



Summary Report

A summary investigation, in accordance with Article 46 of the Ordinance on the Safety Investigation of Transport Incidents from 17th December 2014 (OSITI), as amended on 1st July 2024 (SR 742.161) was carried out with regards to the serious incident. The sole purpose of an investigation of an aircraft accident or serious incident is to prevent further accidents or serious incidents from occurring.

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

Location	Ursenbach (BE), approx. 7 km south of the town of Langenthal	
Coordinates	626 333 / 221 701 (<i>Swiss Grid</i> 1903) N 47° 08' 45" / E 007° 47' 09" (WGS ¹ 84)	altitude 3500 ft AMSL ²
Date and time	9 March 2021, 11:25 hrs (LT ³ = UTC ⁴ + 1 h)	
Type of serious incident	Near collision	
Air traffic service unit	None	
Airspace	Class G	
Closest point of approach between the two aircraft	0.1 NM horizontally, < 100 ft vertically	
Prescribed minimum separation	None	
Airprox category	ICAO category A ⁵	
Aircraft 1	Reims Aviation F152	HB-CYP
Operator	Flugsportgruppe Zürcher Oberland, 8320 Fehraltorf	
Owner	Flugsportgruppe Zürcher Oberland, 8320 Fehraltorf	
Relevant equipment	Transponder (Mode-S), PowerFlarm ⁶	
Type of operation	Instruction	
Flight rules	Visual Flight Rules (VFR)	
Point of departure	Langenthal (LSPL)	
Destination	Speck-Fehraltorf (LSZK)	
Flight phase	Cruise	
Flight instructor	Swiss national, born in 1962	
Licence	Airline Transport Pilot Licence Aeroplane (ATPL(A)) in accordance with the European Union Aviation Safety Agency (EASA), issued by the Federal Office of Civil Aviation (FOCA)	

¹ WGS: World Geodetic System: The WGS 84 standard was adopted by the International Civil Aviation Organisation (ICAO) in 1989 for aviation.

² AMSL: Above Mean Sea Level

³ LT: Local Time

⁴ UTC: Universal Time Coordinated

⁵ Category A: the risk classification of close encounter where there was a high risk of collision.

⁶ PowerFlarm is a traffic information and collision avoidance system for general aviation.

Flying experience	total	13 998 h	during the last 90 days	201:37 h
	on type	46:27 h	during the last 90 days	7:02 h
Student pilot	Swiss national, born in 1993			
Licence	(in training)			
Flying experience	total	63:42 h	during the last 90 days	1:24 h
	on type	63:42 h	during the last 90 days	1:24 h
Aircraft 2	Cessna C182			SP-WTF
Operator	Private			
Owner	Private			
Relevant equipment	Transponder (Mode-S)			
Type of operation	Private			
Flight rules	Visual Flight Rules (VFR)			
Point of departure	Samedan (LSZS)			
Destination	Chambéry Aix-les-Bains (LFLB), France			
Flight phase	Cruise			
Pilot	Polish national, born in 1976			
Licence	Private Pilot Licence Aeroplane (PPL(A)) according to EASA, issued by the Polish Civil Aviation Authority			
Flying experience	total	400 h	during the last 90 days	ca. 10 h
	on type	ca. 200 h	during the last 90 days	ca. 10 h

Factual information

Pre-flight history and history of the serious incident

On 9 March 2021, the crew of the F152 single-engine aircraft registered as HB-CYP performed a training flight from Speck-Fehraltorf airfield (LSZK) as part of their PPL(A) training, during which they practised navigating by sight and landing at Langenthal airfield (LSPL). The flight from Speck-Fehraltorf to Langenthal went according to plan and without any incidents. The return flight was aimed at practising navigation in challenging terrain and flying through the control zones of Emmen (LSME) and Dübendorf (LSMD).

The pilot of the aircraft C182, registered as SP-WTF, was conducting a flight under Visual Flight Rules (VFR) with three passengers on board from Samedan aerodrome (LSZS) to Chambéry Aix-les-Bains (LFLB) in France.

The HB-CYP took off from runway 05 in Langenthal at 11:22 a.m. with the student pilot and flight instructor on board. The flight climbed in a southerly direction.

At about this time, the SP-WTF was cruising over Nebikon (LU) at an altitude of approximately 3500 ft AMSL on a west-south-westerly course. At around 11:25 hrs, the passenger sitting behind the pilot noticed an aircraft on his right. He informed the pilot that they were about to cross in front of this aircraft.

A few seconds later, the flight instructor on board the HB-CYP could briefly see the SP-WTF below him through the right-hand side window after the crossing had already taken place (cf. figure 1).

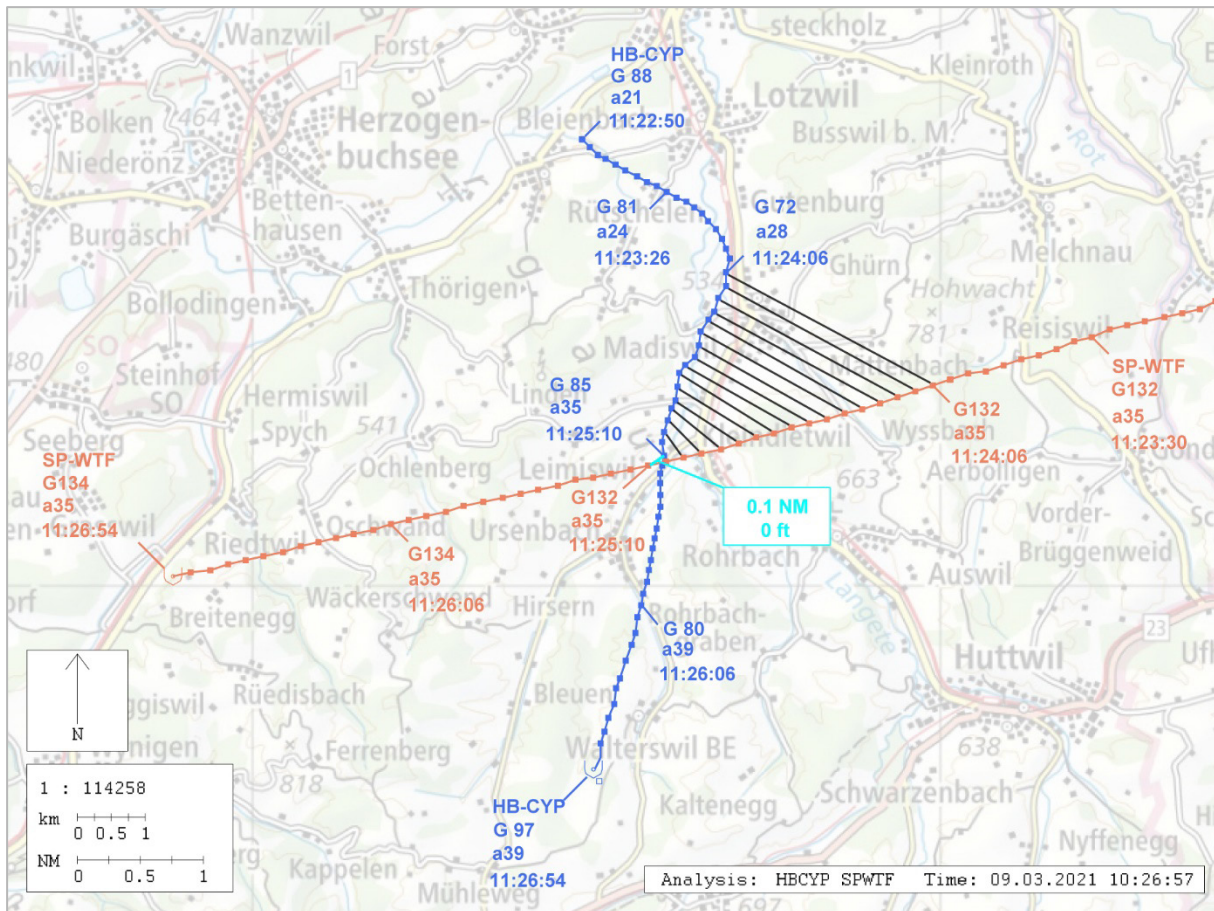


Figure 1: Section of the flight paths of the two single engine aircraft HB-CYP (blue) and SP-WTF (orange) according to radar recordings (interval of 4 seconds) showing the speed over ground (G) in knots, the barometric altitude (a) in hundreds of feet and the local time as well as the horizontal and vertical distances (cyan) at the time of the near collision at 11:25:10 and the connecting lines (black) between the positions of the two aircraft, at a constant angle (constant relative bearing). Source of the base map: Federal Office of Topography.

According to the flight instructor, the HB-CYP's radio was still set to the Langenthal aerodrome frequency (LSPL) at the time of the crossing. At this time, the student pilot was busy leaving the aerodrome frequency and navigating towards the Napf area.

Findings

The HB-CYP was equipped with a Mode S transponder and a PowerFlarm. On the day of the serious incident, the PowerFlarm was not operational. This defect had been entered in the Deferred Defects Report four months prior with the remark 'Deferred to next inspection'. The cause was a defective aircraft power supply of the PowerFlarm.

The SP-WTF had a Mode S transponder; a collision avoidance system was not installed. The modern G1000 avionics offered the option of integrating collision warnings.

Meteorological information

The weather was sunny and windless with good visual flying conditions; there was some haze over the Central Plateau. The cloud base was 3/8 to 4/8 near Langenthal aerodrome (LSPL) at around 5800 ft AMSL.

Analysis

According to the meteorological information available, there were good visual flight conditions at the altitude of approximately 3500 ft AMSL at which the serious incident took place; the weather therefore had no influence on the occurrence of the near collision.

In the airspace of classes Golf and Echo, the 'see and avoid' principle for collision avoidance does not always work satisfactorily. On its website, the FOCA comments on the "[Limits of perception - effectiveness of 'see and avoid' to prevent collisions](#)" and makes recommendations for visual airspace monitoring by pilots.

In addition to design-related limitations of the field of view, the visual detection of other aircraft can be even more difficult. The constant relative bearing⁷ (see parallel connecting lines in figure 1) often comes into play as an aggravating factor (see also the [summary report](#) on a similar dangerous approach of two aircraft in Echo airspace near Sursee (LU) and the Final Reports [No. 2270](#), [No. 2291](#), [No. 2325](#)). Other external influences such as glare from the sun or a weak contrast of flying objects with a thin silhouette against the background, as e.g., a white glider in front of a snow-covered mountain range, can also make it difficult to recognise other aircraft during airspace surveillance.

In addition, reading or carrying out checklists, typical recurring activities such as setting a new radio frequency or updating a flight plan increase the time during which a pilot focuses his attention inside the cockpit (head down time) and cannot carry out airspace monitoring.

Collision avoidance systems or aids to improve visibility in accordance with the 'sense and avoid' principle therefore provide good support for airspace monitoring. Collision avoidance systems, software solutions or applications with a similar purpose are available from various providers. What they all have in common is the need for professional installation, regular updates and updating of any databases, the activation of options or the procurement of necessary licences to guarantee the functional requirements. That is why, as part of the investigation into the collision between the single engine aircraft HB-KLB and the glider HB-3412 on 12 June 2021 west of Piz Neir, the STSB issued Safety Advice No. 56 on this topic (cf. [Final Report No. 2406](#)).

The PowerFlarm on board the HB-CYP was not operational, which is why there was no early warning of the imminent risk of collision. Had the flight instructor or student pilot had the means to react appropriately, a dangerous proximity could have been avoided at an early stage.

Conclusions

The near collision, in which two aircraft crossed each other at close range in airspace Golf under visual flight rules in cruising flight, was due to the fact that mutual visual perception occurred too late. At the time of the serious incident, neither aircraft had any technical means of warning the crew of the imminent risk of collision.

Bern, 10 October 2024

Swiss Transportation Safety Investigation Board

⁷ A constant relative bearing is defined as the approach of two aircraft at a constant angle, i.e., from the perspective of a pilot, the position of the other aircraft remains unchanged and is therefore difficult to recognize.