

**FINAL REPORT ON THE ACCIDENT
TO THE ULM ICP MXP740 Savannah
REGISTERED 59-CBE AT
COMBLAIN-AU-PONT ON
10 JULY 2011**

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1. FOREWORD

This report is a technical document that reflects the views of the investigation team on the circumstances that led to the accident.

In accordance with Annex 13 of the Convention on International Civil Aviation, it is not the purpose of aircraft accident investigation to apportion blame or liability. The sole objective of the investigation and the Final Report is the determination of the causes, and define recommendations in order to prevent future accidents and incidents.

In particular, Art. 17.3 of EU Regulation 996/2010 stipulates that a safety recommendation shall in no case create a presumption of blame or liability for an accident, serious incident or incident.

Unless otherwise indicated, recommendations in this report are addressed to the Regulatory Authorities of the State having responsibility for the matters with which the recommendation is concerned. It is for those Authorities to decide what action is taken.

The investigation was conducted by L. Blendeman, H. Metillon and S. Laureys.
The report was compiled by L. Blendeman

NOTE:

For the purpose of this report, time will be indicated in UTC, unless otherwise specified.

2. GENERAL INFORMATION

Classification: **Accident**
Status: **Final**
Date: **10 JUL 2011**
Time: **15:12 UTC**
Type: **ICP MXP740 Savannah**
Operator: **Private**
Registration: **59CBE / F-JXQC**
msn: **010051001**
Manufacturing Date: **2000**
Engine: **Rotax 912UL**
Propeller: **Duc**
Airframe TT: **273:36FH**

Crew: **Pilot**
Age: 48 years old, male.
ULM Pilot Licence, issued by the French DGAC on 02 JUL 2001.
Ratings:
3-axis ULM (Ultralight).
Authorization to carry a passenger

The pilot started his career in 1999. He held a ULM Pilot licence issued by BCAA in 2002 (but not renewed in 2003), and started training for Private Pilot Licence (PPL) in January 2009.

The pilot passed successfully the flight examination for PPL licence in December 2009, but needed yet to pass the English proficiency examination to get the PPL licence.

Total VFR flight experience exceeds 300FH.

Aircraft Damage : **Totally destroyed.**
Location: **On the banks of the Ourthe river
N 50° 27.958' E 005° 34.773'**
Phase: **Cruise**
Nature: **Private flight.**
Departure Airport: **Private field in Lince**
Destination Airport: **Unknown**
Flight Number: **NA**

3. NARRATIVE

The pilot prepared his airplane for a leisure flight. The airplane took off from a private field in Lince, in the neighbourhood of the pilot's house at 15:01 UTC.

The pilot decided to fly above the Ourthe valley, at 15:12 UTC he was flying at 166 km/h at an altitude of 550 ft (180m) amsl inside the Ourthe valley, at the height of the village of Comblain-au-Pont.

The airplane hit a high voltage line (70kV Goreux – Comblain). The left wing was severed, and the airplane fell down, crashing on the banks of the Ourthe Valley.

A person saw the accident happening, called the emergency services, and ran towards the crashed airplane. The crash area was not easily accessible for the fire brigade and emergency services. The pilot had to be freed from the wreckage, and was transported to the hospital by helicopter.

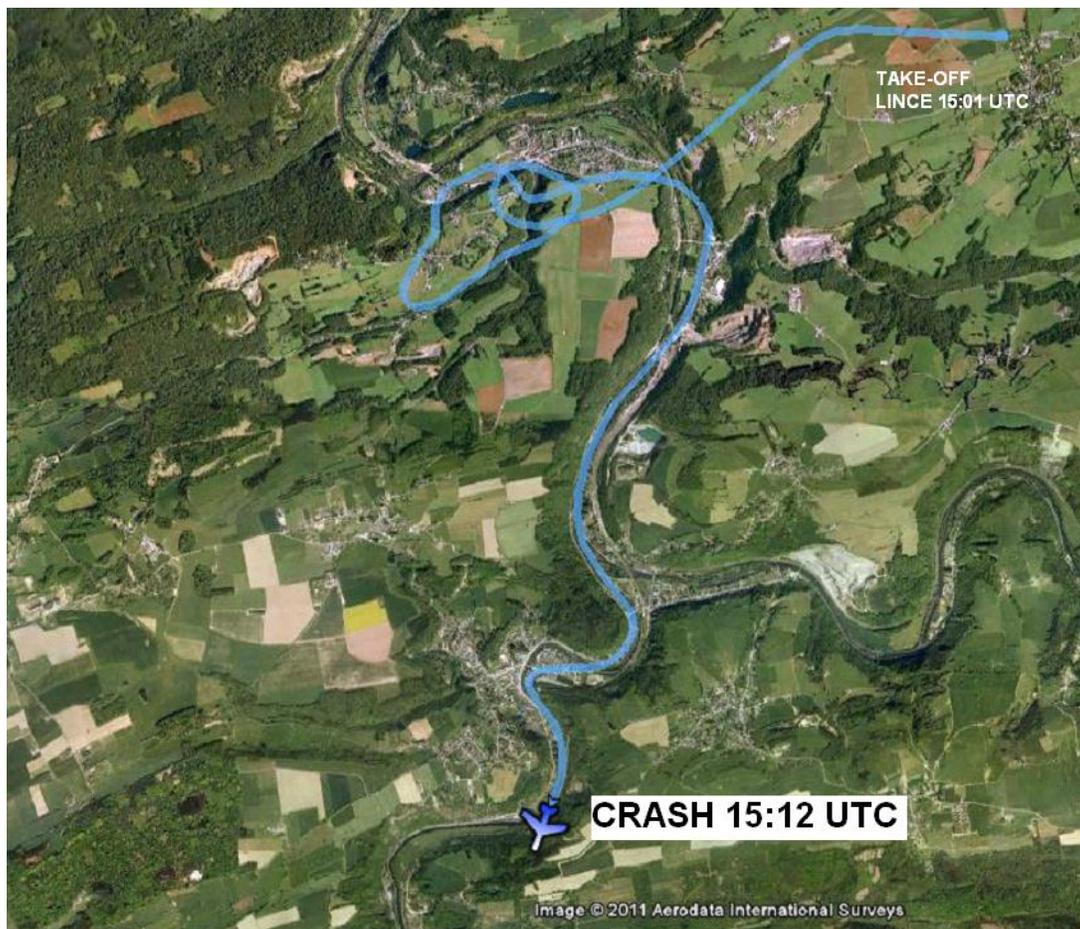


Fig. 1: The flight

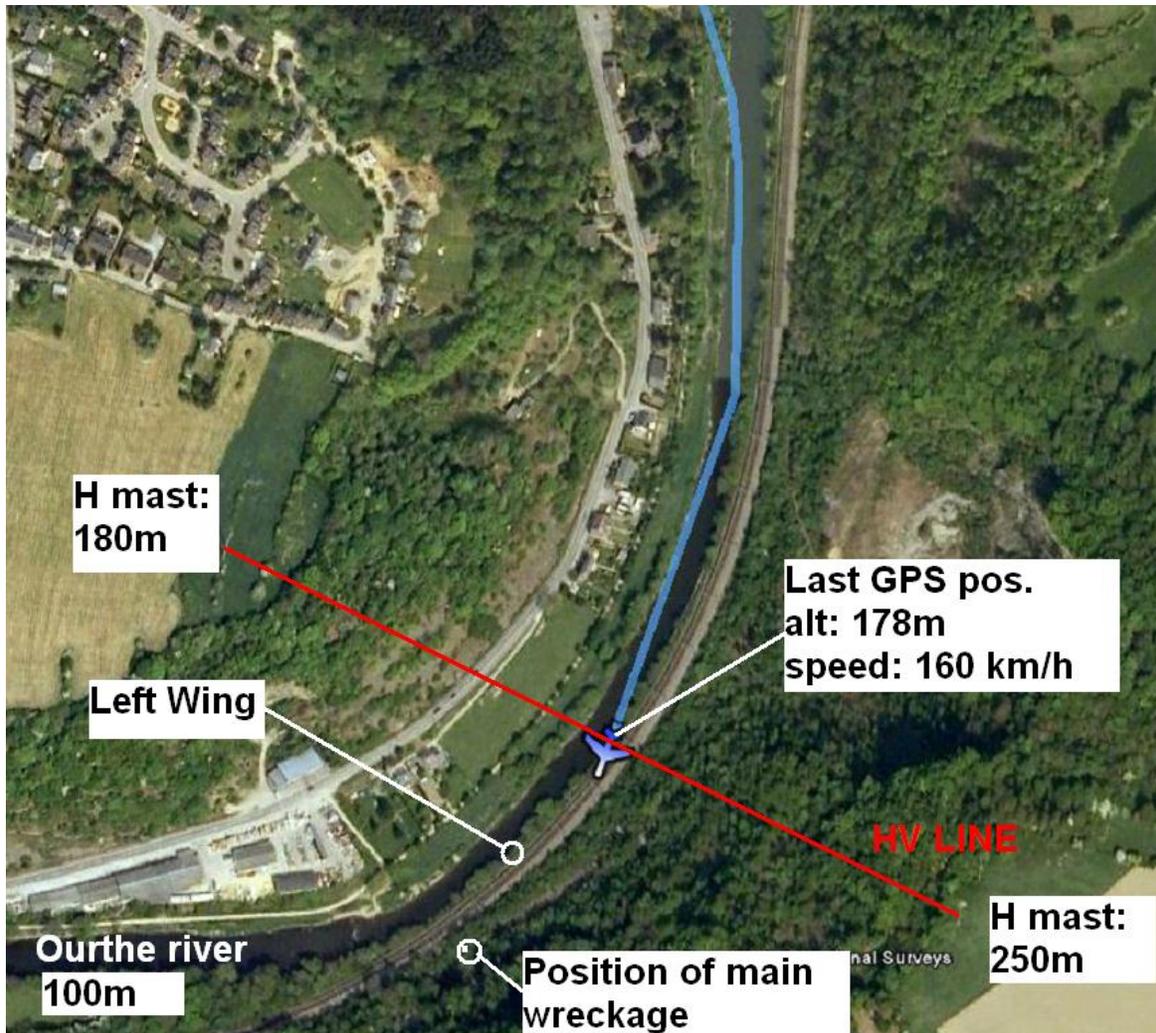


Fig.2: Crash area

4. INJURIES TO PERSONS.

Injuries	Pilot	Passenger	Others	Total
Fatal	0	0	0	0
Serious	1	0	0	1
Minor	0	0	0	0
None	0	0	0	0
Total	1	0	0	1

The injuries of the pilot were extensive, his condition was life threatening upon his evacuation, and extensive surgery was necessary, involving amputation of limbs.

5. AIRPLANE DAMAGE

The airplane fell on the steep side of the hill bordering the Ourthe river.

The left wing was severed at the root during the initial shock with the HV power line. It shows signs of burning at the leading edge due to arcing further to the contact with the cable. It rested below the railroad embankment.

The wreckage of the airplane rested in a wood on the other side of the railroad tracks, further away from the Ourthe river. The RH wing shows impact traces of trees. The fuselage is crushed by impact.

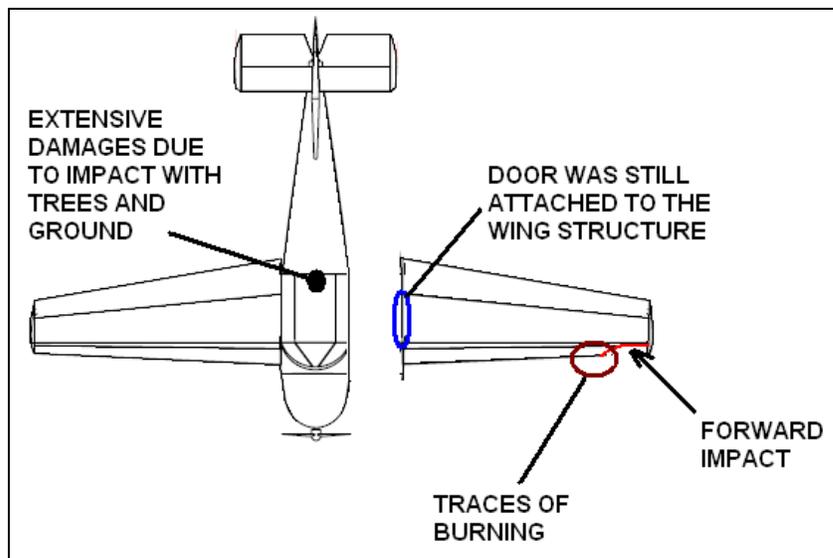


Fig. 3: Damage location

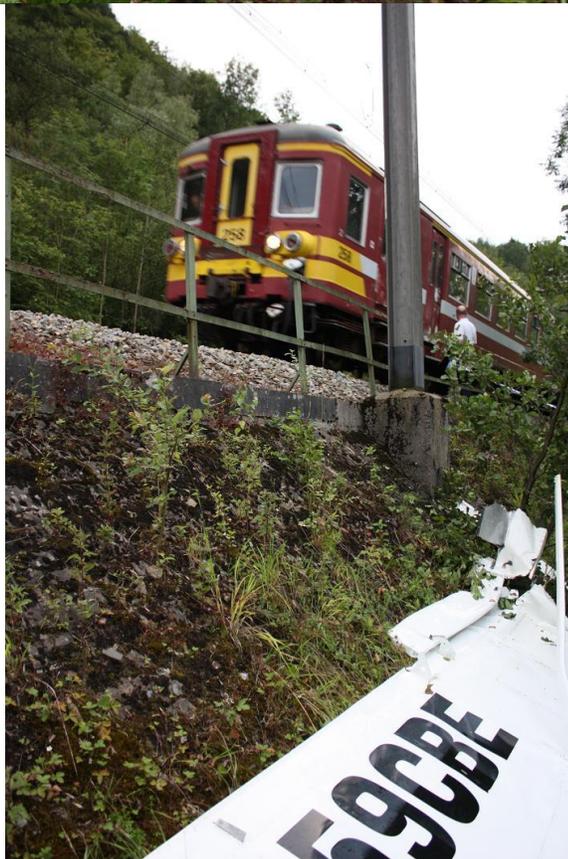


Fig 4 and 5.: Airplane damage

6. METEOROLOGICAL INFORMATION

METARs of Liege Airport (EBLG)

Time: 14.50 UTC

Wind

Direction: 360 degrees – variable between 310 and 030 degrees

Speed: 5 kts

Forward visibility: more than 10 km

Clouds: Few at 4000 ft

Temperature: 19°C

Dew point: 11°C

QNH 1018 hPa

7. AIRPLANE INFORMATION



Fig. 6 : Savannah MXP-740

The Savannah MXP-740 is a conventional, three axis, strut braced, monoplane, constructed of aluminium alloy. It has a high-wing, with a fixed tricycle landing gear. The high-lift wing incorporates leading edge slats and up to 40° of flap (flaperons) for short take-off and landing performance (STOL). Seating for two persons is provided side-by-side with a Y-shaped control column between the two seats. Each seat has a four-point attachment seatbelt. It is equipped with two sets of rudder pedals and two throttles. Two wing tanks and an in-line collector tank located behind the seat have a total fuel capacity of 80 litres. The useable fuel is 77 litres.

Specifications (typical)

Empty Weight	267 kg
Maximum Take Off Weight:	450 kg
VNE	108 kts
Max Speed	87-95 kts
Cruising Speed	78-84 kts
Manoeuvring Speed	74 kts
Approach Speed	31 kts
Stall Speed	23 kts
Range	800 km
Take-off roll	30 to 40 metres

Wing span:	9m
Length:	6.5m
Height	2.9m

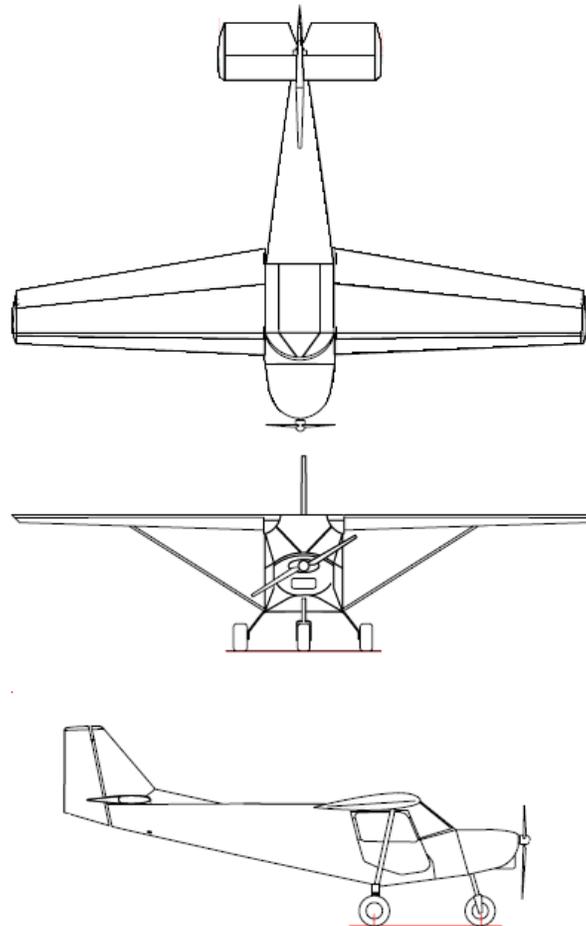


Fig. 7 : 3-view of the Savannah MXP-740

8. SURVIVABILITY

The airplane was not designed to withstand the impact forces, nor was it supposed to, and the pilot was trapped inside the fuselage, his legs caught between the structure and the engine.

The wreckage was barely visible from the road, on the other side of the river, and the area is not heavily populated. The access to the crash area itself was quite difficult, and was only reachable on foot.

The contact with the HV power line itself caused the electrical protection to trip, but the power was reactivated automatically after the short circuit disappeared. The electrical company was not aware of the event at the time.

Fortunately, the pilot remained conscious after the crash, and the accident was witnessed by two persons, fishing in the river, who could raise the alarm.

9. OBSTACLE: The Power Line

The power line crossing the Ourthe river consists of 3 cables running side-by-side from 2 poles located on both sides of the banks of the river (poles N° 42 and 43).

The cables have an external diameter of 12.5 mm and are made of an AMS alloy (Aluminum).

At the time of the accident, the line was carrying 9.6MW from the village of Heid-de-Goreux to Comblain au Pont.

The presence of the line is identified on the aeronautical charts (Low-Air M534 Ed 20).

The cutaway view hereunder is based upon an anamorphic drawing made by Elia. The actual position of the line (red colour) depends from the ambient temperature, the electrical current. The actual position of the cable may vary greatly from the standard position depicted on the drawing.

The power line was not provided with markers to signal its presence, such as lighting or warning balls.

Circulaire /Omzendbrief CIR/GDF03: Marking of obstacles is based upon ICAO Annex 14, Chapter 6 Visual aids for denoting obstacles.

Both documents state the following;

Overhead wires, cables, etc., crossing a river, valley or highway should be marked and their supporting towers marked and lighted if an aeronautical study indicates that the wires or cables should constitute a hazard to aircraft, except that the marking of the supporting towers may be omitted when they are lighted by high-intensity obstacle lights by day.

The BCAA confirms that to-date there is no aeronautical study performed for the Ourthe valley.

After the accident, Elia, the electrical company, confirmed the power line did not suffer any damage.

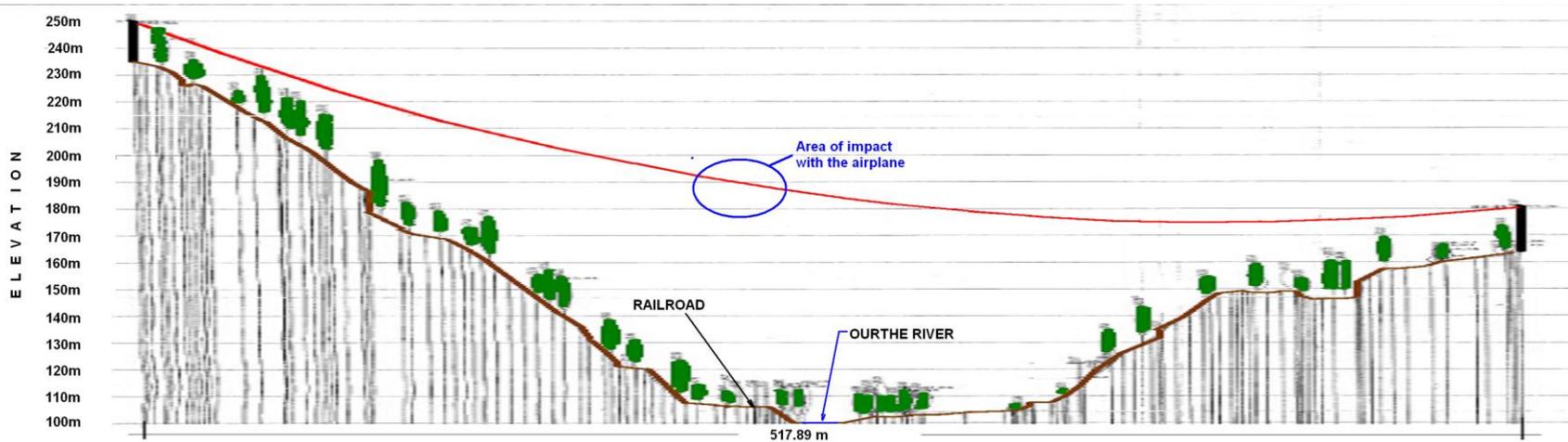


Fig 8: Cutaway view of the Ourthe valley where the HV Power line crosses the valley (facing South West)

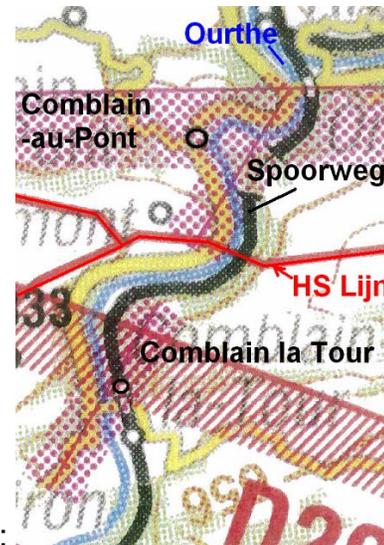


Fig. 9: Detail of the Low-Air chart :

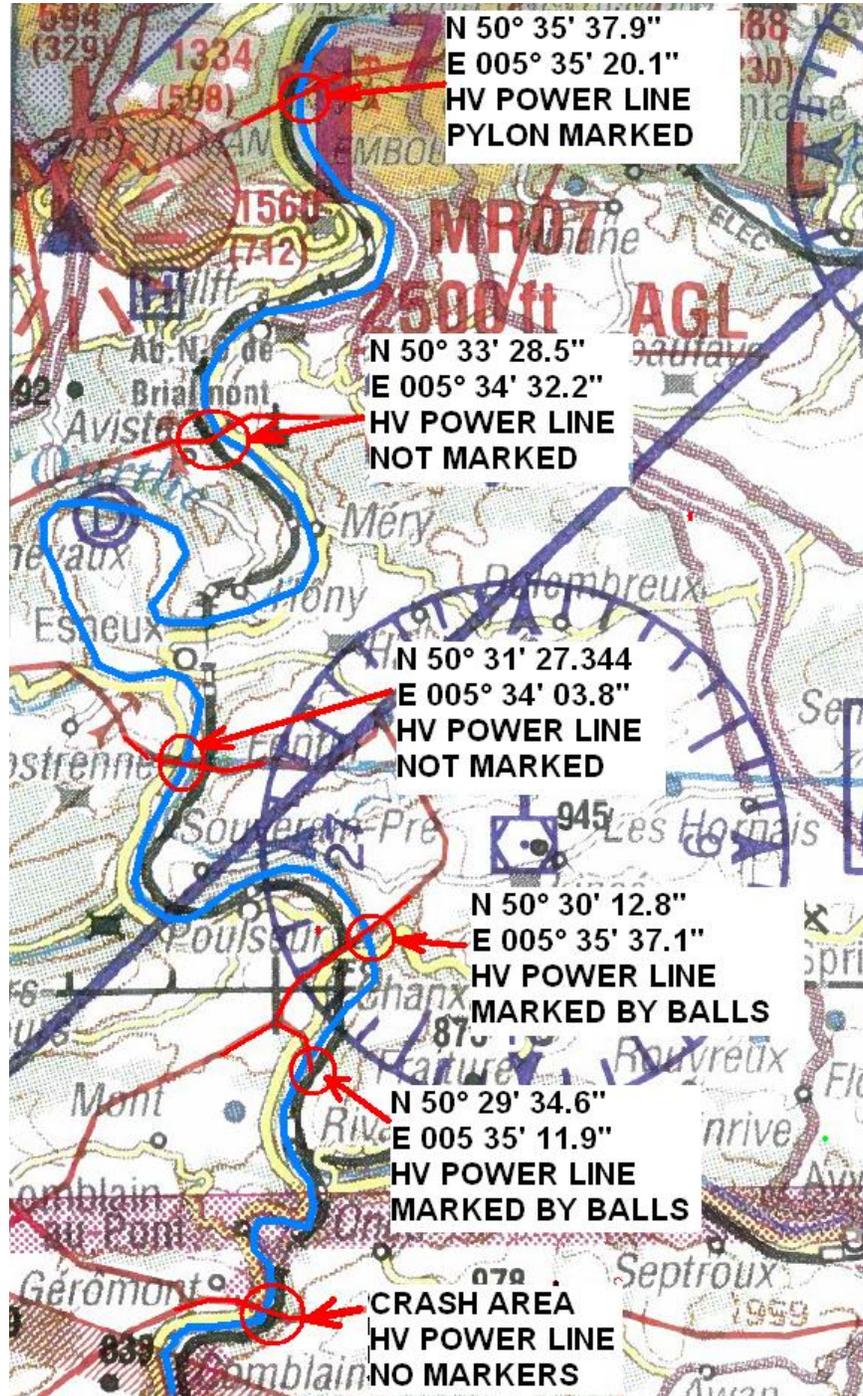


Fig.10 High Voltage Line across the Ourthe River from Comblain-au-Pont down to Embourg.

The High Voltage Line in Comblain-au-Pont is not the only one crossing the Ourthe Valley. From the crash area up to Angleur, there are 7 crossing lines.

The two lines located North of Comblain-au-Pont, that the airplane encountered before the crash, are marked by balls, while the lines North and South of Esneux are not marked. The line crossing the Ourthe in Embourg features marked pylons. The last line in Angleur (not shown on fig.10) is marked.

The pylons in Comblain-au-Pont are not quite visible on both sides of the Ourthe river; see Fig 11.



Fig. 11. HV Power line in Comblain-au-Pont.

10. FLIGHT RECORDER

The airplane was not equipped with a Flight recorder, nor was it supposed to. However, the pilot used a GPS (Garmin GPSmap196), featuring a memory.

The on-board GPS was in good condition, except for the main screen, and the memory of the GPS could be downloaded, and gave the details of the last flight.

The recorded data included:

- time,
- position
- height

11. RULES OF THE AIR.

The Royal Decree of 15 September 1994 defines, among others, the minimum altitude for VFR flights.

Article 74 states:

Except for the needs of taking off or landing, or by exemption granted by the Minister in charge of the Civil Aviation, it is forbidden to fly an aeroplane according to the VFR rules:

a) above the cities (....)

b) elsewhere, at an height lower than 150 m (500 feet) above ground or sea level and at a distance inferior to 150 m of any artificial obstacle, fixed or mobile. (...)

Reviewing the pilot's file, the investigation team noticed some anomalies;

- The flight log states EBML as arrival and departure airfield, while the GPS indicates arrival and departure from a private field in Lincé.
- The temporary permission to fly over Belgian territory for ULM/DPM last issued for 59-CBE was expired since the 29th January 2010.

Also, the airplane took off from a private field in Lincé, while the ULM Regulation requires the use of a certified airfield (art 50 of Ministerial Decree of 25 May 1999).

12. ANALYSIS

The flight log of the airplane could be retrieved and, along with the memory of the GPS, showed no records of previous flight in the close vicinity of the crash area.

The presence of the HV power line is very difficult to detect from the ground, and even more from the sky, since the background would be darker.

The only possible way to detect and avoid the cable was:

- to study the Low-Air chart prior to initiating the flight.
- to fly at a safe altitude with respect to the expected obstacles. (e.g. 1200 ft amsl (400m) taking an terrain elevation of 250 m into account).

13. CAUSE OF THE ACCIDENT

The accident was caused by an inadequate flight preparation and a flight conducted under the minimum required altitude.

Contributing factor:

The power line crossing the Ourthe valley was not provided with markers to make it visible from the air.

14. SAFETY RECOMMENDATION

Recommendation 2011-U-19 to BCAA

AAIU(Be) recommends BCAA to mandate an aeronautical study to determine whether obstacles like wires and cables crossing the Ourthe river such as the 70 kV Power line Heid de Goreux – Comblain, constitute a hazard to aircraft navigation.