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

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SAFETY INVESTIGATION REPORT

Accident to the Robin DR300 - 140 registered F-BSPK on 24 September 2023 at Calais-Marck (Pas-de-Calais)

Time	Around 18:05[1]
Operator	Aéroclub de la côte d'Opale
Type of flight	Introductory flight
Persons on board	Pilot and three 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.	

Collision with kite lines in aerodrome circuit, during an introductory flight

1 HISTORY OF THE FLIGHT

Note: the following information is principally based on statements and radar data.

The pilot was carrying out an introductory flight with a father and his two children in the scope of the "*Un enfant dans le ciel*" day organised locally. He took off from Calais-Marck airport at around 17:50 for a local flight. The A/A[2] procedure was in force. After flying over the Blanc-Nez headland (see Figure 1, point 3), he headed back to the airport and joined the RH downwind leg for runway 24 at an altitude of around 1,200 ft. He was alone in the airport circuit. He turned onto the base leg opposite Oye-plage at an altitude of around 1,000 ft. At the start of the last turn (point 6), at an altitude of around 500 ft, he observed that the speed displayed on the airspeed indicator was progressively decreasing until it reached zero at the beginning of the final. He then complied with the airspeed indicator failure procedure and landed without incident at around 18:10.

On arriving on the apron, he saw that the wings had been cut from the leading edge to the spar, across the entire thickness of the wing. He found a line measuring 69 m long in the cut in the left wing.

It was determined that this event was caused by the aeroplane colliding with kite tether lines while flying over the beach on the base leg at an altitude of 790 ft (point 5). During the collision, no jolts were felt on board, and no warnings or warning lights were activated.

[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.

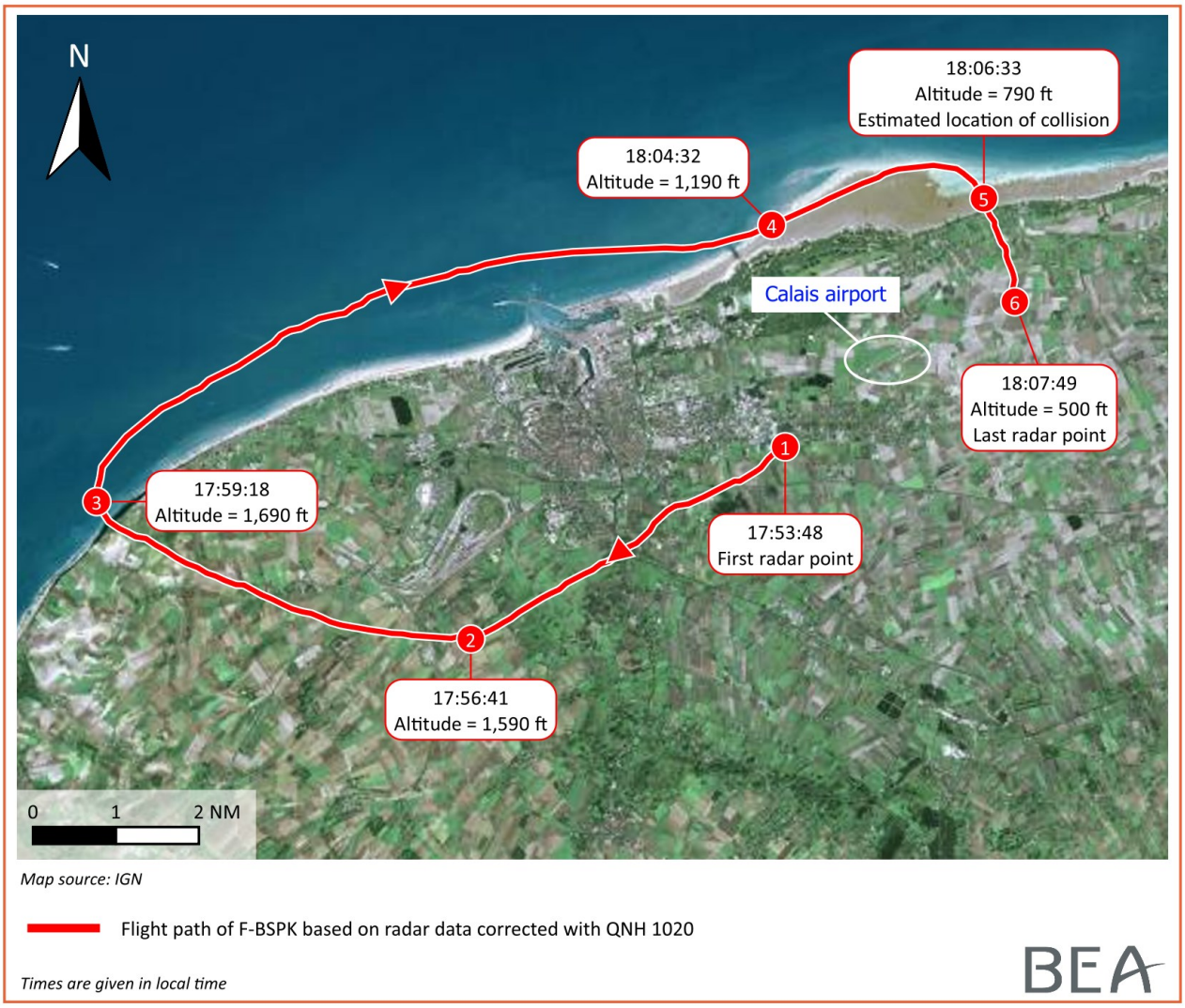

Figure 1: flight path of F-BSPK (Source: BEA)

2 ADDITIONAL INFORMATION

2.1 Meteorological information

The meteorological conditions were the following: wind from 170° of 11 kt, CAVOK.

2.2 Pilot information

The 64-year-old pilot held an aeroplane Private Pilot Licence (PPL(A)) obtained in August 1997 along with the Single Engine Piston (SEP) rating. He had logged 740 flight hours, most of these on the DR300 and DR400, including 21 hours in the previous 3 months and 11 hours in the previous month.

2.3 Damage to aeroplane

The leading edges of the RH and LH wings had been cut.

On the LH wing (see Figure 2), there was a cut in the leading edge over around 40 cm, the wiring for the navigation lights and the Pitot tube line had been severed and there was a cut in the spar over around 5 cm.

On the RH wing (see Figure 3), there was a cut in the leading edge over around 12 cm, and a very small cut in the spar.

Figure 2: LH wing (Source: BEA)

Figure 3: RH wing (Source: BEA)

A line measuring 69 m long with a section of 0.8 mm was found caught in the cut in the LH wing (see Figure 4 below).

Figure 4: line found caught in wing (Source: BEA)

2.4 Origin and characteristics of kite line

A metal bar, around which a kite retaining line was wound, was handed to the BEA, the day after the accident, by witnesses who had been on the beach on the day of the occurrence (see Figure 5 below). The line found on the aeroplane and the one handed over to the BEA were similar. The sum of the lengths of line found was of the order of 500 m.

Figure 5: kite found on beach (Source: BEA)

The upper part of the line, close to the kite, was coated with an abrasive material. The examinations carried out at the BEA using energy dispersive spectrometry coupled with a Scanning Electron Microscope (SEM) revealed the presence of silicon carbide and aluminium oxide (alumina). These components are known for their abrasive characteristics[3].

The bar and wire together weighed around 400 g. The kite, measuring 50 cm long and 60 cm wide, made of very thin paper and light wood, weighed 380 g. The whole system weighed around 780 g.

2.5 Statements

Two people who had been land yachting indicated that kite fights (see paragraph 2.6) had been in progress on the beach. The kite flyers, according to the witnesses, were Pakistanis. After discussions with the witnesses, the kite flyers handed over all of the system to them.

The BEA contacted the Calais town hall, the Oye-Plage town hall, the operator of Calais-Marck airport, and the *Direction Départementale des Territoires et de la Mer* (DDTM) in Boulogne-sur-Mer, which manages requests for kite activities in the scope of events, festivals or gatherings taking place on the coast. None of these services had received a request for the type of kite activity involved in this accident.

The police and gendarmerie services also indicated to the BEA that the kite flyers had not been identified, despite the searches and surveillance carried out in the days following the accident.

[3] This type of line is an easily found off-the-shelf item.

2.6 Kite fighting

This activity, which is particularly popular in Asia, involves kites in close combat trying to cut the opposing kite line by performing shearing manoeuvres when the lines come into contact with each other. To this end, the upper part of the lines is coated with an abrasive material. In Asia, the abrasive part generally consists of a mixture of finely ground glass and rice glue. The lines used for this activity are generally 500 to 600 m long.

2.7 Similar occurrence

Members of the Côte d'Opale flying club were informed of a similar incident the previous month involving a Gendarmerie helicopter on a coastal surveillance mission.

A member of the flying club was able to meet with the gendarmerie section in question and reported that the helicopter pilot had indicated that he had seen a line while flying at an altitude of between 500 and 1,000 ft at the same place where the accident to F-BSPK occurred. It would appear that the line was of a larger diameter than the one involved in the collision with F-BSPK. The pilot thought it was a tethered drone and manoeuvred to avoid collision with the line, which he estimated to be between 300 and 400 m long. He then noticed several kites flying around him.

2.8 Regulatory aspects

2.8.1 Regulation (EU) No 2018/1139 of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency[4].

Under this European regulation, kites are considered to be tethered aircraft with no propulsion system.

However, the abovementioned regulation does not apply if they meet the following criteria:

- the maximum length of the tether is 50 m and their MTOM[5] is less than 25 kg; or
- their MTOM is less than 1 kg, whatever the length of the tether.

This regulation was therefore not applicable in this case because of the weight of the kite and the tether which was approximately 780 g.

For information, this regulation also specifies that, "*The operator and the remote pilot of an unmanned aircraft must be aware of the applicable Union and national rules relating to the intended operations, in particular with regard to safety, privacy, data protection, liability, insurance, security and environmental protection*. *The operator and the remote pilot must be able to ensure the safety of operation and safe separation of the unmanned aircraft from people on the ground and from other airspace users. This includes good knowledge of the operating instructions provided by the producer, of safe and environmentally-friendly use of unmanned aircraft in the airspace [...].*"

Furthermore, these aircraft, when they are subject to the provisions of abovementioned regulation (EU) 2018/1139, must comply with the provisions of Commission implementing regulation (EU) 2019/947 of 24 May 2019 on the rules and procedures for the operation of unmanned aircraft[6].

[4] Version in force on the day of the accident.
[5] Maximum Take-Off Mass.
[6] Version in force on the day of the accident.

As a consequence, they can:

- manoeuvre in the “open” category of operations if they are, among other things, maintained within 120 m. The pilot must always have the aircraft in his visual line of sight. The flights are not subject to any prior operational authorisation;
- manoeuvre in the “specific” category of operations if they are flying at a height of more than 120 m, after having carried out a safety study and been given approval by the civil aviation safety directorate.

2.8.2 Order of 3 May 2017 on the use of non-motorised ultralight aircraft[7]

This order defines a "non-motorised ultralight aircraft" as a non-motorised, single-seat or two-seat aircraft.

This regulation does not therefore apply to kites.

For information, this order specifies that when the tether is less than 50 m, these aircraft are:

- exempted from having airworthiness documents;
- may be flown without an aeronautical qualification;
- are not subject to the Order of 24 July 1991 on the use of civil aircraft in general aviation (article 3 of this 1991 Order, as amended).

2.8.3 Order of 3 December 2020 on the use of airspace by unmanned aircraft[8]

The provisions of this order do not apply to tethered balloons, kites, rockets or unmanned aircraft operating under military air traffic regulations.

2.8.4 Synthesis

No specific regulations apply to kites with a MTOM of less than 1 kg.

However, article L 6131-2 of the Code of Transport stipulates that the operator of an aircraft is fully liable for damage caused by the manoeuvres of the aircraft or objects that separate from it, to persons and property on the ground.

3 CONCLUSIONS

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

Scenario

On returning from an introductory flight, the pilot joined the RH downwind leg for runway 24 at an altitude of around 1,200 ft. In the base leg, at an altitude of 790 ft, the aeroplane collided with the lines of kites being flown by kiters who were carrying out non-declared kite fights. The approximately 500-m long tethers, the top part of which was covered by an abrasive material, cut into the LH and RH wings and severed the air data system making the latter inoperative. No jolts were felt on board, and no warnings or warning lights were activated. The pilot did not realise that this collision had occurred. At the end of the base leg, at an altitude of around 500 ft, he observed that the speed displayed on the airspeed indicator was progressively decreasing until it reached zero at the beginning of the final. He complied with the airspeed indicator failure procedure and landed without incident.

[7] Version in force on the day of the accident.
[8] Version in force on the day of the accident.

Safety lessons

No specific regulations apply to kites with a MTOM of less than 1 kg. Kite flying is considered to pose no risk to aviation safety as the majority of kites are flown at a height of less than 50 m. Furthermore, kite-fighting activities remain marginal and given the low probability of a collision such as that described in this report, the aviation authorities are not considering amending the regulations for kites with a MTOM of less than 1 kg.

It should also be noted that kite flyers, particularly those involved in kite fighting, are not necessarily aware of the risks of their activities interfering with aviation activities.

It therefore seems that the only possible solution is for aerodrome operators to step up surveillance of the area around their aerodrome, as is already the case for the presence of any obstacles.

4 SAFETY MEASURES TAKEN SINCE THE OCCURRENCE

As an immediate measure, the North civil aviation authorities alerted the local elected representatives in the coastal areas about the risk to aviation from kite fighting, emphasising the dangerous nature of engaging in such activities at heights of over 50 m.