German Federal Bureau of
Aircraft Accident
Investigation

Interim Report

Identification

Type of Occurrence:	Accident
Date:	12 January 2014
Location:	Near Trier-Föhren
Aircraft:	Airplane
Manufacturer / Model:	Cessna / 501 Citation I /SP
Injuries to Persons:	Two pilots and two passengers fatally injured
Damage:	Aircraft destroyed
Other Damage:	Open wire, forest and crop damages
Information Source:	Investigation by BFU
State File Number:	BFU CX001-14
Published:	April 2014

Factual Information

On a flight from Shoreham, Great Britain, to Trier-Föhren, Germany, the airplane crashed approximately 2.5 Nautical Miles (NM) in front of runway 22. The four occupants were fatally injured and the airplane was destroyed.

History of the Flight

On Friday, 10 January 2014, the airplane flew from Trier to Shoreham. On the afternoon of 11 January 2014 after a pheasant hunt, a flight plan for the return flight,

which was to take place on the afternoon of 12 January 2014, was filed. The company compiling the flight plan stated, that a few hours later the Pilot in Command (PIC) had changed the time to 1015 UTC.

The handling agent at Shoreham Airport stated, that the pilot in command and the co-pilot had arrived on Sunday at 0850 UTC.

At 1000 UTC, the airplane took off from runway 20. At 1138:25 hrs[1], the co-pilot established contact with Langen Radar. At that time the airplane was in Flight Level (FL) 170. At 1142:51 hrs, after the airplane had descended to FL140, the controller issued the descent clearance to FL70. Approximately one minute later the controller said: "… proceed direct destination again and descend altitude five thousand feet … Spangdahlem QNH one zero two five." The pilot in command acknowledged the clearance. At 1145:23 hrs the PIC said: "… standing by for cancelling IFR." The controller answered: "... roger, IFR is cancelled at one zero two five, your position is one five miles northwest of your destination airfield, squawk VFR, approved to leave." According to radar data, the airplane was approximately in FL90 and flew with a southern heading.

At 1147:26 hrs, about 5 NM east of the omnidirectional radio beacon Nattenheim (VOR NTM), the altitude was 4,900 ft AMSL. The flight path continued east until 1149 hrs. In the area of the city of Wittlich in an altitude of 3,500 ft AMSL, the airplane turned right toward a south-eastern heading. The ground speed was approximately 180 kt. In the course of the right turn the altitude decreased further to about 2,800 ft AMSL and the ground speed to about 160 kt.

During the descent, about 5.7 NM prior to the threshold of runway 22, the airplane intercepted the extended runway centre line in approximately 2,300 ft AMSL.

Several witnesses about 600 m to the north-east and south-east of the accident site heard the engine noise of the airplane. They congruently stated, that the aircraft had come from the direction of the town Esch and had flown in low altitude toward the south-west. One of the witnesses estimated an altitude of 15 to 20 m above the trees bordering the brook Salm and approximately the same height as the open wire located in the area.

Shortly before reaching the steep slope rising by about 60 m, the airplane had been pulled up and banked to the left. Immediately afterwards fire had become visible and impact noises had been heard.

1 All times local, unless otherwise stated.

The airplane impacted the ground in an inverted position. The occupants suffered fatal injuries and the aircraft was destroyed.

The Flugleiter (A person required by German regulation at uncontrolled aerodromes to provide aerodrome information service to pilots) at Trier-Föhren Airfield stated, that on the morning of the accident day, at about 1010 hrs, he had received a phone call from the PIC. During the phone call, the arrival of the airplane had been announced for 1230 hrs. The Flugleiter had informed the PIC about the severe fog prevailing at the airport. He had also told him that, if at all, he expected visibility would increase after 1330 or 1400 hrs.

Personnel Information

Pilot in Command (PIC)

The 55-year-old pilot in command held a Commercial Pilot's License (Airplane) (CPL(A)) which was initially issued in accordance with JAR-FCL German on 28 January 2002 and valid until 11 July 2014. It carried the ratings: C525 PIC, IR valid until 31 October 2014, Piaggio 180 PIC, IR valid until 31 August 2014, Multi-Engine Piston (MEP) (land) PIC, IR valid until 12 July 2014 and Single-Engine Piston (SEP) (land) PIC valid until 12 July 2014.

He also held an Airline Transport Pilot's License (ATPL) issued on 17 July 2013 by the Federal Aviation Administration (FAA) carrying the ratings: Airplane Multi-Engine Land, CE-500, CE-525S and Airplane Single-Engine Land.

His class 1 medical certificate was issued on 13 February 2013 and valid to 25 March 2014.

The BFU does not have the pilot log book. According to the insurance documentation for the airplane of 18 January 2013, the pilot had a total flying experience of about 4,800 hours. In the Cessna 525 he had 2,740 hours and in the Piaggio 180 he had more than 1,500 hours of flight time. The aircraft log book showed, that since February 2013 he had flown about 32 hours in the Cessna 501, and had conducted eight flights with a total of 10 flight hours together with the co-pilot.

Co-pilot

Since 26 January 2001 the pilot held a Commercial Pilot's License Airplane (CPL(A)). This license was changed and then initially issued in accordance with JAR-FCL

German on 4 April 2013 and was valid until 4 April 2018. It carried the ratings: C525 PIC, IR valid until 31 December 2014 and SEP (land) PIC valid until 30 June 2014.

The BFU does not have a medical certificate of the pilot.

In April 2013 the pilot had a total flying experience of 1,350 hours. In the SA226/227 he had flown 550 hours and 250 hours in the Cessna 525.

Since the beginning of June 2013 the pilot had flown the aircraft. According to the aircraft log book, he had flown about 39 flight hours on the Cessna 501.

Aircraft Information

The Cessna 501 Citation I/SP is a twin jet, low-wing aircraft in all-metal construction with retractable landing gear in nose wheel configuration. The aircraft type is certified in accordance with FAR 23 for single pilot operation.

Manufacturer:	Cessna
Type:	501
Manufacturer's Serial Number (MSN):	501-0231
Year of manufacture:	1981
MTOM:	5,375 kg (11,850 lb)
Engines:	Pratt & Whitney Canada JT15D-1A

The airplane had a registration from the United States of America. Total operating hours of the aircraft were 4,282 hours at 4,413 cycles.

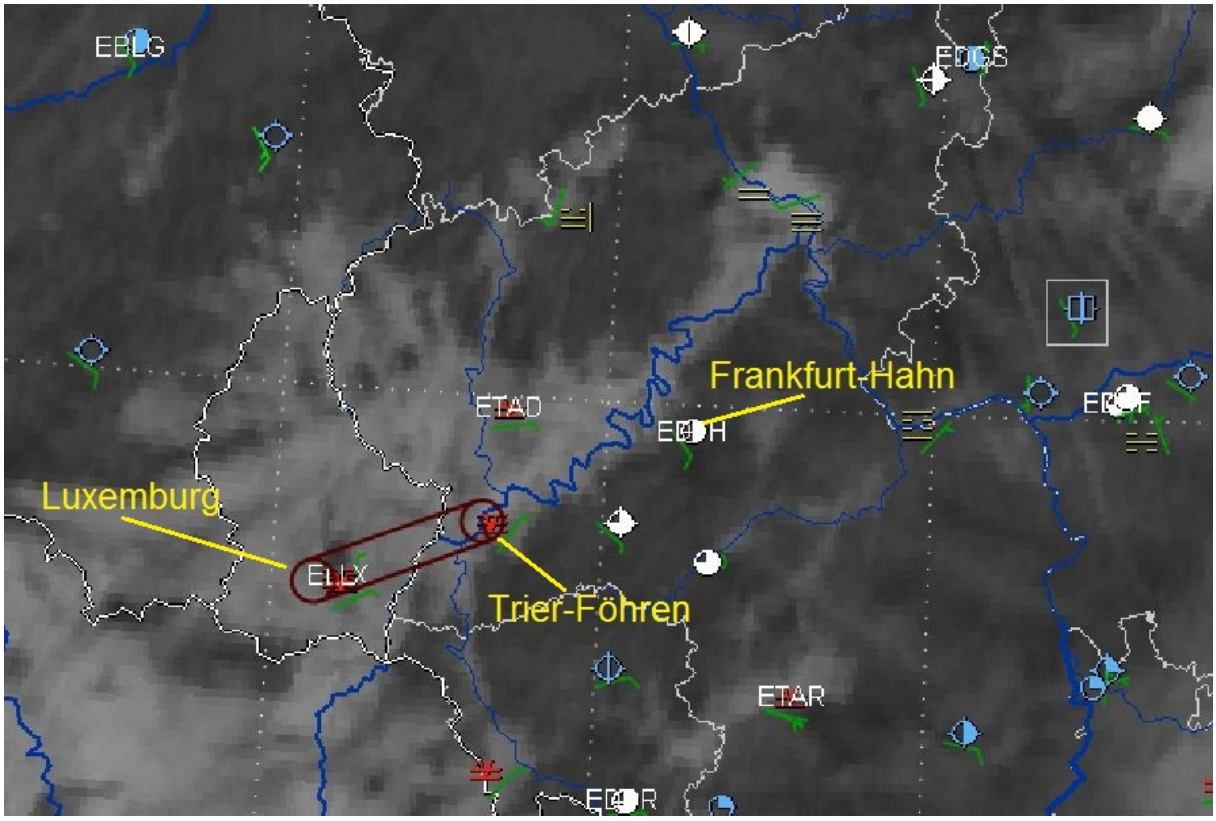
Since the middle of February 2013, the airplane had been operated by a company located in Trier to conduct non-public company flights. Three pilots were deployed either as PIC or co-pilot, one pilot only as co-pilot.

The BFU has the fuel receipt for the airplane from Shoreham Airport of 12 January 2014 showing 1,000 l Jet A1 fuel.

Meteorological Information

The Deutsche Wetterdienst (German meteorological service provider, DWD) stated that for the flight no individual weather information was obtained from one of the Meteorological Advisory Centres for Aviation.

The DWD stated that, at the time of the accident the weather pattern was dominated by an extended inversion in approximately 2,000 ft AMSL influenced by ridges of high pressure. Beneath it, fog or high fog prevailed in the clammy ground layer.



Satellite image of 1100 UTC Source: German Meteorological Service

The area Trier - Luxembourg is marked on the satellite image. It shows a complete fog or high fog layer (white colour) in the entire area of the Mosel valley. The weather report of Trier of 1100 UTC shows freezing fog, the sky is not visible and visibility is below 100 m. The weather station Trier is located a few meters higher than Trier Airfield.

Weather conditions at Trier-Föhren Airfield

The Flugleiter stated the following weather conditions prevailed at Trier-Föhren Airfield:

Wind:	040°/3-5 kt
Visibility:	Fog, visibility 100 - 150 m
Temperature:	-1°C
Barometric air pressure (QNH):	1,020 hPa

Weather conditions at Luxembourg Airport

The BFU has weather information for Luxembourg Airport (ELLX). According to ATIS Information P of 0950 UTC, Low Visibility Procedures were in operation. The horizontal visibility on the ground was given as 100 m. Runway Visibility Range (RVR) values for runway 24, which was in operation, were 175 m, 200 m, and 275 m. Freezing fog prevailed. Cloud cover was given with 5 - 7 octas in 0 ft. Temperature and dewpoint were -2°C each.

Weather conditions at Frankfurt-Hahn Airport

According to the aviation routine weather report of 1150 hrs (1050 UTC), the wind came from 140° with 8 kt. Visibility and clouds were given as CAVOK. Temperature was 1°C, dewpoint was 0°C. Barometric air pressure (QNH) was 1,023 hPa.

Communication

Radio communications between the crew and Langen Radar were recorded and the recording was made available to the BFU for evaluation.

The frequency of Trier-Föhren Airield is not recorded.

Aerodrome Information

Trier-Föhren Airfield is located about 8 NM north-east of the city of Trier. Airport elevation is 666 ft AMSL. It has one asphalt runway oriented 042°/222°, which is 1,200 m long and 30 m wide. The airport is certified for airplanes up to 15,000 kg.

Both landing directions are equipped with a Precision Approach Path Indicator (PAPI). The approach angle for runway 04 is 4° and for runway 22 it is 4.5°. The Flugleiter stated, that the PAPI for landing direction 04 had been in operation.

The Landing Distance Available (LDA) for runway 22 was 1,130 m.

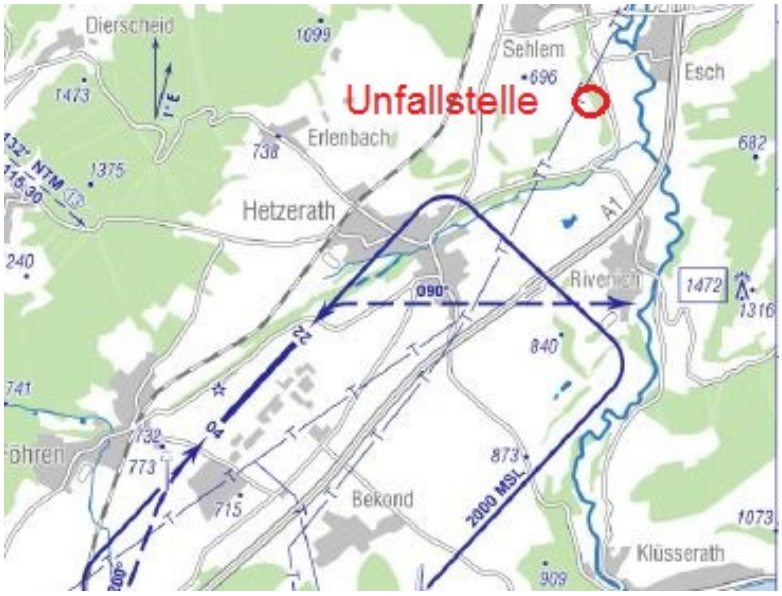
Flight Recorder

The aircraft was not equipped with a Flight Data Recorder (FDR) or a Cockpit Voice Recorder (CVR). These were not mandatory for this airplane.

The radar data from the air traffic service providers in Germany and Luxembourg were made available to the BFU.

Wreckage and Impact Information

The accident site was located about 2.5 NM from the threshold of runway 22 of Trier-Föhren Airfield.



Accident site Source: Air traffic service provider/BFU

Approximately 10 m below the plateau on the forested steep slope the aircraft had contact with tree. The traces in the tree show, that the airplane had had a bank angle to the left of about 25°.

Halfway up, the right wing of the airplane poked out of an approximately 20 m high pylon.

View toward the approach direction Photo: BFU

The angle the right wing had had when penetrating the pylon indicated a left bank angle of about 60°. The right wing showed traces of fire. At the foot of the pylon the right main landing gear, one speed brake, and the right elevator were found.

Between the initial contact with the trees below the plateau and the collision with the pylon the trajectory angle was about 20° upwards.

On an area of about 100 m x 50 m severed branches, parts of the fuselage, the two front cargo doors, the nose landing gear, luggage, and a larger number of pheasants were found.

The wreckage was laying on its back about 106 m from the pylon. The airplane fuselage pointed in the direction of 187°.

The left main landing gear and the flap were extended.

Main wreckage viewed toward the approach direction Photo: BFU

The N1 drive shaft of the left engine could be rotated freely. Five fan blades showed damages. Two fan blades had been pushed into each other. The blades of the N2 drive shaft did not show any damages. Oil leaked from the front bearing housing. The thrust lever on the Fuel Control Unit (FCU) was in the approximately 90° position.

The right engine showed considerable traces of fire. The alternator had been torn off. The mountings of the air intake were partly destroyed and could be separated from the engine without applying too much strength. The N1 drive shaft of the right engine could be rotated freely. Several fan blades showed damages. One fan blade was no longer there. The following two fan blades had been pushed into each other. The thrust lever on the Fuel Control Unit (FCU) was in the approximately 70° position.

The fuselage had been destroyed by impact forces and the fire. Parts of a shotgun were found.

In the cockpit the landing gear lever was in the position "extended".

Horizontal Situation Indicator (HSI) Photo: BFU

Heading and course of about 220° were selected on the Horizontal Situation Indicator (HSI); the indicated heading was 192°.

Fire

The fire was ignited by the collision of the airplane with the pylon.

Additional Information

The Luxembourgian accident investigation authority stated that Aeronautical Information Service (AIS) Luxembourg had never been contacted prior to the accident flight. There were no radio communications with Luxembourgian air traffic service units.

Investigator in charge:	Jens Friedemann
Field investigation:	Peter Baus, Uwe Berndt, Thomas Karge, Jens Friedemann

This investigation was conducted in accordance with the regulation (EU) No. 996/2010 of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation and the Federal German Law relating to the investigation of accidents and incidents associated with the operation of civil aircraft (Flugunfall-Untersuchungs-Gesetz - FlUUG) of 26 August 1998.

According to the law the sole objective of the investigation shall be the prevention of future accidents and incidents. It is not the purpose of this activity to assign blame or liability or to establish claims.

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Aircraft Accident Investigation

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