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

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SAFETY INVESTIGATION REPORT

Accident to the BELL 206 B registered F-BXPF on Friday 3 May 2024 at Peyriac-de-Mer

Time	Around 10:10[1]
Operator	Helicoandrone
Type of flight	Spraying
Persons on board	Pilot
Consequences and damage	Helicopter 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.	

Collision with surface of water during a transit leg of a mosquito eradication flight

1 HISTORY OF THE FLIGHT

Note: the following information is principally based on statements and recordings from the GTN650 computer.

The pilot, sat in the right-hand seat, took off at around 09:40 from the helicopter landing site (HLS)[2] for the fifth mosquito eradication flight of the day. He treated a first area close to HLS, crossed Bages lake, treated new areas and then started flying back across the lake to return to HLS (see **Figure 1**, point 1).

Initially, the helicopter climbed to a height of around 60 m (point 2). After level flight at this height for around 20 s (point 3), the helicopter smoothly descended with an average vertical speed of 350 ft/min. After descending for roughly 35 s, it struck the surface of the water and sunk (point 4). The pilot managed to unfasten his seatbelt and exit the helicopter through the broken canopy. He was picked up by a fisherman who was close to the accident site.

[1] Except where otherwise indicated, the times in this report are in local time.
[2] This is an unlisted site at the following coordinates: 43° 07' 06" N and 3° 02' 09" E.

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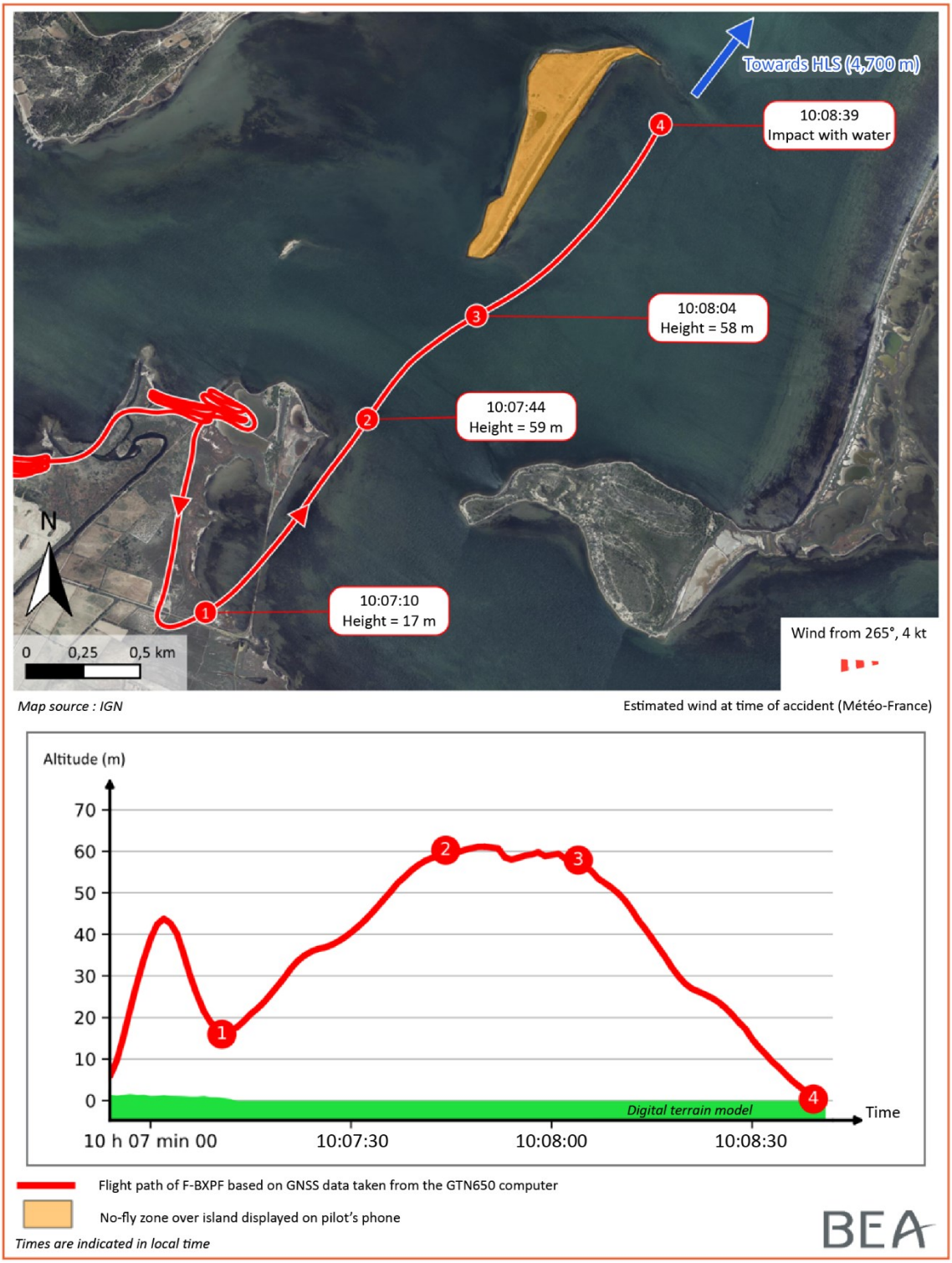

Figure 1: flight path (source: BEA)

2 ADDITIONAL INFORMATION

2.1 Site and wreckage information

The wreckage was lying on its left-hand side, partially submerged in Bages lake, at a depth of around two metres. It was raised by helicopter on 6 May 2024, i.e. three days after the accident. The wreckage had drifted with the current. Not all the parts were found despite later searches.

The airframe had very little damage. The rupture of the tail boom was the result of the blades coming into contact with the surface of the water.

The examination of the tail rotor controls along with the cyclic and collective pitch controls found that they were continuous at the time of the collision with the surface of the water.

The fuel system was continuous, no contamination was observed in the filter. The quantity of remaining fuel was sufficient to continue the flight. A deposit was observed in the bottom of the fuel tank.

2.2 Additional examination information

2.2.1 Examination of engine

The engine was removed and disassembled. The examination was carried out at a manufacturer-approved service centre, under the supervision of the BEA. The examination found that the engine was operating and delivering power at the time of the impact. However, the damage caused by the impact and the corrosion from being submerged in salt water meant that it was not possible to determine the engine's power output.

2.2.2 Fuel analysis

A fuel sample was taken from the helicopter's fuel tank and the refuelling tank. A sample of the deposit observed at the bottom of the tank was also collected.

The analyses showed that it had characteristics corresponding to those of the specified fuel. No contamination was detected.

The analyses showed that the deposit was primarily composed of salt[3]. The presence of salt at the bottom of the tank may be a consequence of water present at the bottom of the tank, prior to the accident, which could have been removed by regular bleeding.

2.3 Helicopter information

The Bell 206B is a five-seat helicopter equipped with a Rolls-Royce M250-C20B engine.

The instrument panel includes an airspeed indicator, a vertical speed indicator, an altimeter, an artificial horizon, and instruments for monitoring engine parameters. The helicopter is not equipped with an autopilot.

[3] Salt is not soluble in JET A1.

The helicopter was dry leased by the operator from 25 March 2024, for a period of seven months with a 100-hour limit.

2.4 Read-out of recorded data

The helicopter was equipped with a Garmin GTN650 on-board computer The SDVFR and Field Navigator[4] applications were installed on the pilot's mobile phone. The GNSS data extracted independently from these systems was consistent and made it possible to reconstruct the flight path.

The analysis of the flight paths of previous flights and the accident flight showed that:

- the altitude of the positioning flight at the start of the day, lasting approximately five minutes, was between 300 and 400 ft;
- the altitude of the legs between the different areas of activity of previous flights was between 200 and 300 ft for legs lasting four to five minutes and approximately 100 ft for legs lasting approximately one minute;
- the altitude crossing the lake at the start of the accident flight, lasting approximately three minutes, was between 25 ft and 100 ft.

The analysis of the pilot's phone activity showed that it was not used for any applications other than those mentioned above during the accident flight.

The data recorded on the SD card of the Crosstour CT9000 camera recovered from the wreckage did not contain the end of the accident flight.

2.5 Meteorological information

Météo-France estimated that the meteorological conditions on the accident site were: wind from 265° of 4 kt with gusts of 8 kt, CAVOK, temperature 14°C, dew point temperature 4 °C.

At the time of the accident, the azimuth of the sun was 92.5° for an elevation of 26.2°.

2.6 Pilot information

The 53-year-old pilot held a helicopter Commercial Pilot License (CPL(H)), with a valid Bell 206 rating. He had logged around 6,000 flight hours, including 240 hours on type and 84 hours in the previous three months. He specified that the majority of his experience was aerial work on the Bell 47.

2.7 Statements

2.7.1 Pilot's statement

The pilot stated that it was the first day of the mosquito eradication mission. He did not feel tired. He had accepted the helicopter the previous day in Lézignan-Corbières and had carried out the positioning flight to Narbonne aerodrome. The morning of the accident, he took off at around 06:20 from Narbonne to reach the HLS located a few minutes' flight away. He recalled a slight humming sound, which he was not used to hearing, during the morning's positioning flight. He specified that this noise came from the rear.

[4] Application used to follow parallel lines in a field.

Before each spraying flight, he topped up the fuel and mosquito eradication product. At the end of the fourth flight, at around 09:00, he took a short break while waiting for the tank to be refilled with the mosquito eradication product. During this break, he placed a camera on the helicopter's spray booms for personal purposes.

He specified that at the end of the rotations, after landing, an amber "TRANS PRESS" indicator light, regarding the transmission oil pressure, would illuminate. This light was no longer on when the system was pressurized at the start of the flights. As the other parameters were normal, he was not concerned.

During the fifth flight, he crossed the lake to treat the fields located on the other side until the product was depleted. He then headed south while consulting the spraying tracking app on his mobile phone[5] in order to record the last field treated. Then he began crossing the lake again to reach the HLS. He estimated that he flew over the lake at a height of approximately 20 m and a speed of 80 kt. He specified that upon approaching a no-fly zone over an island to his left, he regularly monitored his position relative to the island using his mobile phone. At the same time, he continued to visually scan the exterior to ensure safety and to monitor the instruments. He then felt a strong jolt and looked at the instrument panel, without detecting any warnings or anomalies, then looked to the right and left to try to understand what was happening. The pilot reported that the helicopter nosed down and struck the water's surface.

He did not recall intentionally descending while crossing the lake towards the HLS. He thought he had maintained a straight flight path. He explained that he did not have sufficient visual references to judge the helicopter's attitude.

He added that that day, he had not been using the tablet usually provided by the operator because the latter had forgotten to bring it. He added that using a phone, with its smaller screen, forced him to lean slightly forward to read the information displayed on the screen. He recalled that on a previous flight without a tablet, the helicopter had started to descend while he was leaning towards the phone, but he noticed it thanks to external references, particularly the vegetation.

2.7.2 Fisherman's statement

The fisherman stated that he was sailing towards Bages. He heard the helicopter and turned around to look at it briefly. It was flying at low height over the water. He was not concerned, as it is common to see helicopters or aeroplanes at this height during mosquito eradication flights. When he turned around again to look at the helicopter, it was in a dive and struck the water three seconds later. He was not sure if he could still hear the engine during the dive and the impact.

At the time of the accident, he was about 50 m away. He changed course to come to the aid of the pilot.

2.8 Operator information

The operator had recently added agricultural spraying as an area of expertise and leased the F-BXPF for this activity. It had updated the Operations Manual (OM) to incorporate these changes.

[5] The mobile phone was attached with a suction cup mount to the right side of the canopy, slightly high up.

The OM specifies that spraying activities are carried out under VFR with sight of the ground. The treatment height is between one and five meters above the vegetation, and the flight height during positioning flights or between different zones of activity must be a minimum of 500 ft, except for reconnaissance flights of the plots to be treated.

For spraying operations, the operator had planned to use an EFB[6], but had not yet acquired the hardware and associated software. Pending this acquisition, it provided each pilot with a tablet on which an agricultural tracking application was installed, in order to provide the customer with the flight paths flown.

3 CONCLUSIONS

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

Scenario

While flying over the lake to return to the landing area, the pilot unintentionally initiated and controlled the continuous descent of the helicopter at an average vertical speed of 350 ft/min for approximately 35 s from a height of 60 m, while he believed he was in level flight at a height of approximately 20 m. The helicopter struck the water's surface. The pilot managed to release his harness and evacuate through the shattered canopy as the helicopter sank. He was picked up by a fisherman who was close to the accident site.

Contributing factors

The following factors may have contributed to the pilot's loss of situational awareness and the helicopter's collision with the surface of the water:

- the pilot paying increased attention to his telephone while flying at low height over a surface with few visual references;
- the use of an unusual additional navigation aid that required the pilot to change his piloting position by leaning forward, unconsciously making a slight nose-down input;
- the decision to transit at low height, which reduces safety margins.

Safety lessons

Use of a Portable Electronic Device (PED)

An increasing number of pilots are using PEDs, such as tablets, mobile phones, or handheld GPS devices, as an additional navigational aid. The AIR OPS regulation[7] requires that the use of such devices must not affect the performance of aircraft systems and equipment or the ability of the flight crew to operate the aircraft.

PEDs, through various applications, offer numerous advantages such as the availability of documents and data, real-time display, easy familiarization, and customization options. But they also present risks: risks of interference with on-board systems, risks of errors or failures, risks of overheating and fire. They can also, in some cases, contribute to a form of pilot distraction. Thus, even when continuing to carry out a visual scan of the exterior or the primary flight instruments,

[6] Electronic Flight Bag.

[7] Commission Regulation No 965/2012 of 5 October 2012 laying down technical requirements and administrative procedures related to air operations (Version in force on the day of the accident).

the analysis of these references may no longer be sufficiently active. This dissociation between vision and attention reduces the ability to detect certain threats. Maintaining a visual scan then becomes purely functional: it serves to stabilize the flight path, but no longer to prevent risks. The implicit objective has changed, without the pilot being aware of it. Certain salient visual signals can reorient attention and interrupt the dissociation between vision and active analysis; these visual signals are more or less present depending on the area being overflown.

Furthermore, it is important to ensure that the PED is installed in such a way that useful information can be easily consulted without the pilot having to adjust his position.

EASA has published an awareness raising message on this topic, mentioning the video produced by the group "The Rotorcraft Collective" and published by the FAA.

Overflight height

Spraying operations are exempt from the minimum overflight height stipulated by the SERA regulation[8]. This exemption does not cover positioning flights or transit phases to or from landing areas. When these flight phases are short, pilots may be tempted to maintain a relatively low height, keeping to a form of operational logic. This practice can lead to a significant reduction in safety margins at times when attention is not at its highest.

[8]Commission Implementing Regulation (EU) No 923/2012 of 26 September 2012 laying down the common rules of the air and operational provisions regarding services and procedures in air navigation (Version in force on the day of the incident).