

Synopsis

Shortly after departure from Surjány airfield (LHSU), a Scheibe SF-25B motor glider, registered as HA-1279 lost altitude in a right turn and collided with the ground with two persons on board, both licensed pilots. The crash site is 300 meters NE of the departure runway 31.

The Investigating Committee of Transportation Safety Bureau (hereafter referred to as IC) identified the causes as human error and found no grounds to issue a safety recommendation.

In response to the Draft Report sent to him, the pilot of the mishap aircraft submitted a list of remarks to our Bureau. Considering these remarks the IC maintain all conclusions unaltered as set forth in the following Final Report.

Factual Information

Occurrence category	Accident			
Date of occurrence	8 May 2021, 15:05 LT ¹			
Location of occurrence	300 meters NE of Surjány airfield			
Aircraft make, model and registration	Scheibe SF-25B 'Falke', HA-1279			
Year of manufacture, serial number	1970, S/N 4690			
Type and number of engine(s)	Single, Sauer SE 1800 1ES			
Purpose of flight	Non-commercial (private, local)			
People	Number	Crew	Passenger	Other
		Injured		
		1 serious	1 serious, life threatening	0 --
Damage to property	Aircraft: destroyed 3rd party: no damage			
License and ratings of PIC	PPL(A) ² , TMG ³			
Age and citizenship of PIC	50, Hungarian			
Flight experience of PIC	Total	On the type	Last 90 days	Last 7 days
	Flight hours:	183:11	183:11	0
Sources of information	Event report; accident site investigation; pilot, passenger and eye witness accounts			

Flight History

A pilot with 50% fractional ownership in the aircraft (further on referred to as 'owner') arrived at Surjány airfield with two of his friends, also licensed pilots, to take turns in local flights in the aircraft involved. They pulled the plane out of the hangar and topped it off with about 10 liters of automotive gas, giving them about 23 to 25 liters on board, as all three of them recalled in accordance. Following a failed start attempt on the partially depleted battery, the party jump started the engine from a car they parked right behind either wing, with the aircraft's owner in the left pilot seat. Starting up, he taxied to turf strip 31 and, using about half length, took off to the NW. He flew two traffic patterns and taxied back to the hangar. Without shutting down the engine he slid over into the right seat, giving up the left seat for one of his two friends waiting. With the third person busy in the hangar, the two pilots taxied back to strip 31 for a takeoff. Their friend came out of the hangar just in time to see the aircraft start rolling and lift off to the NW. As he

¹ Local Time

² Private Pilot Licence (Aeroplane)

³ Touring Motor Glider

recalls, he witnessed a right turn at low altitude abeam the hangar with a dropping right wing and an ever increasing right bank throughout the turn while the aircraft rapidly descended all the way down to the ground. The crash occurred at the end of the 180-degree right turn on a south-easterly heading. As recorded during the site inspection, the aircraft flew through the top branches of a patch of small trees 145 meters NE of the centerline abeam the threshold, before its right wingtip hit a pile of construction rubble and the fuselage crashed to the ground with a spin, coming to a halt on a north-westerly heading. The pilot in the left seat sustained serious injuries, but he managed to leave the cockpit on his own. His passenger (owner) in the right got trapped in the wreck with serious, life threatening injuries. He was later removed from his seat by the firefighting service who had to chop through the cockpit's right side framework. Both occupants were subsequently taken to hospital.

The pilot later related that during the initial climb after liftoff the aircraft's climb performance fell short of expected so much that he immediately decided to return to the airfield to avoid flying over Road No. 4 that lay across in front of them. He accounted for a buffet first on the left, then also on the right wing, as he tried to steer the aircraft to the left with no avail. He then endeavored a right turn instead, in response to which the aircraft suddenly dropped to the right. Almost instantly, the pilot perceived a north-westerly gust that caught the aircraft from the aft and, depriving it of the remaining lift on the wings, immediately sent the aircraft into a plummet at a vertical speed of 5 or 6 m/s. The instantaneous low altitude did not give the pilot enough room to regain control over the aircraft before the crash. The pilot said, the only action left for him to do was to increase the bank to the right towards the patch of small trees on his right, in an attempt to negotiate the impact.

Accident Site and Aircraft Wreckage

In course of the site inspection the IC discovered the marks of the spinning propeller that shredded through the top branches of the patch of small trees short before the impact. The aircraft then hit the ground with its right wingtip first, which was caught in a pile of construction debris on the site, that spun the aircraft around. The right wing was largely destroyed on impact and absorbed a reasonable amount of the energy, thus increasing chances of survival for the occupants. The aircraft's nose came down next and further increased the spin, while the turning propeller blades shattered and the nose section with the engine separated from the fuselage. The tail section hit the ground next and the deformation of its tubular framework structure absorbed further kinetic energy. At the end of the 180-degree spin the aircraft came to rest on its belly heading NE, opposite the fly-in direction. No fire ensued, which proved indispensable for the survival of the right side occupant, who got trapped in the wreckage.



Figure 1. Aircraft Wreckage

As a result of the impact and the rescue team's activity, the flight controls were damaged to such an extent that made it impossible for the IC to determine whether they had been properly functioning before the crash. However, on the basis of personal testimonies of those involved and the previous flights done that day, the IC had no reason to suspect any flight control malfunction in connection with the event.

Pilot

The person flying the aircraft at the time of the event started his flight training in February 2015 on an SF-25 'Falke' motor glider. He got certified in this class and all his flights since – 183 hours altogether – were logged flown in the same aircraft model. His last flight before the event was six months prior to the accident. His license and class rating were valid at the time of the event, but his medical certificate had expired a few weeks before. He had checked in for renewal in time, but his appointment was cancelled on account of his doctor's Covid infection.

Although both occupants held valid pilot licenses at the time of the event, they both claimed it was perfectly clear to each one of them beyond doubt that the person flying the aircraft was the pilot on the left side, while the occupant on the right, the owner of the aircraft, would be a passenger, relinquishing all control to the pilot on the left.

Aircraft

The owner flew the plane over from Szolnok-Szandaszőlös airfield three weeks prior to the event to permanently change his operating base airfield to Surjány. On short approach he experienced a temporary engine sputter that he

was unable to decipher at the time. He thought it may have been a carburetor heating issue and decided he would give it a closer look at a later date which, eventually, never happened before the event. As one of the main goals of flying the aircraft on the event day he intended to test the engine for this cough and sputter issue.

The aircraft was otherwise well equipped, maintained and documented, with everything in fair working order before the flight. Prescribed mandatory maintenance jobs had been carried out, liability insurance and airworthiness had been taken care of. The IC only found minor defects in the aircraft flight log entries, which did not contribute to the event in any way. Another non-contributing factor was a depleted aircraft battery, which was resolved by jump starting the engine from a car battery. Fuel on board was ample, 23 to 25 liters of automotive gas, a certified fuel type for this engine, was available before the flight.

Take-off mass was close to maximum for this flight. The latest aircraft weighing record available articulates a maximum useful load of 192 kilograms, which was more or less entirely encompassed by 15 to 18 kg of fuel along with the pilot and passenger's combined body weight, as given account for by the witness on ground. There was no indication of out-of-balance conditions.

Weather and Visibility

In his recount, the party's third member, a certified PPL(A) pilot recalled fair weather with good visibility and strong, gusty NW winds during takeoff. METAR⁴ issued at Szolnok Hungarian Airbase (about 20 km away from the site) at 15:15LT accounted for a west-by-northwesterly wind at 15 kph with gusts of 31.5 kph, varying between SW and N (*LHSN 081315Z 29008G17KT 230V350 CAVOK 17/M02 Q1020 NOSIG RMK BLU*). Gust information was not present in the TAF⁵ issued for this period. Both the eye witness and the pilot agree not to have encountered gusts on ground prior to takeoff, the aircraft owner gave account of mild gusts on the ground and considerable gusts on final of his second traffic pattern a little while before the accident flight.

Aerodrome

Surjány airfield (LHSU by ICAO⁶ designation) is a Class IV private airfield on the southern perimeters of the municipality of Surjány, with a single 600 by 50 m grass strip of 13/31 orientation. Field elevation is 86 m. According to the aircraft owner, the NW part of the strip is irrigated and groomed, so he and his friend used this 400-meter westerly section of the field for takeoff and landing on the day.

Organizations

The aircraft is registered with a certified CAMO⁷ as set forth by relevant legislation. Scheduled maintenance work had continuously been carried out and monitored in accordance with its mandatory Maintenance Program. The last 100-hour and annual maintenance packages had been done in due course and the 25-hour maintenance job coming up next was not due yet.

Analysis

In line with relevant regulations, no flight data and voice recording equipment was installed in the aircraft. Neither pilot operated the on-board transponder; consequently no ATC⁸ flight data of the flight in question were available for analysis. The IC reconstructed the chain of events on the basis of facts and context of information obtained, as well as of eye witness, passenger (owner) and pilot testimonies.

The IC have recognized two characteristic set of human factors affecting the casual sequence leading to the accident – both with individual and combined effects as well. The first phenomenon, otherwise rather distinctive in several other cases studied by Hungarian TSB, roots in the fact that private aircraft owners benefit from a wider latitude in operating, maintaining and flying their aircraft than other participants in commercial air transport, whose autonomy is much more restricted by legislative and operational limits, as well as regulated professional control with close accountability in their respective fields. Private owners therefore tend to be more lenient in following up-to-date

⁴ *Aerodrome Routine Meteorological Report*

⁵ *Terminal Aerodrome Forecast*

⁶ *International Civil Aviation Organization*

⁷ *Continuing Airworthiness Management Organization*

⁸ *Air Traffic Control*

legislation including changes in flight and maintenance regulations, local aerodrome rules, just to mention a few examples. In this case indications of such instances lie in not having a sputtering engine checked before the next flight or the owner transferring control to another pilot with expired medical, and the latter pilot flying the airplane in this condition. Furthermore, neither pilot was up-to-date in local airfield regulations and both of them openly regarded such regulations inferior to ‘practical’ aspects of flying.

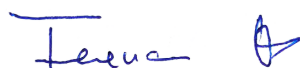
The second set of human factors comprises of decision errors made during preparation and flight, including reduced situational awareness. Specific examples in this case are deficient flight preparation including lack of knowledge in local airfield regulations, a missed review of flight theory and careful flight planning, failure to study and identify potential flight hazards and missing a general review of the situation with the other pilots. This kind of mental preparation would be even more appropriate after a six-month hiatus in flying and could possibly prevent a right turn after takeoff, furnishing the pilot with adequate flight and weather information. A conscientious airspeed calculation and monitoring, including gust safety margins would also have ensured a safe climb out of critical AOA⁹ regime with the given maximum allowable load.

The pilot’s decision to turn around at low altitude right after takeoff cannot be justified solely by poor climb performance. It is a fact that any turn executed in flight will degrade climb performance on account of reducing effective lift on the wings while increasing total drag. In this case, continuing straight flight with the wings level would have been the answer as long as the aircraft, however poorly, was still climbing without actually losing altitude – just as the pilot described the situation. A turn initiated at maximum load and low altitude did undoubtedly have detrimental effect on climb performance, critical angle of attack margin and stall speed. In making a decision turning right, the pilot missed to consider the advantages of flat and empty stretches of land on his left as opposed to a populated area on his right; the negative effect of the gusts from the left; as well as local regulations that require the use of SW patterns for pilots flying engine powered aircraft.

Conclusions

Based on the facts and information gathered, the IC reconstructs the chain of events leading to the accident as follows. The pilot concerned, after a six-month hiatus, made his first flight in lively weather and strong, gusty winds. He missed to revise flight theory and to get reacquainted with flying again with an instructor. On his first takeoff he exercised speed control based on routine rather than continuous and conscious monitoring of adjusted airspeed that he should have determined beforehand, considering aircraft load and weather conditions. Lacking this required level of consciousness may still not get him in trouble in smooth weather, but the prevailing meteorological and load conditions called for carrying a calculated extra speed to provide the necessary margin over stall speed during climb, which cannot be achieved by routinely letting the aircraft naturally lift off in the takeoff run and keeping the usual climb attitude associated with regular climb speeds. Shortly after takeoff the pilot may very well have flown into a thermal downburst that degraded his already poor climb performance, given the marginal load conditions. He could likely have instinctively adjusted attitude to maintain vertical speed that could further reduce his stall margin. He missed to recognize mushy controls accompanied by left, then right wing buffet as signs of an imminent stall. Rather than decreasing pitch to pick up speed and get out of stall conditions, he further aggravated the situation by initiating a left turn that he immediately changed into a right turn. The already developing flow separation set on and the right wing stalled. At this moment a gust coming from the aft destroyed the last of the lift remaining on the left wing and put the aircraft in a stall. Altitude dropped fast while the right bank was increasing. The pilot at this point had nothing left to do to control his speed and attitude to prevent the crash.

As the cause of accident was identified as a chain of human errors, the IC has found no grounds to issue a safety recommendation.



Miklós Ferenci
Investigator-in-Charge



Ákos Hanczár
IC Member

⁹ Angle of Attack: the angle between the chord line of the wing of a fixed-wing aircraft and the vector representing the relative motion between the aircraft and the ambient air

The sole objective of the safety investigation is to reveal the causes and circumstances of aviation accidents or incidents and to initiate the necessary safety measures, as well as make recommendations in order to prevent similar events in the future. Safety investigations shall not be conducted to apportion blame or liability by any means.

General information

This investigation is being carried out by Transportation Safety Bureau on the basis of

- Regulation (EU) No 996/2010 of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation and repealing Directive 94/56/EC,
- Act XCVII of 1995 on aviation,
- Annex 13 as referenced in the Appendix of Act XLVI. of 2007 on the declaration of the annexes to the Convention on International Civil Aviation signed in Chicago on 7th December 1944,
- Act CLXXXIV of 2005 on the safety investigation of aviation, railway and marine accidents and incidents (hereafter referred to as Kbv.),
- NFM¹⁰ Regulation 70/2015 (XII.1) on safety investigation of aviation accidents and incidents, as well as on detailed investigation for operators,
- Act CL of 2016 on General Public Administration Procedures in absence of contradictory regulation set forth in Kbv.

The competence of the Transportation Safety Bureau of Hungary is based on Government Regulation № 230/2016. (VII.29.) on the assignment of a transportation safety body and on the dissolution of Transportation Safety Bureau with legal succession.

Pursuant to the aforesaid legislation,

- Transportation Safety Bureau Hungary shall investigate aviation accidents and serious incidents.
- Transportation Safety Bureau Hungary may investigate aviation and incidents which – in its judgement – could have led to more accidents with more serious consequences in other circumstances.
- Transportation Safety Bureau Hungary is independent of any person or entity which may have interests conflicting with the tasks of the investigating body.
- In addition to the aforementioned legislation, the ICAO Doc 9756 and the ICAO DOC 6920 Manual of Aircraft Accident Investigation also apply.
- This Report shall not be legally binding, nor shall an appeal be lodged against it.

Members of the IC are in no conflict of interest. Persons participating in the safety investigation do not act as experts in other procedures concerning the same case and shall not do so in the future.

The IC shall retain the data and information obtained in the course of safety investigations. Furthermore, the IC shall not disclose for other authorities such data and information, whose holder would have been legally entitled to withhold them.

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Translation

The present document is a translation of the original Hungarian version. Although efforts have been made to provide a translation as accurate as possible, discrepancies may occur. In such eventuality, the Hungarian version is considered overriding.

¹⁰ Ministry of National Development