

No. 2

Aviación y Comercio, S.A., Bristol 170, EC-ADI, crashed near Barajas Airport, Madrid, Spain, on 9 May 1957. Report released by the Directorate General of Civil Aviation, Spain.

Circumstances

The aircraft was on a scheduled passenger transport flight from Santiago de Compostela to Madrid, carrying 32 passengers and 5 crew. As requested, the flight passed downwind to align itself for landing on the assigned runway No. 23 during which manoeuvre the control tower gave it the green light for landing. The aircraft went by at an altitude of about 300 metres, banking slightly to the left in order to see the light signal more easily. At 1904 hours it saw the green light, compensated for its left bank and, banking to the right, started a right spin which continued to the ground. The aircraft hit the ground with the front part of the fuselage, the right wing and the right engine propeller and caught fire. Although the airport fire fighting services reached the aircraft 6 minutes after the accident and promptly went into action, it was impossible to extinguish the fire completely for more than an hour. Its effects, however, were reduced to such an extent that the crew and passengers could have been saved had they not all died as a consequence of the violent impact.

Investigation and Evidence

The pilot had held a licence since 16 January 1952 and had a total of 5 478 hours flight time. The co-pilot had 427 hours to his credit.

The aircraft's flight time since the last 1 750-hour overhaul was 1 098 hours 35 minutes, and since the last 300-hour check, 13 hours 5 minutes. Total flying time for engine No. 1 was 5 179 hours 10 minutes and for engine No. 2,

7 568 hours 25 minutes. Since the last 850-hour overhaul engine No. 1 had flown 96 hours 55 minutes and engine No. 2, 2 158 hours 10 minutes.

The maximum authorized take-off weight for this type of aircraft was 19 145 kilogrammes; according to the load sheet, the gross weight on departure from Santiago de Compostela was 17 537 kilogrammes.

As proved by both the Tower logs and the Barajas Communications Officer's log, the aircraft EC-ADI, arriving from Santiago de Compostela on flight AO-111, was, at 18 hours Z, given landing, runway, wind, QNH and QFE instructions on the long-range direction-finder frequency (owing to airborne VHF failure), and was advised by radio telegraphy that the QGP (clearance to land) would be given by means of light signals from the Tower.

The aircraft received and acknowledged the Tower instructions as is clearly proved by the long-range direction-finder log and by the Radio Operator's log which was recovered from the wreckage.

In view of the fire and the disturbance of the aircraft for the purpose of extracting victims, it was impossible to undertake a complete examination of the control mechanisms and levers or to decide on the condition of the engines at the time of the accident.

Examination of the wrecked control mechanisms failed to disclose any fracture, deformation or jamming prior to the accident as their characteristics proved that this occurred on impact.

Two blades were left on the right engine propeller; the other two were broken off and buried in the ground almost in a feathered position. Examination of the propeller pitch control gear as well as the fracture in the socket of the two blades buried in the ground would appear to indicate that this propeller was not in a feathered position, and this coincides with the (operational) position of the switches of this particular engine.

The position of the flaps at the time of the accident would appear to indicate extension during the first portion of the flight track, judging by the fractured right flap and by the position in which it came to rest after the right wing was bent back.

It appeared that the aircraft went into a stall. The crash against the ground in a right turn coincides with the stalling manoeuvre set out in the "Manual of Instructions to Pilots".

Although an experienced pilot is unlikely to allow his aircraft to stall while the engines are operating at normal cruising revolutions, there is no doubt that this may occur when there is a series of coinciding circumstances.

Failure of the right engine might cause the stall in an aircraft flying at a high angle of attack, especially during a right turn. Although no conclusive proof exists that the engine was running, the information available leads one to believe that it was, and there is consequently but little likelihood that engine failure was the actual cause of the accident.

It seems more probable that the aircraft was flying at a high angle of attack (owing to the fact that the pilot was looking through the window) and that the right turn coincided with a tail wind gust which, with the aggravating circumstances that the pilot's right foot was on the rudder control, caused the stall.

It is believed that the aircraft may have been operating at speed limit, since the pilot had to concentrate his attention on the tower and the signal was not immediately forthcoming, as can be appreciated by the distance covered from the time when the pilot, looking towards the runways, was able to see the terminal building façade at a tangent.

On the other hand, the possibility remains that the aircraft was operated by the co-pilot who had very little experience on this type of aircraft.

Probable Cause

The accident was due to personnel errors.

- 1) The failure of radiotelephony compelled the pilot to concentrate on the green light during the approach manoeuvre.
- 2) The pilot's attention was so distracted that he operated close to the speed limit. Although such a distraction is infrequent, statistics show that it may occur after 5 000, 7 000 and even after 13 000 flying hours.

