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Report A-062/2006

Accident involving
a Piper PA-32 aircraft,
registration D-EJTF,
in Laguardia (Álava),
on 17 October 2006

MINISTERIO
DE FOMENTO

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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 accident 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°	Degree(s)
00 °C	Degrees centigrade
AGL	Above ground level
AIP	Aeronautical Information Package
AMA	Aeronautical Meteorological Service
AP	Automatic pilot
ARO	Air traffic services reporting office
CFIT	Controlled flight into terrain
COM	Communications
CTR	Control zone
DME	Distance measuring equipment
Enc	Altitude encoder
FL	Flight level
ft	Feet
GPS	Global Positioning System
HJ	sunrise to sunset
Hpa	Hectopascal
IFR	Instrument flight rules
IMC	Instrument meteorological conditions
km	Kilometer(s)
kt	Knot(s)
METAR	Aviation routine weather report
MHz	Megahertz
NAV	Navigation
NM	Nautical miles
OML	Operational multi-pilot limitation
OSL	Operational safety pilot limitation
QNH	Altimeter sub-scale setting to obtain elevation when on ground
SAR	Search and rescue
SIC	Special instructions
TAF	Aerodrome forecast
TXP	Transponder
UHF	Ultra high frequency
UTC	Coordinated universal time
VFR	Visual flight rules
VHF	Very high frequency
VML	Must wear multifocal lenses
VOR	VHF omni range beacon

Synopsis

Owner and operator:	Private
Aircraft:	Piper PA-32, registration D-EJTF
Date and time of accident:	17 October 2006; 14:45 local time[1]
Place of accident:	Laguardia (Álava)
Persons onboard and injuries:	3, fatal (1 pilot, 1 copilot, 1 passenger)
Type of flight:	General aviation. Business
Date of approval:	27 February 2008

Accident summary

On 17-10-2006, while en route from Logroño to Vitoria airports, a Piper PA-32 aircraft, registration D-EJTF, impacted the south face of Mount "Cruz del Castillo."

The impact against the terrain completely destroyed the airplane, which caught fire. All three occupants onboard perished in the accident.

The investigation concluded that the most likely cause of the accident was the continuation of a visual flight under meteorological conditions that had deteriorated below minimum requirements.

[1] All times in this report are local. Subtract 2 hours to obtain UTC.

1. FACTUAL INFORMATION

1.1. History of the flight

The aircraft took off at 12:25 on the day before the accident from the Düsseldorf - Mönchengladbach Airport in Germany on a flight plan that called for a 12:00 takeoff and arrival at the destination airport in Vitoria at 17:00. Once airborne, the crew requested to divert to Logroño Airport, where they landed at 17:45. The actual flight lasted 5:20 hours.

Upon landing, the pilot asked the controller about refueling procedures, and was informed that Logroño Airport did not have AVGAS100LL fuel, as published in the AIP for Spain.

Following this, a person identifying himself as the pilot proceeded to the operations office, where he filed the corresponding plan for the return flight from Logroño to Vitoria.

At 08:30 the next day, the safety pilot, the passenger and a third person who sometimes acted as translator were picked up at their hotel in Logroño by a person who took them to the company's facilities for a scheduled business meeting.

At the start of the meeting, they indicated their desire to leave at around 13:00 since they had to go to Vitoria to refuel the aircraft, given that there was no fuel in Logroño, and from there continue on to Germany.

The pilot arrived at Logroño Airport's operations office at 11:30, paid the fees and obtained weather information from the AMA terminal at the office. Specifically, he obtained METARs and TAFs for the Logroño and Vitoria airports, a low level significant weather chart, and a wind and temperature chart for FL50. This person waited at the airport until the arrival of the safety pilot and the passenger, which took place at 13:40.

Due to a problem at the airport's security access point, they could not proceed directly to the aircraft, resulting in a 35-minute delay.

At 14:38, the aircraft took off from Logroño Airport on a VFR flight plan to Vitoria, where they planned to refuel before continuing on the return flight to Düsseldorf-Mönchengladbach Airport.

The aircraft took off from runway 11 at Vitoria Airport. Once airborne, the pilot requested clearance to head directly for the Vitoria VOR (VRA), which was denied by the controller, who informed the pilot that he had to leave the CTR and LER99 via the

Figure 1. View of the accident site from the north of Laguardia

Northwest corridor, further requesting that he be informed when the aircraft reached point NW1 (Viana), which the pilot acknowledged.

Minutes later, the control tower at Logroño Airport received a call from the aircraft informing of their arrival at point NW1. The controller directed the pilot to continue on the Northwest corridor to point NW and to contact Vitoria control tower on frequency 118.45 MHz, which the pilot acknowledged.

There was no further contact with the aircraft.

Given the aircraft's delay in arriving at its destination, the Vitoria control tower unsuccessfully tried to make contact with the aircraft. It then contacted nearby airports in case the aircraft had landed at one of them, receiving negative replies. An aerial search was then initiated for the aircraft.

The aircraft wreckage was found at 19:20 local time on the south face of the Cantabria mountain range, at an elevation of 1,096 meters, in the vicinity of Mount "Cruz del Castillo," some 22 km away from Vitoria Airport.

1.2. Injuries to persons

Injuries	Crew	Passengers	Total in the aircraft	Others
Fatal	2	1	3	
Serious				
Minor				Not applicable
None				Not applicable
TOTAL	2	1	3	

1.3. Damage to aircraft

The aircraft was destroyed by the impact and the resulting fire.

1.4. Other damage

There was no other damage.

1.5. Personnel information

1.5.1. *Captain*

Age: 61

Nationality: German

Aviation licenses

License: Private airplane pilot, since 06-07-1962

License: Commercial airplane pilot, since 19-10-1976

License: Airline transport pilot

Issue date: 28-03-1996

Expiration date: 01-10-2007

Ratings:

- VFR-HJ
- Beechcraft 90/99/100/200: Valid until 09-09-2007
- Instrument flight: Valid until 09-09-2007

Flying experience

Total flight hours:	Over 7,000
Hours on the type:	500

Medical examination

Class:	1
Validity:	until 26/01/2007
Limitations:	SIC, OML, OSL, VML

- SIC. Special instructions.
- OML. Operational multicrew limitation.
  This "valid only as or with qualified pilot" endorsement is applicable when the holder of a CPL or ATPL does not fully meet the Class 1 medical requirements but is otherwise considered to be within the accepted risk of incapacitation. This endorsement is applied by the issuing Authority within the context of a multi-pilot setting.
  The other pilot is to be qualified on the type and must not hold an OML or be above the age of 60.
- OSL. Operational safety pilot limitation.
  This limitation requires that the aircraft be equipped with tandem seats and dual flight controls. The safety pilot must be qualified as a pilot in command on the airplane class/type and rated for the existing flight conditions. He must occupy one of the control seats and be familiar with the type of incapacity to which the pilot is prone, and shall be ready to assume control of the aircraft during the flight should the PIC holding this limitation on his medical certificate be incapacitated.
- VML. Must wear multifocal lenses.

1.5.2. *2nd pilot*

Age:	47
Nationality:	German

Aviation licenses

License:	Private airplane pilot
Issue date:	12-05-1980
Expiration date:	14-04-2009

Ratings:	• Single-engine piston land • Night flying: Valid until 14-04-2008

Flying experience

Total flight hours:	Over 780
Hours on the type:	500

Medical examination

Class:	2
Limitations:	VML

1.6. Aircraft information

1.6.1. *Airframe*

Type:	PIPER
Model:	PA-32
Manufacturing no.:	32-13034
Registration:	D-EJTF
Operator:	Private

1.6.2. *Maintenance record*

Total flying hours:	Unknown
Date of last inspection:	02-09-2006
Hours on last inspection:	1714

1.6.3. *Engine*

Type:	Lycoming
Model:	IO-540-K1G5D
Serial number:	L-24121-48A

1.7. Meteorological information

According to information provided by personnel at the Logroño Airport coordination office, the pilot picked up weather information at said office. Specifically, he requested METARs and TAFORs for the departure and destination airports, a wind and temperature chart, and a significant weather chart.

1.7.1. *Forecasts*

The weather forecasts for the airports of origin, Logroño, and destination, Vitoria, for the day of the accident were as follows:

TAF LELO 170800Z 170918 10018KT 8000 BKN020 OVC080 TEMPO 0918 12020G30KT RA=
TAF LEVT 170800Z 170918 18008KT 9999 SCT030 BKN060 PROB40 TEMPO 0918 18012G25KT PROB TEMPO 0918 RA=

The weather forecast for the day of the accident indicated the presence of a cold front crossing the peninsula from west to east. For the zone that included the Logroño and Vitoria Airports, the forecast called for winds above 30 kt in mountainous areas, visibility between 3,000 and 5,000 meters as a result of rain showers associated with the cold front, mountain obscuration and embedded cumulonimbus with a base between 2,000 and 4,000 ft. Locally, mostly cloudy skies were forecast with a cloud base between 1,000 and 5,000 ft above ground level. To the south of the mountain ranges, the clouds would be layered with moderate icing associated with the front starting at 9,000 ft. Moderate turbulence was forecast to the north of the mountain ranges.

At 2,000 ft, the forecast predicted winds from the south at 15 to 20 kt and a temperature around 16 °C, and at 5,000 ft, winds from the southwest at 30 kt and a temperature of 9 °C.

1.7.2. *Actual meteorological conditions*

The METARs for Logroño (LELO)[2] and Vitoria (LEVT) airports for 14:00 and 15:00 hours, and 14:30 and 15:00 hours, respectively, are as follows:

LELO 171200Z 10012KT 8000 BKN035 BKN095 19/13 Q1011
LELO 171300Z 12011KT 9000 BKN045 BKN095 19/14 Q1011
LEVT 171230Z 16008KT 110V190 9999 FEW024 BKN060 16/12 Q1011
LEVT 171300Z 17008KT 150V210 9999 SCT024 BKN060 16/12 Q1011

[2] The Logroño Meteorological Office is located in the Agoncillo Military Base, which is adjacent to the Logroño Airport, and whose location indicator is LELO.

The most likely weather at the accident site would have been either very cloudy or overcast skies, with a cloud base between 2,000 and 3,000 ft and reduced visibility due to moderate rain showers, and a temperature of 15 °C. Radar images did not reveal storm activity between 14:40 and 14:50. The wind was from the south at about 25 kt.

Information on the weather at the time of the accident was provided by several inhabitants of Laguardia, all of whom agreed that at that time the most notable weather feature was the existence of low-lying clouds obscuring the mountains.

1.8. Aids to navigation

1.8.1. *Aircraft*

The aircraft was outfitted with the following communications and navigational equipment:

Equipment	Make	Model	Serial number
COM1	Garmin	GNS530	78407506
COM2	King	KY197A	1942
VHF NAV1	Garmin	GNS530	55268
VHF NAV2	King	KN53	55268
UHF NAV1	Garmin	GNS530	78407506
GPS1	Garmin	GNS530	78407506
GPS2	King	KLN90A	12423
MKR	King	KMA24	28904
Weather radar	Goodrich	Wx900	J07503986
DME	King	KN62A	25645
TXP	King	KT79	5536
Altitude encoder	Narco	AR850	48883
AP	King	KFC150	41159
Compass	King	KCS55A	30058

1.8.2. *Likely routes taken by aircraft and planned by pilot*

Since it was a VFR flight through class G airspace, the control tower at Logroño Airport did not require the pilot to activate a transponder code. That, along with the

low altitude at which the flight took place, explains why the aircraft was not detected by radar, and why, therefore, there is no radar trace of the path followed by the aircraft.

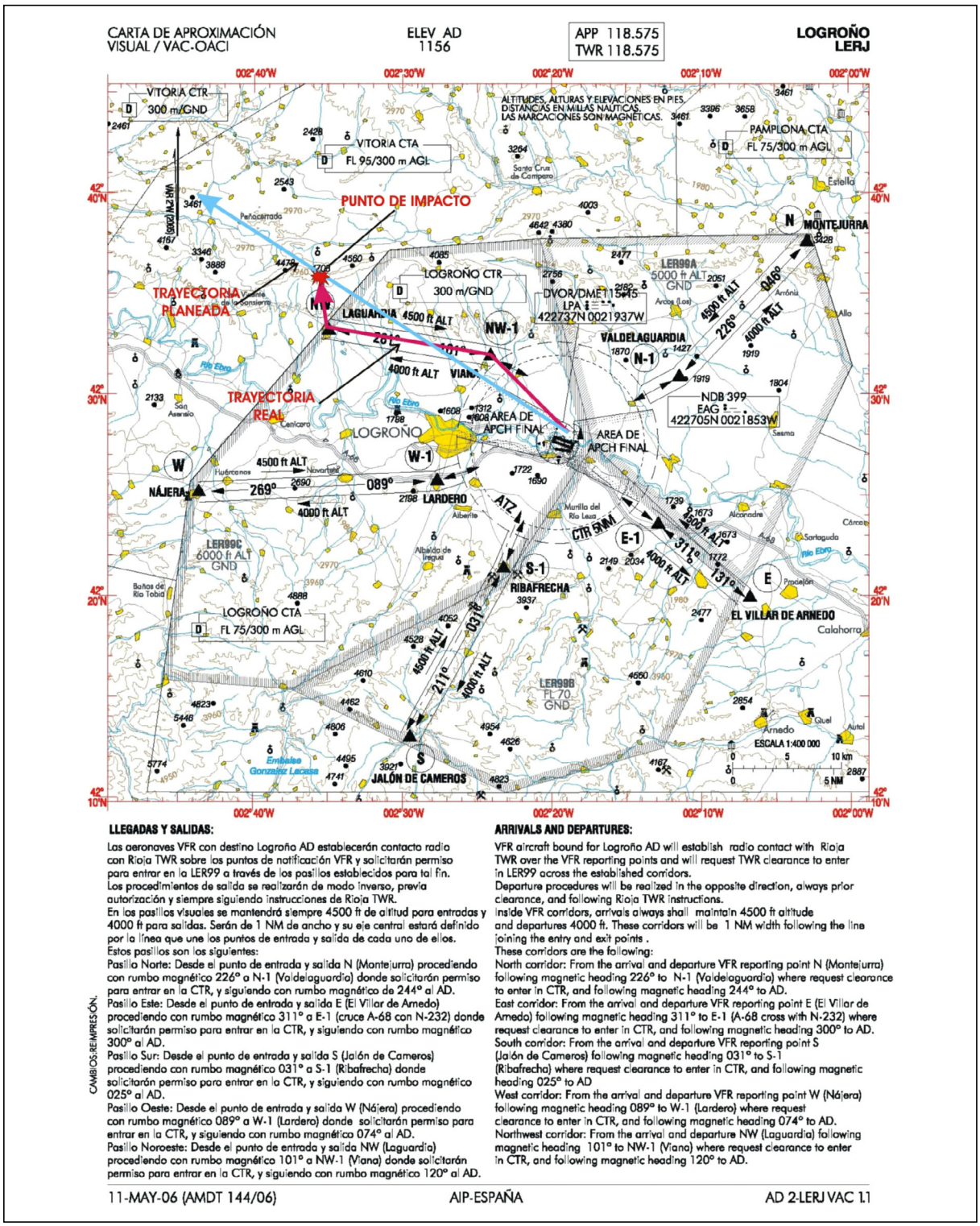

Figure 2. Visual chart for Logroño Airport

Nevertheless, the departure, destination and accident points are all known, as is the course of the final part of the flight which, considering the aircraft exited via visual corridor NW, allows for an estimate of the course taken by the aircraft.

Based on this, it is estimated that after takeoff, the aircraft must have made a left turn of almost 180° to head for Viana and point NW1, which is the entrance to the NW corridor. The altitude, according to information given to the controller by the pilot, was to have been 3,500 ft.

The aircraft must have continued along the NW corridor at an altitude of 3,500 ft until reaching Laguardia (point NW), after which it must have turned right to a heading between 350° and 360°, which would have taken it directly to Vitoria Airport. At that point the aircraft was a little over 4 km away from the eventual impact point.

Seconds before impact, the aircraft may have started a turn to the left, perhaps to head toward point W at the entrance of CTR Vitoria or toward the VRA VOR. The turn was never completed since at the time of impact, the aircraft attitude indicated a roll to the left. The VFR approach procedures for Vitoria Airport are unremarkable, only requiring the pilot to contact the control tower to enter the CTR, maintaining a maximum altitude of 1,000 ft AGL and reporting crossing over points N (Amezaga), S (Peñacerrada) or W (Morillas).

The direct route from Logroño Airport to the VRA VOR would have entailed a left turn after takeoff of around 180° to a heading of 305° straight to the VRA VOR. This path would pass practically directly above Mount "Cruz del Castillo," which the aircraft eventually impacted. The elevation of this mountain is 4,708 ft.

Both trajectories are shown in Figure 2.

1.9. Communications

The first radio contact between the aircraft and the Logroño control tower took place at 14:33:26. In it, the pilot informed of his flight plan with destination Vitoria and requested clearance to take off and then head directly to the Vitoria TVOR/DME (VRA). The most notable subsequent communications are as follows:

At 14:33:50, the controller cleared the pilot to line up on runway 11, providing him with weather information: wind from 110° at 13 kt, visibility 8 km and QNH 1011. The pilot acknowledged the QNH information and the clearance to line up on runway 11.

At 14:34:21, the pilot requested clearance to taxi via the runway to the 11 threshold, which was granted by the controller. Immediately afterwards the pilot acknowledged the clearance and asked the controller if he needed a transponder code.

The controller replied "negative," and asked for a confirmation of the VFR status of the flight. The pilot replied "OK."

At 14:35:24, the controller asked the pilot to confirm that he would leave the CTR via NW and the altitude he would maintain. The pilot replied that he would fly to the VRA VOR at 4,000 ft.

The controller answered "negative, you are flying VFR through the NW corridor, visual corridor," to which the pilot replied, "OK, NW1 and then NW."

The controller then requested once again that the pilot confirm the altitude to be maintained, to which he replied 3,500 ft.

The controller answered "roger," and indicated that he write down the following instructions: after takeoff, turn left to leave CTR via visual corridor NW, and report arrival at NW1. The pilot replied that he would report his arrival at NW1.

At 14:37:20, the pilot informed that he was ready for takeoff. The controller directed him to hold position.

At 14:38:00, the controller authorized the takeoff, providing wind information, which at that time was from 120° at 12 kt.

At 14:41:15, the pilot reported reaching point NW1 and that he was proceeding to NW. The controller informed him that there was no traffic to report, and to contact Vitoria control tower on 118.45 MHz, which the pilot acknowledged.

This was the last radio contact with the aircraft.

1.10. Aerodrome information

1.10.1. *Departure airport (Logroño)*

Logroño Airport was opened on 15 May 2003. It has one runway, orientation 11-29, 2,000 meters long and 45 meters wide. The elevation of the airport reference point is 352.36 meters (1,156 ft), which corresponds to that of the runway 11 threshold.

The airport is within Restricted Area LER99 (Agoncillo), which is divided into three sectors, A, B and C, which extend from the ground to 5,000 feet, FL70 and 6,000 feet, respectively.

The CTR is a 5-NM radius circle centered around the Logroño DVOR/DME (LPA), which is inside class D airspace.

The visual approach chart for the airport, shown in Figure 2, lists the arrival and departure requirements for aircraft on VFR flights. Specifically, it states that those aircraft will arrive or depart via the five visual corridors established for this purpose, identified as North, East, South, West and Northwest, and which connect the CTR to the edge of the restricted area.

Incoming traffic is to maintain an altitude of 4,500 ft within the corridors, while outgoing traffic shall maintain an altitude of 4,000 ft.

The aircraft departed via the Northwest corridor. According to the instructions on the chart, to leave via this corridor, the aircraft had to turn to course 300° after takeoff to head for point NW1, which is the start of the visual corridor, before proceeding on course 281° to corridor departure point NW, which is over the town of Laguardia. From that moment on, the aircraft would be outside the Restricted Area, meaning it would no longer be subject to any course or altitude restrictions other than those imposed by VFR conditions.

1.10.2. *Destination airport (Vitoria)*

The visual approach chart for Vitoria Airport requires approaching aircraft on VFR flights to contact the control tower on frequency 118.45 MHz or 257.80 MHz before entering the CTR, maintaining a maximum altitude of 1,000 ft AGL and reporting passing over points N (Amezaga), S (Peñacerrada) or W (Morillas).

1.11. Flight recorders

The aircraft was not equipped with a flight data recorder (FDR) or a cockpit voice recorder (CVR); neither was required by regulation.

1.12. Wreckage and impact information

The aircraft impacted the south face of Mount "Cruz del Castillo" at a point situated at an elevation of 1,096 meters, and whose coordinates are 42° 35' 43.2" N 02° 35' 16.8" W. The area where the aircraft impacted has a steep gradient, on the order of 70%, ascending toward the north. Figure 3 shows a diagram of the wreckage distribution.

As shown, the propeller, which detached from the engine following the fracture of the crankshaft retaining bolts, was found some 3 meters in front of the main wreckage in an area that exhibited severe impact marks. All three blades were twisted and showed considerable damage, some involving a loss of material.

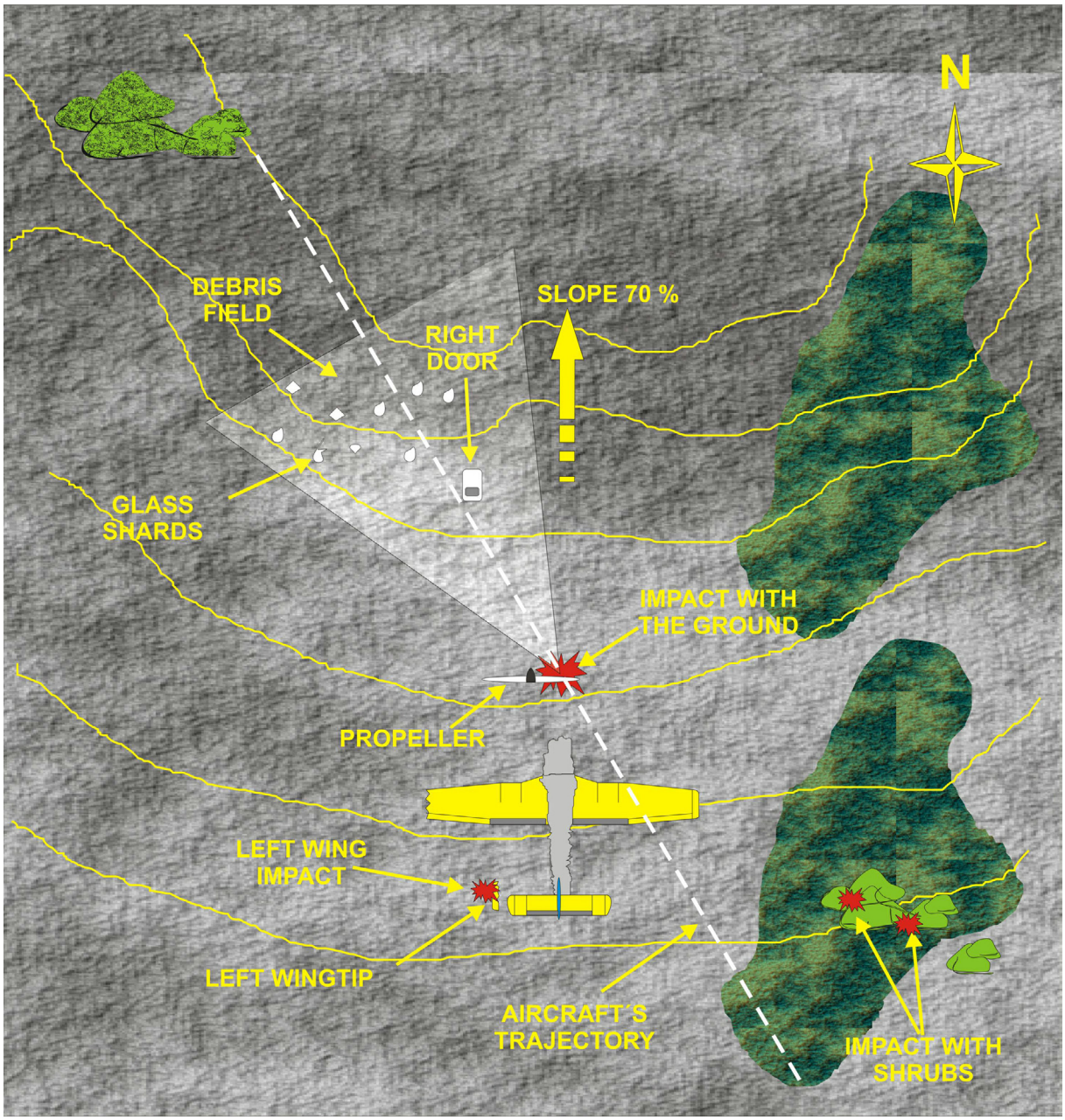

Figure 3. Diagram of the scattering of the wreckage

The main aircraft wreckage was 3 meters downhill from the propeller. It had been severely affected by the fire that broke out following the impact, and which consumed nearly the entire fuselage, sparing only the tail section. Both the cockpit instrumentation as well as the engine and flight controls were completely destroyed by the fire, which prevented their examination.

Although the levers and foot pedals had been consumed, it was still possible to verify cable continuity from the area where these controls would have been to each of the control surfaces.

The engine was also affected by the fire, although to a much lesser extent than the fuselage, allowing for a visual inspection which confirmed a strong impact to its front end, though it showed no signs of having experienced any faults prior to impact. The aft section of the engine had received more fire damage, which affected the accessories mounted in that part.

Only the root sections of the wings showed signs of fire damage.

The left wing exhibited a bend resulting from the impact against the ground that affected part of the leading edge and most of the underside. The left wingtip had been torn off. The flap was deflected downward at almost a 90° angle with respect to the "up" position, and exhibited slight damage from the impact. Since the main wreckage slid a few meters down the mountainside, this may be what caused the flap to deflect downward. Its fittings were found in good condition and the flap moved freely. The aileron also exhibited impact marks and, like the flap, was still attached and could move freely.

The right wing was in better condition than the left. The flap was attached and in the "up" position and could be moved freely. The aileron was practically intact and could be moved without seizing.

The tail section was not affected by the fire. The horizontal stabilizer was in its normal position and showed no evidence of damage from the impact. The rudder, also seemingly undamaged, was perfectly attached to the aircraft structure and could be moved freely.

The elevator was only slightly dented. It was attached to the fuselage and could be moved freely. The elevator tab was undamaged. The left wingtip was found just a few centimeters away from the edge of the left elevator, next to a shrub that showed impact marks along its lower part.

The aircraft's right door was found uphill, some 10 meters beyond and to the left of the propeller, and coinciding with the impact point of the nose section. It was unaffected by the fire.

Glass shards and pieces of cockpit surfaces were found in front of and to the left of the aircraft, up to a distance of 25 meters away.

Figure 4. Left wingtip

Several branches had broken off the top part of two small trees located behind and 12 meters to the right of the aircraft's longitudinal axis,

The remains were scattered in front of and to the left of the aircraft at an angle of about 30° with respect to its longitudinal axis, which allowed for a determination of the aircraft's probable course, as shown in Figure 3.

1.13. Medical and pathological information

The autopsies performed on the bodies of the occupants determined that the cause of death was accidental in nature, and resulted from multiple trauma.

A toxic screen performed on the aircraft pilot's remains was negative.

1.14. Fire

No evidence was found to indicate that the fire broke out in flight. It must have started immediately after the impact with the ground, which broke fuel lines, resulting in a spill. The fuel may then have come in contact with hot engine components and ignited.

The fire, fed by the fuel that continued to spill out, and helped by the downhill gradient, spread to the cockpit, consuming it almost completely.

Figure 5. Tail section

When the aircraft was found, some 4:30 hours after impact, the still smoldering fire was easily doused with an extinguisher by one of the crewmembers from the helicopter that located the wreckage.

1.15. Survival aspects

Given the aircraft's failure to contact the Vitoria Airport control tower, to which it had been transferred by radio at 14:41, starting at 14:44 that tower, as well as the one in Logroño Airport, began calling the aircraft repeatedly on their respective frequencies and

on the emergency frequency of 121.500 MHz. Attempts to contact one of the occupants on his cell phone were also unsuccessful.

Starting at 15:32, nearby airports were contacted to see if any had information on the aircraft. None reported having come into contact with the aircraft.

The ALERFA was activated at 16:12, and the DETRESFA at 17:34.

The search for the airplane was initiated using a SAR aircraft which combed the area north of the Cantabria Mountains. No sign of the aircraft was found.

As a result of the failed efforts, at 18:30 the Civil Guard helicopter based in Agoncillo was requested to join search, taking off at 19:10. The pilot retraced the aircraft's possible flight path and was able to find it on the south face of the Cantabria Mountains. At that time, the aircraft was still smoldering. Given the rough terrain, it was decided not to land, opting instead to lower a technician with a fire extinguisher. This person was able to douse the flames before proceeding to check on the passengers, only to find they had all perished.

In light of these circumstances, and considering the existing adverse weather conditions, namely fog, the difficult terrain, and the approaching nightfall, it was decided to suspend all efforts to reach the aircraft by ground.

Improved weather conditions the next day allowed rescue teams to reach the site of the wreckage and extract the bodies of the three occupants.

Considering the characteristics of the accident, the speed with which the aircraft was presumably flying, the violence of the impact against the mountain and the subsequent destruction of the aircraft, the occupants had practically no chance to survive.

1.16. Tests and research

1.16.1. *Eyewitness statements*

No eyewitnesses were found who saw the aircraft impact the mountain, or even anyone who saw the aircraft in the moments prior to impact. The sole account available is from a person who was in the vicinity of the accident site, and is included to provide information on the prevailing weather conditions in the area.

This person stated that he had gone to a place called "Los Molinos," which is situated some 2 km south of the accident site, at 15:30, and that at around 18:00, he heard a strange noise coming from the mountain. He looked in the direction of the sound, but

could see nothing through the fog that covered the area and which almost completely blanketed the mountain.

About 20 minutes later, he was able to see through a clearing in the fog what appeared to be the smoldering wreckage of a small plane high atop the mountain.

He then went to his car, where he had his cell phone, to report what he had seen.

Before he could do so, he saw a helicopter circling over and then hovering above the aircraft. A short time later, he watched as the helicopter flew away in the direction of Laguardia.

1.17. Organizational and management information

Not applicable.

1.18. Additional information

None.

1.19. Useful or effective investigation techniques

Not used.

2. ANALYSIS

2.1. Flight preparation

The occupants of the aircraft had initially planned on going not to Logroño, but to Vitoria, since they were not aware of the existence of an airport in Logroño. Before departing from Germany, however, they must have had some knowledge of an airport in Logroño, which was much closer to their intended destination, and which led them to modify their plans. This information must have reached them shortly before they were to depart, since they did not modify their flight plan, which still listed Vitoria as their destination. The change took place once the aircraft was already airborne.

This fact undoubtedly had negative repercussions on the flight preparations, at least the last segment, since the pilot did not have sufficient time to study the characteristics of Logroño Airport.

This hypothesis is supported by the fact that upon landing in Logroño, the pilot requested information from the controller on refueling procedures, from which one may conclude that he was not aware of the lack of a refueling service at Logroño Airport, this being public knowledge insofar as it is included in Section 4, "Handling Services and Facilities," of the aerodrome data sheet for Logroño Airport published in AIP Spain.

These circumstances forced the pilot to modify his likely intentions, namely to fly directly from Logroño to Düsseldorf-Mönchengladbach, and to head first to Vitoria to refuel.

Concerning the preparations for this flight, the following aspects are worth noting:

- According to information provided by personnel at the Logroño Airport ARO office, the pilot did not request any information concerning this airport.
- Direct flight to VRA.
- From the radio communications between the pilot and the Logroño Airport control tower before takeoff, it follows that the pilot was unaware that VFR flights had to exit the CTR via visual corridors, since his intention was to fly directly to the VRA VOR. A certain knowledge of these corridors on the part of the pilot was evident from these communications, however, since when the controller directed him to leave via visual corridor NW, the pilot replied "OK, NW1 and then NW."

Concerning the first point above, it is true that the pilot could have obtained that information from another means, such as Internet, on the evening prior to the day of the accident.

The lack of knowledge shown by the pilot concerning the outbound procedures in effect at Logroño Airport during his exchange with the control tower, however, indicate

that he either did not have said information or he had not analyzed it adequately. In either case, it is almost certain that the pilot did not study the planned route, since had he done so he would have known that the elevation of the mountains in the area over which he was flying was higher than his actual altitude during the flight.

Finally, there is one more condition worth noting that could have affected the preparations for this flight, namely the anticipated short duration. This circumstance, along with the visual flying conditions, may have contributed to the pilot's failure to adequately study both the outbound procedures and the route.

Flight preparation must also include a check of forecast weather conditions along the route. As detailed in the relevant section, the visibility in the area of the accident would have been around 3,000 to 5,000 meters due to rain showers associated with the front, with mountain obscuration and embedded cumulonimbus with a base between 2,000 and 4,000 ft and mostly cloudy skies with a cloud base between 1,000 and 5,000 ft above ground level. A proper and realistic analysis of the available weather data and of the elevations in the area would have resulted in the conclusion that, both along the planned as well as the actual route taken, weather conditions would in all likelihood be below those required for flying under visual conditions.

2.2. Events of the flight

The portion of the flight between takeoff and the time the aircraft presumably reached point NW, since there is no evidence that the aircraft actually passed this point, appears to have transpired without incident. Once past this point, the aircraft was outside restricted area LER99, meaning the only restrictions in effect were those imposed by the VFR flight.

As for the subsequent events of the flight, and keeping in mind that the elevation of this point is 3,596 ft, and that the pilot informed that he would maintain 3,500 ft within visual corridor NW, it stands to reason that the pilot did not initiate a climb maneuver after leaving visual corridor NW.

Additionally, considering the altitude at which the aircraft was presumably flying, the elevation of the mountains and the position of the VOR, it is likely that the aircraft was not receiving the signal from this navaid. In all likelihood, then, they would have been flying with the aid of GPS on a direct heading to the destination airport.

Had the pilot studied the terrain elevations, he would have realized that to reach Vitoria Airport, he had to cross the Cantabria Mountains, with elevations of between 4,000 and 4,700 ft. To maintain adequate terrain clearance, then, he should have been flying at an altitude of between 5,000 and 5,700 ft.

2.3. Impact analysis

In light of the marks found on the ground and the condition of the propeller, it can be stated that at the time of impact, the aircraft engine was supplying power.

An inspection of the aircraft's flight controls did not reveal the presence of a fault or malfunction prior to impact.

The marks left by the aircraft on the ground and the surrounding vegetation, as well as the arrangement of the wreckage, led to the conclusion that at the moment of impact, the aircraft was on level flight, with a 25°-30° roll to the left and at speed.

According to available weather reports and information provided by local residents, it can be concluded that the aircraft entered the clouds, at which time the crew lost all visual ground references.

As a consequence, it may be concluded that the impact had all the characteristics typical of a controlled flight into terrain (CFIT).

As for the eyewitness statement regarding a noise coming from the area where the aircraft impacted the ground hours after the accident, it is believed that said noise may have occurred as a result of the aircraft sliding down the mountain.

3. CONCLUSIONS

3.1. Findings

- The aircraft had a valid airworthiness certificate and had undergone all scheduled maintenance inspections.
- No evidence was found of any fault or malfunction in the aircraft which may have contributed to the accident.
- The pilot had valid Private Pilot, Commercial and Airline Transport Licenses and was rated for the type of aircraft and flight in question.
- The safety pilot had a valid Private Pilot License and was rated for the type of aircraft and flight in question. His experience consisted of 780 flying hours.
- The available weather forecasts called for winds in excess of 30 kt in mountainous regions, visibility between 3,000 and 5,000 meters due to rain showers associated with the front, mountain obscuration and embedded cumulonimbus with bases between 2,000 and 4,000 ft. Locally overcast skies were forecast with cloud bases between 1,000 and 5,000 above ground level.
- The pilot did not properly plan the flight, especially with regard to the departure procedures from Logroño, the flight level and the weather forecast.
- The crew may have lost visual ground references during the flight, deciding to continue with the visual flight under instrument weather conditions.
- An inspection of the wreckage on the ground showed that the aircraft impacted the side of a mountain called Cruz del Castillo while in controlled flight.

3.2. Causes

The probable cause of the accident was the continuation of a visual flight under weather conditions that had degraded below those required for visual flight.

Inadequate flight planning is considered to be a contributing factor in the accident.

4. SAFETY RECOMMENDATIONS

None.