No. 10

Serviços Aéreos Cruzeiro do Sul S.A., Convair 240, PP-CEZ accident at Vitória Airport, Espirito Santo State, Brazil on 9 May 1962. Report, dated 10 October 1962, released by the Brazilian Air Ministry, (SIPAer).

1. Historical

1.1 Circumstances

The aircraft was flying the Rio de Janeiro-Vitória segment of a scheduled international flight. At 2220 hours GMT it reported it was over Guarapari at 2 700 m and in instrument meteorological conditions. The aircraft was authorized to descend to 2 100 m and told to maintain that altitude until reaching the non-directional radio beacon at Vitória. At 2228 hours it reported it was three minutes out at 2 100 m and in visual meteorological conditions. The flight continued its descent and was given landing instructions for runway 23. The controller in the tower watched the aircraft descending, and at the end of the downwind leg he saw the landing lights being adjusted. When the aircraft reported on final, the landing instructions were repeated. Shortly thereafter power was applied in an effort to climb the aircraft, but it collided with a eucalyptus tree at a height of 40 m, 1 860 m from the threshold of runway 23. At that stage of the approach the aircraft should have been at a minimum altitude of 190 m (150 m above the ground). Fire broke out following impact.

1.2 Damage to aircraft

The aircraft was destroyed by impact and subsequent fire.

1.3 Injuries to persons

Three crew and twenty passengers were killed in the accident. Two passengers survived but were seriously injured.

2. Facts ascertained by the Inquiry

2.1 Aircraft information

An overhaul (300-hour) of the aircraft was completed on 13 April 1962. Since that time it had flown 126 hours. The maintenance reports on the aircraft for the three weeks prior to the accident showed no abnormality.

The aircraft's take-off weight was 18 261 kg. It was estimated that during the Rio de Janeiro-Vitória portion of the trip it would have used approximately 625 kg of fuel. Therefore, at the time of the accident it weighed about 17 636 kg. The maximum permissible landing weight is not given in the report nor is any accurate information provided regarding the aircraft's centre of gravity.

2.2 Crew information

The pilot-in-command had flown a total of 18 386 hours. His time on Convair aircraft was 2 526 hours including 2 426 hours as pilot-in-command. He had a valid instrument rating and had flown a total of 6 128 hours on instruments. His night flying experience amounted to 2 144 hours.

The co-pilot had 3 637 hours' flying experience which included 395 hours on Convairs. His instrument experience while flying at night amounted to 1 212 hours.

Both were medically fit, and their flight time did not indicate that they were fatigued. Also, they were both familiar with the topography of the land in the accident area.

2.3 Weather information

Weather bulletins issued around the time of the accident, which occurred just after 2228 hours, showed no conditions which would have caused the accident. It was a dark, moonless night. The pilot of another aircraft, which flew over the area just after the accident, said that although there was light rain and turbulence, he was able to keep the runway in sight at all times.

2.4 Navigational Aids

The non-directional beacon at Vitória was operating satisfactorily and was available to the aircraft during its descent.

2.5 Communications

No communications difficulties were experienced.

2.6 Aerodrome Installations

All runway and obstruction lights were operating normally. The rotating beacon was also in good working condition. Approach lighting is not mentioned.

2.7 Fire

The post-crash fire destroyed the aircraft.

2.8 Wreckage

Very little wreckage remained to be examined following the fire. Based on the wreckage pattern, it was concluded that at the time of impact the aircraft was intact.

3. Comments, findings and recommendations

3.1 Discussion of the evidence and conclusions

According to the testimony of the two surviving passengers and qualified ground witnesses, nothing unsual occurred prior to the accident. However, the passengers felt that the aircraft descended too fast and that the turn onto final was too steep. From this it was inferred that the aircraft may have been too close to the runway on its down-wind leg. While on final they heard power being increased just prior to impact.

For this aircraft type the standard procedure when on base leg is to make a descending turn that must terminate at an altitude of 150 m. As the turn was steep, the pilot must have neglected his altimeter and instead used the runway lights as reference points. The quick descent also made it difficult for him to estimate the aircraft's altitude As a result he misjudged his distance and descended too low behind the eucalyptus trees, losing sight of the runway lights. When he realized this, it was too late to avoid the collision with the trees.

When carrying out an approach at night in visual meteorological conditions the aircraft's altitude must be checked continuously on the altimeter until the aircraft nears the runway.

3.2 Probable cause

The pilot did not carry out the approach in accordance with the procedures prescribed by the airline and misjudged his distance from the runway.

3.3 Recommendations

No recommendations were made following the investigation of this accident.

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