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COMISIÓN DE
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AVIACIÓN CIVIL

# Report A-061/2006

Accident involving
a Lancair FB320 aircraft,
registration OO-136,
in Puértolas (Huesca),
on 17 October

GOBIERNO DE ESPAÑA
MINISTERIO DE FOMENTO

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SECRETARÍA GENERAL DE TRANSPORTES
COMISIÓN DE INVESTIGACIÓN DE ACCIDENTES E INCIDENTES DE AVIACIÓN CIVIL

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# Foreword

This report is a technical document that reflects the point of view of the Civil Aviation Accident and Incident Investigation Commission (CIAIAC) regarding the circumstances of the event and its causes and consequences.

In accordance with the provisions of Law 21/2003 and pursuant to Annex 13 of the International Civil Aviation Convention, the investigation is of exclusively a technical nature, and its objective is not the assignment of blame or liability. The investigation was carried out without having necessarily used legal evidence procedures and with no other basic aim than preventing future accidents.

Consequently, any use of this report for purposes other than that of preventing future accidents may lead to erroneous conclusions or interpretations.

This report was originally issued in Spanish. This English translation is provided for information purposes only.

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# Abbreviations

| | |
|---|---|
| 00° | Sexagesimal degree(s) |
| ft | Feet |
| FL | Flight level |
| ft/min | Feet per minute |
| GPS | Global Positioning System |
| h | Hours |
| hh:mm | Time in hours and minutes |
| HP | Horsepower |
| KCAS | Knots calibrated airspeed |
| kg | Kilogram(s) |
| kt | Knot(s) |
| LT | Local time |
| m | Meter(s) |
| min | Minute(s) |
| MTOW | Maximum takeoff weight |
| PPL(A) | Private Pilot License (Aircraft) |
| rpm | Revolutions per minute |
| SE | Single engine |
| UTC | Coordinated Universal Time |
| VFR | Visual Flight Rules |
| VOR | VHF omnidirectional Radio-range |
| WAFC | World Area Forecast Center |

# Synopsis

| | |
|---|---|
| Owner and operator: | Private |
| Aircraft: | Lancair FB320, registration OO-136 |
| Date and time of accident: | 17 October 2006; 13:31 (local time) |
| Place of accident: | Escuaín, in the municipality of Puértolas (Huesca) |
| Persons on board: | 1 (pilot) |
| Injuries and damage: | Pilot deceased. Aircraft destroyed |
| Type of flight: | General aviation. Non-commercial. Private |
| **Date of approval:** | 25 June 2008 |

## Accident summary

The pilot was scheduled to fly on 17 October 2006 from the town of Marmande (France) to Tangiers (Morocco). The path included a stopover in Tarbes (France). The flight was conducted under VFR.

The data obtained on the weather conditions present during the flight advised against its performance. On the other hand, it has not been possible to ascertain the precise weather data with which the pilot started the flight, though his check of the data took place over two hours before the takeoff of the accident flight.

Radar data obtained from ATC services in France and from the GPS (Global Positioning System) unit onboard the aircraft both indicate that the flight path was straight to the foothills of the Pyrenees before changing course on several occasions. There was a sharp drop in altitude as the aircraft flew over the Escuaín Gorge before impacting one of its hillsides.

The pilot had ample experience on the aircraft type and had flown to the same destination before. The usual flight path, however, entailed flying around the Pyrenees via Biarritz.

The report concludes that the most probable cause of the accident was a loss of lift due to icing. A contributing factor was improper flight planning.

# 1. FACTUAL INFORMATION

## 1.1. History of the flight

### 1.1.1. *Introduction*

The pilot had planned to fly on 17 October 2006 from the town of Marmande (France) to Tangiers (Morocco) aboard a Lancair FB320 aircraft, registration OO-136. The flight resulted from an occupational obligation he had with the company for which he worked. At the destination, he was to have met with a colleague to carry out their work.

The information obtained indicates that the pilot initially planned to fly from Marmande to Agen (France), where he would file the customs paperwork, and from there fly to Tangiers directly. Since the customs office in Agen was closed, he decided to fly to the aerodrome in Tarbes-Lourdes-Pyrénées, near Tarbes (France), where the customs office was open, and from there continue on to Tangiers, using the Zaragoza and Córdoba VORs as references.


**Figure 1.** Location map

### 1.1.2. *Description of flight*

The pilot filed a preliminary flight plan in Bourget for a VFR flight originating in Tarbes with destination Tangiers.

The aircraft took off from the Vizareil aerodrome in Marmande at 11:54[1] and headed for the aerodrome in Tarbes-Lourdes-Pyrénées, where it landed at 12:31. The aircraft had been fully refueled before starting this flight.

The pilot then activated the above mentioned flight plan and took off once more at 12:52 from Tarbes, en route to Tangiers.

During the flight, as the aircraft crossed over the Pyrenees, the pilot deviated from his course to loop to the west and then back to the east, following the Pineta Valley in Ordesa National Park. After flying over a part of the valley, he proceeded to the Escuaín Gorge, where the aircraft crashed to the ground at 13:31 (see flight path below).

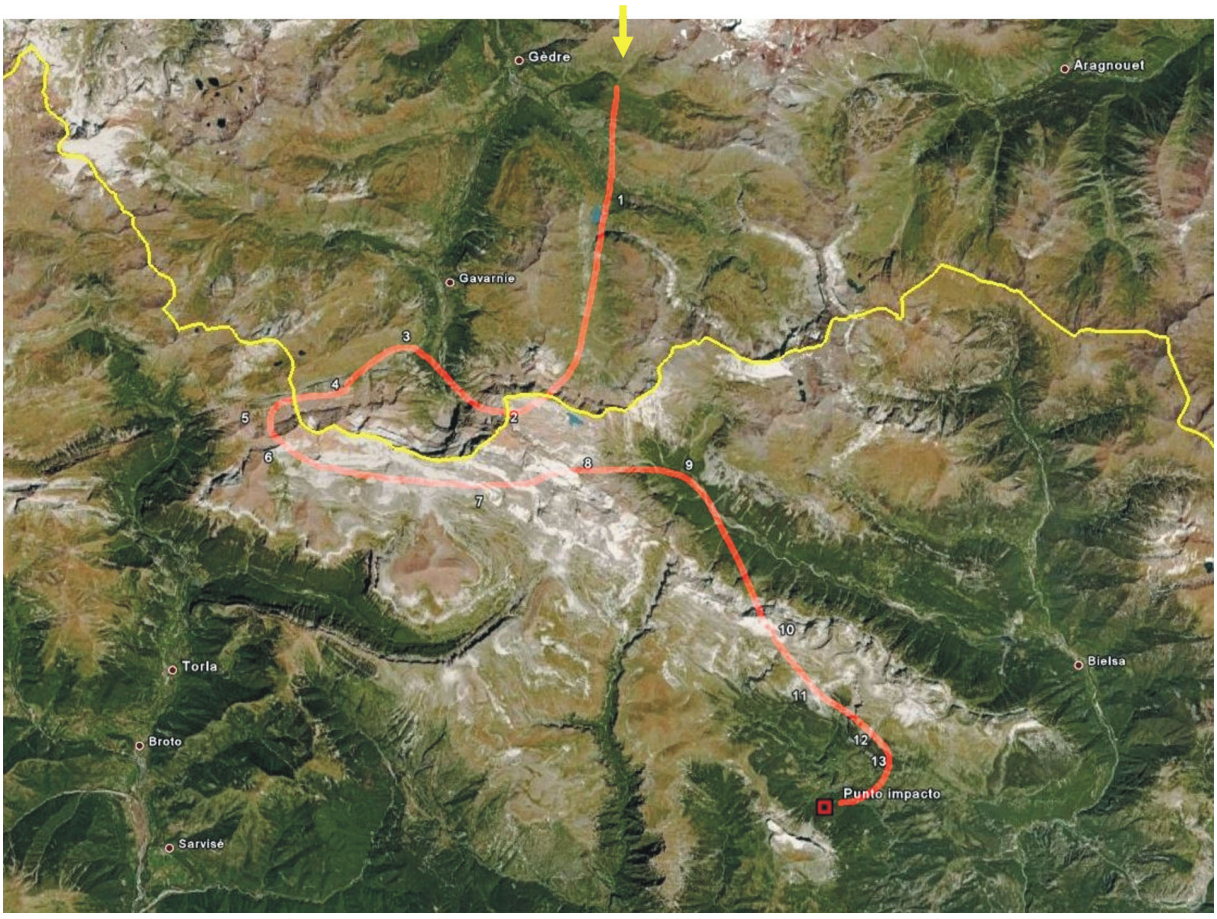


**Figure 2.** Flight path taken by the aircraft

[1] All times are local.

Eyewitnesses at a nearby lookout point were able to see the final moments of the flight and alerted emergency services, which found the pilot deceased and the aircraft at the foot of the trees covering the hillside.

## 1.2. Injuries to persons

| Injuries | Crew | Passengers | Total in the aircraft | Others |
|---|---|---|---|---|
| Fatal | 1 | | 1 | |
| Serious | | | | |
| Minor | | | | Not applicable |
| None | | | | Not applicable |
| TOTAL | 1 | | 1 | 1 |

## 1.3. Damage to aircraft

The aircraft was destroyed by the impact against the trees which covered the mountainside. The damage resulting from the fall was limited to shrubs covering the ground under the wreckage and to a tree against which it was leaning.

## 1.4. Other damage

The work necessary to recover the wreckage required clearing the trees from around the aircraft.

## 1.5. Personnel information

| | |
|---|---|
| Age: | 55 |
| Nationality: | French |
| License: | PPL(A) |
| Certificate of Competency: | • Date obtained: 31-07-2003<br>• Expiration date: 31-07-2008 |
| Ratings: | Single engine (SE) |
| Medical certificate: | Class 2, valid until 31-03-2007 |
| Total flying hours: | 930:26 h |
| Hours on the type: | 604:11 h |

## 1.6. Aircraft information

### 1.6.1. *Airframe*

| | |
|---|---|
| Type: | Lancair |
| Model: | FB320 |
| Manuf. Number: | 813/1993-1996 |
| Registration: | OO-136 |
| MTOW: | 765 kg |

### 1.6.2. *Airworthiness certificate*

| | |
|---|---|
| Number: | 4554 |
| Class: | Restricted Airworthiness Certificate |
| Issue date: | 30-11-1998 |

### 1.6.3. *Maintenance record*

| | |
|---|---|
| Total flying hours: | 796 |
| Last annual inspection: | 27-05-2006 |
| Total hours on last annual inspection: | 720 h |

### 1.6.4. *Engine*

| | |
|---|---|
| Type: | Lycoming |
| Model: | IO-320-D1B |
| Power: | 160 HP |

### 1.6.5. *Propeller*

| | |
|---|---|
| Type: | MT-PROPELLER |
| Model: | MTV-12-C/170-36a |
| Serial number: | 94238 |

### 1.6.6. *General characteristics*

The Lancair 320 aircraft assembled with a 160-hp engine at 2,700 rpm. The normal operating speed is between 70-183 KCAS.

The Belgian civil aviation authority had authorized its use for daytime VFR flights. The aircraft had no anti-icing system.

As stated in the flight manual, the capacity of the wing fuel tanks was increased in June 2006 to a total fuel loadout of 53 gallons (200 liters).

## 1.7. Meteorological information

According by information provided by sources close to the pilot, at 10:00 on the day of the flight, and before taking off from Marmande, he phoned to check the weather information, the contents of which are unknown. Subsequently, once at Tarbes, it has been verified that the pilot did not request any weather information before taking off once more.

### 1.7.1. *Meteorological information around the time of the accident*

Weather information available for the accident site and the area being overflown indicated very cloudy skies. The cloud base was between 2,000 and 3,000 ft. Winds were gusting from the south at 25 to 30 kt.

Weather radar in the time frame between 13:10 and 13:30 detected weak storm activity. The satellite image also revealed the presence of the Foehn effect in the Pyrenees, with the cloud mass extending all along the border with Spain.

In addition, eyewitnesses to the flight of the aircraft described the weather conditions as being similar to those shown below in the photograph of the hillside where the aircraft crashed, taken on the day following the accident.

**Figure 3.** Picture of the accident site

### 1.7.2. *Meteorological information from the World Area Forecast Center (WAFC)*

The maps forecast by the WAFC for 12:00 UTC on the day of the accident showed a front advancing from west to east across the Iberian Peninsula. Associated with the front were embedded cumulonimbus with tops at FL350, heavy icing between FL100 and FL200, moderate turbulence up to FL220 and very cloudy to overcast skies with cumulus and altocumulus clouds.

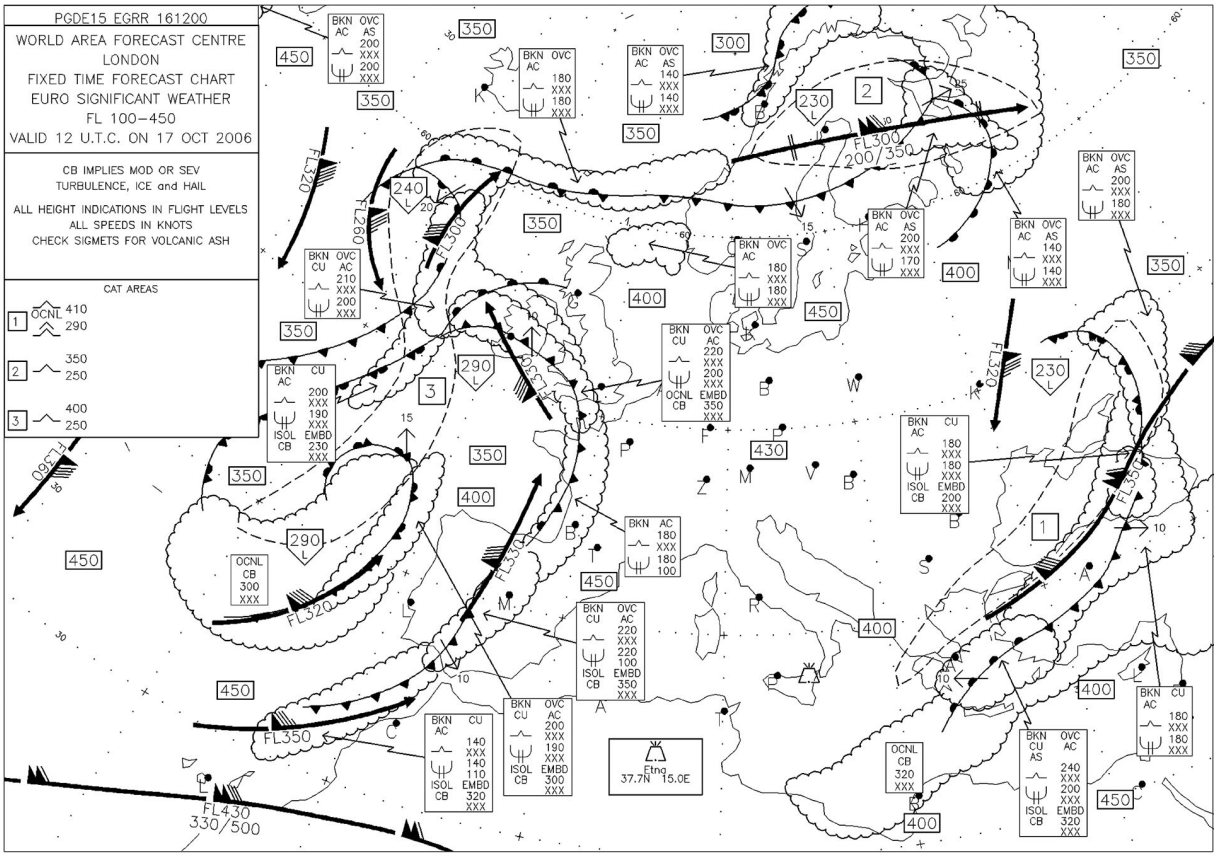


**Figure 4.** Meteorological map

## 1.8. Aids to navigation

Not applicable.

## 1.9. Communications

There is no record of the pilot having maintained radio communications with ATC in France or Spain.

Radar control services in France did, however, record the position of the assigned transponder code (7030) and detected its loss of radar track at 13:29. The Barcelona Air Traffic Control Center held radar contact until 13:17.

## 1.10. Aerodrome information

None.

## 1.11. Flight recorders

The aircraft was not equipped with a flight data recorder or with a cockpit voice recorder. Applicable aviation regulations did not require any type of recorder to be installed aboard the aircraft.

## 1.12. Wreckage and impact information

The aircraft flew over the Escuaín Gorge transversely before impacting one of its sides. During this time a considerable drop in altitude occurred as the aircraft was turning to the right. The aircraft was found at an altitude of 1,150 m on the eastern hillside of the gorge.

### 1.12.1. *Exterior inspection of the aircraft*

The terrain where the aircraft fell slopes sharply and is covered by trees exceeding 15 m in height. It was not possible to determine the aircraft's attitude as it entered the treetops due to the height of the trees and to the difficult terrain. There were, however, no signs of severed vegetation in the vicinity of the wreckage.

The aircraft was found leaning against the left wing root, with the fuselage atop a tree which had broken near the base. Its trunk was abraded along a 5-meter long section due to contact with the wing. Also, the area from the instrument panel to the propeller was practically detached from and below the main fuselage section at a 50° angle with respect to the aircraft's longitudinal axis.

Other damage evidenced by the aircraft was localized to the wings. The right wing was destroyed and detached from the fuselage, and only one-third of the left wing remained attached. The propeller appeared to be intact with the exception of one of the three blades, which had broken under the weight of the engine. The aft half of the fuselage appeared undamaged.

In addition, the access to the cockpit, which uses a folding canopy that hinges at the front, was found open, with the transparent canopy material destroyed. Moreover,

the hinge showed signs of distortion corresponding to hyperextension in its opening run.

Flight continuity of the flight controls was verified. The landing gear was retracted.

Despite the rainy conditions present during the inspection, there was a smell of fuel in the area.

### 1.12.2. *Interior inspection of the aircraft*

A check of the cockpit revealed the following indications:

- Master "on".
- Magnetos "off".
- Throttle lever at idle.
- Rich mixture.
- Fuel pump "off".
- Propeller pitch at halfway point.
- Fuel selector between "Left" and "H" (auxiliary tank) positions.
- Beacon "off".

## 1.13. Medical and pathological information

The forensic medical report indicated that the pilot received a severe blow to the right part of his body which affected that side of the trunk and resulted in head trauma and a fracture at the base.

## 1.14. Fire

There was no fire.

## 1.15. Survival aspects

Rescue services were notified of the event thirty five minutes after its occurrence. The first rescue attempt took place by air but was hampered by the terrain and the weather conditions, which forced the coordination of a rescue by ground.

Medical personnel could only confirm the death of the pilot.

The pilot was in the LH seat, leaning against the rear of the RH seat backrest, which had folded toward the front. He was also wearing a four-point seatbelt, which held him in place after the aircraft crashed into the ground.

## 1.16. Tests and research

### 1.16.1. *References to other flights*

Data from the pilot's log book show that from 2004 to 2006, he had flown as pilot in command of the same aircraft on fourteen trips to Africa, five of them to Morocco. He had also flown routinely to various European countries.

Other data indicate that the route taken to Morocco had been via Biarritz, and that it was the first time he had taken the route of the accident flight, at least as pilot in command.

### 1.16.2. *Aircraft flight path*

The path followed by the aircraft following its takeoff from Tarbes was recorded in radar data taken by ATC services in France. In addition, the aircraft had a GPS unit which was recovered from the crash site and whose data corroborate those of ATC.

A study of said data reveals that the flight path was practically straight, with a climbing profile up to the Pyrenean foothills, at which point the heading changed for four minutes from south-southwest to northwest, toward the cirque of Gavarnie (France), before turning 180°. On this new easterly heading, the aircraft crossed the north foothills of Monte Perdido (3,355 m) before arriving at the valley of Pineta, which it descended to the southeast for four and a half minutes. While traversing the valley, at about the halfway point, it crossed toward the Escuaín Gorge, where it impacted the ground.

The flight level (according to GPS data) went up to a maximum of 4,050 m (FL130) and remained above the terrain at all times. In the vicinity of Monte Perdido, the altitude indicated by the GPS was 3,620 m (FL115). It was only in the last minute of flight that the aircraft altitude dropped precipitously at a rate of 6,800 ft/min as the aircraft turned to the right, until it impacted the slopes of the Escuaín Gorge.

The straight-line distance between Tarbes and the impact point is 68 km, and the flight path taken by the aircraft was 98-km long.

### 1.16.3. *Examination of the data provided by the GPS unit aboard the aircraft*

Aboard the aircraft was a Garmin GPS unit, model GPSmap 296, serial number 67107898, which included, among others, data on the flights made on the day of the accident.

A check of those data allowed for a reconstruction of the path taken by the aircraft (see Section 1.1.2), which matches the data supplied by ATC services in France.

An altitude profile of the path was also obtained. Its salient conclusions are listed above (Section 1.16.2).

Considering the accuracy of the lateral and vertical data exhibited by this type of GPS receiver, the data are considered to closely mirror the actual path taken by the aircraft. The last vertical position recorded by the GPS unit, differs from that listed on the topographical map by 15 meters.

### 1.16.4. *Inspection of the powerplant*

Both the engine and propeller were recovered from the accident site and taken to a maintenance center for inspection.

The engine and accessories were in good general condition, in keeping with proper maintenance. Most representative of the damage was a slight dent in the lower part of the number 1 cylinder, which is located in the right front of the engine. The fuel and ignition systems showed no signs of malfunctions. The engine crankshaft rotated freely.

In brief, the propulsion system did not exhibit any anomalies which may have affected the flight.

### 1.16.5. *Eyewitness statements*

The final segment of the flight was observed by several local residents who were positioned in a vantage point from which they could widely see the Escuaín Gorge (see figure 5). Two of them stated not hearing any engine sounds and that the terrain was

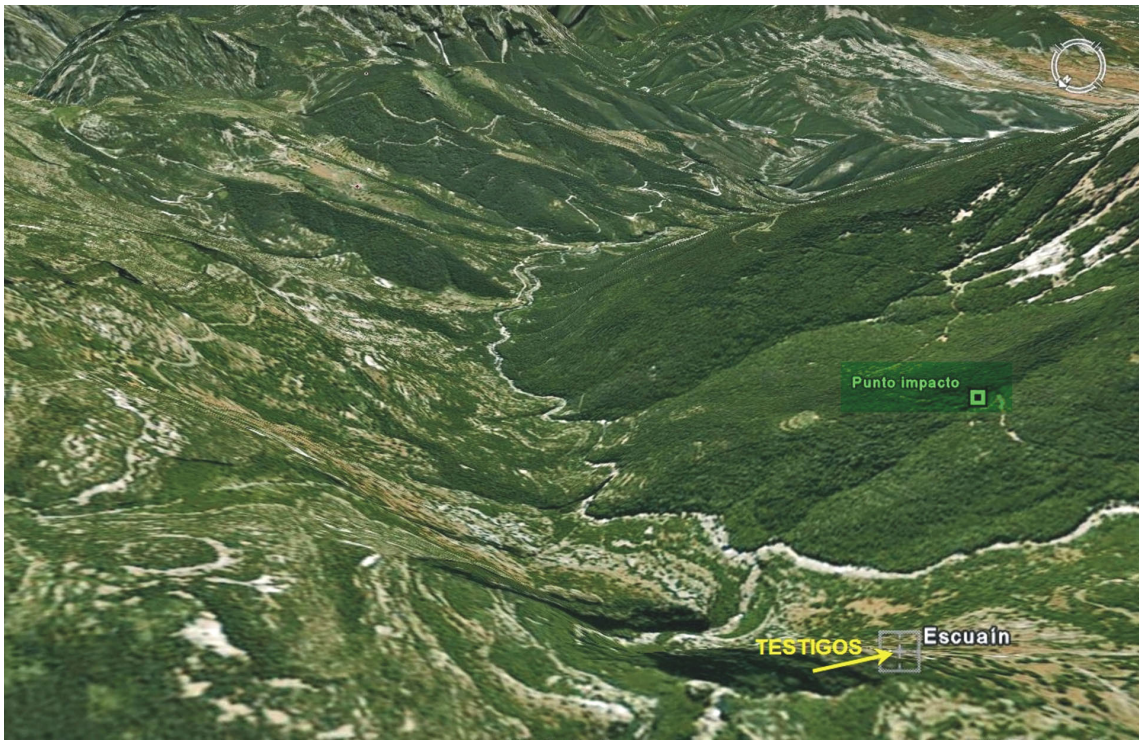


**Figure 5.** Escuaín Gorge general view

at an altitude higher than the aircraft's. The flight was slow and unstable, "as if it were floating," as it traced out a turn to the right. The aircraft then dropped almost vertically against the top of the trees on the hillside.

## 1.17. Organizational and management information

Not applicable.

## 1.18. Additional information

None.

## 1.19. Useful or effective investigation techniques

None.

# 2. ANALYSIS

## 2.1. Flight planning and general overview

Data gathered during the investigation reveal that the pilot had planned to fly from Marmande to Tangiers on 17 October 2006 for business reasons.

The flight plan, activated between Tarbes and Tangiers, reflected the VFR conditions under which the the flight would take place.

In planning the flight, the pilot checked the weather information by phone at about 10:00, and before taking off from Marmande, at 11:54, he fully refueled, which gave him a range of 6 hours.

The first flight segment, to the aerodrome at Tarbes, lasted 37 minutes. Aviation authorities at this airport noted that the pilot did not request weather information and did not refuel. After stopping for 21 minutes, he took off en route to Tangiers at 12:52.

Considering the weather information available to the pilot, the data collected during the investigation indicate that he did not adequately assess the meteorological situation either due to a lack of or misinterpretation of data, since the significant weather charts clearly showed the difficult flying conditions. Moreover, given the considerable distance and duration of the flight, he should have paid more attention to any changes which may have manifested themselves along the way.

On the other hand, it is understandable why the pilot did not request new weather information before taking off from Tarbes, considering that the significant weather chart available at 10:00 (08:00 UTC) was valid until 12:00 UTC, and would therefore have contained the same information.

## 2.2. Pilot experience

A check of the pilot's log book revealed that he was very familiar with the aircraft. The data showed that he used the aircraft routinely in every season of the year. He also made frequent long duration flights, specifically to Africa.

One important factor to consider is the fact that the path with which the pilot was familiar passed over the western end of the Pyrenees, using Biarritz as a reference point, no doubt due to the presence of good reference points for visual flight. This way it also avoided the mountainous foothills of the Pyrenean range.

According to information obtained during the investigation, it was the first time that he had taken that route as pilot in command. This situation of flying over unfamiliar terrain was aggravated by the prevailing adverse weather conditions.

Also worthy of note is the fact that the flight was associated with the pilot's professional activity, which may have led him to gloss over the weather data as weighed against the need to arrive at his destination, where another person was waiting for him.

## 2.3. Analysis of meteorological conditions

Prevailing conditions at the accident site at the time of the event were below the minimum required for a VFR flight.

Information on the weather conditions obtained from maps of the area overflown by the aircraft indicated the possibility of icing between FL100 and FL200, altitudes between which the final segments of the flight took place, as indicated by the radar data recorded by ATC services in France and by the GPS unit aboard the aircraft.

Also the presence of a band of clouds along the Spanish side of the Pyrenees hampered the progress along the route planned by the pilot, which seems to justify the deviation to the west made by the aircraft shortly before crossing the Pyrenees, undoubtedly in search of references on the ground or of a break in the clouds.

After taking off from the aerodrome in Tarbes, the aircraft initiated a constant climb on a steady course. In the foothills of the French Pyrenees the pilot altered course, which had been perpendicular to the mountain range, some 90º to the right. From that point on, the flight level decreased from 4,000 m to values between 600 and 400 m lower. This event may be explained by the presence of a band of clouds along the Spanish side of the Pyrenees, possibly forcing him to try to find both an area free of clouds and more recognizable references on the ground.

From that point on the flight took place at altitudes of around 3,400 m. The aircraft flew over the highest features on the terrain, always maintaining adequate height and ground clearance.

The weather situation, however, indicated the presence of icing conditions in the margin of the altitudes at which he was flying. This would explain the sharp drop in flight level near the Escuaín Gorge at rates in excess of 6,000 ft/min, which does not seem to correspond with the possibility that the pilot maneuvered so as to drop below the cloud cover in an effort to find references on the ground.

The aircraft's flight path as it impacted the hillside was practically vertical. There was no scattering of wreckage or of vegetation. The turn attitude was to the right in a slight

nose-down position, as evidenced by the injuries to the pilot and by the damage to the aircraft's fuselage.

## 2.4. Other technical considerations

The workshop inspection of the engine did not reveal any malfunctions. A failure of the powerplant could thus be ruled out.

The positions of the controls after the accident indicate that the pilot, aware of his situation, initiated the emergency landing checklist but did not complete it.

# 3. CONCLUSION

## 3.1. Findings

- The pilot held a valid PPL(A) license, with a total of 930 flying hours, 604 of them on the type.
- The aircraft had a valid and in force restricted airworthiness certificate. It was not technically suited to fly in icing conditions.
- The flight was conducted under VFR conditions.
- It is not known what weather information the pilot consulted before the flight.
- The weather conditions were not adequate for the flight as planned. The weather reports indicated the existence of icing areas at the flight levels used by the aircraft, as well as the presence of clouds along the southern face of the Pyrenees.
- The pilot flew to Africa on a regular basis.
- The pilot was taking the route of the accident flight for the first time as pilot in command.
- The flight was being made for business reasons.
- The aircraft made a significant course change as it was flying over the Pyrenees.
- The aircraft experienced a sharp descent in the last minute which resulted in its impacting against the terrain.

## 3.2. Causes

The most probable cause of the accident was a loss of lift due to icing.

A contributing factor was the inadequate flight planning which resulted in the pilot flying at levels in which icing conditions were forecast and which left him without visual ground references.

## 4. Safety recommendations

None.