

No. 20

Transcontinental S.A. de Transportes C.é I., C-46, LV-FTO accident near Buenos Aires Airport, Argentina, on 30 June 1961. Report No. 1477 released by The National Director of Civil Aviation, Argentina.

Circumstances

The aircraft was flying the last segment of a scheduled flight between Salta and Buenos Aires (Aeroparque) Airport with a stop in Córdoba. It carried 4 crew and 31 passengers. Departure from Pajas Blancas Airport, Córdoba was at 1846 hours*, and the aircraft flew at an altitude of 2 700 m making routine contacts until it approached Buenos Aires Airport where it was cleared for an instrument approach to runway 12. During the approach, approximately 1 300 m from the threshold of the runway and 175 m to the right of the extended runway centreline the aircraft hit a railway signal mounted on top of an 8 m support, which caused it to lose the outer part of its right wing. The aircraft turned about 45° to the right, hit a group of trees and telegraph lines with its propellers and left wing and fell in a public area where it caught fire due to fuel spillage. The time of the accident was about 2057 hours. Twenty-two passengers and the 2 pilots perished in the accident. The aircraft was destroyed.

Investigation and EvidenceThe Aircraft

A 6 000-hour inspection was carried out on the aircraft in February 1961, and the aircraft's airworthiness certificate was re-validated until 30 September 1961.

On 28 May 1961 another inspection was made at the time of the left engine change. The aircraft continued flying until the date of the accident. All the required periodic inspections were fully recorded

and on 30 June 1961 the aircraft had a total of 8 926:40 hours, of which 6 780 hours had been logged since the last major overhaul.

The authorized maximum take-off weight for this aircraft was 21 614 kg, and its maximum landing weight was 21 546 kg. The aircraft's actual gross weight at time of take-off from Pajas Blancas was 20 658 kg, i.e. within the permissible limits.

The Crew

Four crew members were aboard the flight - the pilot, co-pilot and two stewardesses. Only the two stewardesses survived the accident.

Both pilots held valid airline transport pilot licences. The captain had flown a total of 6 772 hours, and the co-pilot had logged a total of 3 816 hours. From various statements it appeared that the co-pilot was occupying the left-hand seat at take-off and was still in this position ten minutes before the accident. At no time had either pilot exceeded the maximum number of hours permitted.

Weather conditions

The weather forecast given at time of take-off (1846 hours) from Pajas Blancas, which was to cover the duration of the flight, was:-

overcast; rain 8/8; cloud type: stratus and numbostratus with a 100 m to 200 m ceiling; at 2 500 m there was an 8/8 overcast of altostratus; visibility was from 2 to 4 km. No turbulence was forecast.

* All times are local.

The conditions at Buenos Aires which were passed to the aircraft at 2042 were as follows:-

2000 hours wind ESE 15/20 kt;
visibility 4 km; present
weather, rain, over-
cast 8/8 fractostratus
at 100 m; barometric
pressure 1021.1; tem-
perature 10°C; dew-
point 9°C.

The instrument approach chart valid at the time of the accident was issued on 15 May 1961 and was in use by the company. It showed as minimum values for runway 12 at night a ceiling of 130 m and a visibility of 1 500 m.

Transcontinental S.A. had raised the minimum ceiling to 150 m but retained the figure of 1 500 m for visibility.

The weather conditions at Buenos Aires were below the minima laid down by Transcontinental S.A. and also below those laid down by the official authority.

The Approach to Buenos Aires Airport

From the time the flight contacted the control tower and started its approach procedure the conversation exchanged between the aircraft and the tower was recorded on magnetic tape.

First contact with the tower was at 2042 hours when the aircraft advised that it was over El Mundo radio station at 900 m. The flight was cleared to descend to 600 m and head for the outer marker "OP". At this time the 2000 hour weather observation was passed to the aircraft.

At 2048 the flight reported it was over the inner marker "P" and would start its turn to fly the outbound leg and would return over the same marker "P" to check the passage. Three minutes later it was over the outer marker "OP" on the outbound leg at an altitude of 600 m. At 2054, still on its approach, LV-FTO advised it was making

a procedure turn for approach to the aerodrome and would inform when over the outer marker "OP". Two minutes later it was over the outer marker "OP", in partial contact, with visibility reduced by showers. The tower cleared it to final approach requesting the aircraft to report again over the inner marker "P". Nothing more was heard from the aircraft.

Site of the Accident

The accident site was at an elevation of 6 m asl, in front of the Balneario railway station. Railway tracks which start at Retiyo Central Station pass in front of the airport and run parallel to the runway for its entire length to serve Balneario Station. In the station there is a building, 10 m high, which is used as a signal cabin. It is surrounded by trees which vary from 10 to 20 m in height. A few metres from the station, still in the same direction and at the side of the tracks, there is a semaphore signal which is mounted at the top of an 8 m mast.

The aircraft hit the metal mast, its right wing's outer portion was cut off about 7 m from the tip. The severed portion of the wing was carried forward by its own momentum and landed upside down about 50 m from the point of impact. The aircraft continued onward, veering to the right and after hitting several trees with its left propeller and wing, turned on its back and struck the ground with the cockpit roof, propellers and engines. The fuel tanks were ruptured, and the aircraft was totally destroyed in the subsequent fire.

Both engines were functioning, and increased power was applied a few moments before the crash. It was presumed that both engines were stopped following the loss of lateral stability which was impossible to counter at the time the portion of wing and corresponding aileron were torn off.

Witness information

One witness on the ground, an engine driver, was leaving the Balneario Station at 2056 hours driving a passenger train. About

150 m in front of the locomotive he observed the landing lights of an aircraft which was flying above the railway tracks; the lights were shining directly on the train. At first, the witness thought it was a low-flying aircraft in normal flight; then he observed that, as it approached, it was also losing altitude as if to land. For that reason, he turned off the train's headlight in order not to blind the pilot of the aircraft which, at that moment, passed about 3 m above the roof of the train cabin. He saw the aircraft tilt from left to right as though it had struck an obstacle, and then it straightened out, but he heard a sharp noise and felt sure that the aircraft had hit something.

The engine driver and the fireman on the same train declared that the weather was bad at the time. It was drizzling, and visibility was 300 m.

Some of the surviving passengers stated that the aircraft was flying very low before reaching the River Plate stadium. They could see the lights of the Vicente Lopez area. They then passed very low in front of the stadium and further along they could see the streets of the city, vehicles and people. At the same time, they observed that the engines were working perfectly, that the undercarriage and flaps had been lowered, and the landing lights were on. Later they heard an acceleration of the engines, followed by a hard jolt on the right side of the aircraft, and had the impression of making "an about face". They stated that there was neither fire nor explosion in the aircraft before the accident.

This was confirmed by the statements of the two stewardesses.

Instrument Approach Procedure

a) Official approach procedure for runway 12 as stated was published on 15 May 1961 and will remain a temporary document until the inner marker "P" is located in its final position, i.e. in line with the axis of the runway. It was 130 m to the left of that line.

When making the approach, after authorization has been received from the tower, the outer marker "OP" must be passed over at an altitude of 310 m, on a heading of 123°. The inner marker must be passed over at a minimum altitude of 130 m if visual contact has not already been established with the runway threshold. The climb-out should then be made on a heading of 90°. The minimum altitude in the area is 600 m.

b) Performance of the markers and of the control tower

The markers "OP" and "P" were working perfectly on the day of the accident according to the statements of the operator in the control tower. This was confirmed by the pilots of four aircraft who used the airport previously. They landed between 1950 hours and 2035 hours, i.e. a few minutes before the arrival of LV-FTO. The pilot of LV-FTO appeared to have some difficulty in recognizing the identification signal of the marker "P" during his procedure approach. However, despite this, he heard its emission and identified it correctly. He then decided to make another pass over it to complete identification, after which he made a turn to locate the "OP" marker.

c) Application of the procedure by the aircraft involved

If one plots, graphically, the instrument approach made by the aircraft in accordance with the communications which were sent to the control tower, the location of the aircraft would be above the outer marker "OP" in partial contact flight, with visibility reduced by rain. (No altitude specified). That marker is located in line with runway 12, at a distance of 7 km from its threshold.

If the aircraft had flown over the outer marker "OP" at the altitude prescribed by the procedure 310 m in a slowly descending trajectory 2.5 m/sec it should have climbed out if the threshold of runway 12 was not visible at the time it reached an altitude of 130 m (critical altitude) still heading for the

inner marker "P". How then could it be explained that the aircraft struck a railway signal 8 m above the ground and located 305 m to one side of the inner marker "P"? It should be remembered that this obstacle is not in line with the runway, but offset 175 m from its centreline. This means that the aircraft was flying to the right of the runway, at an altitude lower than that prescribed by the regulations covering instrument approach procedures.

From this, it is obvious that the pilot abandoned instrument flying, and did not comply with the indications of the approach chart. Another aircraft captain who landed on the same runway at 2035 hours, just a few minutes before the accident to LV-FTO, encountered a ceiling of 180 m and said it was necessary to make the approach on instruments for this landing.

As to whether he should have attempted an instrument approach procedure under the weather conditions which prevailed at the time, the data reveal that these conditions were below permissible limits authorized by the Government office and even more below those authorized by Transcontinental S.A. for a night landing on runway 12.

It cannot be doubted that the pilot came down lower than the prescribed critical altitude of 130 m during the instrument approach, as he hit an obstruction 8 m in height.

Supposing that the captain actually crossed the outer marker "OP" at the prescribed altitude of 310 m, not only did he descend lower than the critical altitude of 130 m without establishing normal visual contact with the runway threshold and without having passed the inner marker "P", but he did not make a descent at the prescribed rate of 2.5 m/sec. If he had done this after passing the outer marker at 310 m and then descended below the critical altitude, his altitude would have been 68 m at the railway signal.

After reading the statements of the aircraft's passengers, it was obvious that

they identified lights in the Vicente Lopez area, and vehicles and people in the area of the River Plate stadium. In view of the weather conditions, low ceiling, and, at times, heavy rain, it must be admitted that the identification of such objects could not have been possible unless the aircraft passed the outer marker "OP" at an altitude lower than that prescribed (310 m).

Passing the outer marker at a low altitude, attempting to continue contact flying when weather conditions did not permit, and abandoning the protection of the inner marker as a control caused the aircraft to hit the railway signal.

Actions of the control tower operator and the Transcontinental S.A. dispatcher at Buenos Aires

The tower operator cleared the aircraft to make an instrument approach but did not clear it to land.

As required by the regulations, the dispatcher forwarded complete weather information to the Operations Office in Córdoba so that the aircraft captain could be given the weather situation for the route and for Buenos Aires Airport as well as for the Mar del Plata Airport, the alternate. He could have suggested to the captain that the alternate be used, since the weather minima at Buenos Aires Airport were below those authorized by Transcontinental S.A.

However, the explanation he gave in his testimony was accepted, i.e. that he spoke to a captain who landed a few minutes before LV-FTO arrived. This pilot had stated that the actual weather conditions were better than those reported officially. On the other hand, the dispatcher knew that the control tower had passed the necessary weather information to the aircraft in question. It showed values lower than those authorized. The dispatcher also knew that the pilot was aware of this fact, as his operations manual gave the values applicable to the various airports. Furthermore, the pilot was familiar with the airport.

In short, the dispatcher knew that a procedure approach only had been authorized and that no clearance had been given for landing. He also knew that, although the pilot had a partial visual contact, he had to follow the procedure which, if carried out correctly made for a safe landing. He said that for this reason he did not suggest that the captain change his destination,

as he (the dispatcher) did not wish to interrupt him while he was working out his problem. However, he would have done so if the aircraft had been unable to land.

Probable Cause

The pilot failed to follow the instrument approach chart during the approach.
