AI2020-6

AIRCRAFT SERIOUS INCIDENT
INVESTIGATION REPORT

PRIVATELY OWNED
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October 29, 2020

Japan Transport Safety Board

The objective of the investigation conducted by the Japan Transport Safety Board in accordance with the Act for Establishment of the Japan Transport Safety Board (and with Annex 13 to the Convention on International Civil Aviation) is to prevent future accidents and incidents. It is not the purpose of the investigation to apportion blame or liability.

TAKEDA Nobuo
Chairman
Japan Transport Safety Board

Note:

This report is a translation of the Japanese original investigation report. The text in Japanese shall prevail in the interpretation of the report.

AIRCRAFT SERIOUS INCIDENT INVESTIGATION REPORT

RUNWAY OVERRUNNING
PRIVATELY OWNED
PIPER PA-46-350P, JA121C,
AT OSHIMA AIRPORT, JAPAN
AROUND 10:08 JST, MAY 4, 2019

September 25, 2020
Adopted by the Japan Transport Safety Board

Chairman TAKEDA Nobuo
Member MIYASHITA Toru
Member KAKISHIMA Yoshiko
Member MARUI Yuichi
Member MIYAZAWA Yoshikazu
Member NAKANISHI Miwa

1. PROCESS AND PROGRESS OF THE AIRCRAFT SERIOUS INCIDENT INVESTIGATION

1.1 Summary of the Serious Incident	On Saturday, May 4, 2019, a privately owned Piper PA-46-350P, registered JA121C, took off from Yao Airport to make a leisure flight. When landing on Runway 21 at Oshima Airport, it overran the runway and was disable to perform taxiing. A total of five persons on board the aircraft, including a captain and other four passengers, and there were no injuries.
1.2 Outline of the Serious Incident Investigation	The occurrence covered by this report falls under the category of "Overrun, from a runway (when an aircraft is disabled to perform taxiing)" as stipulated in Item (iii), Article 166-4 of the Ordinance for Enforcement of Civil Aeronautics Act of Japan (Ordinance of the Ministry of Transport No. 56 of 1952), and is classified as a serious incident. The Japan Transport Safety Board (JTSB) designated an investigator-in-charge and an investigator on May 4, 2019 to investigate this serious incident. Although this serious incident was notified to the United States of America, as the State of Design and Manufacture of the aircraft involved in this serious incident, the State did not designate its accredited representative. Comments were invited from parties relevant to the cause of the serious incident and from the Relevant State.

2. FACTUAL INFORMATION

2.1 History of the Flight	According to statements of the captain, an Air Traffic Services Flight Information Officer at Oshima Airport (hereinafter referred to as "Information Officer"), and an officer at Oshima port and airport

	administration office (hereinafter referred to as "Administration Office Staff"), the history of the flight up to the serious incident is outlined below. At 08:52 JST (UTC+9 hours; unless otherwise noted, all times are indicated in JST in this report on a 24-hour clock) on Saturday, May 4, 2019, a privately owned Piper PA-46-350P, registered JA121C, took off from Yao Airport (Osaka Prefecture) to fly to Oshima Airport (hereinafter referred to as "the Airport") under VFR. Before the flight, the captain checked that there would be no problem for the flight, obtaining the weather information of the Airport. Besides, considering the flight time and weight limits, the captain loaded the Aircraft with sufficient fuel to make an about 4-hour flight, and confirmed there was no abnormality in the Aircraft during preflight inspections. Furthermore, the captain did not obtain any weather information during the flight because he checked that there was no information on weather that would hinder the flight and thought no further information were required. At around 10:02, the Aircraft established communication with the Information Officer at the position about 10 nm (about 18.5 km) west of the Airport. The Information Officer informed the Aircraft that wind direction 060°, wind velocity 9 kt, the active runway was Runway 03, and said "REPORT LEFT BASE RUNWAY 03". At around 10:05 the Information Officer informed that there was no obstruction on Runway 03, and the captain read it back. (See Figure 1: Estimated flight route ①) The Aircraft was flying at an altitude of about 1,000 ft, but the runway could not be sighted because to the west of the Airport there were clouds at the same level as the altitude of the Aircraft. When the Aircraft descended to an altitude of about 900 ft, the north side of the runway was able to be sighted. Although the captain did not check the landing performance with the flight manual, he decided to land on Runway 21, judging the Aircraft would be able to land even in a tail wind based on the runway length and his flight experience. After that, at around 10:07, the Information Officer sighted the Aircraft, and informed the Aircraft saying "Are you sure that is Runway 21? Wind direction is 070°, and wind velocity is 7 kt, it's a tail wind" because the Aircraft seemed to be going to land on Runway 21. As the Aircraft reported saying "Roger, We go on to land Runway 21", the Information Officer informed the Aircraft saying "There is no obstruction on Runway 21." (See Figure 1: Estimated flight route ②)

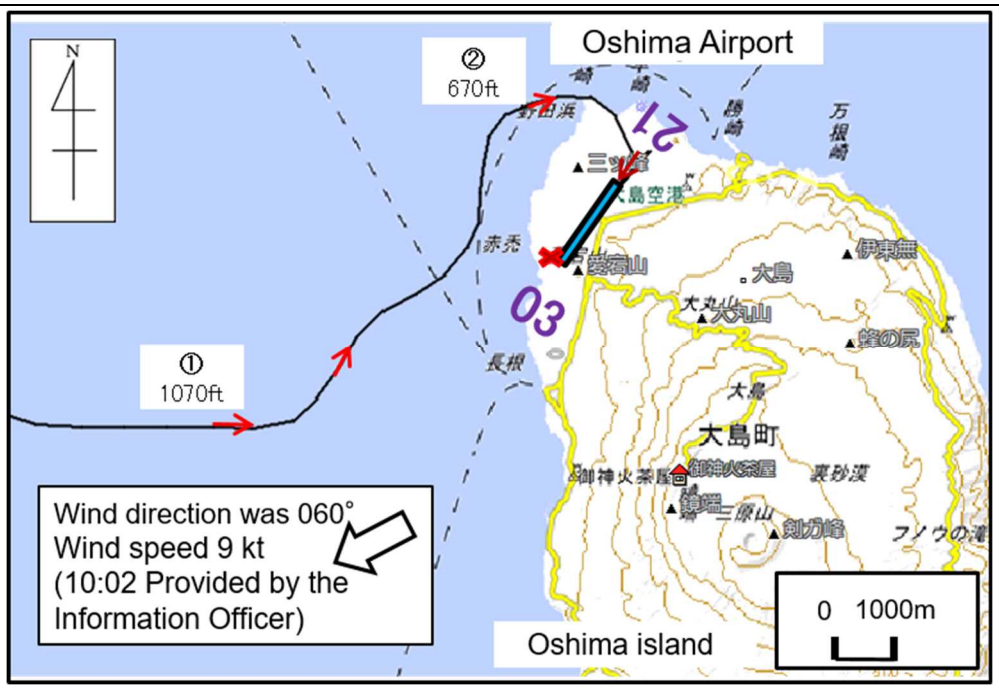

Figure 1: Estimated flight route (according to radar track records and ATC communication records)

The captain made an early base turn and the Aircraft flew on the route closer to the runway than usual. When the Aircraft was lined up with Runway 21, the captain heard a warning sound meaning unextended landing gears, therefore, he extended the landing gears and almost at the same time received from the Information Officer the information calling attention to the fact that the landing gears were not extended. Although the speed of the Aircraft was 110 KIAS*1 at the time comparing with the approach speed of 80 to 85 KIAS stipulated in the aircraft manual, the captain continued its approach judging the aircraft could stop within the runway which length was 1,800m. In this situation, he made a landing with Flaps 20° as there was no time to extend the full flaps 36°.

As the captain thought the Aircraft touched down beyond the third touchdown zone marking from the threshold of Runway 21, he applied the brakes with normal braking force, taking into consideration the burst of tires, and the Aircraft reduced its speed. As the Aircraft was approaching the threshold of Runway 03, the captain applied maximum braking, however, the Aircraft overran the runway, halted on uneven ground, and was disable to perform taxiing. The captain and the passengers exited from the Aircraft by themselves.

*1 KIAS: Knots indicated airspeed

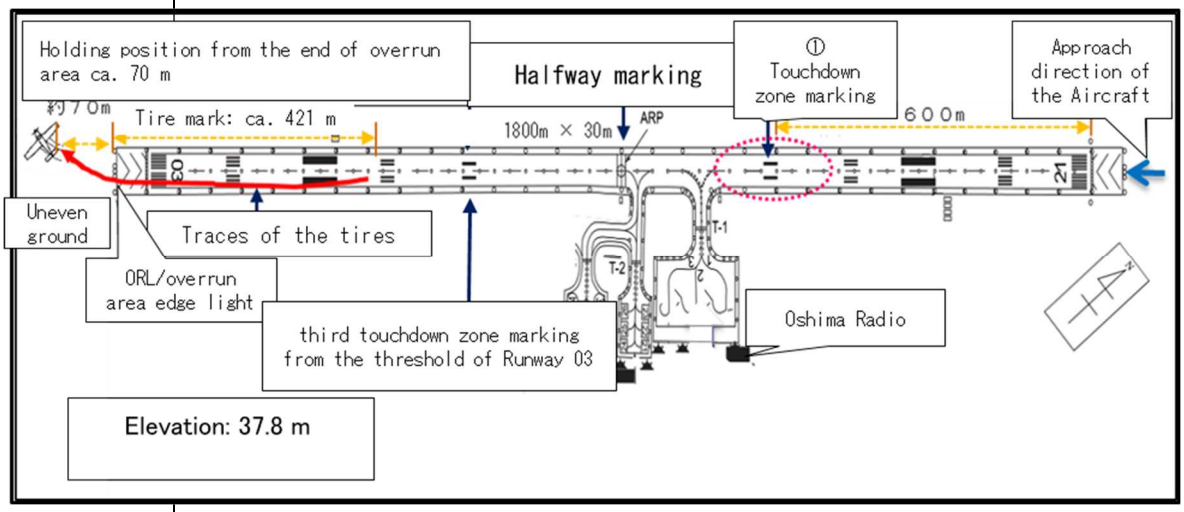

Figure 2: Runway plan view

According to the Information Officer, the Aircraft approached in a steep angle from the base leg closer to the runway than usual. As the landing gears of the Aircraft were not extended even when the Aircraft was lined up with the runway, the Information Officer informed the Aircraft about it. The Information Officer sighted that the landing gears of the Aircraft were extended, and the Aircraft had not touched down even when it was passing the halfway marking. After that, the Information Officer did not watch the Aircraft touch down due to radio communication with other aircraft, but after the radio communication with other aircraft was over, he found the Aircraft overrunning the runway.

Besides, according to other Information Officer and Administration Office Staff who worked during the same hours and witnessed the Aircraft landing, the Aircraft was attempting to land from a higher altitude than usual when approaching the runway, and they stated that the touchdown point of the Aircraft was on the south-west side from the halfway marking.

Furthermore, according to the report submitted by the captain to the Civil Aviation Bureau immediately after the serious incident, it is noted that the Aircraft touched down at the point on the latter part of Runway 21 (south side from the halfway marking).

The serious incident occurred on uneven ground (34°46'24" N, 139°21'22" E) in the vicinity of the southern threshold of the runway at the Airport at around 10:08 on May 4, 2019.

2.2 Injuries to Persons	None

2.3 Damage to Aircraft

(1) Extent of damage: Slightly damaged

- Aircraft damage
  - ① Right main wing leading-edge: Impact damage, bent
  - ② Propellers: Scratch marks
  - ③ Right forward fuselage: Outer skin dented
  - ④ Nose gears: Actuator damaged, scratch marks on the door

There was no abnormality in the brake system.

Figure 3: Serious incident aircraft

(2) Damage to ground facilities

① Barbed wire fence around the Airport: Broken

② ORL/overrun area edge lights: One light broken

③ SALS/simple approach lighting system: Three lights broken

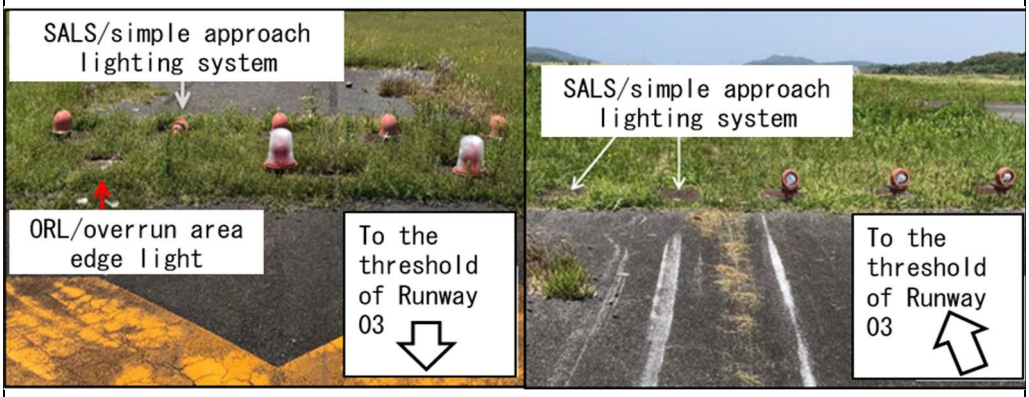

Figure 4: Damaged ground facilities

2.4 Personnel Information

Captain Age 72

Private pilot certificate (Airplane)

Specific Pilot Competence

Expiry of practicable period for flight: April 4, 2020

Type rating for single-engine(land) October 14, 1994

Class 2 aviation medical certificate

Validity March 31, 2020

Total flight time 1,252 hours 34 minutes

Total flight time on the type of the aircraft 780 hours 04 minutes

Flight time in the last 30 days 6 hours 13 minutes

2.5 Aircraft Information	(1) Aircraft Type: Piper PA-46-350P Serial number: 4636356 Date of manufacture: July 15, 2004 Certificate of airworthiness: No.DAI-2018-611 Validity: December 26, 2019 Category of airworthiness: Airplane, Normal Category Total flight time 1,510 hours 04 minutes Flight time since last periodical check (50-hour inspection on April 21, 2019) 14 hours 25 minutes (2) When the serious incident occurred, the weight and balance of the Aircraft are estimated to have been within the allowable range.
2.6 Meteorological Information	The aviation routine weather report for the Airport announced at 10:00 was as follows: Wind direction: 050°, Wind velocity: 9 kt, Visibility: 10 km or more Cloud: Amount: 1/8, Type: Stratus, Cloud base: 900 ft Amount: 6/8, Type: Cumulus, Cloud base: 1,100 ft Temperature: 19°C, Dew point: 17°C, Altimeter setting (QNH): 30.06 inHg
2.7 Additional Information	The landing ground roll distance was 1,200 ft (366 m), when calculated using the performance table described in the flight manual of the Aircraft, and based on the weight at the time of the serious incident and the following computational conditions. However, the landing ground roll distance cannot be calculated using the performance table when a tail wind speed exceeds 5 kt. (Computational conditions) Runway: paved, level, and dry runway surfaces, Landing gears: extended Brakes: maximum, Flap angle: 36°, Approach speed: 78 KIAS, Throttle: closed, Touchdown: stalled, Outside air temperature: 19°C, Wind: tail wind 5 kt

3. ANALYSIS

3.1 Involvement of Weather	Yes
3.2 Involvement of Pilot	Yes
3.3 Involvement of Aircraft	None
3.4 Analysis of Findings	(1) Landing runway It is highly probable that the captain recognized the active runway was Runway 03 based on the information provided by the Information Officer.

It is probable that because the captain could sight the north of runway after lowering the altitude when he had not been able to sight the runway due to low clouds during the flight to the Airport, he immediately attempted to land on Runway 21. It is probable that the captain was informed by the Information Officer that the wind would be a tail wind when landing on Runway 21, but he did not change his decision to land on Runway 21, judging from his flight experience that the runway length was enough to land. On the other hand, according to the Aircraft performance specified in the flight manual, the Aircraft is not assumed to land in a tail wind of 5kt or more. It is probable that the Aircraft should have aborted the approach and considered landing on Runway 03 in order to ensure a safe landing because it was not in an emergency situation that would require a forced landing, such as aircraft problems or fuel shortage.

(2) Approach situations

It is probable that because the captain initiated a base turn earlier and the Aircraft was affected by the northeastern wind, the base leg got close to the runway, which resulted in shorter final leg. For this reason, it is highly probable that the captain could not afford to perform flight maneuvers, could not reduce the speed, could not extend the landing gears until the warning alarmed around when the Aircraft was lined up with the final leg, in addition, the flap setting remained at 20° as he could not able to change the flap setting in time, and in this way, he failed to conduct operation required for a safety landing and continued to approach.

It is probable that the Aircraft should have made a go-around because the Aircraft's approach was not stable for landing.

(3) Overrunning

Judging from the approach speed of 110 KIAS and tail wind effects, it is probable that the Aircraft's speed at the time of touchdown greatly exceeded the calculation range for the landing ground roll distance in the flight manual.

It is probable that the braking distance was approximately 1.9 times longer when calculated in the same condition except for the speed by increasing the approach speed from 78 KIAS (Ground speed 83 kt) to 110 KIAS (Ground speed 115 kt).

Besides, the captain thought the Aircraft touched down beyond the third touchdown zone marking from the threshold of Runway 21, and applied the brakes normally, however, it is probable that the Aircraft touched down at the point beyond the halfway marking based on the report submitted by the captain and the statements of eyewitnesses. As shown in Figure 2, the same touchdown zone marking as the third touchdown zone marking from the threshold of Runway 21 is installed in the west side of the runway beyond the halfway marking as the third touchdown zone marking from the threshold of Runway 03. Furthermore, the captain stated that he did not applied maximum braking for a while after touchdown, taking into consideration the burst of tires, however, as the Aircraft was approaching the runway end, he applied maximum braking, and therefore, it is probable that the tire mark put in Figure 2 was the one that was made when the captain applied maximum braking. Based on these, it is somewhat likely that

	the place where the Aircraft touched down was at the third touchdown zone marking from the threshold of Runway 03, beyond the halfway marking on the runway. In case that the Aircraft touched down in a tail wind of 5 kt, at the point about 600 m from the threshold of Runway 03, the landing ground roll distance is estimated to have been approximately 700 m when calculated based on the values obtained from the flight manual, and therefore, it is somewhat likely that the Aircraft was not able to stop within the runway length. As mentioned above, it is probable that the Aircraft overran the runway because it touched down at an excess approach speed at the point beyond the halfway marking. As regards the reason why the Aircraft touched down at an excess speed at the point beyond the halfway marking, it is somewhat likely that the captain delayed in extending the landing gears, in addition, there was no time to extend the full flaps, thus he could not afford to perform usual flight maneuvers without grasping accurately the Aircraft's position on the runway.

4. PROBABLE CAUSES

In this serious incident, it is highly probable that because the Aircraft touched down in a tail wind at an excess speed at the point beyond the halfway marking on the runway when landing at Oshima Airport, it overran the runway and was disable to perform taxiing with its gears damaged.