Safety Investigation Report

Air Accident Investigation Unit

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AAIU-2020-09-13-01

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Final

ACCIDENT
RANS COYOTE
AT LASNE
ON 13 SEPTEMBER 2020

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ABOUT THIS REPORT

This safety investigation report is a technical document that reflects the views of the investigation team on the circumstances that led to the accident and is conducted in accordance with Annex 13 to the Convention on International Civil Aviation and Regulation (EU) No 996/2010.

The sole objective of the safety investigation and the Final Report is the determination of the causes, and to define safety recommendations in order to prevent future accidents and incidents.
It is not the purpose of this investigation to apportion blame or liability.

In particular, Article 17-3 of Regulation (EU) 996/2010 stipulates that the safety recommendations made in this report do not constitute any suspicion of guilt or responsibility.

This investigation was conducted by the Air Accident Investigation Unit of Belgium, (AAIU(Be) further in this publication). It is the Belgian permanent national civil aviation safety investigation authority as defined in Article 4 of Regulation (EU) No 996/2010 and established in accordance with the Royal Decree of 8 December 1998.
This unit is part of the Federal Public Service Mobility and Transport and is functionally independent from the Belgian Civil Aviation Authority and other interested parties.

SYMBOLS AND ABBREVIATIONS

’	Minute
‘’	Second
°C	Degrees centigrade
AAIU(Be)	Air Accident Investigation Unit (Belgium)
ACC	Area Control Center
AGL	Above Ground Level
ATC	Air Traffic Control
BCAA	Belgian Civil Aviation Authority
CFF	Centrifugal Force
CPF	Centripetal Force
DGAC	Direction Générale de l’Aviation Civile (French CAA)
DGLV	Directoraat-Generaal Luchtvaart
DGTA	Direction générale Transport Aérien
E	East
EASA	European Aviation Safety Agency
EBBZ	Buzet Airfield
EU	European Union
FH	Flight hour(s)
Fr	Français
ft	Foot (Feet)
GPS	Global Positioning System
hp	horse power
hPa	Hectopascal
kg	Kilogramme
km	Kilometer
km/h	Kilometer per hour
kt	Knot(s)
l	Liter
lbs	Pounds
L/W	Lift divided by Weight
LF	Load Factor
LFQD	Arras – Roclincourt Airfield
LH	Left hand
LOC-I	Loss of Control – In flight
m	Metre(s)
m^2	Square meter
N	North
Nl	Nederlands
PIC	Pilot in Command
QNH	Pressure setting to indicate elevation above mean sea level
RH	Righthand
SEP	Single Engine Piston rating
sq ft	Square feet
UTC	Universal Time Coordinated
VFR	Visual Flight Rules

TERMINOLOGY USED IN THIS REPORT

Safety factor: an event or condition that increases safety risk. In other words, it is something that, if it occurred in the future, would increase the likelihood of an occurrence, and/or the severity of the adverse consequences associated with an occurrence.

Causal (safety) factor: any act, omission (individual), behaviour or condition (system) that produces an effect; eliminating a cause will eliminate the effect.

> **Direct causal factor:** the most obvious reason (acts or omissions, so mostly individuals) why an adverse event happens
>
> **Indirect causal factor:** A less obvious reason (acts, omissions, conditions) for an adverse event happening. The hazard has not been adequately considered via a suitable and sufficient risk assessment

Contributing (safety) factor: a condition that influences the effect by increasing its likelihood, accelerating the effect in time, affecting severity of the consequences, etc.; eliminating a contributing factor(s) won't eliminate the effect.

Other (safety) factor: a safety factor identified during an occurrence investigation which did not meet the definition of contributing safety factor but was still considered to be important to communicate in an investigation report in the interests of improved transport safety.

Safety issue: a safety factor that
(a) can reasonably be regarded as having the potential to adversely affect the safety of future operations, and
(b) is a characteristic of an organization or a system, rather than a characteristic of a specific individual, or characteristic of an operational environment at a specific point in time.

Safety action: the steps taken or proposed to be taken by a person, organization or agency on its own initiative in response to a safety issue.

Safety recommendation: A proposal by the accident investigation authority in response to a safety issue and based on information derived from the investigation, made with the intention of preventing accidents or incidents. When AAIU(Be) issues a safety recommendation to a person, organization, agency or Regulatory Authority, the person, organization, agency or Regulatory Authority concerned must provide a written response within 90 days. That response must indicate whether the recommendation is accepted, or must state any reasons for not accepting part or all of the recommendation, and must detail any proposed safety action to bring the recommendation into effect.

Safety message: An awareness which brings to attention the existence of a safety factor and the lessons learned. AAIU(Be) can distribute a safety message to a community (of pilots, instructors, examiners, ATC officers), an organization or an industry sector for it to consider a safety factor and take action where it believes it appropriate. There is no requirement for a formal response to a safety message, although AAIU(Be) will publish any response it receives.

INTRODUCTION

Classification:	Accident	**Occurrence category:**	LOC-I
Level of investigation:	Full investigation	**Type of operation:**	Non-commercial – Cross-country
Date and time[1]:	13 September 2020 16:32 UTC	**Phase:**	En route – Low flying
Location:	N 50°40,3013' / E 004°26,5831 Field in Lasne, Belgium	**Operator:**	Private
Aircraft:	Rans S-6ES Coyote II	**Aircraft damage:**	Destroyed
Aircraft category:	Fixed wing - Ultralight	**Injuries:**	2 fatally injured

Synopsis

The accident occurred at 16:32 UTC. AAIU(Be) was notified by Skeyes' ACC at 16:45. An investigation team arrived at 18:04 to conduct the on-site examination.

The airplane was seen flying at low altitude by people walking on a country road. The airplane made a 180 degrees turn and crashed. The airplane caught fire and was totally destroyed. The two occupants were fatally injured

Summary of factors

Organisational	None determined
Aircraft	None determined
Human	Performance/control parameters – Altitude – Not attained/maintained Performance/control parameters – Pitch control – Not attained/maintained Action/decision – Incorrect action performance – Pilot
Environmental	None determined

[1] All time data in this report are indicated in UTC, unless otherwise specified

1. FACTUAL INFORMATION

1.1 History of flight

The pilot/owner had agreed with a befriended couple of persons living in his neighbourhood to take them with for a local flight from the aerodrome of Buzet (EBBZ) that day. The purpose of the flight was essentially sightseeing, eventually taking them in the neighbourhood of their houses, located in Lasne.

As the aircraft only has one passenger seat, he had to perform several flights taking the family members individually. The flights occurred without problem. The last family member sat in the righthand seat and the aircraft took off for the final trip at 16:15.

Figure 1: Flight from EBBZ to Waterloo reconstructed from primary radar images

The flight was more or less in a straight line, from EBBZ to the 'Lion's Mound' (Fr: 'Butte du Lion', Nl: 'De Leeuw van Waterloo'), a man-made conical hill, followed by a wide righthand turn around that monument towards the village of Plancenoit (a district of the municipality of Lasne). From that point the aircraft was not visible anymore on the primary radar, probably due to the aircraft in a descent on low height. .

Witnesses on the Chemin de Camuselle stated that they saw the airplane overflying the dirt road, in a north-easterly direction at low altitude.

One of the witnesses stated he saw one of the aircraft occupants waving with the hand.

The aircraft then made a left turn with a 'high' bank angle. The airplane was then seen plunging to the ground.

Figure 2: Last part of the flight: dotted lines are not covered by the radar

The aircraft hit the ground almost vertically and immediately took fire. The 2 occupants died upon impact.

1.2 Injuries to persons

Table 1: List of injuries

Injuries	Crew	Passenger	Others	Total
Fatal	1	1		2
Serious				
Minor				
None				
Total	1	1		2

1.3 Damage to aircraft

The aircraft was totally destroyed in the fire that followed the impact.

1.4 Other damage

Light soil pollution due to the aircraft fire.

1.5 Personnel information

Table 2 : General pilot data

Age	67
License	ULM Pilot issued by DGAC – France on 04/09/2008
Ratings	Multi-axis ULM – issued on 04/09/2008 Authorization to carry a passenger – issued on 03/08/2009

The pilot's home address is very close to the crash scene (1.5 km to the SE).

The pilot log book was not retrieved, however, the recordkeeping is not mandatory in accordance with the French regulation on ULM.

A report was made by friends of the pilot. This report states, among others;

- The pilot would have accumulated more than 1000 FH on the type of aircraft
- The pilot was familiar with the area of the crash
- The pilot was used to carry passengers – family or friends.

1.6 Aircraft information

The RANS S-6ES Coyote II is an American constructed two-seat single engine ultra-light airplane featuring a tractor configuration and a high-wing monoplane.

Airplanes are designed and produced as a kit by the company "Rans Design, Inc" .

All models of the S-6 feature a welded 4130 steel tube cockpit, with a bolted aluminium tube rear fuselage, wing and tail surfaces all covered in fabric.

The S-6ES went into production in April 1990. It is the second generation of the original S-6 design. The ES denotes "extended span" which was obtained through a fuselage re-design and resulted in improved performance and appearance.

RANS offers two different wing sizes for the Coyote II.

The standard rectangular wing (Area 155,25 sq ft) is a constant chord and 34.5 feet in span with constant chord ailerons and flaps. This configuration offers best take off and climb performance.

The other trapezoidal "116" wing (Area 116 sq ft)) allows for 10 to 15 mph higher cruise but stall speed is increased by 5 to 8 mph and take off roll is 60 to 100 feet more.

The Coyote II kit can be ordered with tricycle or conventional landing gear.

The standard engine is the 80 hp Rotax 912UL, with the 100 hp Rotax 912ULS being optional.

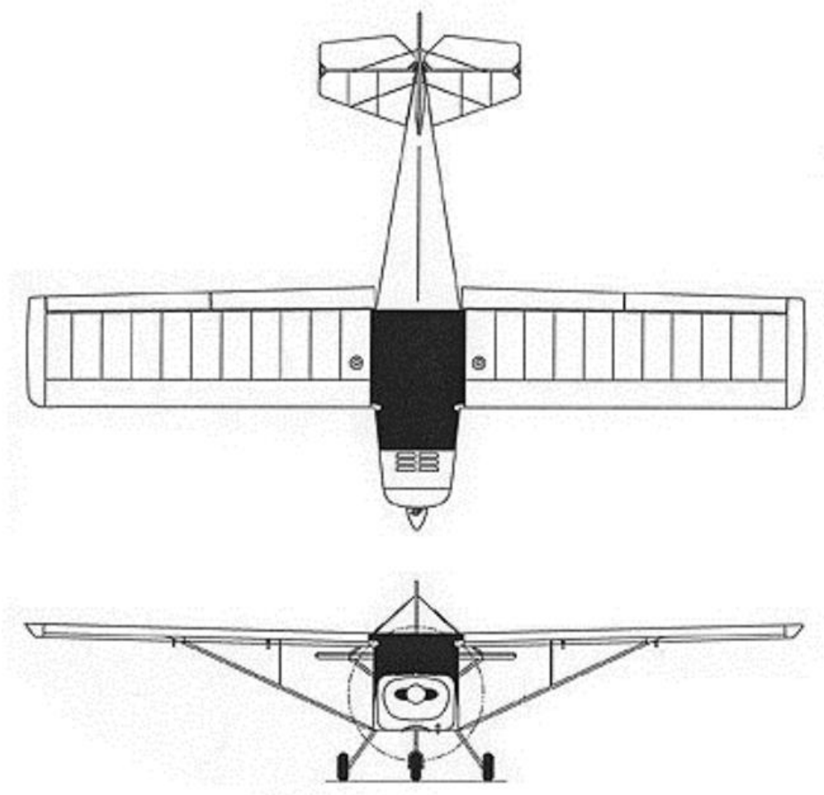

Figure 3: Rans Coyote

Table 3 : Airframe data

Model	Rans S-6ES Coyote II Wing 116
Manufacturer	Rans Designs, Inc
Serial number	08061756
First registered on	07/02/2007
Ownership changes:	2 (17/02/2009 – 08/03/2013)
Administrative Base:	LFQD - Arras – Roclincourt

Table 4 : Engine data

Type	Reciprocating
Model	912 ULS-FR (P)
Manufacturer	BRP Rotax Aircraft Engines
Max power	73.5 hp

Table 5 : Propeller data

Model	Flash 2
Manufacturer	Duc Propellers

General characteristics

- Crew: 1
- Capacity: 1 Passenger
- Wing Surface: 10.78 m2.
- Length: 6.1 m
- Wingspan: 8.9 m
- Max Empty weight: 283 kg
- Max weight: 450 kg
- Fuel tank capacity: 68 l + optional tank

Performance

- VNE speed: 209 km/h
- VSO speed: 61 km/h

Fuel System

The fuel system is made of :

- 2 integral fuel tanks installed in the inboard structure of each wings;
- 1 optional auxiliary fuel tank (10 GAL.) installed aft of the cockpit;
- 2 shut off valves installed on the lower mid cockpit dashboard;
- A tank indicator gauge for each wing tank on each upper cockpit side.

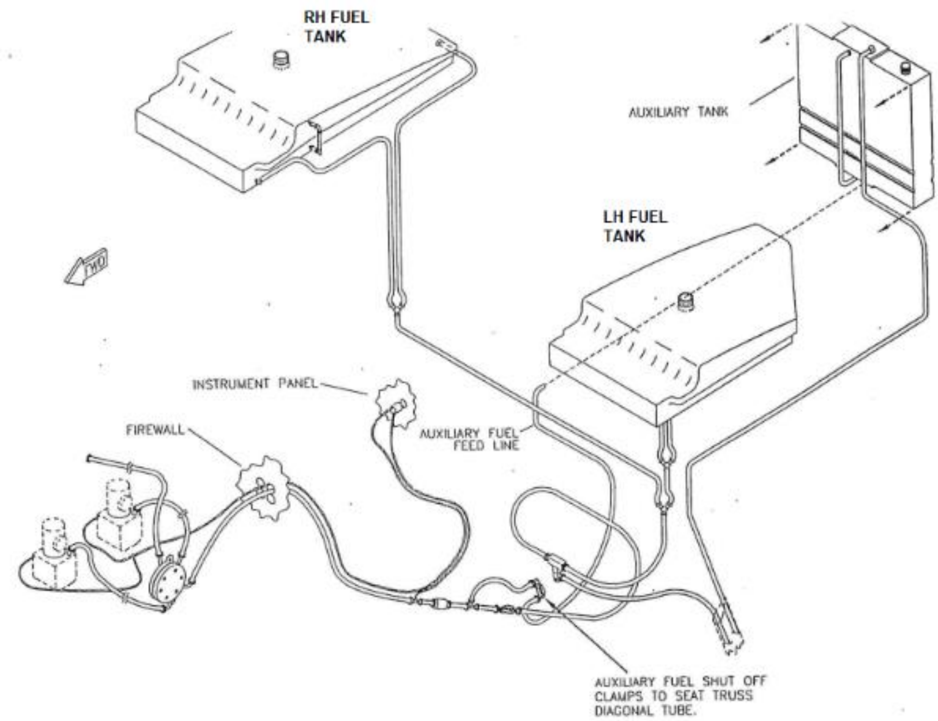

Figure 4 : Fuel system

Figure 5 : Auxiliary Fuel Tank (fuselage - behind the cockpit – another Rans Coyote aircraft)

1.7 Meteorological conditions

1.7.1 METAR Brussels Airport (24 km to the North)

16:20
CAVOK
Wind speed: 4 kt
Wind direction: 200 degrees, variable between 170 and 290 degrees
Temperature: 24 °C – Dew point: 12 °C
QNH: 1025 hPa

16:50
CAVOK
Wind speed: 3 kt
Wind direction: 190 degrees, variable between 160 and 220 degrees
Temperature: 24 °C – Dew point: 12 °C
QNH: 1025 hPa

1.7.2 METAR Charleroi Airport (25 km to the South)

16:20
CAVOK
Wind speed: 3 kt
Wind direction: 350 degrees, variable between 290 and 050 degrees
Temperature: 25 °C – Dew point: 11 °C
QNH: 1025 hPa

16:50
CAVOK
Wind speed: 4 kt
Wind direction: 360 degrees, variable between 330 and 030 degrees
Temperature: 24 °C – Dew point: 12 °C
QNH: 1025 hPa

1.8 Aids to navigation

Primary radar data were collected to retrace the flight from the take-off in Buzet airfield.

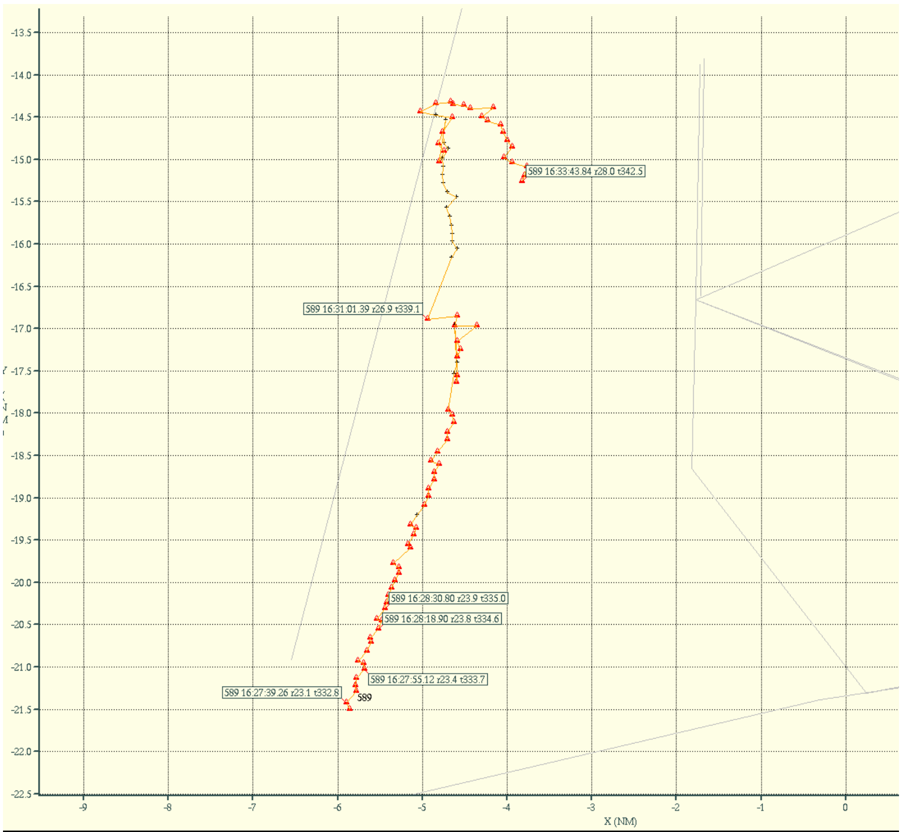

Figure 6 : Primary radar trace

1.9 Communications

The airplane was equipped with a radio, but no communication was neither recorded nor reported by other pilots.

1.10 Aerodrome information

Not relevant.

1.11 Flight recorders

The aircraft was not equipped with a data recorder, nor was it required. No device with recording capability (such as a camera or GPS) could be retrieved from the wreckage.

1.12 Wreckage and impact information

1.12.1 The crash scene

The airplane crashed in a field next to a dirt road in the commune of Lasne, Belgium. The crash area has an elevation of 135m, ie 443ft above mean sea level.

Upon the arrival of the investigators, the aircraft was totally destroyed by fire.

A short time after the crash occurred, an aircraft flew over the scene and took several pictures.

The wreckage shows an orientation of 257 degrees.
The wing impacted the ground and left a trace, in front of the wreckage. The ground was very dry and quite hard.

The flight path was reconstructed based upon the statement of several witnesses who were walking on the dirt road at the time of the accident.

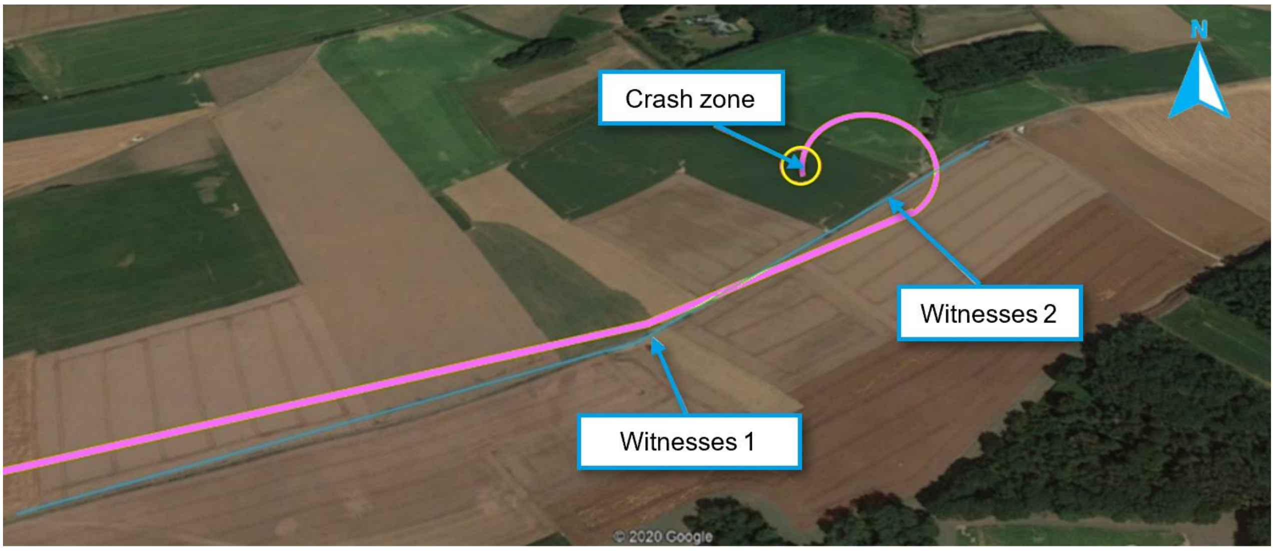

Figure 7 : Last part of flight path, surroundings and position of witnesses

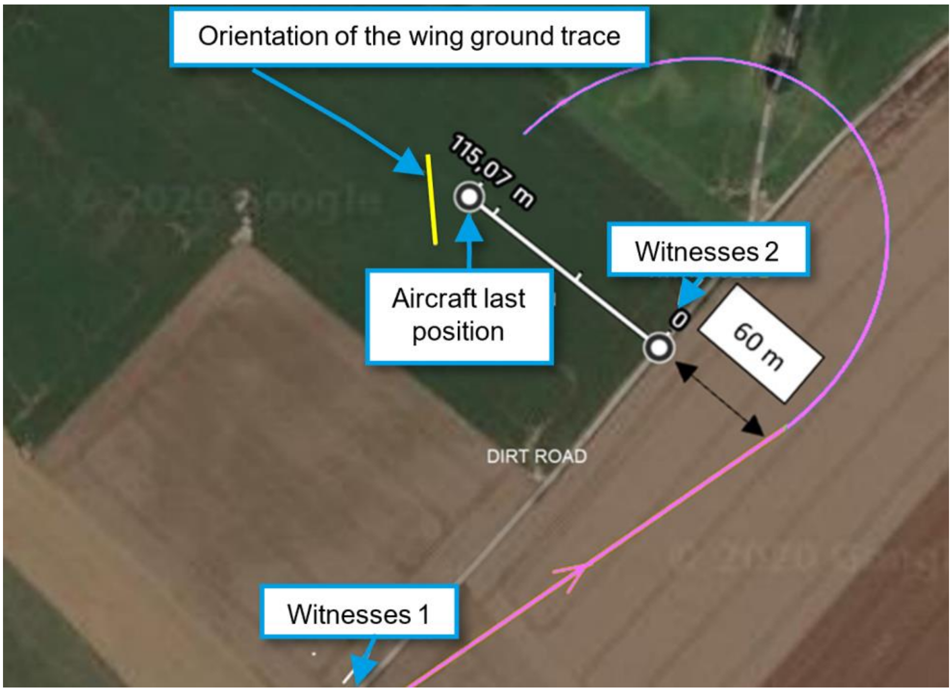

Figure 8 : Last part and dimensions

A couple (hereafter named witnesses 1) was walking on the dirt road, northwards, when they heard the airplane coming behind them. The witnesses stated : "the airplane came towards us at a very low height, so that we fell the need to duck". The airplane continued its flight above the field next to the dirt road, going up a little (estimated 30 m above ground), then initiated a turn to the left, going back in our direction. We saw the airplane turning in front of the small wood with the wings at a bank angle of 45-60 degrees. The witnesses then saw the wings levelling off and the airplane immediately plunging to the ground. The fuselage and wing were clearly visible. Before the crash the engine made a regular noise.

Another couple (herafter called witnesses 2) was walking down the dirt road, They saw the airplane coming towards them, from Waterloo. He turned and came at a very low altitude, above the dirt road. The airplane went up a little when passing their position, above the field next to the dirt road. The couple saw one of the occupants of the airplane waving to them and as all appeared to be normal with the airplane, they waved back. . They estimate the airplane was 60 m away from the dirt road at that moment. The airplane then initiated a turn to the left. The bank angle of the airplane during the turn was estimated between 45 and 60 degrees.
The next thing the witnesses saw was that when the airplane completed the 180 degrees turn, suddenly it plunged vertically to the ground.

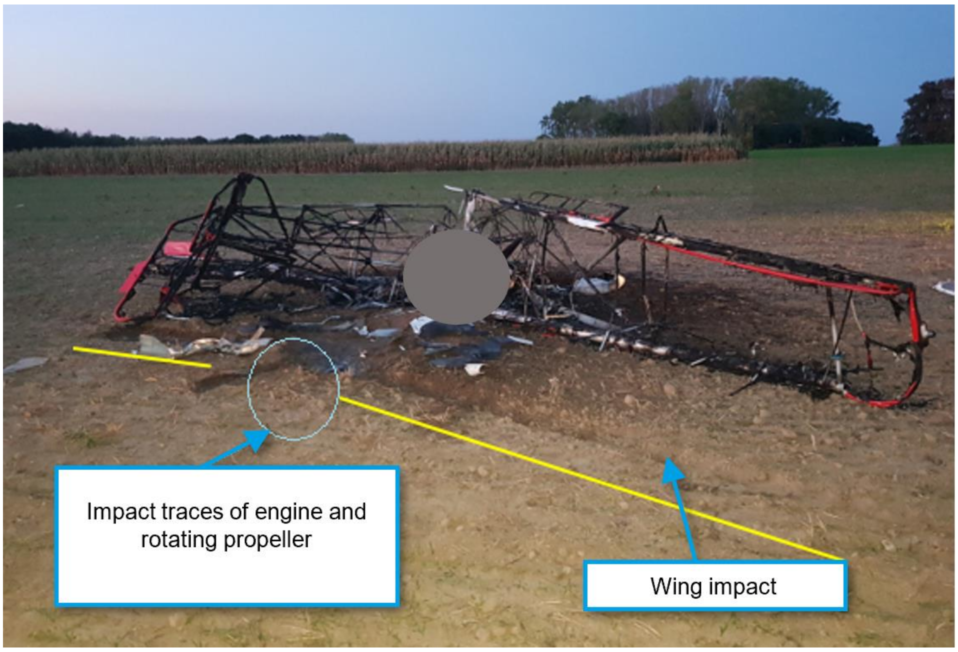

Figure 9

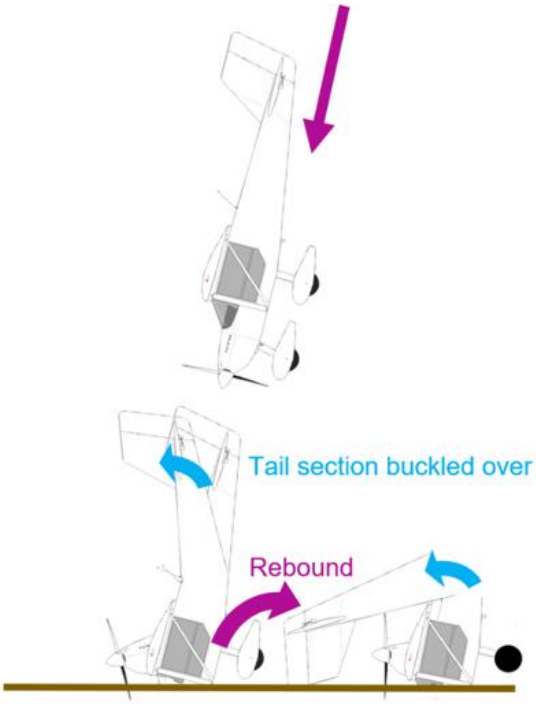

Figure 10: Impact sequence

The witnesses account of the event and the traces on the ground confirms the nearly vertical impact of the aircraft and the subsequent rebound of the wreckage, most probably due to the hard ground.

1.12.2 Wreckage inspection

The wreckage was further inspected on 2 October 2020.

1.12.2.1 Inspection of the fuselage aft section

General

The fuselage section aft of the cockpit is made of assembled aluminum tubes. These tubes were bent and broken at the level of the aft fuselage and cockpit junction.
The horizontal stabilizer, rudder, control surface and associated control cables and input rods were still in place on the tail section, all elements being correctly assembled with bolt, nuts and safety pins.
The only marks visible on the control cables were those performed by the fire brigade during the intervention on site and documented during the removal of the bodies and evacuation of the airplane wreckage.

Tail section

The 2 elevators were still correctly hinged and connected to the horizontal stabilizer with bolts, nuts and safety pins. The elevator rod was torn out at the level of the cockpit junction. A manual input on the elevator rod revealed that both elevators surfaces were functioning normally and still linked and synchronized together with their associated hardware. The surfaces were working normally up and down on manual input on the control rod.

The elevator trim tab was still present on the right hand elevator and connected to the electrical motor located on the right elevator surface. All parts, bolts, nuts and hinges of the tab system were present but the trim tab surface was broken at the level of elevator/tab inner hinge. The trim tab actuator rod was bent due to this rupture. The tab system electrical wiring was still present with one electrical wire of the trim motor broken and other wirings separated at their welded point, probably due to impact and the damage to the tab hinge.

Figure 11: Tail section

Figure 12: Trim tab broken hinge

The rudder surface was still connected and correctly hinged on the vertical fin. The control cable system and pulleys were still functional. A manual input on the rudder control cables revealed that the rudder was functioning correctly to the left & right motion.

1.12.2.2 Inspection of the fuselage cockpit section

The remaining section of the cockpit resumed to :

- the remaining of the flight controls pulleys and cables (aileron cockpit controls & associated pulleys & cables, elevator broken torque tube, remaining of rudder controls, flaps control & cable) ;
- 1 control stick on the right side and associated torque tube;
- the 2 main landing gear legs and associated brakes and tires.

Figure 13: Fuselage structure

1.12.2.3 Wings

The tubular structure of both wings was complete with flaps, ailerons and respective control hardware still present.

Right wing

The wing tubular section was bent and broken at the level of the wing to fuselage junction. The flaps and aileron surfaces were still connected to the wing. The wing leading and trailing edge were broken on 2/3 of the wing mid length. From this trailing edge rupture, the wing tubular structure at the flaps area was severely bent, with significative torsion in an upward direction.

The 2 right wing struts were still connected to the wing but bent at their respective wing leading and trailing edge attachment points and broken forward of their fuselage point of connection.

The fuselage junction of the wing strut was found severed but still attached to a torn part of the lower cockpit structure.
The flaps & aileron were still connected on the wing hinges and manually operable up and down. The flaps were more damaged due to the wing torsion at this area.
The wing torque tubes, yokes and attaching hardware were still present but broken and bent on several different places of the wing structure.


Figure 14: Wing strut - fuselage junction


Figure 15: Right wing

Left wing
The left wing was still connected with bolts to the tubular structure of the cockpit upper section. The wing was complete with flaps & aileron and with no significative apparent deformation, other than from the impact with the ground) or rupture on the wing structure.
The 2 wing struts were still connected to the wing leading and trailing edge and resting in place, in their normal position, they were severed at the broken junction to the fuselage.
The flaps & aileron were still connected on the wing hinges and manually operable up and down. All the wing movable surface controls were in place, with the wing torque tubes, yokes and attaching hardware still present and not presenting any significative marks of rupture or bending other that the normal deformation due to the ground impact.


Figure 16: Left wing

The structural damages to the right wing appear to be far more extensive than on the left wing.

1.12.2.4 Engine inspection

On the accident site, the engine was found with the lower surface lying on the ground, the right aft upper surface partially covered by the firewall.

The cockpit firewall was bent over the upper surface of the engine and was removed for the engine inspection.
All plastic component were consumed by the fire and some aluminum components were found melted.
The external inspection of the engine revealed the following observations :

- the rocker covers were melted on their external surfaces;
- the oil tank, oil filter, starter and magneto system were present and severely burned;
- the 2 carburetors were entirely burned and melted by the fire;
- The oil radiator was found damaged in the separated parts of the airplane still containing soil from the impact,
- the high temperature of the fire caused some pistons to be "tightly bound" inside their engine cylinder, leading to the inability to rotate manually the engine from the hub during the inspection, the engine crankshaft was found blocked.

The internal inspection of the engine was performed with the removal of all rocker covers and removal of cylinder n°2. The attempt of removal of cylinder n°4 was not possible due to the piston tight inside the cylinder.

The internal inspection revealed that :
- the ignition sparks did not show any sign of abnormality;
- the cylinder valves, cylinder heads and piston surfaces did not show any sign of abnormality.

Figure 17: Cylinders and Valves

1.12.2.5 Propeller

For the purpose of identifying the blades during the investigation, their position found on the wreckage is referred to their position on the drawing below;

Figure 18: Blade position convention (view from the front of the aircraft)

The blade located at 2 o'clock remained attached to the engine hub, damaged (severely burned) and longitudinally delaminated (split) from the root.
The blade located at 6 o'clock was separated from the hub, broken at the root of the hub and found fully longitudinally split in several parts.
The blade located at 10 o'clock was found complete, covered by soil, and broken from the hub at the level of the root but in general good condition.

Figure 19: 10 o'clock propeller blade

1.12.2.6 Various parts

Several other small parts were found broken, damaged and/or partially burned, amongst others:

- Battery elements,
- Wing struct fittings
- remaining burned doors parts,
- plexiglass,
- various instruments (burned and non-exploitable),
- wing & fuselage aluminum various tube & rods,
- remains of belt buckle,
- both wheel cowls.

All the plastic parts, elements or instruments in the cockpit & engine area have been completely destroyed by the fire.

1.13 Medical and pathological information

AAIU(Be) requested no autopsy of the occupants.

1.14 Fire

The fire broke out after impact.

1.15 Survival aspects.

The investigation could not determine the efficiency of the seat belts, due to the extensive damage caused by the fire. The forces at impact were very high and sufficient to render the occupant unconscious.

Some of the witnesses ran towards the aircraft in an attempt to rescue the occupants, but they stated that the occupants were not visible from the outside and that fire broke out very rapidly after impact.

The fire brigade arrived within the first 10 minutes after the accident.

1.16 Tests and research

No specific test or research were conducted during this investigation.

1.17 Organizational and management information

Not applicable.

1.18 Additional information

1.18.1 Airspace

The aircraft was flying under Visual Flight Rules (VFR) in the uncontrolled airspace, Class G, of the Brussels FIR (Flight Information Region) of which the upper border was locally limited by the controlled airspace class C of Brussels TMA One at 1500 ft AMSL.

1.18.2 Rules of the air

For the minimum height the European rule SERA 5005 states that:
Except when necessary for take-off or landing, or except by permission from the competent authority, a VFR flight shall not be flown:

- over the congested areas of cities, towns or settlements, or over an open-air assembly of persons at a height less than 1 000 ft above the highest obstacle within a radius of 600 m from the aircraft;
- elsewhere, at a height less than 500 ft above the ground or water, or 500 ft above the highest obstacle within a radius of 150 m from the aircraft.

Furthermore SERA 5001 states that in airspaces class F and G at and below 3 000 ft AMSL, or 1 000 ft above terrain (whichever is the higher) aircraft have to stay clear of cloud and with the surface in sight. No minimum distance from clouds is required

1.19 Useful or effective investigation techniques

Not applicable.

2. ANALYSIS

2.1 The flight

The purpose of the flight was leisure and sightseeing. Both pilot and occupant were living in Lasne, where the airplane arrived, from the Buzet airfield. It stands to reason that the pilot wanted to show the surroundings of Lasne, the Lion of Waterloo and other remarkable spots.

Up to the arrival in Waterloo, the turn towards Lasne, the flight could be qualified as ‘normal’.

When above Plancenoit, the airplane altitude decreased up to the point that the radar lost track. This was just before the airplane turned to fly above the dirt road (Chemin de Camuselle).

All witnesses were in agreement regarding the very low height at which the airplane approached the field. The flight could be qualified as a ‘low pass’ at this point. The area is quite open, without obstacles that could endanger the flight. There was also no sign that the airplane was in difficulty, or trying to make an emergency landing; the engine was running smooth and one of the occupants waved the hand.

The airplane made then a ‘tight’ turn to the left with – according to the witnesses – a high bank angle.

This could be considered as a steep turn, as that is generally defined as a turn with an angle of bank of 30 degrees or more.

In level flight, the lift equals the weight. The load factor LF = L/W =1

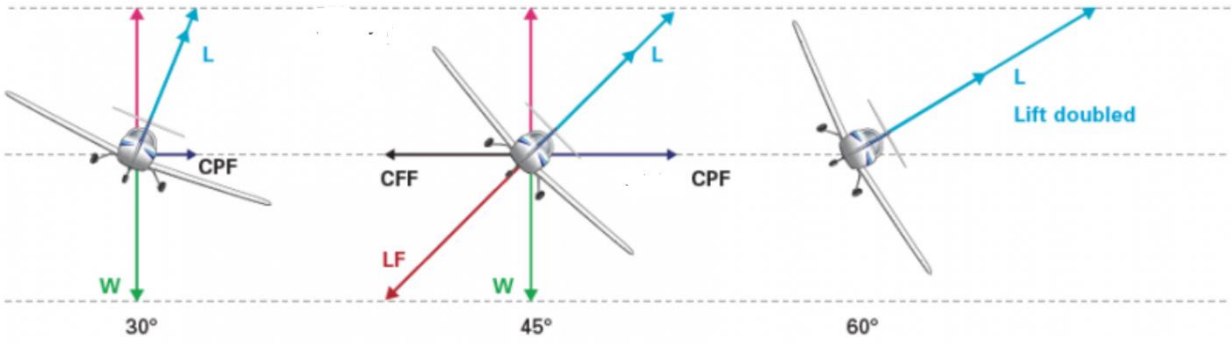

Figure 20 : Increased lift (and thus angle of attack) required to keep the aeroplane level with increased bank (source: CAA New Zealand)

When the wings are banked, the inclination of lift vector decreases the vertical component of lift (needed to compensate the weight) and increases the horizontal component (CPF – Centripetal force, as opposed to the Centrifugal force, CFF)), needed to make the airplane turn.

In a coordinated level turn, an increase of lift is required. The increase of lift requires an increase of angle of attack. As a result, the load factor (LF) increases.

At a bank angle of 45 degrees, the lift must be increased by 1.41, while at 60 degrees, the lift must be doubled.

The stall speed increases as the square root of the load factor. Assuming a stall speed of 35 knots in level flight, at 60 degrees and of bank the stall speed will increase by the square root of the load factor (+2), which is 1.41. This means an increase of 40%, thus a stall speed of 49 knots.

At the same time, because lift is increased by increasing the angle of attack, the drag will also increase, reducing the airspeed during the turn.
This is an undesirable situation, with the stall speed increasing and airspeed decreasing. Therefore, the power is increased to compensate for the increased drag to maintain a margin over the stall speed and to maintain altitude.

The ground traces and damages observed on the wreckage show that the righthand wing touched the ground first and a righthand turn before impact. This is an indication of an asymmetric stall where the righthand wing stalled first. This is also consistent with the witness statements saying that they saw the righthand - and higher - wing coming down (appearing as wings levelling off) and the airplane immediately plunging to the ground. This happens when stall occurs during a climbing turn or during a level uncoordinated turn when the aircraft is too much yawed to the outside of the turn. In both those cases the angle of the attack is higher on the outside; in this case the righthand wing. The critical angle of attack could then have been exceeded when, in order to keep or gain altitude, the pilot pulled excessive back force on the stick without adding the extra power. The stall would cause an incipient spin to the right.

As the aircraft was according to the witnesses flying at 30 m (100 ft) AGL, it would have been impossible to recover from the stall before impact with the ground.

2.2 Altitude

The class G airspace in which the airplane evolved was locally limited to 1500 ft AMSL. As the terrain elevation was around 450 ft AMSL, it means that the aircraft had still 1000 ft altitude above the ground to fly in uncontrolled airspace. There were also no clouds at the time of the accident. So besides a possible engine or other technical problem, there was no obvious reason to breach the requirement of a minimum height of 500 ft above the ground (SERA 5005).

2.3 Impact with the ground

The important shock at impact would have ruptured the fuel lines and the tank located in the aft fuselage causing the fuel to spill on the engine and battery and igniting. The presence of fuel in this tank would be the cause of the post-impact fire.

2.4 Technical inspection

The inspection of the airplane wreckage, of the remaining flight control surfaces and the engine, despite the heavy damages due to the ground impact and subsequent high temperature fire of the whole airplane, did not reveal any signs of evident (and pre-impact) technical failure.

The more consequent damages (ruptures & bending) observed on the right wing, with damage on the propeller confirm a vertical impact of the airplane with the right wing advancing forward (also observed with the impact marks on the ground).

3. CONCLUSIONS

3.1 Findings as to causes and contributing factors

- The airplane was flying at a very low height above an open field.
  [contributing factor]
  [Performance/control parameters – Altitude – Not attained/maintained]

- The airplane made a tight turn to the left with an excessive bank angle.
  [contributing factor]
  [Action/decision – Incorrect action performance – Pilot]

- The power and pitch were not maintained at an adequate value while in the turn, resulting in an aerodynamic stall and subsequent loss of control.
  [cause]
  [Performance/control parameters – Pitch control – Not attained/maintained]
  [Action/decision – Incorrect action performance – Pilot]

3.2 Other findings

- The pilot was duly qualified and experienced.
- The inspection of the airplane did not reveal any technical anomaly.

4. SAFETY RECOMMENDATIONS

The AAIU(Be) didn't issue any safety recommendation.

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