BEA
Bureau d'Enquêtes et d'Analyses
pour la sécurité de l'aviation civile

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SAFETY INVESTIGATION REPORT

Accident to the TECNAM P2008 JC registered F-HXLG on Thursday 26 December 2024 on Lyon - Brindas aerodrome

Time	Around 13:45[1]
Operator	ACOL (Aéroclub Ouest Lyonnais)
Type of flight	Local
Persons on board	Pilot and passenger
Consequences and damage	Aeroplane destroyed
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 run, attempted take-off, runway overrun, collision with an obstacle, fire

1 HISTORY OF THE FLIGHT

Note: the following information is principally based on statements.

At around 13:45, the pilot, accompanied by his son, undertook a take-off on unpaved runway 19 of Lyon - Brindas aerodrome for a local flight. According to the pilot's statement, during the take-off run, half-way along the runway, the speed of the aeroplane was 40 kt[2]. He then felt two hard jolts. On approaching the end of the upwind runway at a speed he estimated as still being 40 kt, he pulled on the stick to take off. He indicated that the aeroplane did not rise. He then completely reduced engine power and braked but the aeroplane overran the end of the runway. The aeroplane crossed the road situated around 50 m beyond threshold 01 and then collided with a small wall. A fire broke out. The pilot and his son, uninjured, evacuated the aeroplane.

2 ADDITIONAL INFORMATION

2.1 Pilot information

The 55-year-old pilot held an aeroplane Private Pilot Licence (PPL (A)) obtained in 2010. He had totalled 252 flight hours, including 187 hours as pilot-in-command. Since joining the flying club 3 years before the accident, he had flown 34 h including 29 h on the Tecnam P2008 of which 3 h in the 3 months preceding the accident.

The pilot indicated that the aeroplane was configured for take-off (flaps in first detent). He did

[1] Except where otherwise indicated, the times in this report are in local time.
[2] The glossary of abbreviations and acronyms frequently used by the BEA can be found on its web site.

not carry out any briefing before the take-off. The pilot thought that the second half of the runway would allow him to reach the rotation speed of 48 kt. According to him, the condition of this segment of the runway, which was waterlogged and even muddy in places, limited acceleration. He indicated that he remained focused on taking off without envisaging rejecting it. In hindsight, he believed he was in a “tunnel effect” and explained this by his lack of previous experience of situations requiring the take-off to be rejected. He believed that the jolts felt during the take-off run were caused by depressions in the runway surface. He added that the grass was approximately five centimetres high.

He stated that he had read an email sent in November by the flying club's chief pilot warning of the particular condition of the runway (see paragraph 2.4). He had also seen a message on the same subject on the homepage of the flying club's website when he booked the aeroplane. For this reason, before undertaking the flight, he had walked along the first half of the runway and the taxiway. He had considered that their condition was compatible with taking-off with the aeroplane.

Furthermore, in the absence of a NOTAM and seeing from the aircraft booking software that a flight had been carried out that same morning with an instructor, he was reassured about the feasibility of the flight. He added that he had already become bogged down with an aeroplane on the taxiway leading to runway 01 and knew that he had to be vigilant in that area.

2.2 Aerodrome information

Lyon - Brindas aerodrome uses an A/A frequency. It is managed by Aéroclub de l’Ouest Lyonnais. It is situated at an altitude of 1,040 ft. The unpaved runway measures 438 m long.

The president of the flying club specified that in the winter, the grass is not cut.

The VAC indicates that the aerodrome is reserved for aeroplanes and gliders flown by pilots who have been approved to use it by an instructor.

2.3 Meteorological information

The meteorological conditions estimated by Météo-France for Lyon-Brindas at the time of the accident were the following: light westerly wind, visibility greater than 10 km, clear sky to few clouds, temperature 5 °C.

According to rainfall data provided by Météo-France, 42 mm of rain had fallen in Brindas between 13 and 23 December, including 29.2 mm between 18 and 23 December. Minimum ground temperatures were below zero from 18:00 on 25 December to 10:00 on 26 December.

2.4 Flying club information and statements

The president of the flying club stated that the condition of the runway on the day of the accident was typical for winter after heavy rainfall.

He specified that the decision to close the aerodrome is made on a case-by-case basis by an instructor or a member of the board, either for certain aircraft with limited performance or for all aircraft. No closure had been decided for the day of the accident.

Information was regularly sent out to warn pilots of the runway conditions.

The last email from the chief pilot was dated 28 November, one month before the occurrence. Sent to all pilots, it reported that the runway was “slippery” and advised them to check the runway conditions before undertaking a flight and to calculate take-off performance with additional margins. The chief pilot had added that the rain of the last few days could compromise the safety of the flight, and had reminded pilots not to hesitate to delay take-off or cancel their flight if in doubt.

In addition, messages were posted in the form of “post-it notes” on the homepage of the flying club's website, from where aircraft reservations are made:

- From 28 November to 7 December:
    - Remember to check the condition of the runway before undertaking a flight and calculate your take-off performance with additional margins. The rain over the last few days may compromise the safety of your flight. Do not hesitate to delay your take-off or cancel your flight if you have any doubts. The runway may have more or less well drained areas in certain places;

- From 24 to 28 December:
    - The runway is very wet. Taxiway 01 is clearly unusable. Be patient, it will dry out.

In addition, the flying club's recommended procedure for rejecting or continuing take-off required the aeroplane’s speed to be checked at the midpoint of the runway: if 70-80% of the speed had not been reached (i.e. 38 kt for the P2008), it was recommended that the take-off be rejected. The pilot stated that he was aware of this instruction.

Lastly, the club president confirmed that an instruction flight had been carried out on the morning of the accident without difficulty, as the runway was frozen.

2.5 Measures taken after accident

Following the accident, the president of the flying club informed the BEA that discussions were underway on improving the communication of information about the condition of the runway to pilots and on the criteria for deciding to close the runway. Discussions were also underway on having the runway maintained by a landscaper to improve drainage.

An internal safety meeting at the flying club with the participation of pilots and an internal meeting between instructors were held in January 2025. The latter was used to clarify and harmonise the instructions and procedures for approving pilots for solo flights, which, since the meeting, include a rejected take-off.

It also led to the implementation of a decision-making matrix for pilots. This matrix is located in the pilot room, visible when booking and picking up keys for the flight, as well as in the logbook folder of each aeroplane.

2.6 Aircraft information

2.6.1 Weight and balance

The maximum take-off weight of the aircraft is 650 kg. According to the weight and balance sheet completed by the pilot before the flight, the take-off weight of the aircraft was 629 kg and the centre of gravity was within the envelope specified by the manufacturer.

2.6.2 Take-off performance

The flight manual specifies a rotation speed of 48 kt. At maximum weight, at an altitude of 1,000 ft, with a calm wind, at 0 °C, and in take-off configuration, the theoretical take-off run on a grass runway is 216 m and the distance to flight through 50 ft is 361 m.

The pilot used the flying club's software to calculate take-off performance. The software indicates that a margin of 10% should be added when the grass is long and more than 10% for soft ground. The pilot considered that the grass was not high and added a margin of 10%. The take-off distance provided by the software was 238 m and the distance to flight through 50 ft was 385 m, in accordance with the flight manual.

2.7 Take-off briefing

In 2022, the FAA published an article entitled *10 tips for safer takeoffs and landings* on the blog, [3] *FlySafe – General Aviation Safety Enhancement Topics*. It states in particular, that the best way to prepare for emergency situations on take-off is to, "*Vocalize your plan even if there's no one to hear it but you.*"

- note the runway you'll use and the aircraft take-off configuration;
- describe your departure path & note what you'll do in case of power loss before rotation;
- state your rotation, lift off, and climb speeds;
- state what you'll do if power is lost in the climb;
- state where you'll go if you have to carry out an off-airport landing.

The *Guide de l'instructeur VFR* (VFR instructor's guide) published by the École Nationale de l'Aviation Civile (ENAC) indicates that the take-off briefing is a tool which enables pilots to introduce an action plan. It is based on the identification of potential threats and associated risks (Threat and Error Management, TEM), and the corresponding appropriate strategy, in particular in the event of an abnormal situation before rotation, or an engine failure after rotation.

2.8 Rejected take-off

The importance of planning and executing an acceleration-stop manoeuvre is discussed by the FAA in the document *FAA-H-8083-3* "*Airplane Flying Handbook*", Chapter 6 *Takeoffs and Departure Climbs*. This document specifies that, "*Emergency or abnormal situations can occur during a takeoff that require a pilot to reject the takeoff while still on the runway. Circumstances such as a malfunctioning powerplant, inadequate acceleration, runway incursion, or air traffic conflict may be reasons for a rejected takeoff. Prior to takeoff, the pilot should identify a point along the runway at which the airplane should be airborne. If that point is reached and the airplane is not airborne, immediate action should be taken to discontinue the takeoff.*"

[3] The purpose of this blog is to promote aviation safety by discussing current technical, regulatory, and procedural aspects affecting the safe operation and maintenance of aircraft. Although based on current FAA policy and rule interpretations, all material is advisory or informational in nature and should not be construed to have regulatory effect.

In December 2022, the FFA Training Commission, in collaboration with the Prevention and Safety Commission published a practical guide on the same topic, entitled *Arrêter son décollage en sécurité* (How to stop your take off safely) which describes several factors that lead a pilot to make the decision to stop take off safely.

3 CONCLUSIONS

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

Scenario

The pilot, who had never encountered a situation outside of instruction that required rejecting the take-off, remained focused on the take-off run, which he continued, even though the condition of the runway, which was wet and even waterlogged and muddy in places, did not allow him to reach sufficient speed. When he saw the end of the upwind runway, the pilot anticipated the rotation by making a nose-up input, but the aeroplane did not leave the ground. The pilot then completely reduced power and applied the brakes. The late rejection of the take-off did not prevent the aeroplane from over-running the runway. The aeroplane continued its run for about 50 m before colliding with a low wall and catching fire.

The pilot, who had walked the first half of the runway before undertaking his flight, had not sufficiently taken into account the danger that the condition of the second half of the runway could pose.

Safety lessons

Estimating take-off performance

This occurrence serves as a reminder that the estimation of aircraft performance is a theoretical calculation and that particular attention must be paid to environmental parameters, such as runway conditions (in the case of the accident to F-HXLG, a short, grass runway after a period of rain), before considering undertaking a flight. These parameters can significantly alter take-off or landing performance and compromise flight safety.

Rejecting take-off in the event of an abnormal situation

During the take-off run, pilots may find themselves facing abnormal situations that are not always associated with the activation of a visual or aural warning. Pilots may then be unsure of the seriousness of the situation and delay the decision to reject the take-off. Clearly identifying criteria for rejecting a take-off and putting them in a hierarchal order during a briefing will allow the pilot to anticipate the situation and thus optimise decision-making.

Value of an oral briefing before take-of

When a problem occurs during the take-off, the pilot has no time to think and must act instinctively. Vocalizing the before take-off briefing is an essential anticipation process that mentally prepares the pilot for the possibility of rejecting the take-off in the event of an anomaly or incident, and the associated actions. This briefing is all the more important if it is tailored to the hazards and threats that the pilot identified prior to the flight (in this case, if the runway condition had been identified as a potential hazard, decision criteria in addition to the 40 kt mid-runway rule could have been defined and verbalized).