



Accident to the SOCATA - TB20
registered **F-GDNU**
on 22 May 2023
at Langogne-Lespéron

Time	Around 12:20 ¹
Operator	Private
Type of flight	Cross-country
Persons on board	Pilot and four passengers
Consequences and damage	Aeroplane substantially damaged

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

**Insufficient acceleration during take-off,
attempted take-off, runway overrun**

1 HISTORY OF THE FLIGHT

Note: the following information is principally based on data from the SkyDemon application installed on the pilot's mobile phone and on statements.

The day before the accident, the pilot took off from Brive-Souillac airport (Corrèze), where he spent the weekend with his family, with the intention of returning to Cannes (06), where he lived. The weather conditions forced him to divert to Langogne-Lespéron aerodrome, where he landed at approximately 13:30.

The next day, at around 12:20, the pilot, accompanied by his wife and his three children, took off from unpaved runway 22 at Langogne-Lespéron aerodrome bound for Cannes-Mandelieu airport. The aeroplane was in flaps-retracted configuration. While approaching the opposite end of the runway at a speed he estimated to be 65 kt, the pilot pulled on the stick to take off. He indicated that the aeroplane barely lifted off the ground before touching down again. The aeroplane then overran the runway with a slight deviation to the left. It continued its course over a distance of around 100 m before coming to a stop in a thicket.

2 ADDITIONAL INFORMATION

2.1 Site and wreckage information

The aeroplane came to a stop in a thicket about one metre high. The three landing gears were ruptured. The flaps were retracted.

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



Figure 1: photograph of F-GDNU after the accident (Source: local flying club)

2.2 Pilot's experience and statement

The 48-year-old pilot held a Private Pilot Licence - Aeroplanes (PPL(A)) issued in 2014. At the time of the accident, he had logged approximately 400 flight hours, 300 hours of which on F-GDNU which he purchased in 2017. He did not hold a mountain rating and had never been to Langogne-Lespéron aerodrome before.

The pilot indicated that, at the runway midpoint, the aeroplane's speed was 55 kt. He thought that the second half of the runway would enable him to reach the rotation speed. According to him, the runway condition on this segment, which was muddy and wet, limited acceleration to a speed of 62 kt. He also indicated that he intended to take off with flaps retracted.

Note: as the pilot was injured in an accident a few days after the accident to F-GDNU, the investigation was not able to obtain any further information. In particular, it was not possible to obtain any information about the pilot's flight preparation or the conditions under which he diverted and chose the aerodrome on the previous day.

2.3 Aerodrome information

Langogne-Lespéron aerodrome is used on the A/A frequency. It is located at an altitude of 3,339 ft. The runway to be used by aeroplanes on take-off is unpaved runway 22. It has an average downward slope of 1.1 %, and the runway take-off distance available is 883 m. The last third of the runway has mainly a downward slope. The president of the aerodrome's flying club indicated that the runway is covered with sparse grass, which is more present and thicker on the second half of the runway.

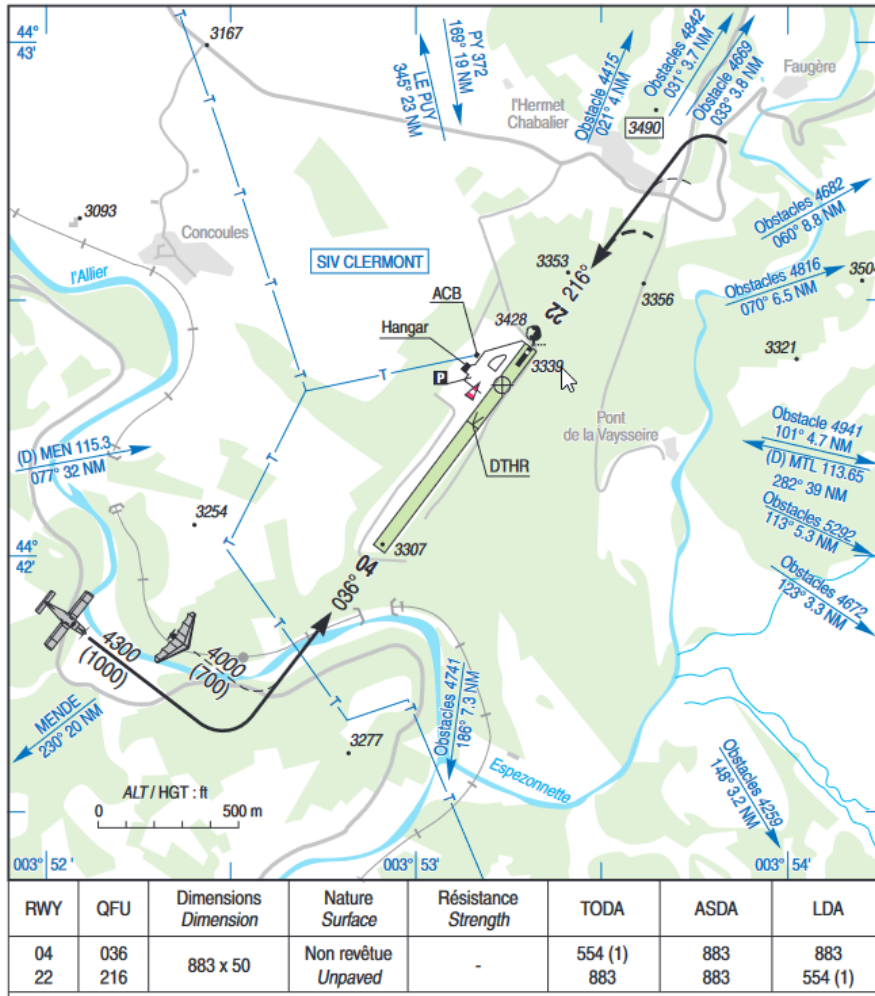


Figure 2: excerpt from Langogne-Lespéron aerodrome VAC chart (Source: AIS)

The VAC chart indicates that Langogne-Lespéron aerodrome is restricted to based aeroplanes, pilots who hold a mountain flying rating or pilots who already carried out a reconnaissance of the strip with an instructor and used the aerodrome as pilot-in-command in the last 12 months.

2.4 Meteorological information

The meteorological conditions estimated by Météo-France at Langogne-Lespéron at the time of the accident were as follows:

- thundery showers the day and night before;
- overcast sky with a ceiling at around 1,000 ft;
- light north-westerly wind of around 3 kt with gusts up to 7 kt;
- visibility greater than 10 km;
- outside air temperature 13 °C.

The president of the local flying club said that there was no wind on the morning of the accident.

2.5 Aeroplane information

2.5.1 Weight and balance

The aeroplane's maximum permissible take-off weight is 1,400 kg. According to the weight and balance sheet drawn up by the pilot before the flight, the aeroplane's take-off weight was around 1,350 kg, and the balance was within the limits defined by the manufacturer.

2.5.2 Take-off performance

Depending on the runway condition, the flight manual (SECTION 5 - Performance) recommends increasing the take-off distance by:

- 10 % on short grass;
- 25 % on high grass.

The flight manual (SECTION 5) specifies that take-off run distances on short, wet grass should be increased by 25 %.

The flight manual (SECTION 4 - Normal procedures) specifies that the rotation speed is 68 kt with the flaps in the take-off configuration (10°). In this configuration and under the following conditions - weight 1,350 kg, pressure altitude 3,300 ft, outside air temperature 13 °C (International Standard Atmosphere (ISA) +5 °C), dry paved runway - the estimated take-off run distance, based on the take-off performance tables provided in the flight manual, is approximately 450 m. Therefore, on a short, wet grass runway, the take-off run distance is approximately 550 m with the flaps in the take-off position. This distance does not take into account the downward slope of the runway or the variations in grass height and moisture along the runway.

The take-off performance indicated in the flight manual corresponds to the configuration with flaps in the "take-off" position. In flaps-retracted configuration, the take-off run distance is increased. The flight manual does not provide a performance table for this configuration.

The aeroplane's GNSS positions recorded on SkyDemon show that the pilot also started the take-off run 60 m from threshold 22, providing him with a runway take-off distance available of approximately 820 m.

2.6 Local flying club member's statement

A member of the flying club spoke to the pilot before the flight. The pilot stated his intention to take off with flaps retracted because the aeroplane accelerated faster this way. The witness stated that he was worried before the aeroplane took off, but the pilot, who seemed very calm, assured him that he had calculated the aeroplane's performance. The witness added that the pilot walked up and down part of the runway before his flight. He added that the runway was very wet due to heavy rainfall during the night and the day before the accident.

At the time of take-off, the witness was near the flying club hangars located in the vicinity of threshold 22. He lost sight of the aeroplane during the take-off run on the last third of the downward sloping runway.

He added that the mountain rating or the reconnaissance flight are required due to the presence of trees before the threshold of runway 22, which impose a very steep path on landing and prohibit take-off on runway 04. There is no particular elevation around the site, which is located on a

plateau. According to him, taking off from runway 22 presents no particular difficulties or constraints, and it is possible to abort take-off without any particular risk.

3 CONCLUSIONS

The conclusions are solely based on the information which came to the knowledge of the BEA during the investigation.

Scenario

The pilot, accompanied by four passengers, wanted to perform a cross-country flight from Langogne-Lespéron aerodrome, located at an altitude of around 3,300 ft, to where he had diverted the previous day. The aeroplane's take-off performance in flaps-retracted configuration, close to maximum weight, combined with the unpaved, wet runway condition, did not allow the aeroplane to reach sufficient speed to take off. The start of the take-off run around 60 m from the runway threshold also reduced the take-off distance available. The pilot applied a nose-up input and the aeroplane slightly lifted off the ground before touching down again. The aeroplane overran the runway and continued its course over a distance of around 100 m before coming to a stop in the vegetation.

Contributing factors

The following factors may have contributed to the aeroplane's runway overrun at take-off:

- the decision to take off with an aeroplane configuration for which the take-off performance cannot be calculated using the flight manual;
- the early rotation by the pilot at a speed lower than that specified in the flight manual in take-off configuration (first flap detent position).

The BEA investigations are conducted with the sole objective of improving aviation safety and are not intended to apportion blame or liabilities.