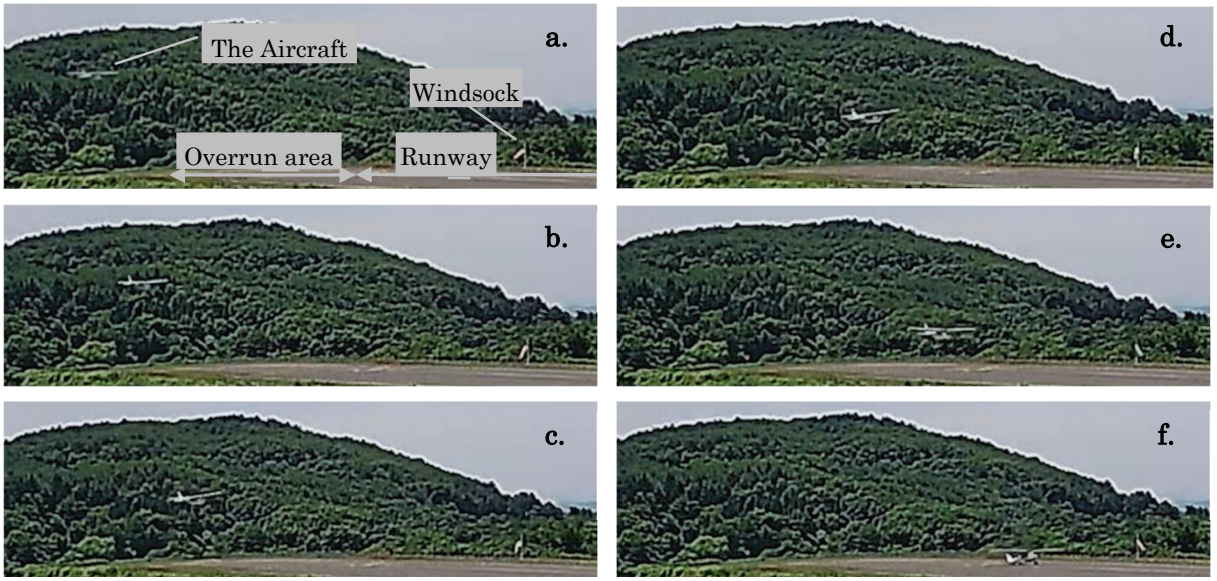

Figure 3: Movements of the Aircraft and the Windsock Five Seconds before Touchdown to Touchdown (from Surveillance Camera Records)

*7 "Tie-down ring" is the ring on the apron and fuselage used to moor small aircraft and to others to the apron by rope or other means.

a. Five seconds before touchdown, the aircraft was just short of the south end of the runway and the windsock indicated that the wind was blowing from the northwest at 10 kt (5.1 m/s).
b. Four seconds before touchdown, the aircraft was just short of the south end of the runway, and compared to the wind conditions in a., the change in the wind direction was smaller, but the windsock indicated that the windsock indicated that the wind velocity had dropped to about 5 kt (2.8 m/s).
c. Three seconds before touchdown, the aircraft passed the south end of the runway, and compared to b., the windsock indicated that the wind velocity had dropped to 5 kt or less.
d. Two seconds before touchdown, the aircraft was flying over the overrun area, and the windsock indicated that the wind was blowing from the southwest at about 5 kt.
e. One seconds before touchdown, the aircraft began to flare, and the windsock indicated that the wind was blowing from the south at about 5 kt.
f. The main wheel of the aircraft touched down and the lower aft section of the fuselage touched the runway surface, and the windsock indicated that the wind was blowing from the south at about 10 kt.

(4) Perception of Wind Conditions by Captain and Student Pilot

The captain and the student pilot realized that at Fukushima Sky Park, such changes in wind direction, which would affect take-offs and landings, often occur in winter when a strong north-westerly wind blows, but they did not expect it to happen in summer.

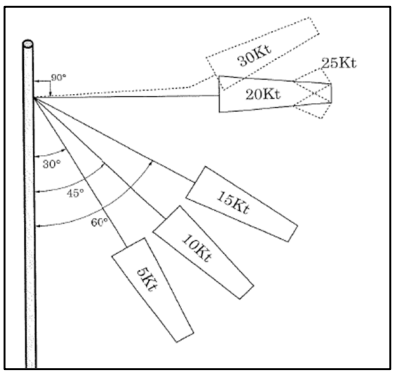

Figure 4: Estimated Wind Velocity based on Windsock (Source: AIM-J)

3. ANALYSIS

The JTSB concludes that, based on the movement of the windsock recorded by the surveillance camera, it is certain that at the time of the serious incident, the direction of the wind blowing over the runway (Runway 32 side) at Fukushima Sky Park frequently changed to south or north while the aircraft approached the runway for landing. On the other hand, the captain and student pilot, recognizing that the windsock indicated a north-westerly wind, which was almost a headwind, probably did not expect such changes in wind direction, which would affect take-offs and landings. Therefore, it is probable that the captain judged that the aircraft would be able to land without difficulty with the student pilot at the controls, and the student pilot performed a landing procedure as usual.

As described in the Event Occurred and Relevant Information (3) in 2. FACTUAL INFORMATION, it is more likely that around the time that the aircraft began to flare, the direction of the wind blowing over the runway changed from north-west to south, blowing from the rear left, causing the aircraft to lose airspeed and lift rapidly with the nose up, touching down at a higher rate of descent than normal, and the lower aft section of the fuselage touching the runway surface.

It is probable that the captain and student pilot did not have time for an evasive maneuver ,

as the aircraft's descent rate became higher than normal just before touchdown. As changes in wind direction during landing can significantly affect the control of the aircraft, it is necessary for the pilots to anticipate changes in wind direction, taking into account the wind information provided by the Operations Assistants and others by radio.

4.PROBABLE CAUSES

The JTSB concludes that the probable cause of this serious incident was that around the time that the aircraft began to flare, as the direction of the wind blowing over the runway changed from north-west to south, the aircraft rapidly lost lift with the nose up, touched down at a higher descent rate than normal, and the lower aft section of the fuselage probably touched the runway surface.

It is probable that the captain and student pilot did not have time for an evasive maneuver , as the aircraft's descent rate became higher than normal just before touchdown.

5.SAFETY ACTIONS

(1) Safety Actions Required

It is difficult for a pilot to observe the movement of the windsock and understand the change of wind direction from that movement just before landing. It is effective for the pilots to obtain information from the Operations Assistants and others about the wind conditions in the circumstances of the change in wind direction in order for the pilots to understand the change in wind direction.

(2) Safety Actions Taken after the Serious Incident

The Operations Manual for Fukushima Flight Service, for which the Fukushima Sky Park staff provide services, had been revised to state that they should actively provide pilots with information on change in the specific surface wind conditions, especially when there is a crosswind from the northwest side and changes in wind direction and velocity.