

CZECHOSLOVAK CIVIL AVIATION INSPECTORATE

F I N A L R E P O R T
on aircraft accident investigation

Type of airplane
BE-36

Registration Marks
HB-EJQ

Operator:

Date: 15. 9. 1991

Place of Accident: Jesenice Dam, Cheb Region

Prague
October 1991

A.

Bonanza BE-36 Turbine airplane, HB-EJQ
Jesenice Dam, Cheb Region, September 15, 1991

B. The airplane flying over the dam decreased flight altitude so that it hit the water level by propeller blades, ditched and sunk.

Pilot and passengers rescued uninjured

An aircraft accident investigation group of the Civil Aviation Inspectorate was designated. Appropriate bodies of the Czech Republic Police took part in the investigation group work. The investigation group cooperated with the Swiss Aviation Authority as well as with the experts of Air Special, operator of the airplane.

Final Report is issued by the Czechoslovak Civil Aviation Inspectorate, Ruzyně Airport, 160 08 Prague 6.

C. Main part of the Final Report consists of:

1. Investigation
2. Analyses
3. Conclusions
4. Safety Recommendations

1. INVESTIGATION

1.1 History of the Flight

The BE-36 airplane, registration marks HB-EJQ, took off from the Karlovy Vary airfield on September 15, 1991 at 11,05 GMT for a flight to Nürnberg via Cheb. Mr. _____ was pilot-in-command, Mrs. _____, his wife and Mrs. _____ being passengers.

At that time several other airplanes departed for the same route. Pilot of one of these airplanes was brother Mr. _____.

Flight route crossed the Jesenice dam. The pilot did not state flight level in the flight plan and entered only the abbreviation VFR, as usual in other countries, thinking that the flight can be carried out at an altitude of 100 m AGL max., whereas this altitude is published in AIP of Czech and Slovak Federal Republic as the minimum altitude, according to the provisions of Czechoslovak Aviation Regulations.

The BE-36 airplane, piloted by _____ was reached by the airplane piloted by his brother before arriving at the dam and afterwards, until the accident, the airplanes were flying in formation, with the BE-36 slightly back to the starboard.

This formation flight was carried out at a minimum altitude above the water level over a distance of approximately 1 km, according to testimonies of witnesses, who were looking at the flight of the airplanes from different places on the dam shore. Propeller of the BE-36 airplane hit the water level with its blades in course of the airplane's gradual descent. All the propeller blades were bent in opposite direction to the propeller rotation on hitting the water at unchanged engine power setting, with consequent destruction of propeller reduction gear, due to increased torque. Overspeed of the engine free turbine followed and the engine stopped. The pilot

successfully ditched the airplane and he, as well as the passengers, were transported to the shore by the onlooking fishermen without sustaining any injuries. Shortly after ditching the airplane sunk.

1.2 Injuries to Persons

No person was injured in the aircraft accident.

1.3 Damage to Aircraft

It was impossible to assess the damages because the airplane is not of Czechoslovak manufacture, nor is any airplane of the same type operated in the Czech and Slovak Federal Republic. From the point of view of approaches to repair in CSFR the damage is considered to be of larger extent /replacement of engine, propeller, stabilizer, etc./ which is repairable in case that the airplane rigging is not out of tolerance.

Extent of damage:

The airplane was damaged on striking the water as well as during its beaching.

The lower fuselage part and the wings at their roots are damaged by impact against water. The fuselage is also distorted at the cabin door hinges with minor damage found on several other places. The wings, with the exception of deformation at the leading edge root, are exhibiting no damage of larger extent. Ailerons are operative and the landing flaps are in their retracted position. The empennage is damaged, evidently due to rescue operations. The starboard stabilizer is twisted and distorted. Horn balance of the elevator is torn off. Rudder and elevator are operative with trim tabs approximately in their neutral positions.

The landing gear was in its retracted position so that the landing gear well door was distorted on striking the water. The nose landing gear does not stay locked and was damaged

following emergency extension under water by the diver during rescue operations. The landing gear is exhibiting further minor damage /landing light torn off, etc./ occurring during rescue operations.

Airplane outer surface was not soiled during preceding flight operations.

The propeller together with the propeller shaft is broken off from the reduction gear as well as a part of the reduction gear housing. All the three propeller blades were indentically distorted on impact against water. They are bent back approximately in the middle of the blade plane over the trailing edge and twisted. Besides they are twice bent back perpendicularly to the blade plane. All the propeller blades are in the feathered position. There is no evident damage of the engine but maximum engine speed was exceeded prior to the engine impact against water. Airplane controls are fully operative, showing no damage as well as trim tab control. Electrically operated landing flaps are in their retracted position, the landing gear extended by means of emergency control. Throttle control lever is in its take-off power position and the propeller pitch control is in the cruise pitch position.

Fuel feed was connected to the outer fuel tanks through the main fuel tanks and was cut OFF after the accident.

Barometric instruments are indicating different readings due to pitot static system being flooded by water.

1.4 Other Damage

There were no other damages.

1.5 Personnel Information

Pilot Mr.

private pilot
commercial pilot licence and

a flight instructor license

He has completed more than 3 500 flying hours on different types of aircraft according to his statement.

There were no other data on the pilot available for the investigation group.

1.6 . Aircraft Information

1.6.1 Airplane

BEECH A 36, registration marks HB-EJQ, serial No. E 2130, T. C. 3A15

Manufacturer: Beech Aircraft Corporation

Airworthiness Certificate No. EJQ/b/1, issued by the Swiss Civil Aviation Authority on June 8, 1988.

It was impossible to verify the validity of the airworthiness certificate on the basis of documents available.

Certificate of entry into the Swiss Aviation Register No. EJQ/a/2, issued by the Swiss Civil Aviation Authority on July 4, 1989

Owner:

It was impossible to ascertain hours flown since manufacture and adherence to the maintenance system on the basis of available documentation.

1.6.2 Engine

ALLISON ODA 250-B17C, model 771-1000-1, serial No. 771-007
STC: SA 3523NM, year of manufacture 1987

Manufacturer: Allison Gas Turbines

It was impossible to ascertain engine hours since manufacture and adherence to the maintenance system on the basis of available documentation.

1.6.3 Propeller

Hartzell HC-B3TE-7

Manufacturer: Hartzell Propeller Inc., Piqua, Ohio, USA

1.6.4 Airplane Mass and Balance

Due to lack of data it was impossible to determine exactly airplane mass. Considering airplane load /pilot, two passengers, baggage and fuel/ it may be stated unambiguously, in accordance with the BEECH A 36 Flight Manual, that neither balance nor mass limitations were exceeded.

1.6.5 Fuel and Oil used

The airplane was fuelled with turbine engine kerosene. The following fuel quantities were determined in the fuel tanks after the accident

Starboard outer tank	20 gallons
Starboard main tank	10 gallons
Port main tank	empty
Port outer tank	20 gallons

Mobil Oil JET II was used in the engine. It was impossible to determine its quantity as it formed an emulsion with water flooding the engine after the airplane sunk.

1.7 Meteorological Situation

Meteorological conditions for a VFR flight were fully complied with and had no influence on the accident origin.

1.8 Aids to Navigation

were not utilized during the given flight

1.9 Communications

had no influence on the accident origin

1.10 Aerodrome Information

Aerodrome of departure had no influence on the course of the aircraft accident.

1.11 Flight Recorders and Other Means of Recording

are not installed in the airplane

1.12 Wreckage and Impact Information

Jesenice dam is situated 5 km SE from town Čeb. Aircraft accident took place in the area of the hut settlement Mechová 100 m off shore, 7,5 km off Čeb. In the place of accident the dam is approximately 7 m deep. After ditching the airplane sunk to the bottom of the dam. No airplane parts separated. Landing gear was extended by the diver using the emergency landing gear extension procedure and the airplane was beached by means of ropes.

1.13 Medical Examination

Not performed.

1.14 Fire

No fire broke out on the airplane

1.15 Survival Aspect

There was no need to organize search. The pilot and passengers were rescued immediately after the aircraft accident.

1.16 Tests and Research

It follows from witness testimonies that the other airplane, piloted by the brother of the damaged airplane pilot, was initially flying over the place of accident and that it landed after several minutes on a field, not far from the place of the accident. Two men from this airplane ran to the place of accident and after making sure that the crew of the crashed airplane is o.k. they returned to their airplane and continued in flight.

An assumption arose in course of investigation that the wife of the crashed airplane pilot took photographs of the other airplane flying over the water level. Police investigator

asked for this reason Mrs. _____ to hand over the film from her camera. She agreed and took herself the film from camera in such a manner that the last shots on the film were illuminated, thus destroying evidence. Pilot of the airplane, even after being acquainted with witness testimonies, denies flying at an altitude less than 50 m AGL and maintains that emergency landing was caused by engine failure.

Personal documents were withdrawn from the pilot by the investigation group on the spot i. e. the private pilot license, the commercial pilot license and the flight instructor license. All these documents were sent on October 2, 1991, according to an agreement, to the Swiss Aviation Authority.

2. ANALYSES

A. Analysis of Crew Activities

Pilot _____ took-off on September 15, 1991 at 1105 UTC in the BE-36 airplane, registration marks HB-EJQ, with two passengers on board, from Karlovy Vary airfield, bound for Nürnberg. The route of flight was crossing the Jesenice dam. The flight was proceeding in VFR conditions at an assumed flight altitude of 100 m AGL.

Several other airplanes were following the same route among which was also an airplane piloted by Mr. _____, brother of Mr. _____.

Both airplanes approached each other and before reaching the Jesenice dam, they were flying in formation 50 m apart, the HB-EJQ airplane flying slightly behind Mr. _____ airplane on starboard.

On arrival to the dam the airplanes gradually descended to close vicinity of the water level. According to testimonies of witnesses, dwelling on different places of

the dam, propeller blades of the airplane piloted by Mr. hit water. The airplane bounced slightly to an altitude of several metres, after touching water level and a ditching followed. The pilot and passengers abandoned the airplane and were taken to the shore by the present fishermen. The pilot declared in his statement, that flying over the dam, he was maintaining an altitude of 50 m AGL and that ditching was caused by an engine failure. This statement is considered as entirely misgiving in the light of propeller and propeller reduction gear damage as well as in the light of witness testimonies.

B. Analysis of ATC Activities

Air traffic controller accepted flight plan which was uncorrectly filled up by the pilot /e.g. airspeed and altitude data/. He did not enter date and time of submission of the flight plan. He also issued a flight clearance to the HB-EJQ which was not complete and did not adhere strictly to the principles of RT instructions and phraseology.

Notwithstanding the deficiencies found in the air traffic controllers' activities, these deficiencies had no influence on not maintaining minimum flight altitude above ground and had no causal relationship with the origin of the aircraft accident.

3. CONCLUSIONS

- pilot-in-command was appropriately qualified for the given flight
- no defects were found on the airplane prior to the flight
- meteorological conditions for a VFR flight existed
- pilot-in-command did not know provisions of Czechoslovak Regulations issued in AIP CSFR, part RAC 1-1-3,

paragraph 4.4, covering minimum flight altitudes en-route during VFR flights

he carried out the flight at an altitude of 70 m AGL to the vicinity of Jesenice dam, where he descended to 50 m AGL and proceeded in gradual descent to the close proximity of the water level. Flying in close proximity of water level he did not manage pilotage and propeller blades hit water level

- propeller blades bent in the direction opposite to the direction of rotation and due to excessive torque propeller reduction gear was destroyed.
- The pilot ditched the airplane due to overspeed and following stoppage of the engine
- the airplane sunk after ditching, the pilot and passengers rescued without being injured

Cause of the Aircraft Accident

Impact of the airplane against water level was the cause the aircraft accident after minimum VFR flight altitude above ground was not maintained.

During formation flight the pilot gradually descended to close proximity of water level where the airplane propeller hit water and due to propeller damage and destruction of the propeller reduction gear the pilot was forced to ditch the airplane.

4. SAFETY RECOMMENDATIONS

Considering adverse trends in flight operations safety of foreign operators it is recommended to the Swiss Aviation Authority to take efficient measures, within its authority, to prevent aircraft accidents resulting from lack of discipline on the part of pilots and from violating aviation regulations.


Ing. František L O U D A
Director
CSFR Civil Aviation Inspectorate

Prague, October 21, 1991