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INVESTIGATION REPORT

Accident to the Pro.Mecc. Sparviero SP10 100R identified 57AYE

on 7 October 2019
at Jumeauville (Yvelines)

Time	Around 16:50[1]
Operator	Private
Type of flight	Cross-country
Persons on board	Pilot and one passenger
Consequences and damage	Pilot and passenger fatally injured, microlight destroyed

This is a courtesy translation by the BEA of the Final Report on the Safety Investigation published in April 2021. As accurate as the translation may be, the original text in French is the work of reference.

[1] Except where otherwise indicated, the times in this report are in local time.

In-flight loss of control, collision with ground

1 - HISTORY OF THE FLIGHT

On the day of the accident, the pilot travelled to the microlight strip at Flavacourt (Oise) in the afternoon. He talked to two other pilots who were planning a flight to Saint-André-de-l'Eure aerodrome (Eure). He decided to join them. He took off shortly after them, accompanied by a passenger who was also a microlight pilot. They all met up at Saint-André-de-l'Eure. From here, the pilot of the Sparviero and his passenger took off first, bound for Mureaux aerodrome (Yvelines). On the return leg, the microlight crashed in a field, in the commune of Jumeauville (Yvelines), 38 km from Saint-André-de-l'Eure.

2 - ADDITIONAL INFORMATION

2.1 Information about the microlight occupants

The 69-year-old pilot was issued with a fixed wing microlight pilot certificate in 2015. He had logged 244 flight hours in the Storch, and 47 flight hours in the Sparviero identified 57AYE, which he purchased in January 2019. He kept his Sparviero at the Flavacourt strip.

The 67-year-old passenger also held a microlight pilot licence issued in 2009, along with an aeroplane private pilot licence issued in 2007. His single engine piston (SEP) aeroplane rating had expired in 2011.

The autopsies showed that the two occupants were very overweight and had very serious heart conditions, likely to cause episodes of dizziness and/or fainting. The toxicology report did not bring to light any element that might have contributed to the accident.

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2.2 Aircraft information

The Sparviero is a side-by-side two-seater, low-wing microlight. 57AYE entered into service in 2010 and was equipped with a Rotax 912 ULSFR engine. It had logged approximately 1,120 flight hours at the time of the accident. It was previously owned by a microlight club and had been maintained by an approved aeroplane mechanic. According to the club, the microlight had not experienced any major problems.

2.3 Weight and balance

The microlight was equipped with two 45 l tanks, It was not possible to determine the amount of fuel in the tanks when the microlight departed from Flavacourt. Given the weight of the two occupants, the weight of the microlight without fuel would have been 504 kg. With the fuel at maximum level, the take-off weight would have been 569 kg. The maximum permissible take-off weight for a class 3 two-seater microlight equipped with a reserve parachute is 472.5 kg.

The microlight's centre of gravity for this flight was estimated to be 36.4% of the mean aerodynamic chord with maximum fuel, and 38.1% without fuel. The flight manual specifies that the balance must be between 22% and 33%.

The microlight was therefore in exceedance of the weight and balance limits during both take-offs.

2.4 Stall

The stall speed of an aeroplane is dependent on its weight. At a weight of 472.5 kg, the stall speed of the Sparviero with its flaps retracted is 72 km/h. At a weight of 569 kg, the stall speed would have been around 10% (i.e. 7 km/h) higher.

The Sparviero is not equipped with a stall warning system[(2)], and the flight manual specifies that, when slowing down, the aeroplane gives no signs that warn the crew of the onset of stall. However, pilots say that a vibration can be felt before stall.

[(2)] It is not a regulatory requirement.

2.5 Meteorological information

The METAR report for Pontoise and Toussus-le-Noble aerodromes, respectively located approximately 27 km north-east and south-east of the site of the accident, reported few clouds between 3,500 and 4,000 ft, a visibility of more than 10 km and a south-westerly wind of between 4 and 10 kt.

2.6 Statements

The two pilots whom the pilot of 57AYE joined at Saint-André-de-l'Eure are based at Flavacourt and often spoke with the pilot. They described him as a very meticulous person, who took care of his microlight. The pilot told them that, on the whole, he was very satisfied with the microlight but complained that it was difficult to reach the instrument panel with his seatbelt fastened. Moreover, they explained that the pilot had already experienced an engine failure on final in another microlight and that he had managed to land without difficulty.

They stated that the wind had been light on the trip between Flavacourt and Saint-André-de-l'Eure and that the visibility was excellent.

A witness to the accident saw the microlight take a steep dive into the field and specified that the parachute was not deployed. He did not see the start of the fall.

2.7 Examination of site and wreckage

The wreckage was found complete, upside down in a field. The area was free of any obstacles. Observations made of the accident site indicated that the microlight collided with the ground with a steep nose-down attitude, that the tanks contained fuel and that the flight control linkages were continuous before the impact. Damage to the cockpit did not enable the positions of the different controls to be determined. The position of the flaps could not be determined either. The reserve parachute was found deployed but the presence of the safety pin indicated that it deployed upon impact.

Due to the damage caused by the impact with the ground, the propulsion system could not be tested. During the examinations made after disassembly at the BEA's premises, a fly was found in line with the main jet of one of the two carburettors. This type of pollution can interrupt the flow of injected fuel, which may result in a desynchronization of both carburettors and a reduction in power.

On this same carburettor, the tank seal looked very new. However, due to a lack of a record of maintenance work carried out, the date of the last maintenance performed on the carburettor was not known.

3 - CONCLUSIONS

The conclusions are solely based on the information which came to the knowledge of the BEA during the investigation. They are not intended to apportion blame or liability.

Scenario

The blockage of the jet of one of the carburettors by a fly may have caused a desynchronization of the carburettors and led to a reduction in available power. However, this failure alone does not explain the loss of control.

The balance exceeded the aft balance limit described in the microlight's user manual. This condition is conducive to a longitudinal instability and to a heightened sensitivity of the flight controls.

Excessive weight also tends to increase the stall speed.

If the reduction in speed that results from the decrease in power is not rapidly detected and corrected using an appropriate action, it may result in a loss of control.

Contributing factors

The presence of the safety pin on the reserve parachute may have prevented its deployment by the pilot.

Safety lessons

In the absence of a stall warning system, it may be difficult to detect the stall, in particular in an unusual situation that can induce stress, and with a microlight presenting few aerodynamic stall warning signs. Compliance with the maximum take-off weight and the balance means that flights are undertaken in a known flight envelope defined by the manufacturer.

Removing the reserve parachute safety pin at the start of each flight is essential. In a critical situation, the pilot may forget to or not have time to remove it, and therefore not be able to use the parachute.