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INVESTIGATION REPORT

Accident to the class-6 Helisport CH 77 Ranabot registered 54AXP

on 15 July 2019
at Grand Couronné microlight base (Meurthe-et-Moselle)

Time	Approximately 13:20[1]
Operator	Private
Type of flight	Local flight
Persons on board	Pilot
Consequences and damage	Pilot fatally injured, microlight substantially damaged

This is a courtesy translation by the BEA of the Final Report on the Safety Investigation published in June 2020. As accurate as the translation may be, the original text in French is the work of reference.

[1] Unless otherwise stated, all times given in this report are in local time.

Loss of control on landing, collision with ground

1 - HISTORY OF THE FLIGHT

Note: the following information is based mainly on a video recording taken by a camera mounted on the instrument panel.

The pilot, who was also the owner, took off from runway 06 at Grand Couronné microlight base[2] at about 13:15 for a training flight. The windsock indicated a wind strength of about 10 to 20 kt blowing from a north-north-easterly direction[3].

After a first left-hand low-level circuit pattern (about 100 ft), offset to the right of the runway (see Figure 1), the pilot went around and completed a second low-level circuit pattern (maximum 250 ft).

On short final ❹, the microlight veered to the right. The pilot continued in order to enter hover over a prepared strip adjacent to the runway ❺. While it was a few metres above the ground ❻, the microlight turned right 180° and then left and hit a bank with its left skid. The microlight tipped over and came to rest on its right side.

[2] The microlight base has a grass runway 06-24 (dimensions: 400 m x 40 m). There are fields in the direct vicinity of the runway, which are surrounded by forests. The runway is located on a plateau at an altitude of 1,250 ft and is managed by the club of which the pilot was a member.

[3] The aircraft flight manual states that control of the aircraft in the hover was demonstrated in winds of 15 kt from any direction.

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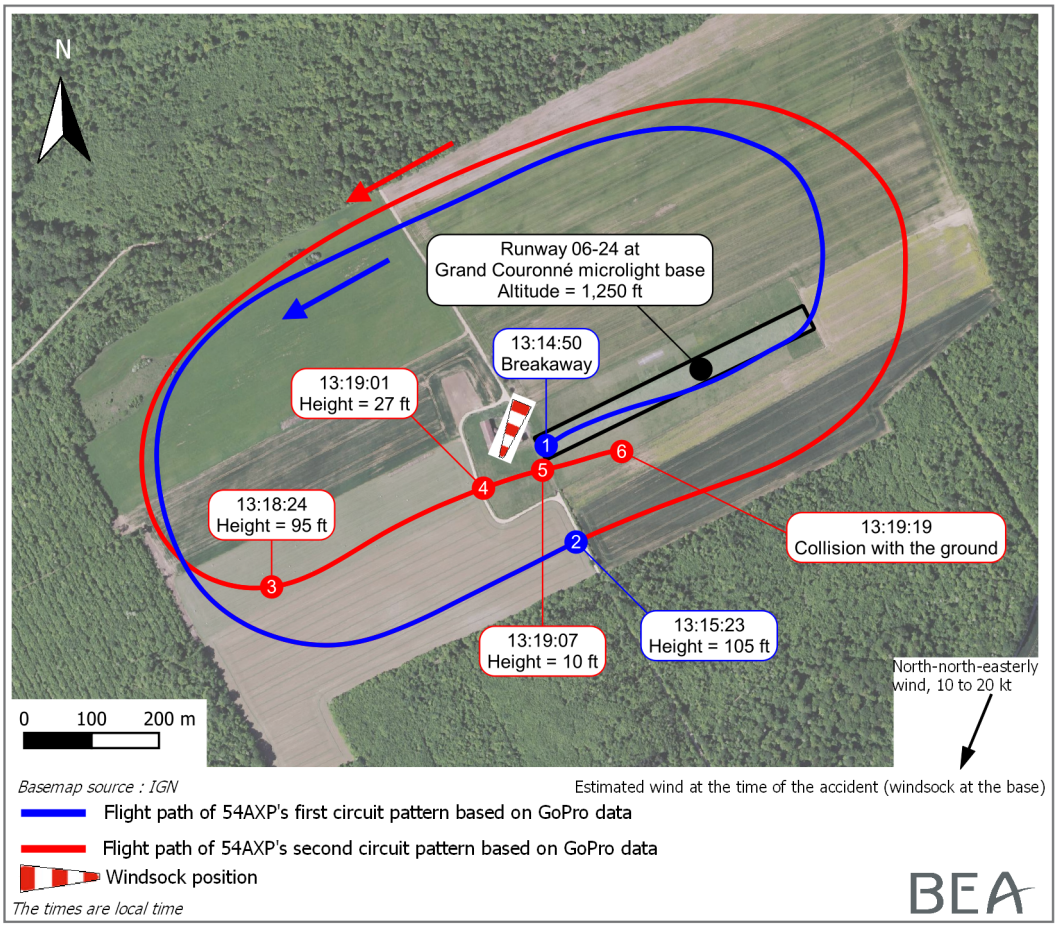

Source: BEA

Figure 1: Path of 54AXP

2 - ADDITIONAL INFORMATION

2.1 Analysis of recordings

The engine computer was taken from the accident site. It records a number ofparameters, which were analysed to determine the final accident sequence. These data were correlated with the video data. The following points were determined:

- The pilot flew across the threshold of runway 06 at a height of 10 feet at the end of the second circuit pattern. He continued his path towards hover flight.
- When he increased power to maintain the height of the microlight as it approached the ground, the microlight yawed to the right until it was at an angle of 180° in respect of its initial direction.
- The pilot then reduced power, the microlight lost height and yawed to the left; the front of the left skid struck the bank of a ditch and then rolled over on to its right side before coming to rest.

2.2 Microlight information and wreckage examination

2.2.1 CH77 Ranabot

The CH77 Ranabot is a class-6 microlight helicopter, in which the pilot sits on the right side.

54AXP was delivered to the pilot on 3 March 2019 following its construction by the CH77 importer (it had been ordered in late 2017). It was not equipped with dual controls.

2.2.2 Site and wreckage

An examination of the wreckage did not reveal any defects that could have contributed to the accident. The damage observed was caused by the accident.

Source: BEA

Figure 2: Wreckage of 54AXP

The following points were observed:

- The pilot was strapped in with his 4-point harness.
- A 15-kg bag of wood pellets was on the floor on the passenger side. This bag is provided by the importer when the microlight is delivered to simulate the effect of a passenger weighing approximately 65 kg on the centre of gravity and so that a pilot alone on board is not hampered by the lack of stability of the microlight.
- A 35-kg sandbag was strapped to the passenger seat. This bag was installed by the pilot probably to approach the maximum weight and simulate the weight of a passenger.
- The tanks contained 28 litres of fuel (total capacity of 66 l).

The estimated weight was 443 kg, which was less than the maximum weight of 450 kg. The estimate of the centre of gravity showed that it was centred towards the front of the helicopter and was within the centre-of-gravity envelope specified in the AFM.

2.3 Pilot information

2.3.1 Licence, rating and experience

The 50-year-old pilot had held a class-6 microlight pilot licence since 30 June 2017.

The pilot kept an up-to-date flight logbook. He had logged:

- 32 training flight hours on Dynali H3 during the first half of 2017, after which he obtained his licence. The instructor stated that he had not completed a supervised solo flight. This is not required under the regulations. However, it is recommended in the training manual for class-6 microlight pilots published by the French Microlight Pilots' Federation (FFPLUM), which is available on its website[4].
- 25 training flight hours on a CH77 Ranabot during the summer of 2017, the second half of 2018 and March 2019 (upon delivery of 54AXP), including dual-control flights and a few solo flights.
- 4 hours 40 minutes' flight time on 54AXP between March and July 2019 at Grand Couronné microlight base.

The pilot had passed the specific flight and ground tests (DGAC/DSAC) required to obtain the authorisation to carry a passenger on a class-6 microlight. These test certificates were signed on 4 July 2019 by the CH77 Ranabot instructor who had overseen the pilot. The pilot's logbook did not mention any flight associated with this authorisation to carry passengers.

The pilot also held a certificate issued by FFPLUM in 2019 allowing him to make commercial local microlight flights (sightseeing flights, introductory flights, initiation flights). It was signed on 6 July 2019 by the president of the club at the microlight base, of which the pilot was a member. The president of the club had held a class-3 (fixed wing) microlight pilot's licence since 1994 with an authorisation to carry a passenger and had logged about 500 flight hours. He stated that he signed the certificate because the pilot had just been authorised to carry a passenger by a class-6 microlight pilot instructor.

2.3.2 Company

The pilot was the CEO of an electrical contracting company. At the end of 2017, the company's corporate object had been extended to include other activities, such as "*helicopter sightseeing flights and helicopter rentals*."

He also ran a website for local "helicopter sightseeing flights", via which it was possible to book and pay for flights for durations ranging from 12 to 30 minutes, as well as customised flights.

The pilot was not obliged to inform the French Civil Aviation Authority (DGAC) about the commercial local flights (sightseeing flights) since this is not a specific activity defined by the order of 24 July 1991 on the conditions of use of civil aircraft in general aviation[5].

[4] https://ffplum.fr/images/formulaires/FFPLUM_pilote_classe6_ed210.pdf

[5] https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=LEGITEXT000006077971

2.4 Sightseeing flights

Article R330-1 of the French Civil Aviation Code[6] stipulates that local flights[7] performed in microlights do not require an operating licence or an air carrier certificate.

French and European regulations[8] governing introductory flights, including sightseeing flights, do not apply to microlights.

For pilots holding a Private Pilot Licence (PPL) and Light Aircraft Pilot Licence (LAPL), the following is required:

- Minimum experience: at least 200 flight hours since obtaining the licence on the category of aircraft on which the operation concerned is performed.
- Recent experience: at least 25 flight hours in the previous 12 months.

The French Aeronautical Federation (FFA) includes this information on its website in a practical information sheet entitled "*Vol de découverte*" (Introductory flights).

For microlight pilots, there is no such document or regulation. However, FFPLUM provides a certificate of "*sufficient experience*" (no values indicated) issued for the purpose of conducting commercial local microlight flights (sightseeing flights, introductory flights, initiation flights) in order to benefit from FFPLUM's aviation civil liability insurance. It can be signed by an instructor or a club president. It stipulates that the pilot has sufficient and recognised technical and teaching experience of flying microlights.

In 2016, the BEA issued the following recommendation: **the DGAC is considering the advisability of defining regulatory requirements for commercial microlight activities aimed at approximating them with the requirements defined for aircraft covered by Regulation 216/2008 [Recommendation FRAN-2016 040]**, as part of its investigation into the accident involving the microlight registered 68TK.

The DGAC, in conjunction with FFPLUM, is working on a revision of the Order of 24 July 1991, which should take account of this recommendation.

2.5 Statements

2.5.1 Statement by a person close to the pilot

She indicated that the pilot was an avid helicopter enthusiast, but said that he was always a little stressed when flying.

He therefore planned his flights carefully. She indicated that the pilot probably did not have confidence in himself and dreaded adverse meteorological conditions. He had already had a fright on a previous take-off.

He would record and watch his flights to improve his flying. He had shown her his passenger carriage certificate on July 4 and proposed to take her on a flight the next day, which she declined. The pilot had never taken a passenger on board his microlight.

He had wanted to launch his sightseeing flight venture to recoup his maintenance and fuel costs. Everything had been organised with a view to launching this venture.

[6] https://www.legifrance.gouv.fr/affichCodeArticle.do?idArticle=LEGIARTI000006844989&cidTexte=LEGITEXT000006074234&dateTexte=20060101

[7] A local flight is a non-stop flight with identical points of departure and arrival, lasting less than 30 minutes between take-off and landing, except for microlight aircraft, and during which the aircraft does not fly more than 40 kilometres from its point of departure.

[8] Order of 18 August 2016 on aspects left to the discretion of the competent national authority by amended Regulation (EU) No 965/2012 (order implementing the European regulation) https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000033052860&categorieLien=id - Decree D510-7 of the French Civil Aviation Code (decree applicable to aeroplanes and helicopters "*Appendix 1*", i.e., excluded from the scope of the European regulation) https://www.legifrance.gouv.fr/affichCodeArticle.do?idArticle=LEGIARTI000006844019&cidTexte=LEGITEXT000006074234&dateTexte=19981003

She said that there was a lot of wind on the day of the accident, particularly on the plateau on which the microlight base is located. He had not flown for two weeks. She said that ''*it had weighed on him*'' and he was anxious to get back to flying.

2.5.2 Statement by the CH77 Ranabot instructor

The instructor was also the importer and seller of the CH77 Ranabot and was based in France. He had logged more than 15,000 flight hours, mainly on helicopters and class-6 microlights.

In 2017, he met the pilot, who had held his microlight pilot's licence for just a few months. He said that the pilot's skill level at that time was still low. He had not flown solo and was not comfortable flying at height.

The pilot had made his first flights alone on board while familiarizing himself with the CH77 Ranabot. The pilot had told him that flying alone on board was very different. He had stayed in touch with the pilot after delivery of the microlight. The pilot had expressed his apprehension and the instructor had advised him to stop flying.

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 pilot was planning to perform sightseeing flights on a class-6 microlight. He had committed personally and financially to this project.

The pilot was conducting training flights with a view to launching this activity, including simulating the presence of passengers using weights placed in the cockpit.

On the day of the accident, the pilot was conducting a training flight alone on board in relatively strong wind conditions. On final, after a second low-level circuit pattern, the microlight deviated to the right of the runway, probably pushed by the wind. The pilot continued in order to enter hover on the prepared strip adjacent to the runway. As he was approaching the bank of a ditch bordering the field at a very low height, the pilot lost yaw control of the microlight. When entering hover, he increased power to maintain the height of the microlight. This action increased the counter-rotating torque of the main rotor and the microlight yawed to the right. The pilot had probably not anticipated this effect and did not sufficiently counter the torque with rudder inputs. The microlight was 180° from its initial direction. The pilot was probably worried and so reduced power. The microlight lost height and yawed to the left. The front of the left skid struck the bank and the microlight rolled over on its right side and came to rest.

Contributing factors

The pilot was probably feeling under pressure due to the impending start of his sightseeing flight venture. This may have led him, despite his apprehension, to continue flying without seeking outside assistance, including for aspects relating to the carriage of passengers.

The low height at which the circuit patterns were completed may have been symptomatic of this apprehension.

The stress caused by a possible lack of confidence in his ability to cope in the prevailing flight conditions may have had an impact on his performance, particularly during his second offset approach and hover.

The strength of the wind, which was close to the microlight's demonstrated hovering limits, may have contributed to the pilot's difficulty in maintaining control.

Safety lessons

The pilot had the necessary authorisations to perform sightseeing flights in microlight aircraft. He had little experience, about 60 hours of dual-control flights and about five flight hours alone on board.

The pilot, who was alone on board on this flight, was preparing for commercial flights. This occurrence highlights the fact that a pilot who was still in the process of perfecting his skills was able to conduct local commercial flights in microlights even though he had little experience. The discrepancy between the requirements of such an activity and the skills acquired can have a negative impact on flight performance and thus on flight safety.

The activity of commercial microlight flights is not subject to minimum experience, unlike similar activities on aircraft covered by Regulation (EC) No 216/2008 of the European Parliament and of the Council. A forthcoming revision of the Order of 24 July 1991 should incorporate requirements to ensure a minimum level of competence and experience for pilots performing commercial operations, in particular in microlight aircraft.

In the past, the BEA has recommended to the DGAC that it define regulatory requirements for commercial activities performed in microlights.