Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Büro für Flugunfalluntersuchungen BFU
Bureau d'enquête sur les accidents d'aviation BEAA
Ufficio d'inchiesta sugli infortuni aeronautici UIIA
Uffizi d'inquisiziun per accidents d'aviatica UIAA
Aircraft Accident Investigation Bureau AAIB

Final Report No. 1946 by the Aircraft Accident Investigation Bureau

concerning the accident

to the Pierre Robin DR 400/180 aircraft, D-ERAD

on 6 March 2005

in Val da Fain, Pontresina municipality/GR,

13 km east-south-east of St. Moritz

After a review procedure according to art. 22 – 24 of the Ordinance dated 23 November 1994 relating to the Investigation of Aircraft Accidents and Serious Incidents (VFU/SR 748.126.3) the Federal Aircraft Accident Board has declared with decision on 13 November 2009 the Investigation Report by the Aircraft Accident Investigation Bureau dated 17 January 2007 as the Final Report.

Aéropôle 1, Route de Morens, CH-1530 Payerne

Ursachen

Der Unfall ist auf eine unzweckmässige Abflugtaktik von einem Gebirgsflugplatz zurückzuführen, in deren Folge es zu einer Kollision mit dem Gelände kam.

Zum Unfall haben beigetragen:

- Die geringe Gebirgsflugerfahrung des Piloten
- Eine unzweckmässige Flugvorbereitung
- Die hohe Abflugmasse

General information on this report

This report contains the conclusions of the Aircraft Accident Investigation Bureau (AAIB) on the circumstances and causes of the accident which is the subject of the investigation.

In accordance with art 3.1 of the 9th edition, applicable from 1 November 2001, of Annex 13 to the Convention on International Civil Aviation (ICAO) of 7 December 1944 and article 24 of the Federal Air Navigation Act, the sole purpose of the investigation of an aircraft accident or serious incident is to prevent accidents or serious incidents. The legal assessment of accident/incident causes and circumstances is expressly no concern of the incident investigation. It is therefore not the purpose of this investigation to determine blame or clarify questions of liability.

If this report is used for purposes other than accident prevention, due consideration shall be given to this circumstance.

The definitive version of this report is the original in the German language.

Unless otherwise indicated, all times in this report are indicated in Swiss local time (LT), corresponding at the time of the accident to Central European Time (CET). The relationship between LT, CET and coordinated universal time (UTC) is as follows: LT = CET = UTC + 1 h.

For reasons of protection of privacy, the masculine form is used in this report for all natural persons, regardless of their gender.

Final Report

Owner	Private
Operator	Flugschule Hans Grade GmbH, D-Schönhagen
Aircraft type	Pierre Robin DR 400/180
Country of manufacture	France
Country of registration	Germany
Registration	D-ERAD
Location	Val da Fain, Pontresina municipality/GR elevation 2245 m AMSL 13 km east-south-east of St. Moritz
Date and time	6 March 2005, 11:32 LT

General

Brief description

On 6 March 2005 at 11:25 LT, the single-engined Robin DR400/180 aircraft, registration D-ERAD, took off from runway 21 at Samedan aerodrome. Seven minutes later, the aircraft grazed the terrain in a side valley of the Bernina valley and then came abruptly to a standstill. The pilot was seriously injured; the passengers were uninjured. The aircraft was destroyed.

Investigation

The accident took place at 11:32 LT. At 11:45 LT, the pilot reported the event to the Grisons cantonal police by mobile telephone using the 112 emergency number. At 11:50 LT, the Rega operations centre raised the alarm with Samedan base and at 12:06 LT a helicopter with a doctor and a rescue medic landed at the accident site.

At 12:18 LT, a second helicopter with another doctor and a flight assistant took off from Samedan in support. The AAIB opened an investigation on the same day at approximately 15:00 LT in cooperation with the Grisons cantonal police.

The accident is attributable to an inappropriate departure tactic from a mountain aerodrome, resulting in a collision with the terrain.

The following factors contributed to the accident:

- the pilot's limited experience of mountain flying
- inappropriate flight preparation
- the high take-off mass

1 Factual information

1.1 Pre-flight history and history of flight

1.1.1 Pre-flight history

On 3 March 2005 the pilot, accompanied by three friends, took off from Schönhagen (D) in the Robin DR400/180 aircraft, registration D-ERAD. At 13:17 LT, he landed at Samedan aerodrome (5600 ft AMSL). According to MeteoSwiss, visibility was 4 km at the time of the landing, with a cloud base of approximately 6700 ft AMSL. The landing on 3 March was the third by the pilot in Samedan; he had taken off from this aerodrome only once.

1.1.2 Preparation

On 6 March 2005 the pilot and his three passengers arrived at Samedan aerodrome to fly back to Schönhagen (D).

The pilot submitted the VFR ATC flight plan for the flight from Samedan to Schönhagen (D) via the AMIE (AIS Metrological Information Environment) Terminal in the Samedan aerodrome ARO. In view of the poor weather conditions in the direction of Zernez, the pilot marked a route via Julierpass, KPT (Kempten VOR), ALB (Allersberg VOR) and LEG (Leipzig VOR) on the ATC flight plan.

According to his statements, he was unable to retrieve all the information available on the AMIE system installed at the aerodrome (wind at altitude, NOTAM, KOSIF, GAFOR, etc), because he was not acquainted with it. The pilot stated that he had obtained information about the weather via the internet in his hotel. No documents of any kind relating to the weather conditions were found on board.

The pilot was unable to explain why he had not followed the flight pattern shown on the Samedan visual approach chart (LSZS VAC 10). The corresponding chart was on board the aircraft.

After completing departure formalities, the pilot and the three passengers went to the aircraft, which was parked in a heated hangar. After moving the aircraft to the fuel pump, the pilot instructed the flight operations employee of the Engadine Airport to fill up both wing tanks and the main tank. The tanks were filled with a total of 139 litres of AVGAS. According to his statement, the pilot carried out a detailed pre-flight check.

1.1.3 History of flight

At 11:25 LT, the Robin DR400/180, D-ERAD, took off from runway 21 and flew along the extended runway centreline in the direction of St. Moritz. On the VAC chart, a right turn of approximately 90° is specified approximately 500 m after the end of the runway. A 180° left turn is then marked.

When the pilot realised that he was unable to continue flying straight ahead because of the rising terrain, he requested clearance from Samedan control tower to turn left in order to gain altitude. One minute later, he reported that he was over Pontresina and continuing to fly south to gain altitude *("Aeh, Samedan Tower, ähm, I need some more altitude. I'm going to the south over Pontresina now")*. This was his last radio communication.

Shortly afterwards, an eyewitness at the Alp Languard ski lift (approximately 1870 m AMSL) observed the aircraft east of Pontresina, flying slowly with a high nose-up attitude. This eyewitness estimated that the aircraft was flying 70 to 100 m above the ground.

In the vicinity of Morteratsch, according to the pilot's statement, he set the flaps to the first detent because he wanted to improve the climb performance of his aircraft. When he realised that he could not climb any better, according to his statement he retracted the flaps again. He intended to fly a 180° turn to the left. When he realised that this was not possible, he continued his climb up the valley with the intention of finding a point which would allow a 180° turn. Near the car park of the Diavolezza aerial cable railway, where the valley is somewhat less narrow, the pilot decided to initiate a left turn. However, after flying over a high-voltage line he aborted the turn, because he was afraid that he would not manage to fly over the line a second time. As a result, he flew on the right side of the valley into the Val da Fain below the Piz Alv.

When the pilot realised that the valley was getting narrower and that his altitude was not sufficient, he wanted to initiate a 180° turn. At approximately the same time, the right-hand main landing gear touched the snow-covered slope. About 25 metres after the first contact, the aircraft cleared the top of a rock outcrop and came to a standstill on the other side of the summit, with the nose facing the valley, in snow 4-5 metres deep. All the occupants were able to exit the aircraft unaided.

The pilot was seriously injured, whilst the passengers were uninjured. The aircraft was destroyed.

1.2 Injuries to persons

	Crew	Passengers	Third parties
Fatally injured	---	---	---
Seriously injured	1	---	---
Slightly injured or uninjured	---	3	

1.3 Damage to aircraft

The aircraft was destroyed.

1.4 Other damage

None.

1.5 Personnel information

1.5.1 Pilot

Person	German citizen, born 1958
Licence	Private pilot's licence, issued by the German Federal Republic on 02.10.1996.
Ratings	Voice, navigation and aeronautical radio service rating for ground or air radio in English or German for flights under visual flight rules.
Registered aircraft classes	SEP (land)
Registered aircraft types	NIL
Medical fitness certificate	Class 2
Last medical examination	29.09.2004, findings: fit with VDL restriction

1.5.1.1 Flying experience

Total	536:19 hours
during the last 90 days	6:16 hours
on the accident type	149:07 hours
during the last 90 days	5:35 hours

Commencement of pilot training in 1994 in the USA.

1.5.2 Passengers

Front right:	German citizen, born 1958, no flying experience
Rear left:	German citizen, born 1956, no flying experience
Rear right:	German citizen, born 1943, no flying experience

1.6 Aircraft information

Type	Pierre Robin DR 400/180
Characteristics	Four-seater low wing aircraft, wooden construction, with fixed landing gear
Year of construction Serial number	1993 2217
Engine	Lycoming 0-360-A3A, 180 HP (2700 RPM sea level) serial No.: L 26393-36A
Propeller	Sensenich 76 EM 8 S 5 – 0 - 64
Equipment	According to equipment list: VHF-NAV King KX 155, transponder King KT-76A, ACK.Tech A-30, GPS King KLN 90B, ELT Kannad 406 AF
Certification	Passenger transport 3 / air operation
Operating hours	Airframe: 3919:18 hours
Mass and centre of gravity	At take-off in Samedan, the mass was 1159 kg (2560 lb). The maximum permitted take-off mass of the aircraft is 1100 kg (2425 lb). The centre of gravity was 0.569 m and was therefore behind the permitted limit of 0.564 m.
Airworthiness certificate	Issued by the LBA Germany on 05.01.1999.
Maintenance	The last periodic condition check was carried out by the LBA on 26.10.2004 at 3884 hours of operation. The last 100 hour check with replacement of the engine was carried out on 03.12.2004 at 3898:32 hours of operation. The last weighing was carried out on 25.02.2005 at 3912:51 hours of operation.
Fuel	Two wing tanks, one main tank and one extra tank in the fuselage provide a tank capacity of 240 l. Fuel grade AVGAS 100LL
Consumption	38-40 litres per hour (value from experience)
Fuel reserve	At the time of the accident there were approximately 185 l of fuel in the tanks. On the basis of experience, this corresponds to a possible flight time of approximately 4:40 hours.

1.6.1 Additional information according to the flight manual

Speeds DR 400/180			*kt*	*km/h*
Lift-off speed			*54*	*100*
Initial climb speed			*70*	*130*
Speed for optimum climb	*flaps 1st detent*		*81*	*150*
	without flaps		*92*	*170*
Speed for optimum angle of climb	*flaps 1st detent*		*70*	*130*
	without flaps		*76*	*140*
Normal climb without flaps			*92*	*170*
Normal climb without flaps at ceiling altitude			*86*	*160*
Maximum permitted speed with flaps in 2nd detent			*92*	*170*
Approach speed			*68*	*125*
Stall speed	*without flaps*	*(Pitch 0°)*	*57*	*105*
	flaps 1st detent	*(15°) (P.0°)*	*53*	*99*
	flaps 2nd detent	*(60°) (P.0°)*	*51*	*95*

Climb performance:

Max. mass: 1100 kg (2425 lb), in standard atmosphere

1) Flaps in "take-off position":
Climb speed (Vz) on the ground (827 ft/min) 4.2 m/s
Reduction by 0.24 m/s (47 ft/min) every 1000 ft

2) Flaps retracted:
Climb speed (Vz) on the ground (885 ft/min) 4.5 m/s
Reduction by 0.24 m/s (47 ft/min) every 1000 ft

1.6.2 Calculation of mass and centre of gravity

The following calculation is based on the last weighing on 25 February 2005 carried out before the accident with an empty mass of 640.7 kg. At the time of the accident, there was a mass summary dated 12 February 2002 onboard the aircraft. It listed an empty mass of 627 kg.

Mass and centre of gravity for aircraft D-ERAD, DR400/180, standard aircraft, maximum permitted take-off mass 1100 kg:

	Mass (kg)	Arm behind reference line (m)	Moment (kgm)
Empty mass	640.7	0.33	220.0
Pilot and front passenger (81+2.5 kg) (86+2.5 kg)	172	0.41	70.5
Rear passengers (89+2.5 kg) (83+2.5 kg)	177	1.19	210.6

Fuel main tank max. 78 kg (max. 109 l x 0.72 kg/l)	78	1.12	87.3
Fuel wing tank max. 58 kg (max. 2 x 40 l = 80 l)	57.6	0.10	5.7
Fuel extra tank max. 36 kg (max. 50 l)	---	1.61	---
Baggage (max. 60 kg) (9.6+7.8+8.7+8.0+2 kg extras)	36.1	1.90	68.6
Ramp mass, standard aircraft max. 1103 kg	1161.4		662.7
Fuel for start-up and taxiing	- 3	1.12	- 3.4
Take-off mass, standard aircraft, max. 1100 kg	1158		659

The mass data was acquired by the police as follows: the body mass of the occupants was requested. The mass of clothing was assumed to be 2.5 kg each. The accompanying baggage was weighed.

The empty mass includes full oil level and 1 litre non-flyable fuel (note: 1 l AVGAS 100LL = 0.72 kg).

Centre of gravity = total moment / take-off mass

0.569 m = 659 kgm / 1158 kg

Permitted range of centre of gravity = 0.205 m to 0.564 m behind the reference plane.

1.6.3 Engine power

According to the Robin DR400/180 flight manual, the Lycoming 0-360-A3A engine develops a maximum power of 180 HP at 2700 rpm at sea level in standard atmosphere.

According to the manufacturer's information, the same engine develops 42 HP less power at an altitude of 2245 m AMSL (7365 ft AMSL) under standard conditions. This corresponds to a reduction of approximately 25 percent.

1.7 Meteorological information

1.7.1 General

The information in sections 1.7.2 to 1.7.5 was provided by MeteoSchweiz.

1.7.2 General weather situation

An extended upper low-pressure zone determined the weather in the Alpine region. Switzerland was in the area affected by a cold front, which was gradually moving off to the east. Northerly winds were transporting moderately humid air masses into the country.

1.7.3 GAFOR

Valid from 09-15 UTC 06.03.2005:

92 Samedan-Julier-Bad Ragaz: X, X, X (closed, closed, closed)
reference altitude 7500 ft AMSL

91 Bad Ragaz-Altenrhein: X, X, X (closed, closed, closed)
reference altitude 1600 ft AMSL

93 Samedan-Malojapass-Menaggio: O, O, O (open, open, open)
reference altitude 6200 ft AMSL

Aviation weather forecast valid from 06-12 UTC:

Under hazards, the following was stated:

Alpine passes from the north in cloud, poor visibility with snowfalls and moderate north wind turbulence on the southern slopes of the Alps.

1.7.4 Weather at the time and location of the accident

The following information on the weather at the time and location of the accident is based on a spatial and chronological interpolation of the observations of different weather stations.

On the basis of the information available, the following weather conditions can be assumed at the time and in the area of the accident:

Cloud	2/8 base at 9500 ft AMSL, 4/8 base at 23 500 ft AMSL
Visibility	about 40 km
Wind	North-east 5 to 7 knots, gusting up to 10 knots
Temperature/dewpoint	-12 °C / -18 °C
Atmospheric pressure	QNH LSZH 1013 hPa, QNH LSZA 1006 hPa
Position of the sun	Azimuth: 162°, elevation: 37°
Hazards	Of the hazards mentioned in the aviation weather forecast, none can be directly identified for the location of the accident.

1.7.5 Weather conditions in Samedan on 3 March 2005

On the basis of the information available, the following weather conditions can be assumed at the time the pilot arrived in Samedan on 3 March 2005:

Cloud	8/8, base approx. 6700 ft AMSL
Weather	Light snowfall
Visibility	about 4 km
Wind	North-east 5 to 7 knots, gusting up to 10 knots
Temperature/dewpoint	-07 °C / -10 °C
Atmospheric pressure	QNH LSZH 1004 hPa, QNH LSZA 1011 hPa
Position of the sun	Azimuth: 193°, elevation: 36°
Hazards	The Alps were in cloud from the south and there was moderate turbulence due to the Föhn wind. Reduction in visibility due to snowfall.

1.7.6 ATIS Samedan on 6 March 2005

10:20 calm, 10 km, few 1000, broken 5000, -6, 1001, nosig

1.8 Aids to navigation

Not applicable.

1.9 Communication

The radio conversations took place in accordance with customary practice. The pilot did not report any technical problems of any kind.

1.10 Aerodrome information

Not applicable.

1.11 Flight recorders

Not required and not installed.

1.11.1 Analysis of the data recorded by the Garmin Pilot III GPS

On 05.04.2005, a month after the accident, the cantonal police found the GPS, which was still in working order. It indicated the position 796.683/148.728. The Garmin Pilot III GPS used by the pilot recorded the flight of D-ERAD.

The following data were recorded: date of flight, flying time, flight route, direction of flight, speed over ground and true track. The altitude was not recorded.

Extract from the analysis:

At 11:25:23 LT, the aircraft took off from runway 21 at Samedan (1707 m AMSL, 5600 ft AMSL); speed 54 kt (100 km/h).

At 11:27:50 LT, the aircraft flew over the Flaz river at Pontresina (1805 m AMSL, 5900 ft AMSL) on a track of 135° and at a speed of 96 kt (178 km/h).

At 11:29:50 LT, the aircraft was over the Flaz river above Morteratsch (1896 m AMSL, 6200 ft AMSL) on a track of 138° and at a speed of 84 kt (156 km/h).

Between 11:29:23 LT and 11:30:20 LT, the speed of the aircraft reduced from 95 kt to 83 kt and then increased again to 96 kt.

At 11:30:55 LT, the aircraft was in the vicinity of the mountain side on the left side of the valley close to the Diavolezza aerial cable railway (2093 m AMSL, 6900 ft AMSL) on a track (at the start of the turn) of 117° and at a speed of 96 kt (178 km/h).

11:30:59 LT: track 091°, speed 93 kt

11:31:02 LT: rack 062°, speed 89 kt

11:31:24 LT: track 016° (at the end of the turn), speed 77 kt

11:31:31 LT: track 028° (in the Val da Fain), speed 72 kt

11:31:51 LT: track 033°, speed 73 kt

11:32:06 LT: track 055°, speed 67 kt

11:32:12 LT: track 058°, speed 69 kt. This final recording coincides with the contact with the terrain.

The total distance travelled by the aircraft (take-off to contact with the terrain) was approximately 10 NM.

1.12 Wreckage and impact information

1.12.1 Site of the accident

The site of the accident is approximately 3 km from the entry to the Val da Fain (Heutal) in the Val Torta region on the north side of the Bernina Pass. The Val da Fain branches off right-angled in a north-easterly direction between Bernina Suot and the base station of the Diavolezza aerial cable railway. At the entrance to the valley, to the right is the Piz Alv (2975 m AMSL) and to the left the Piz Albris (3166 m AMSL). At the entrance to the valley, the valley floor is at 2100 m AMSL. The average gradient of the Val da Fain, which runs in a gentle right curve over 6 km to the Furcla Stretta (2467 m AMSL) is approximately 6-7%.

Coordinates: 796 719 / 148 736; elevation: 2245 m AMSL (7365 ft AMSL)

Sheet No. 1258, La Stretta, of the 1:25 000 national map of Switzerland

1.12.2 Impact

The right main landing gear came into contact with the terrain, which was covered with 2-3 metres of snow, and as a result was torn from the wing. At reduced speed, after about 25 metres the aircraft cleared the top of a rock outcrop, then slid over the upper part of the slope and came to rest with the nose in the direction of the valley on a layer of snow 4-5 metres thick. The impact loosened a windslab, which then slid into the brook bed 70 metres below.

1.12.3 Wreckage

The wreckage exhibited little external damage, but the wooden structure was substantially destroyed on impact. The right main landing gear remained in the snow at the point of first contact with the terrain. In the area of the second point of contact, wood and plastic debris were found within a 10 x 30 m rectangle.

The right wing was bent against the fuselage and destroyed. The wingtip and the leading edge were intact. The left wing and the left main landing gear were intact.

The fuselage was buckled to the left and the tail was separated at the connection point to the fuselage. The tail was intact and the control surfaces were free. The cabin was intact. The central fixing point of the rear abdominal seatbelts had been torn out. The front three-point belts withstood the loads. The engine components were damaged and the propeller was deformed.

1.12.4 Cockpit

The following was established on examining the cockpit:

- The right throttle control lever was entirely pulled out and the control knob was missing. The left throttle control lever was torn off.
- The tank selector was in the main tank position. The electric fuel pump was switched off. The mixture was pulled out 1 cm. The carburettor pre-heater was closed.
- The altimeter showed 7360 ft AMSL for a QNH of 1002 hPa.
- The heading showed 330°.
- The flaps were fully extended in the 2nd detent.

- The switches for the autopilot and for the electric trim were in the OFF position. The trim was at 2.5 nose-heavy in the white range.
- The King KLN 90B GPS was switched off.
- The installation for an ELT KANNAD 406F existed. The device was not onboard.
- The aircraft was equipped with a BAC ATCS 2000 time calculator and an EDM 700.
- The switches for the battery, alternator and magnetos were in the OFF position.

1.13 Medical and pathological information

The pilot was healthy at the time of the accident. The toxicological blood analysis showed no indication of the effects of alcohol.

1.14 Fire

Fire did not break out.

1.15 Survival aspects

The accident was survivable thanks to the deep snow at the site of the accident.

The installation for an ELT KANNAD 406F emergency transmitter existed. The device was not onboard.

The alarm was raised by the pilot using a mobile telephone.

1.16 Tests and research

The examination of the airframe and the engine including its components gave no indications of any kind of pre-existing technical defects. In particular, the compression of all four cylinders, measured in the cold state, was above 74 PSI. The manufacturer requires a minimum value of 70 PSI. It can therefore be assumed that at the time of the accident the engine was producing the expected power.

1.17 Organisational and management information

Not applicable.

1.18 Additional information

Not applicable.

2 Analysis

2.1 Technical aspects

The pilot had not reported any technical problems before the accident. The examination of the airframe and the engine including its components gave no indications of any kind of pre-existing technical defects. At the time of contact with the terrain the engine was providing power.

2.2 Human and operational aspects

The pilot's logbook shows that the pilot had crossed the Alps four times on flights to Italy (Venice twice, Treviso and Verona once each). On 06.02.1998 he made an Alpine flight from Sion accompanied by a flying instructor and two passengers onboard an aircraft of the same type. The landing on 3 March in Samedan was his third on this aerodrome. His experience of mountain flying must be described as limited.

On 6 March, the Alps were in a northerly air current and covered by the clouds associated with a cold front. The aviation forecast and GAFOR considered the Alpine crossing as difficult in view of the turbulence and snowfalls. The cloud base was 2600 m AMSL and all VFR routes to the north were closed.

The route via the Julier Pass and Kempten specified on the ATC flight plan was not flyable on this day. It is therefore questionable whether the meteorological information was actually consulted.

From the analysis of the GPS data it is apparent that after taking off from runway 21 in Samedan the pilot had continued to fly along the extended runway centreline. Since he was not following the published departure route, he had insufficient space to turn to the left, down the valley, away from obstacles. He was therefore forced to fly into the Val Bernina.

The pilot then attempted to improve the climb performance of his aircraft by extending the flaps, but this led to a worsening in climb performance. It must remain an open question why the flaps were fully extended at the time of the accident. Flying into the Val Bernina at this altitude and with this load left the pilot, who was inexperienced in mountain flying, with hardly any possibility of making a 180° turn.

At the Diavolezza areal cable railway station, the aircraft was so close to the terrain that according to the pilot's own statements he aborted the 180° turn he had initiated for fear of not being able to fly over the high-voltage line and flew into the Val da Fain. From this point onwards, there was no longer any possibility of making a 180° turn.

3 Conclusions

3.1 Findings

- The pilot was in possession of a private pilot's licence, PPL(A), issued by the German Federal Republic on 02.10.1996. The last training flight was made on 24.09.2004.
- The last medical fitness examination took place on 29.09.2004, Class 2; result: fit.
- There are no indications that the pilot was in ill health at the time of the accident. The blood alcohol analysis produced a negative result.
- The pilot and passengers were secured by three-point belts. The central fixing of the rear abdominal belts did not withstand the load and was torn from the wooden anchor point.
- Examination of the airframe and engine produced no indications of pre-existing defects.
- The installation for an ELT KANNAD 406F was existent. The device was not onboard.
- The pilot used his own Garmin Pilot III GPS, which was subsequently used for data analysis. During the flights on 3 and 6 March 2005, the pilot did not use the installed KING KLN90B GPS.
- On 03.03.2005 the pilot landed in Samedan in difficult to critical weather conditions (VFR). This was his third landing in Samedan.
- The pilot was unable to explain why he had not followed the flight pattern shown on the Samedan visual approach chart (LSZS VAC 10). The corresponding chart was on board the aircraft.
- The pilot had taken off from Samedan only once before the flight involved in the accident.
- No documents of any kind relating to the weather conditions were found on board.
- The pilot explained that he had extended the flaps over Morteratsch to improve his rate of climb.
- In the wreckage, the flaps were found in the 2nd detent (60°).
- On 06.02.1998 the pilot made an Alpine flight from Sion accompanied by a flying instructor and two passengers on an aircraft of the same type.
- The pilot had submitted a VFR ATC flight plan, destination Schönhagen (D). He specified an expected flight time of four hours.
- The route specified in the ATC flight plan was not flyable due to the prevailing weather.

3.2 Causes

The accident is attributable to an inappropriate departure tactic from a mountain aerodrome, resulting in a collision with the terrain.

The following factors contributed to the accident:

- the pilot's limited experience of mountain flying
- inappropriate flight preparation
- the high take-off mass

Berne, 17 January 2007 Aircraft Accident Investigation Bureau

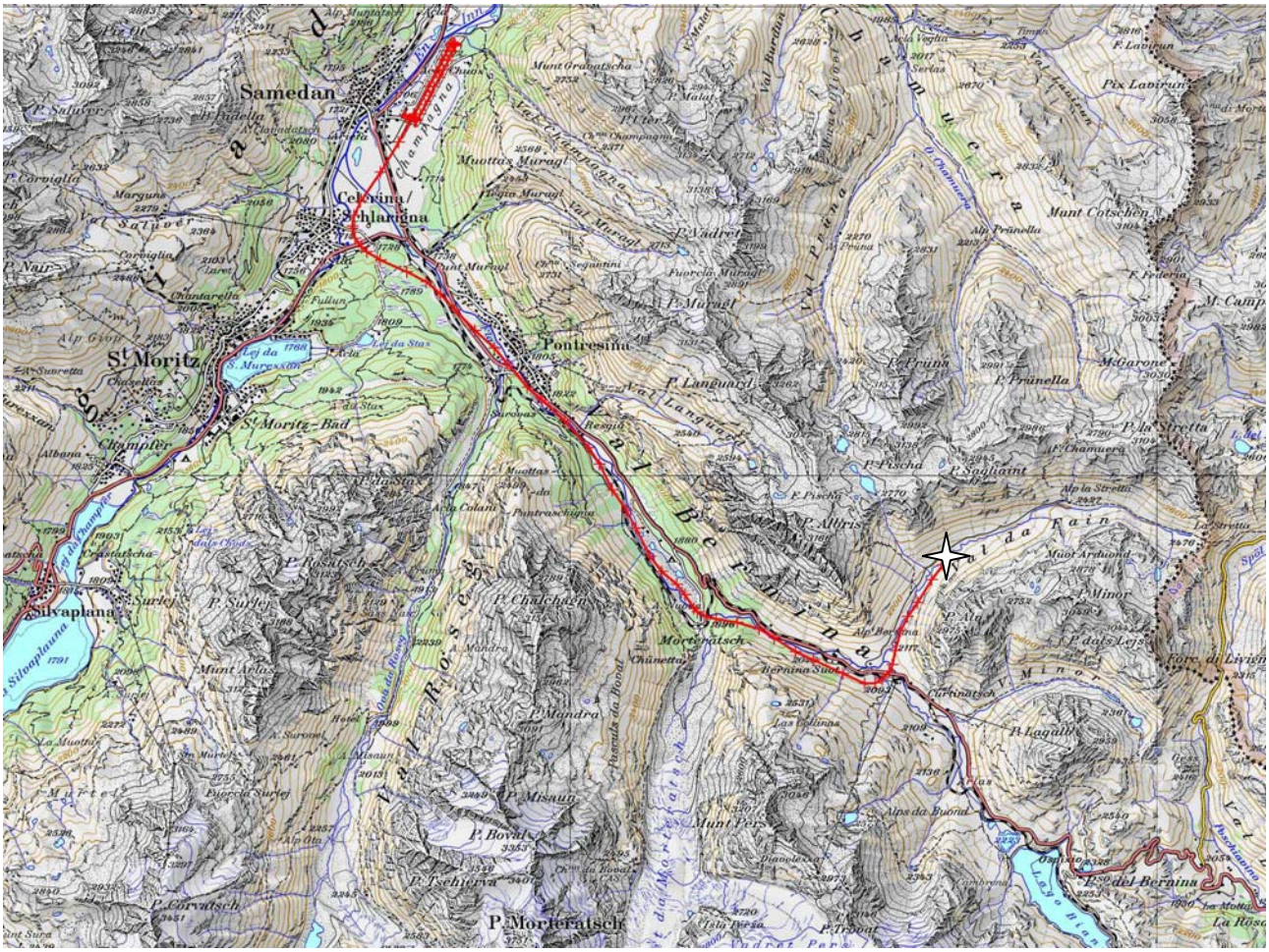
This report contains the conclusions of the AAIB on the circumstances and causes of the accident which is the subject of the investigation.

In accordance with art 3.1 of the 9th edition, applicable from 1 November 2001, of Annex 13 to the Convention on International Civil Aviation (ICAO) of 7 December 1944 and article 24 of the Federal Air Navigation Act, the sole purpose of the investigation of an aircraft accident or serious incident is to prevent accidents or serious incidents. The legal assessment of accident/incident causes and circumstances is expressly no concern of the incident investigation. It is therefore not the purpose of this investigation to determine blame or clarify questions of liability.

If this report is used for purposes other than accident prevention, due consideration shall be given to this circumstance.

Annex 1

Extract ICAO chart of Switzerland



Route Robin DR400/180, D-ERAD, according to GPS

✦ Place of the accident

Annex 2

Wreck D-ERAD

Contact main landing gear right

Released avalanche

Impact

Wreck

Annex 3


SICHTANFLUGKARTE-ICAO
VISUAL APPROACH CHART-ICAO
TWR/AFIS 135.325 HX
ATIS 136.600 MHz
SAMEDAN
LSZS
PEILUNGEN SIND MISSWEISEND
BEARINGS ARE MAGNETIC
1:100 000
HÖHEN in ft
ELEVATIONS in ft
VAR 1°09' E (03.5)
JET & MULTI ENG APCH
La Punt
MNM 7000 ft
6600 ft SINGLE ENG ACFT
Bever
Samedan
Celerina
Schlarigna
St. Moritz
St. Moritz-Bad
ST. MORITZ
LSZM 1783
Pontresina
Muottas Muragl
LS-D11
135.475
31500 ft
GND
P. Languard
Geradeausanflug für Jet- und zweimotorige Flugzeuge
Straight-in approach for jet- and twin-engine aeroplanes
Lärmempfindliche Gebiete
Noise sensitive areas
HEL Routen MNM 6000 ft, kreuzen der Pistenachse nur mit Bewilligung TWR.
Landefeld wird durch TWR zugewiesen
HEL Routes MNM 6000 ft, crossing of RWY-axis with TWR clearance only.
Landing area advised by TWR.
Erhöhte Segelfliegertätigkeit MAY-OCT
Intense Glider ACT MAY-OCT
CTN:
GLD FREQ: A/A 123.675
OBST ELEV: ft /HGT: ft
VFG RAC 6-3 Gebirgsflug /Mountain flying
COR: FREQ, OBST
06/03 AUG 14
SKYGUIDE, CH-8058 ZURICH-AIRPORT
LSZS VAC 10