No. 50

Aerolíneas Argentinas, Comet IV, LV-AHR, accident at Campinas Airport, São Paulo, Brazil, 23 November 1961. Report released by The Brazilian Air Ministry.

Circumstances

The flight had originated at Buenos Aires, Argentina. At Vira Copos (Campinas) Airport, Brazil, the engines were started at 0520 hours and the aircraft took off for Trinidad (alternately Barbados) at 0538 hours. After reaching an altitude of about 100 m, the aircraft lost altitude, collided with a eucalyptus forest and was destroyed. Twelve crew and forty passengers died in the accident, which occurred at approximately 0540 hours.

Investigation and Evidence

The Aircraft

It had flown a total of 5 242 hours, 2 242 of which had been flown since the last overhaul and about 6 hours since the last 90-hour inspection. It was not possible to check the maintenance reports regarding the 30 days prior to the accident.

The Crew

A pilot-in-command, co-pilot and ten other crew members were aboard the flight.

The pilot-in-command was sitting in the right-hand seat, presumably acting as instructor at the time of the accident. He had flown the following hours:

total flight time	12 550 hours
as pilot-in-command or instructor	11 246 hours
by night	5 791 hours
in the same type aircraft	1 612 hours
as pilot-in-command or instructor in the same type of aircraft	584 hours

He held a valid IFR rating.

The co-pilot was sitting in the left-hand seat and had no flight time registered as pilot-in-command on this type of aircraft. It was, therefore, believed that he was receiving instruction as such. His previous experience was:

total flight time	13 427 hours
in the same type of aircraft	1 074 hours
as pilot-in-command in this type of aircraft	zero hours
by night	2 833 hours
instrument flight	unknown

He also held a valid IFR rating.

It was not believed that the accident was caused by fatigue as the crew had only flown about 3 hours during the preceding 24 hours.

Weather conditions

It was not believed that the weather situation contributed to the accident. It was a dark night due to 7/8 stratocumulus at 400 m and to 8/8 coverage by altostratus at 2 100 m.

Weight at take-off

At time of take-off the aircraft was estimated to weigh 71 488 kg. The maximum authorized weight was 72 575 kg, i.e. 1 087 kg below the maximum allowed.

The centre of gravity was within the prescribed limits.

From the time of starting the turbines to the actual take-off about 528 kg of fuel were consumed, thus increasing to 1 615 kg the balance in favour of safety. According to the control tower's testimony the take-off run was approximately 2 000 m. According to the dispatch estimate it should have been 2 240 m.

Take-off run

From tests with LV-AHU, another aircraft the same type as LV-AHR, it was concluded that the take-off run took about 40 seconds.

Climbing angle

In view of the control tower operator's testimony, the conclusion was reached that the aircraft's climbing angle was around 4.5°. The aircraft reached an estimated altitude of 100 m. Taking into account the minimum climbing angle of 4.5°, the aircraft should have reached an altitude of 120 m, which corroborates the control tower operator's statements.

Comparing the above with the results obtained during the LV-AHU test flight, it was concluded that from the beginning of the take-off run up to 120 m, LV-AHR took about 55 seconds. Then it should have reached the indicated airspeed of 170 kt. At that moment LV-AHR was midway between the take-off point and the first impact point. So, taking into consideration the remaining runway (1 240 m) and the distance from the end of the runway to the first impact point (1 930 m), the aircraft flew 3 170 m.

The point where the aircraft started losing altitude could not precisely be stated ... however, it may be estimated as the middle distance between the point where the aircraft became airborne and the first impact point.

Comet IV flight instructions

According to the instructions, when a speed of 170 kt is reached, the pilot must control the "elevator change gear". When changed from "coarse" to "fine" the aircraft's nose has a tendency to drop, which has to be counteracted by using the manual trim tab. It was believed that the unit was under control when the accident occurred.

From analysis it was deducted that the aircraft, LV-AHR, hit the eucalyptus tree in a nearly horizontal attitude, which leads to the conclusion that the pilot, a short time before, when noting the loss of altitude, attempted to regain climbing attitude but due to the action of the elevator travel limiting unit in the "fine" position, the aircraft took longer to regain it. This must have been the reason why, at the moment of collision with the tree, the aircraft was still flying in a horizontal attitude.

Reconstruction of the last part of the flight

One hundred and twenty metres after the first impact point the pilot put the aircraft in a climbing angle of approximately 25°. This conclusion was reached as the eucalyptus trees were burned from the top down, probably by turbine exhaust gas, and the elevator counterbalance collided with a eucalyptus tree and was then torn off. About 145 m after the first impact point the aircraft collided with a larger eucalyptus tree and fire in the left wing pod tank resulted. Moments later a further impact occurred with another eucalyptus in the No. 1 reactor area. The aircraft began sinking. Due to terrain declivity the aircraft touched the ground about 303 m from

the first impact point. The aircraft slipped, ultimately collided with a ground obstacle, and exploded. Many fuselage parts found 120 m from the first impact point showed no signs of fire.

Probable Cause

It was presumed that the co-pilot was under flight instruction. If such was the case, the instructor, who was pilot-in-command, may have failed to brief or supervise the co-pilot properly.

Observations of the Government of Argentina as the State of Registry of the Aircraft Concerned

Argentina has determined, in the light of information it has gathered, that the cause of the accident was "Failure to operate under IFR during a take-off by night in weather conditions requiring IFR operation and failure to follow the climb procedure for this type of aircraft; a contributory cause was the lack of vigilance by the pilot-in-command during the operations."

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