

AA2016-1

**AIRCRAFT ACCIDENT  
INVESTIGATION REPORT**

**WAVE SOARING HIDA  
J A 2 5 6 9**

**February 25, 2016**



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

## COLLISION WITH A MOUNTAIN SLOPE WAVE SOARING HIDA GROB MODEL GROB G109B (MOTOR GLIDER, TWO-SEATER), JA2569 NYUKAWA-CHO, TAKAYAMA CITY, GIFU PREFECTURE, JAPAN AT AROUND 14:38 JST, MAY 1, 2015

January 22, 2016

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

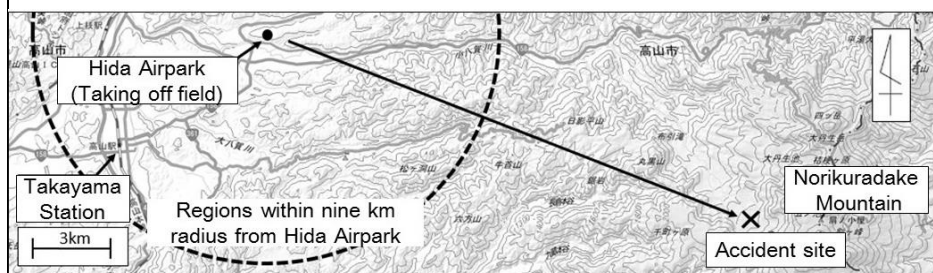
The Japan Transport Safety Board designated an investigator-in-charge and an investigator on May 2, 2015 to investigate this accident. Although Federal Republic of Germany as the State of design and manufacture of the aircraft involved in this accident was notified of this accident, it did not designate an accredited representative. Comments were invited from a party relevant to the cause of the accident and the relevant State.

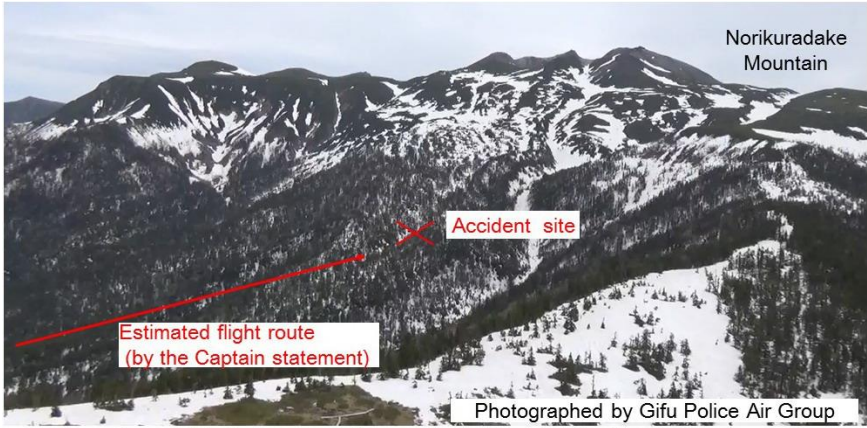
### 2. FACTUAL INFORMATION


#### 2.1 History of the Flight

According to the statements of the captain (hereinafter referred to as "the Captain") and the passenger, the history of the flight is summarized as follows.

On Friday, May 1, 2015 at around 14:23 Japan Standard Time (JST, UTC+9 hrs), a Grob Model Grob G109B, registered JA2569, owned by Wave Soaring Hida, took off from Hida Airpark in Takayama City, Gifu Prefecture for leisure flight. In the first place, the plan was to fly through



	<p>intermontane regions within nine km radius from Hida Airpark for the hope of the passenger that he wanted to look at mountains, however it flew toward Norikuradake Mountain because of fine weather.</p> <p>The Glider flew at the speed of 90 to 100 km/h while undergoing the updraft in the north side of the ridge ranging from east to west, and reached the altitude of 200 to 300 m above the ridge before Norikuradake Mountain. Afterward, when the Glider was approaching Norikuradake Mountain while climbing along the west gradually-inclined upwardly slope in the north side of the ridge, the Glider suddenly encountered the downdraft causing its descent.</p> <p>Although the Captain tried to make the Glider climb with <math>V_x^{*1}</math> by opening the throttle, sufficient climb could not be obtained against the gradient of the slope. When the Captain tried to turn around, the altitude was already too low to avoid the contact of the wing end with trees if the main wing was tilted, so that the Glider collided with the slope in a climbing attitude without circling.</p> <p>The propeller pitch of the Glider was set at Climb mode <sup>*2</sup> from the time of taking off, the air brake was not used, and there were no anomalies in the engine and the control system.</p> <p>The Captain and the passenger escaped out of the fuselage after the Glider collided with the slope. Although the Captain tried to request rescue, the radio was out of order and his cellular phone was out of range, so that he could not request rescue.</p> <p>Afterward, they made a short climb on the slope, requested rescue by cellular phone, and were rescued by helicopter of Gifu Police.</p> <p>The accident occurred in the mountains in Nyukawa-cho, Takayama-city, Gifu prefecture (36°06'30" N, 137°31'41" E) at around 14:38, May 1, 2015.</p>  <p>Geographic features near the accident site and estimated flight route</p>
2.2 Injuries to Persons	None
2.3 Damage	<p>Extent of damage of the Glider: Destroyed</p> <ul style="list-style-type: none"> <li>• Propeller: Broken (Two blades were both ruptured)</li> <li>• Left and right main wings: Broken (The right main wing was broken from the body installation part)</li> </ul>

	<p>• Fuselage: Broken (It was broken from the tail part)</p>																		
2.4 Personnel Information	<p>Captain Male, Age 73</p> <p>Private pilot certificate (Motor Glider) October 13, 1970</p> <p>Class 1 Aviation Medical Certificate Validity: October 13, 2015</p> <p>Specific pilot competence review (Glider) Validity: April 10, 2016</p> <p>Total flight time (excluding airplane) 4,711 hours 51 minutes</p> <p>Total flight time on the type of aircraft 25 hours 42 minutes</p>																		
2.5 Glider Information	<p>Type of the Glider: Grob Model Grob G109B</p> <p>Serial number 6255</p> <p>Date of manufacture March 20, 1984</p> <p>Certificate of airworthiness No. 2015-34-02</p> <p>Validity: April 15, 2016</p> <p>Category of airworthiness Motor Glider Utility U</p> <p>Total flight time 3,191 hours 49 minutes</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>																		
2.6 Meteorological Information	<p>(1) According to the Captain, the weather was fine with good visibility and weak north wind at the accident site, while cumulus were seen in several points from Hida Airpark to Norikuradake Mountain.</p> <p>(2) The wind direction and wind velocity are as follows, which were observed in Automated Meteorological Data Acquisition System in Tochio located 15 km north of the accident site:</p> <table border="1"> <thead> <tr> <th>Observation time</th> <th>Average wind velocity (for 10 minutes)</th> <th>Maximum instantaneous wind velocity</th> </tr> </thead> <tbody> <tr> <td>14:00</td> <td>West 5.3 m/s</td> <td>West-southwest 8.8 m/s</td> </tr> <tr> <td>14:10</td> <td>West 4.6 m/s</td> <td>West 8.2 m/s</td> </tr> <tr> <td>14:20</td> <td>West 4.4 m/s</td> <td>West-southwest 8.3 m/s</td> </tr> <tr> <td>14:30</td> <td>West-southwest 5.0 m/s</td> <td>West-southwest 9.2 m/s</td> </tr> <tr> <td>14:40</td> <td>West 3.9 m/s</td> <td>West 7.9 m/s</td> </tr> </tbody> </table>	Observation time	Average wind velocity (for 10 minutes)	Maximum instantaneous wind velocity	14:00	West 5.3 m/s	West-southwest 8.8 m/s	14:10	West 4.6 m/s	West 8.2 m/s	14:20	West 4.4 m/s	West-southwest 8.3 m/s	14:30	West-southwest 5.0 m/s	West-southwest 9.2 m/s	14:40	West 3.9 m/s	West 7.9 m/s
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2.7 Additional Information	<p>(1) Situation of accident site</p> <p>The accident site was the west slope with comparatively-gentle gradient in the vicinity of Norikuradake Mountain where the altitude above sea level was about 2,300 m and the inclination angle was about 20 degrees.</p> <p>The Glider halted among trees on the slope in the conditions where it was highly banked to the right and the nose was directed toward the northeast.</p> <p>Two propeller blades of the Glider were ruptured and the fragments from one of them were scattered over about five m lateral side of the Glider.</p> <p>The propeller pitch of the Glider was set at Climb mode.</p> <div style="text-align: right;">  <p>Situation of the accident site (photographed by Gifu Police)</p> </div>																		

	<p>(2) The flight manuals of the Glider includes the following description: <i>service ceiling: 5,400 m</i> <i>Vx: 90 km/h</i></p> <p>(3) Any aircraft shall report its flight plan to the Minister of Land, Infrastructure, Transport and Tourism based on Civil Aeronautics Act Article 97 (2); however, it shall be unnecessary in cases where the aircraft flies above the area within nine kilometer radius from the place of departure and lands at a location within the said area (Ordinance for Enforcement of the Civil Aeronautics Act Article 205 (1)).</p> <p>The Glider changed the first plan during flight so as to fly above the area nine km or more away from the place of departure, and thus the flight plan must be reported to the Minister of Land, Infrastructure, Transport and Tourism by radio, etc.; however, the report was not performed.</p>
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※1 "Vx" means speed for best angle of climb.

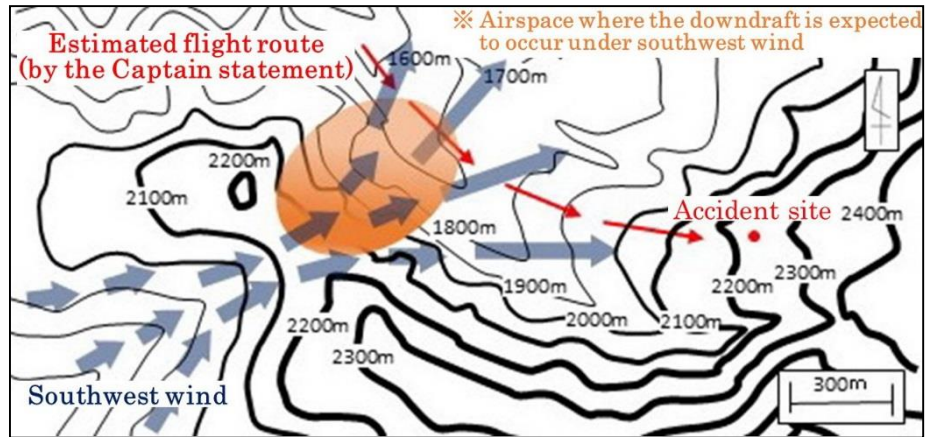
※2 "Climb mode" means a pitch angle of the propeller selected in takeoff, climb, or any cases requiring climbing thrust. The Glider can adjust the pitch angle of the propeller according to flight conditions to three modes: Climb mode, Cruise mode or Feather mode.

### 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>(1) Effects of downdraft</p> <p>It is somewhat likely that the airspace in about 500 to 1,000 m west-northwest of the accident site was the lee side of the ridge under the southwest wind and the wind over the ridge was concentrated to cause the downdraft due to the geographic features.</p> <p>It is probable that the Glider got into the airspace described above while climbing from the west along the mountain slope whose gradient is gradually upward and encountered the downdraft to descend the altitude, when the accident occurred.</p> <p>(2) Involvement of pilot</p> <p>Even if a pilot encountered unexpected change of air current such as mountain wave, or the downdraft, it is important to fly through a flight route and at altitudes to surely avoid the collision with the ground.</p> <p>It is probable that the Captain was approaching without expecting the occurrence of downdraft in the airspace described above (1).</p> <p>It is highly probable that the Captain encountered the downdraft to descend the altitude and tried to turn around to avoid the collision with the slope; however, the Glider already approached the ground too close to avoid the contact of the wing end with trees if the main wing was tilted, so that it could not be circled. In addition, it is highly probable that</p>

the Glider could not make a climb corresponding to the gradient and collided with the slope that time.

It is somewhat likely that it is because the Captain approached the mountain slope too close and did not fly at the altitude enough to avoid the downdraft that it fell to the altitude preventing the turnaround.



Geographic features near the accident site, wind direction and estimated flight route (Based on Electronic Map 25,000, Geospatial Information Authority of Japan as a reference)

(3) Involvement of glider

It is probable that the Glider had no anomalies.

(4) Report of flight plan

In this accident, the Captain and the passenger were able to get out of the Glider and request rescue by cellular phone.

However, there are many cases where they cannot get out of the aircraft and request rescue in the accidents involved in crash or emergency landing, and it is not possible to specify the accident occurrence location if the accident occurred when the aircraft flew without reporting the flight plan through intermontane regions where positioning by ground radar is impossible; therefore, it is probable that search and rescue will be extremely difficult. In order to perform prompt activity for search and rescue if the accident should occur, the flight plan must be appropriately reported by radio or other methods, if the report of the flight plan is necessary due to intension change after taking off and so on.

4. PROBABLE CAUSES

In this accident, it is highly probable that the Glider fell to the altitude preventing the turnaround and could not climb along the gradient when it approached the mountain slope while climbing, so that the Glider collided with the slope.

It is probable that it is because the Glider approached the mountain slope too close and did not fly in the altitude enough to avoid the downdraft that it fell to the altitude preventing the turnaround.