

Investigation Report

Identification

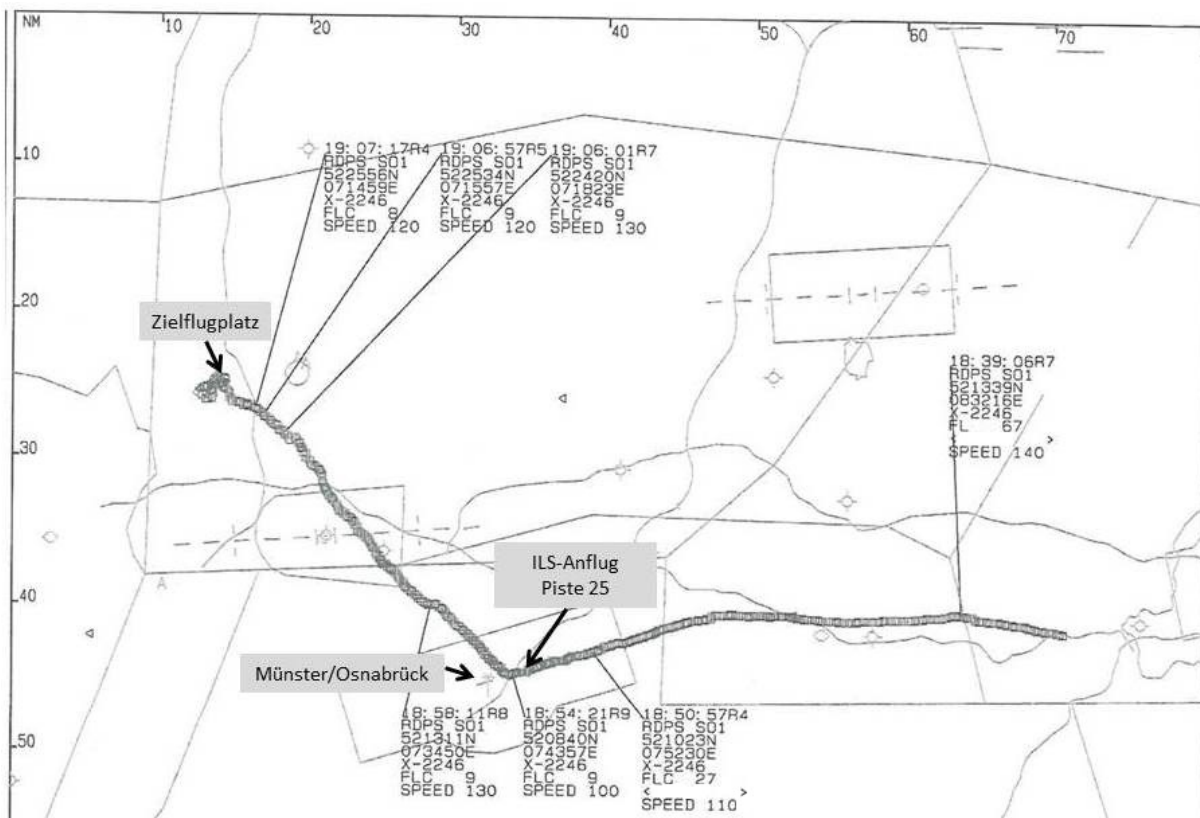
Type of Occurrence:	Accident
Date:	14 January 2009
Location:	Near Nordhorn-Lingen
Aircraft:	Airplane
Manufacturer / Model:	Socata, Groupe Aérospatiale / TB 20
Injuries to Persons:	Three persons fatally injured
Damage:	Aircraft destroyed
Other Damage:	Crop damage
State File Number:	BFU CX001-09

Factual Information

During the approach to the runway of Nordhorn-Lingen Airfield the wing collided with trees in the final approach turn.

History of the Flight

After a day trip, the aircraft took off at 1730 hrs¹ from Zielona Góra/Babimost Airport (EPZG), Poland, for the return flight to Nordhorn-Lingen (EDWN), Germany. The flight was conducted in accordance with Instrument Flight Rules (IFR) until Munster-Osnabruck Airport. By using the Instrument Landing System (ILS) of runway 25 a descent was conducted from cruise level down to Visual Meteorological Conditions (VMC). At 1954 hrs the IFR flight ended as planned in approximately 800 ft AMSL. The flight was continued in accordance with Visual Flight Rules night (VFR-night) until the uncontrolled destination aerodrome approximately 27 NM away. At this time the TB 20 was in approximately 1,000 ft AMSL and in radio contact with Bremen Radar.



Radar data

Source: Air traffic service provider/BFU

At 1959:30 hrs the pilot established radio contact with Bremen Radar. Then, after the air traffic controller had issued clearance until the destination aerodrome, the pilot

¹ All times local, unless otherwise stated.

wanted to leave the frequency at 2001:16 hrs to call Nordhorn. The controller asked: “[...] confirm you have the field in sight and landing is assured”. Answer: “Eh’ not yet madam”. At 2001:39 hrs the controller required the pilot to: “Ja please call Nordhorn on your second set as you have one otherwise call Nordhorn and then come back to my frequency until you have the field in sight”. The answer from the aircraft: “Eh’ I’ll fly on till I have the field in sight and call you then”.

At 2007:16 hrs Bremen Radar called the aircraft: "Ja just radio check eh’ do you have the field in sight already”. Answer: “Not yet madam we have two miles to go”.

At 2008:36 hrs the pilot reported: “Eh’ we have it the field in sight”.

Only when the pilot reported to have the airfield in sight did the controller allow him to leave the frequency. According to the radar data the aircraft was right above the airfield at that time.

The Flugleiter (A person required by German regulation at uncontrolled aerodromes to provide aerodrome information service to pilots) at Nordhorn-Lingen stated that the first radio contact took place at 1940 hrs during the approach to Munster-Osnabruck. At that time the following information was given to the pilot: Visibilities 1.5 km, very hazy, restriction area Nordhorn-Range not active and runway 06 in use.

At about 1955 hrs the pilot called the Flugleiter again and informed him that the aircraft was still 10 NM from the destination airport away. The Flugleiter switched on the runway lights.

Shortly after 2000 hrs the Flugleiter heard the overflight of an aircraft and asked the pilot: “I hear you, do you have the airfield in sight?” According to his statement the cockpit answered “kurz und knackig” (short and crisp): “Yes Sir”.

The further course of the flight could only be roughly reconstructed using witnesses' statements and radar echoes which due to the low altitude of the aircraft had only partially been recorded.

The aircraft turned to a western course after it had crossed the airfield and then passed it to the north in approximately 700 ft ASML. Then the flight path changed to southwest. West of the airfield a spacious right-hand turn followed, which ended in the approximate landing direction for runway 06. The aircraft had a speed of 130 to 160 kt and was in 600 ft AMSL to 900 ft AMSL. The first approach was aborted and a go-around conducted.

A knowledgeable witness, whose attention had been drawn to the aircraft by engine noise, saw that the airplane flew in western direction along the northern airfield street. With the help of its position lights the witness estimated it was flying in 400 ft to 500 ft AGL. He could not see the aircraft, but heard that it flew a left-hand turn and then moved towards the airfield again. For a short time the roar of the engine could be heard, then a harsh bang and afterwards there was silence.

The last radar signal of the aircraft was recorded at 1911:32 UTC, approximately one NM west of the airfield, at a speed of 90 kt, and in approximately 700 ft AMSL.



Flight path

Google Earth™-Kartenservice, BFU

The flight path in the picture above was reconstructed with the help of the recorded radar data.

During the second approach to runway 06 while performing a left-hand turn into the final approach the low-wing aircraft collided with trees south of the extended centre line. The aircraft crashed to the ground. The three occupants suffered fatal injuries.

Personnel Information

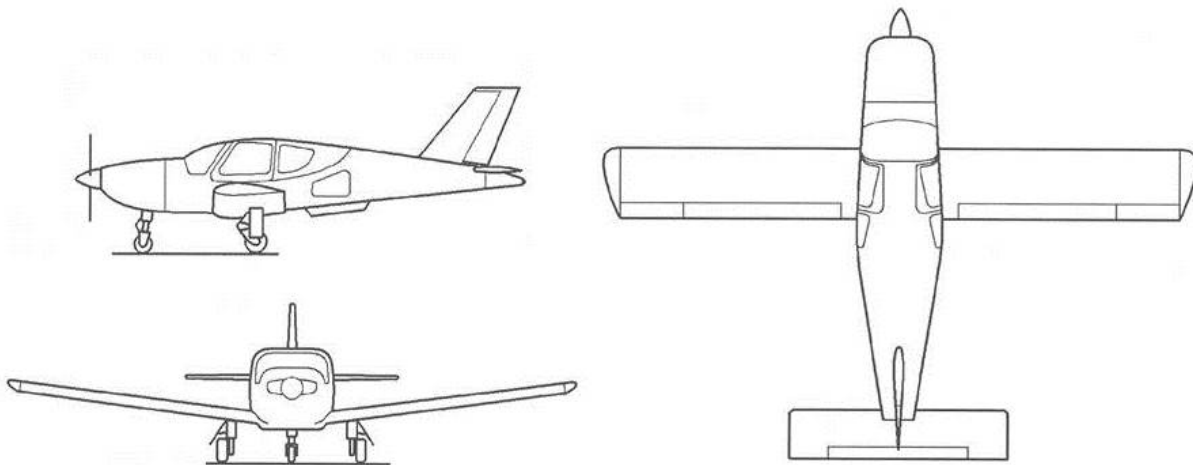
The pilot in the left-hand seat was 43 years old and held a private pilot's license issued in accordance with JAR-FCL by the Dutch aviation authority on 10 July 2006. It was valid until 1 September 2010. The licence did not show any entries for night flight or instrument ratings. His class 2 medical certificate was issued in Germany on 17 January 2007. It was valid to 17 January 2009. He wore glasses and had to carry a spare set of glasses (VML). He had a total flying experience of approximately 430 hours. About 80 hours of which he had flown in 2008.

The pilot in the right-hand seat was 56 years old and held a commercial pilot's license issued in accordance with JAR-FCL by the Dutch aviation authority on 11 July 1980. It was valid until 1 November 2009. On 27 January 2001 he acquired the instrument rating for the first time. It was valid until 1 August 2009. On 30 September 2002 he acquired the instructor rating for the first time. It was valid until 1 November 2009. He also held several examiner ratings for aviation personnel. His class 1 medical certificate was issued in Germany on 3 November 2008. It was valid to 03/11/2009. He wore glasses and had to carry a spare set of glasses (VML). He had a total flying experience of approximately 4,500 hours; 300 hours of which he had flown in 2008. According to his pilot's log book the accident flight had been the second flight in the aircraft type involved since 2006.

Aircraft Information

The aircraft type Socata TB-20 GT Trinidad is a four to five seat low-wing aircraft in all-metal construction with retractable landing gear. Its year of manufacturer was 2004 and it was equipped with a 6-Zylinder-Lycoming IO-540-C4D5D with 186 kW (250 PS) and a three-blade variable metal propeller. It was certified for flights in accordance with IFR. In the right instrument panel an artificial horizon and an altimeter were fitted for flight attitude control. The other instruments were used for engine monitoring. The aircraft was equipped with a 2-axes autopilot.

The last annual airworthiness inspection was conducted on 16 April 2008. The airplane had a Dutch certificate of registration and its total operating time was approximately 623 hours. The last 50-hour inspection was conducted on 27 August 2008 at 607 total operating hours. The aircraft had a maximum take-off mass of 1,400 kg and according to the last weight report of 20 April 2007 an empty mass of 928 kg.



Three-way view

Source: Socata/BFU

Meteorological Information

The expert opinion of the Deutsche Wetterdienst (German meteorological service provider, DWD) stated, among other things:

On 14 January 2009 the airplane with the registration [...] did not obtain any individual meteorological flight briefing for a VFR flight from Munster/Osnabruck (EDDG) to Nordhorn from any Luftfahrtberatungszentrale (Meteorological Advisory Centres for Aviation) of the DWD.

The self-briefing systems of the DWD *pc_met* or *Www.flugwetter.de* did not record any access under the name of the pilot in command [...].

The forecast for General Aviation (Area North), valid between 1500 UTC and 2100 UTC, predicted humid air mass in the northwest. The GAFOR classification for west Niedersachsen (Lower Saxony) (Area 7) and Teutoburger Wald (Area 9) were classified as X-Ray. Also Area 32 (Munsterland) was classified as X-Ray, i.e. weather conditions with ground horizontal visibilities below 1,500 m and/or ceilings of below 500 ft AGL were expected. Freezing level was approximately 4,000 ft descending to 2,500 ft, in the southeast negative temperatures from the ground up to 1,500 ft AGL.

Weather at the Time of the Accident

During take-off of [...] from Munster/Osnabruck (EDDG) to Nordhorn ground horizontal visibility of 4,500 m was observed at Munster Airport. The weather station Rheine-Bentlage (ETHE), located in the vicinity of the flight path, reported at 1800 UTC a

ground horizontal visibility of 3,200 m and at 1900 UTC a ground horizontal visibility of 2,800 m. Along the flight path from Munster/Osnabruck to the destination area visibilities decreased continuously. The weather station Lingen reported at 1900 UTC a ground horizontal visibility of 1,400 m. The weather station of the Geoinformationsdienst der Bundeswehr Meppen (German Armed Forces geo information service) recorded at 1912 UTC a ground horizontal visibility of 921 m. From this data it can be deduced that along the flight path ground horizontal visibility was below 1,500 m and values below 1,000 m were temporarily possible.

At 1850 UTC at Munster/Osnabruck multi-layered clouds was observed. The lowest ceiling (3 to 4 octas) was in 2,300 ft AGL. Above lay another cloud layer (5 to 7 octas) in 3,700 ft AGL. The weather station Rheine-Bentlage reported at 1820 UTC the lowest ceiling (5 to 7 octas) in 800 ft AGL. At 1900 UTC there the lowest ceiling (6 octas) was in 400 ft AGL and another cloud layer (6 octas) in 900 ft AGL. The weather station Lingen reported at about 1900 UTC the lowest ceiling (5 octas) in 300ft AGL. Above that 7 octas were in 700 ft AGL. At 1912 UTC the weather station Meppen recorded a ceiling in 45 m (approximately 150 ft). Dew point difference was below one Kelvin (K).

Radio Communications

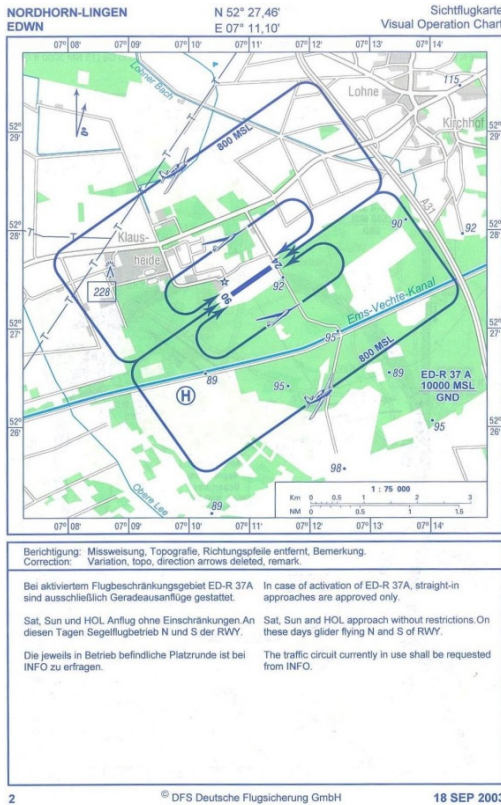
Radio communications with Bremen Radar, which ended approximately four minutes prior to the accident in the immediate vicinity of the airfield, were recorded and made available to the BFU as transcript. Radio communications with the Flugleiter at Nordhorn Airfield were not recorded.

Aerodrome Information

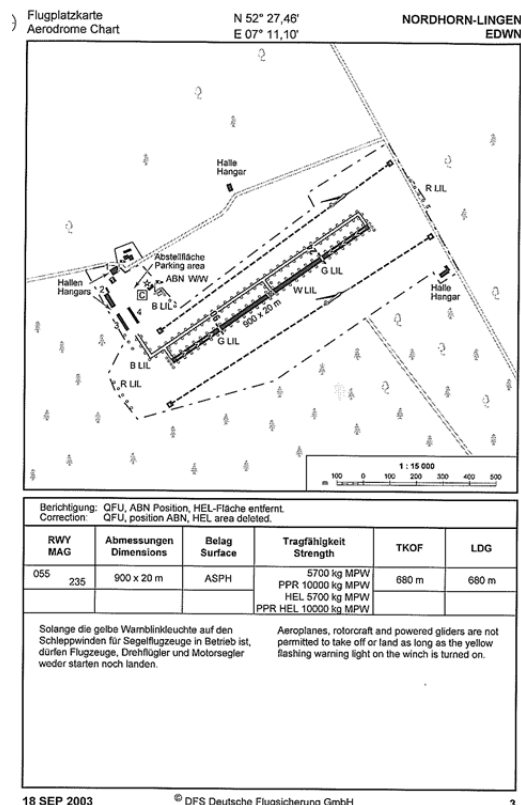
The uncontrolled airfield Nordhorn-Lingen is located one NM east of the town Klausheide. Aerodrome elevation is 85 ft AMSL. It is located within the restricted area ED-R 37 A. At the time of the TB 20's approach the restricted area was not active.

The airfield is mostly surrounded by high forest. The asphalt runway 06/24 (055°/235°) is 900 m long. Landing distance available for both landing directions is

680 m. The airfield is equipped with simple runway edge lighting and green threshold lighting.



Visual operation chart/aerodrome chart



Source: DFS

Flight Recorders

The air traffic control radar recording trace was available to the BFU for evaluation.

Wreckage and Impact Information

The accident site was located approximately 900 m prior to runway 06 of Nordhorn-Lingen Airfield; approximately 100 m right of the extended centre line in a forest with 20 - 30 m high conifers. Approximately 150 m prior to the accident site traces of the initial contact with trees were found. The airplane's moving direction proceeded to 020°. Parts of the aircraft were strewn over an area of approximately 140 m x 50 m, either laying on the ground or hanging in trees.

A trace on the forest floor of approximately 8.5 m in length indicates that the wreckage overturned and then came to a stop on a tree. The aft fuselage area was bent in

the process and the tail section almost completely severed. The investigation did not reveal any technical malfunctions.



Accident site

Photo: BFU

Medical and Pathological Information

A post-mortem examination was performed on the three deceased persons. There was no influence by alcohol and drugs. The blood did not contain any carbon monoxide. All injuries the occupants had suffered could be attributed to the accident.

Fire

There was no evidence of in-flight fire or fire after the impact.

Survival Aspects

The search and rescue distress coordination centre received the distress call at 2013 hrs; approximately 20 minutes later the aircraft was found in the forest.

Due to the type and severity of the injuries the accident was non-survivable for the occupants.

Analysis

The aircraft had a valid certificate of registration and was properly maintained. The last airworthiness inspection was conducted on 16 April 2008. There were no indications for a technical malfunction of the aircraft.

The pilot in the left-hand seat was not sufficiently licenced for the conduct of the flight. His licence did not show any entries for instrument rating or night qualification. His total flying experience of approximately 430 under VFR conditions during the day was assessed as good. The very experienced pilot in the right-hand seat, who also had flight instructor, examiner, and instrument ratings, should probably serve as safety pilot for the pilot in the left-hand seat during this particular flight. The flight plan named the pilot in the right-hand seat as Pilot in Command (PIC).

He was sufficiently qualified for this flight, but should then have taken the seat of the PIC. His total flying experience was assessed as very good. His flying experience on the type involved of only two flights was assessed as low.

From the weather data it could be deduced that between 300 ft AGL and 700 ft AGL low cloud cover of 5 to 7 octas prevailed and the ceiling temporarily decreased to approximately 100 ft AGL. The ground horizontal visibilities were between 1,000 m and 1,500 m, partially even below 1,000 m.

The weather was not suitable for a flight under visual flight rules.

The option to abort the flight, because of the ever worsening weather conditions, and, for example, return to Munster-Osnabruck, was not made use of.

That the flight took place at night complicated matters. Besides the runway lighting there were no other sources of light, because of the bordering forest and the lack of villages in the vicinity of the entire traffic pattern area. This would have been very helpful as areal horizon reference especially with the prevailing bad meteorological conditions at night. When flying at night above terrain without outlines the horizon is not well-defined and therefore misjudgement of pitch and altitude is possible. If there are no reference points the pilot will have difficulties to correctly assess speed, distances and the size of objects.

The radar data indicates that the pilot in the left-hand seat, who was inexperienced in regard to Instrument Meteorological Conditions (IMC), conducted the first approach to runway 06 of Nordhorn-Lingen Airfield. The traffic circuit was flown with changing altitudes and a too much speed, which supports the above evidence.

According to the radar data the second approach was much more stabilised. It is to be assumed that the pilot in the right-hand seat conducted the second approach. What made it more difficult for him was that on the right side he only had an artificial horizon and an altimeter available, all other flight monitoring systems were fitted to the left side of the instrument panel.

It is likely that the pilot flew the final approach turn too low without reference to the natural horizon and because he did not want to lose visual contact with the airfield due to the weather. Then the collision with trees occurred and the aircraft crashed to the ground.

The kind of accident site and the distribution of the wreckage parts allow the conclusion that the aircraft impacted the ground with a steep angle, high horizontal velocity, and an almost straight forward movement.

Conclusions

The air accident was caused by the aircraft colliding with trees during a final approach turn flown too low in bad visual meteorological conditions at night.

Investigator in charge: Holger Röstel

Field investigation: D. Nehmsch, U. Bernd

Braunschweig August 2016

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 - FIUUG*) of 26 August 1998.

The sole objective of the investigation is to prevent future accidents and incidents. The investigation does not seek to ascertain blame or apportion legal liability for any claims that may arise.

This document is a translation of the German Investigation Report. Although every effort was made for the translation to be accurate, in the event of any discrepancies the original German document is the authentic version.

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