

AA2015-4

**AIRCRAFT ACCIDENT  
INVESTIGATION REPORT**

**GENERAL INCORPORATED ASSOCIATION SHIZUOKA PREFECTURE  
AERONAUTIC ASSOCIATION**

**J A 2 5 4 9**

**April 23, 2015**



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 determine the causes of an accident and damage incidental to such an accident, thereby preventing future accidents and reducing damage. It is not the purpose of the investigation to apportion blame or liability.

Norihiro Goto  
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 ACCIDENT INVESTIGATION REPORT

FUSELAGE DAMAGE CAUSED BY UNDERSHOOT  
GENERAL INCORPORATED ASSOCIATION SHIZUOKA PREFECTURE  
AERONAUTIC ASSOCIATION  
PZL-BIELSKO SZD-51-1 “JUNIOR”  
(GLIDER, SINGLE-SEATER),  
JA2549  
NEAR THE FUJIKAWA GLINDING FIELD  
SHIZUOKA CITY, SHIZUOKA PREFECTURE, JAPAN  
AROUND 12:00 JST, AUGUST 17, 2014

March 27, 2015

Adopted by the Japan Transport Safety Board

Chairman Norihiro Goto  
Member Shinsuke Endoh  
Member Toshiyuki Ishikawa  
Member Sadao Tamura  
Member Yuki Shuto  
Member Keiji Tanaka

## 1. PROCESS AND PROGRESS OF THE INVESTIGATION

The Japan Transport Safety Board designated an investigator-in-charge and an investigator on August 17, 2014 to investigate the accident. Comments were invited from parties relevant to the cause of the accident. Comments were invited from a party relevant to the cause of the accident and relevant State.

## 2. FACTUAL INFORMATION

2.1 History of the Flight	According to the statements of the captain and the witness, the history of the flight up to the time of the accident is summarized below: On Sunday August 17, 2014, a PZL-Bielsko SZD-51-1 “Junior”, registered JA2549, operated by general incorporated association Shizuoka Prefecture Aeronautic Association, took off from Fujikawa Gliding Field in Shizuoka prefecture at 11:48 JST (Japan Standard time : UTC+9hrs) with towing by airplane for familiarization flight, and after flying for about 10
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minutes, it started the final approach to the Gliding Field.

The captain practiced the forward slip\*<sup>1</sup> combined with the air brake while making the final approach to the Gliding Field at an altitude of 150 m and the distance about 700 m from the threshold of the runway. Later on, the captain returned the bank angle of the Glider at the level in order to finish the forward slip practice. When he confirmed the air speed indicator at the time when the Glider passed the point about 300 m from the runway, it showed 110 km/h. Also, the altitude of the Glider at that time was about 60 m as usual from the way the Gliding Field can be seen, and it was in a stable flying attitude.

The captain operated the rudder while keeping the bank angle of the Glider at the level to direct the nose toward the runway, and opened the air brake a little. At that time, he encountered a downdraft and felt like being tossed by the current, so he closed the air brake. However, The Glider continued to descend at a large descending rate. The captain kept a descending attitude so as not to stall and performed a pitch-up before touchdown, but the Glider's fuselage was damaged when it undershot and touched down on a field at the distance about 130 m from the runway. The Glider undershot and damaged the fuselage at around 12:00.

A witness who landed at the Gliding Field in another glider about 5 minutes before the accident occurred, was watching the aircraft making a forward slip during the final approach from 100 m south of the piste, with an other club member who flew with him.

The forward slip was using the bank angle in the reverse direction (left) against the crosswind (west wind component). The Glider returned the bank angle to the level after performing the forward slip, but the nose of the Glider was pointing toward the west more than necessary. The course and altitude of the Glider was normal at that time.

After that, at the same time when the Glider turned its nose toward the direction of the runway while keeping the bank angle at the level, it sank suddenly and fell toward the ground at once.

There was no change in the attitude of the glider that accompanied a stall. The air brake was open about 1/4 to 1/2, and this condition continued until it fell down to around the ground and became out of sight blocked by obstacles.

	<p>The distance from the runway threshold Flight altitude</p> <p>Distance : 700 m → Altitude: 150 m</p> <p>Distance : 300 m → Altitude : 60 m</p> <p>Distance : 130 m → Altitude : 0 m</p> <p>* Perform forward slip (Left bank, Right ladder)</p> <p>* Return the angle of the bank at the level * The nose of the glider was pointing toward the west more than necessary (by the statement of a witness)</p> <p>* Keeping the bank angle of the glider to the level to operate the ladder to direct the nose toward the runway</p> <p>* Descend at a large descending rate * Undershoot Touched down on a field at the distance about 130 m from the runway threshold</p> <p>Piste → ● Witness → ×</p> <p>Fujikawa Gliding Field</p> <p>Wind direction : Almost south Wind velocity : About 5-7 kt (by the statement of the captain)</p>
	The history of the Flight based on the statements of the captain and the witness
2.2 Injuries to Persons	None
2.3 Damage	<p>Extent of damage of the Glider: Substantially damaged</p> <ul style="list-style-type: none"> <li>• Left wing Damage on the leading edge</li> <li>• Fuselage Partially damaged</li> <li>• Empennage Partially damaged</li> </ul>
2.4 Personnel Information	<p>Captain Male, Age 46</p> <p>Private pilot certificate (Glider) April 8, 2014</p> <p>Rating for High Class Glider April 8, 2014</p> <p>Class 2 Aviation Medical Certificate Validity: April 23, 2016</p> <p>Total flight time 66 hr 58 min</p> <p>Total flight time on the type of aircraft 12 hr 16 min</p>
2.5 Glider Information	<p>Type: PZL-Bielsko SZD-51-1 "Junior"</p> <p>Serial number B-2141</p> <p>Date of manufacture April 13, 1995</p> <p>Certificate of airworthiness No. 2014-48-02</p> <p>Validity: April 28, 2015</p> <p>Category of airworthiness Glider Utility U</p> <p>When the accident occurred, the Glider's weight and the position of the center of gravity were estimated to have been within the allowable range.</p>

<p>2.6 Meteorological Information</p>	<p>(1) According to the captain, the weather on the day of the accident was cloudy in the mountain area, but it was sunny around the Gliding field, with good visibility, 5-7 kt of almost southerly wind.</p> <p>(2) According to the witness, there was a south-southwest wind of 5-7 kt with a little wind fluctuation at the time when he landed at the Gliding Field in another glider at 5 minutes before the accident.</p> <p>(3) Wind direction and wind velocity (converted m/s to kt) observed around the Gliding Field were as follows:</p> <table border="1" data-bbox="475 526 1449 869"> <tr> <td data-bbox="475 526 635 739" rowspan="2">Observation Point Time of observation</td> <td data-bbox="635 526 1045 651">Shimizu, at 3 m elevation (about 13 km southwest of accident site)</td> <td data-bbox="1045 526 1449 651">Fuji, at 66 m elevation (about 7 km north-northeast of accident site)</td> </tr> <tr> <td data-bbox="635 651 1045 739">Average wind direction velocity/maximum instantaneous wind velocity</td> <td data-bbox="1045 651 1449 739">Average wind direction velocity/maximum instantaneous wind velocity</td> </tr> <tr> <td data-bbox="475 739 635 784">11:50</td> <td data-bbox="635 739 1045 784">South-southeast 5.4 kt / 11.1 kt</td> <td data-bbox="1045 739 1449 784">South 6.2 kt / 10.9 kt</td> </tr> <tr> <td data-bbox="475 784 635 828">12:00</td> <td data-bbox="635 784 1045 828">South-southeast 6.6 kt / 11.9 kt</td> <td data-bbox="1045 784 1449 828">South 7.0 kt / 11.7 kt</td> </tr> <tr> <td data-bbox="475 828 635 869">12:10</td> <td data-bbox="635 828 1045 869">South-southeast 5.4 kt / 10.7 kt</td> <td data-bbox="1045 828 1449 869">South 6.6 kt / 12.1 kt</td> </tr> </table>	Observation Point Time of observation	Shimizu, at 3 m elevation (about 13 km southwest of accident site)	Fuji, at 66 m elevation (about 7 km north-northeast of accident site)	Average wind direction velocity/maximum instantaneous wind velocity	Average wind direction velocity/maximum instantaneous wind velocity	11:50	South-southeast 5.4 kt / 11.1 kt	South 6.2 kt / 10.9 kt	12:00	South-southeast 6.6 kt / 11.9 kt	South 7.0 kt / 11.7 kt	12:10	South-southeast 5.4 kt / 10.7 kt	South 6.6 kt / 12.1 kt
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<p>2.7 Additional Information</p>	<p>(1) Detailed Information on Damage</p> <p>A slight damage was confirmed at the nose section, lower fuselage and lower part of the empennage.</p> <p>The left wing of the Glider came in contact with the barn placed on the field (a simple barn about 1 m high), and its leading edge was damaged.</p> <p>There was no damage at both tips of wing.</p> <p>There were no abnormalities for the operation of flight control system and air brake.</p> <p>(2) The Accident Site Description</p> <p>The Glider was on the ground with its nose heading toward the Gliding Field.</p> <p>There was a trace of about 18 m in length on the field from dragging the empennage.</p> <p>(3) Flight manual</p> <p>The flight manual of the Glider describes about the approach speed for landing, glide ratio and stall as follows.</p> <p><i>Approach speed for landing:</i> 90-100 km/h</p> <p><i>Maximum glide ratio:</i> 1:35 (at 333 kg in the weight)</p> <p><i>Stall:</i> Buffeting occurs at around 70 km/h. Even in this case, it is possible to fly without pitch-down by keeping the speed at about 68 km/h while fully pulling the control stick. The height loss by stall is 30 m or less.</p> <div data-bbox="1034 1227 1401 1429" data-label="Image"> </div> <p style="text-align: center;">Situation at accident site</p>														

\*1 "Forward slip" is a method to descend while keeping the approach course in a sideslip condition, and mainly used as a method to change the altitude without increasing the speed of the glider.

### 3. ANALYSIS

3.1 Involvement of Weather	Yes
3.2 Involvement of Pilot	Yes
3.3 Involvement of Glider	No
3.4 Analysis of Findings	<p>The weather at the time of the accident was cloudy in the mountain area, but it was sunny around the Gliding field with about 5-7 kt of almost southerly wind. However, after the captain finished practicing the forward slip, he encountered a downdraft and felt like being shaken by the current. The Glider continued to descend at a large descending rate even though he closed the air brake. Hence, it is somewhat likely that the Glider he encountered a wind fluctuation such as downward currents on the final approach course.</p> <p>As the descent of the Glider occurred when the captain operated the rudder to direct the nose toward the Gliding Field and opened the airbrake a little while keeping the bank angle at the level, it is somewhat likely that the occurrence of side slipping due to the rudder operation or the increase of the drag due to opening the air brake contributed to the descent.</p> <p>Based on these, it is somewhat likely that either encountering a wind fluctuation, the occurrence of side slipping due to the captain's rudder operation, or the increase of the drag due to opening the air brake, by single, or by a combination of those, contributed the descent of the Glider.</p> <p>In addition, while the captain stated that he operated to close the air brake during descend, it is highly probable that the air brake was open based on the statements of the witness. As the drag was increased by opening the air brake, it is somewhat likely that the captain could not keep the altitude even though he tried to perform the pitch-up operation before touching down.</p>

### 4. PROBABLE CAUSES

In this accident, it is highly probable that this accident was caused by the Glider's undershoot, touching down to the field short of the runway and damage of the fuselage as it continued to descend at a large descending rate during the final approach.

It is somewhat likely that the Glider continued to descend at a large descending rate to either encountering a wind fluctuation, the occurrence of side slipping due to the rudder operation, or the increase of the drag due to opening the air brake, by single, or by a combination of those contributed.