No. 37

Fa. Helmut Horten G. M. B. H., Learstar Mod. 18, D-COCA aircraft, crashed at Muraugraben near Krumpendorf, Wörtharsee on 24 August 1957. Report released by the Department of Civil Aviation, Austria.

Circumstances

The aircraft was on a return flight to Klagenfurt from Stuttgart carrying a crew of three. At 1752 hours GMT the flight requested landing instructions from Klagenfurt tower and was subsequently "cleared to enter traffic circuit SW 340/2 kts Ry 29 report downwind, no local traffic." At 1758 hours following failure of the left wing in flight, the two-engine aircraft went down in flames in the Klagenfurt area near Krumpendorf, Germany, killing all crew members.

Investigation and Evidence

The aircraft was certified in the U. S. A. as type Lodestar. It was reconverted to type Lockheed Mod. 18 (Learstar) after a total of 7 793 flying hours. The type certification was approved by the U. S. Civil Aviation Authority. The last complete overhaul was carried out after 7 793 hours of operating time and since then the aircraft had been operated for 395 hours up to 20 August 1957 according to entries found among the fragments of a log. While the total operating time of the power plant is unknown, it amounted to 379 hours since the complete overhaul.

The first pilot held a valid airline pilot licence granted by the State of North Rhine-Westphalia and was qualified for IFR flights and as instructor for commercial pilots, first class. He held ratings for the following aircraft types: Beechcraft E 18S, D 18S, C50, Cessna 78, Piper Apache and Lockheed Learstar. In addition, he held equivalent licences issued by the U. S. authorities. He also held a flight engineer's licence and a general radio operator's licence.

The second pilot held a valid commercial pilot's licence (2nd class).

Actual weather at the scene of the accident

The weather report of the Meteorological Office at Klagenfurt on 24 August at 1800 hours GMT, which applied also to the scene of the accident, was as follows:

wind 340°

visibility 60 km, 1/8 Sc 5 000 ft, 7/8 Ac in 12 000 ft

Weather forecast prior to take-off

The pilot was given the following briefing at 1630 hours GMT by the Stuttgart Meteorological Office:

A strong cold front crossed the Federal territory from west to east in the course of the day; at 1200 hours GMT it was along the line Berlin-Munich-Milan and reached the line Vienna-Genoa.

During the oral briefing the pilot mentioned that he had already crossed the cold front twice during that day and was familiar with the associated weather phenomena. He asked only for possible additional information. It was pointed out to him that the cold front was now over the Alps where severe turbulence and some thunderstorms could be expected. The weather at the destination was good, and an important change was not expected and did not occur.

Upper air winds 10 000 - 14 000 ft amsl, 250 - 260° at 20 to 30 knots. The freezing level south of the Alps was about 10 000 ft amsl higher than north of the Alps.

Reconstruction of the flight up to the accident

The flight from Stuttgart into the Klagenfurt area was normal. Eye witness reports clearly indicated that the aircraft came from the west and after flying low across Lake Worth climbed while initiating a left curve over the eastern end of the lake. Upon reaching the reciprocal course the aircraft was put on speed again towards Krumpendorf. North of Krumpendorf the failure of a wing was noticed. The aircraft then caught fire and descended vertically near the Pirkerkogel.

Witnesses statements were contradictory in respect of the following points:

a) Which wing broke during flight - right or left?

b) Did the wing break off before or after the fire started?

As regards (a) -

The fact that the right wing crashed and burned together with the fuselage, and that the left wing was located about 80 to 100 m from the wreckage of the fuselage indicates that it was the left wing that broke off during flight.

As regards (b) -

Examination of the left wing showed no marks of burning such as traces of soot or heat. It may be concluded, therefore, that the fire on the aircraft broke out in the air only after the wing had broken off.

The tail must already have become detached from the fuselage before the crash of the fuselage occurred as pieces of the tail were found about 150 to 200 m away (bearing of 150°). The smaller inertia of the tail unit compared to that of the fuselage, and its flutter effect caused a deviation from the diving angle of the fuselage.

The relevant investigation had the following results:

Traces of burning and soot were found especially on the left half of the tail. This indicates that the tail broke away only after the fire started and thus only after failure of the right wing.

This statement was corroborated by the reports of witnesses -

"... after breaking off of the wing with subsequent explosion, detached parts, presumably of the vertical and horizontal tail surfaces, as well as other fragments whirled through the air and remained behind the diving craft";

"... there I observed a piece other than the wing which also broke away but which I could not exactly identify";

"... broke the left wing. Then another large piece - which I could not identify - and a smaller one fell to the ground ..."

Location of the wreckage

The main wreckage was found on both sides of the Muraugraben which runs from about 1.5 km northwest of Krumpendorf in a west-southwest direction. The burned parts of the fuselage and of the right wing were found in a clearing on the northern side of the Muraugraben, about 25 m above the bottom of the graben. *

The left wing broke off directly beside the engine between the left engine and the fuselage and was found on the south side of the Muraugraben, about 5 m above the bottom of the graben amidst a clump of tall trees, about 80 to 100 m from the fuselage wreckage. The main part of the elevator unit was located approximately 150 m from the fuselage on a bearing of 150° on a mountain path south of the Muraugraben. The other pieces of the elevator unit were scattered within a radius of several hundred metres from this spot.

* a depression

Condition of wreckage

The fuselage and right wing were totally demolished by impact and fire. There were no traces of burning visible on the left wing which had broken off directly beside the engine (inner side). The landing gear was retracted. Traces of burning and soot were noticeable on the pieces of the elevator unit.

Results of Technical Examination

A stress failure was assumed after examination of the left wing fracture. This assumption was supported by the laboratory examination report of the Vienna Technische Hochschule. The summary of the report given by the Technical Testing and Research Laboratory of the Vienna Technische Hochschule indicates the following:

"The Aviation Authority submitted two pieces of the wing spar originating from the crashed aircraft D-COCA. The pieces were U-shaped pressed profiles of light metal. The fracture surfaces of the profiles and the neighbouring areas showed large, permanent distortions which preceded the fracture. The fracture, a bending failure, resulted from a single static and jolting overstress. Examinations showed that the fracture surfaces do not reveal any traces of a vibration failure..."

Since the fuselage and the right wing had been completely demolished, only the control linkage of the left wing could be tested. A limited operation of the aileron was still possible despite the partial distortion of the wing through impact. The left half of the elevator was broken at the attachment flange of the torsion rod. About 60% of the skin on the left half of the stabilizer was torn off on one side, probably due to interior pressure (rivet extraction) and showed traces of burns and soot on the side as well as on the outside.

Probable Cause

The accident was due to the breaking off of the left wing between the engine and the fuselage as a result of overstrain on the assembly, and fuel ignition followed.

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