Aviation Safety Investigation Report 199603734

Cessna Aircraft Company Stationair

15 November 1996

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Occurrence Number: 199603734 **Occurrence Type:** Accident
Location: 25km ENE Canberra, Aerodrome
State: NSW **Inv Category:** 3
Date: Friday 15 November 1996
Time: 1400 hours **Time Zone** ESuT
Highest Injury Level: Fatal
Injuries:

	Fatal	Serious	Minor	None	Total
Crew	1	0	0	0	1
Ground	0	0	0	0	0
Passenger	2	0	0	0	2
Total	**3**	**0**	**0**	**0**	**3**

Aircraft Manufacturer: Cessna Aircraft Company
Aircraft Model: U206F
Aircraft Registration: VH-RPW **Serial Number:** U20602836
Type of Operation: Non-commercial Pleasure/Travel
Damage to Aircraft: Destroyed
Departure Point: "Turalla", NSW
Departure Time: 1400 ESuT
Destination: Coolah, NSW

Crew Details:

Role	Class of Licence	Hours on Type	Hours Total
Pilot-In-Command	Private		240

Approved for Release: Wednesday, June 25, 1997

FACTUAL INFORMATION

The pilot had planned a visual flight rules (VFR) flight to Coolah. A significant ridgeline, oriented approximately north-south and extending for many kilometres, was located about 1 km to the west of the airstrip. The surface winds were from the north-west at a reported strength of 15-20 kts, with some stronger gusts.

Witnesses observed the aircraft take off to the north-west and climb into wind for a distance of about 0.5 km. It then turned right onto a northerly heading and tracked parallel to the ridgeline but appeared to gain altitude very slowly, reaching a maximum height of about 200 ft.

Approximately 2 km to the north of the airstrip, the aircraft was observed to abruptly adopt a nose-high attitude. The attitude then levelled and the aircraft turned left, whilst losing altitude, until it was tracking downwind in an easterly direction. At this time the aircraft commenced to roll from side to side before the left wing suddenly dropped. It then descended steeply until it collided with the ground and caught fire. The pilot and both passengers sustained fatal injuries.

The aircraft was a Cessna U206F which was fitted with a Continental IO-520-F, 300 HP engine and a three-bladed constant speed McCauley propeller. At the time of the accident, the weight of the aircraft was estimated to be 1,484 kg. Using climb performance data derived from the Cessna U206F Owner's Manual, the aircraft's expected maximum rate of climb in the ambient conditions was about 900 ft/min.

An onsite examination of the wreckage revealed that the forward fuselage area had been severely disrupted by impact forces before being substantially consumed by fire. In the area of the instrument panel and firewall, virtually all alloy components were reduced to a molten state. The wings were found next to, but detached from, the fuselage. Impact forces had detached the fibreglass left wingtip fuel tank. The right wingtip fuel tank was ruptured, with the lower surface removed. Examination of the airframe found no condition which may have contributed to the accident.

The engine was found inverted and displaced to the left of the fuselage, facing back at an angle of about 45 degrees to the fuselage. The propeller was found separated from the engine. Both the engine and propeller were removed from the accident site for specialist examination.

Inspection of the engine found no indication of any pre-impact failure or defect which may have affected the normal operation of the aircraft. Examination of the propeller indicated that the engine was probably operating at a low power setting, consistent with the throttle being retarded to idle prior to impact.

Strong winds had been experienced in the Canberra region during the two days prior to the accident flight. On the day of the accident, the local meteorological situation was dominated by a front moving north along the south coast of NSW. Ahead of this, winds continued to be strong and gusting from the north-west, flowing at approximately right angles over the ridgeline. A pilot who had flown over the accident site shortly after the occurrence, reported that the windspeed at a height of 500 ft was 48 kts. The surface windspeed was reported to be 15-20 kts.

Specialist advice from the Bureau of Meteorology indicated that the synoptic situation in the area at the time of the accident was conducive to the formation of lee waves with associated strong downdrafts in excess of 1,300 ft/min. Lee waves are characterised by strong airflow, conforming to a wave-like motion, with separate areas of descending and rising air.Though often associated with the presence of lee waves, there was no evidence of lenticular cloud (lens or cigar shaped cloud) due to the low relative humidity.

The pilot held a valid licence for the operation being undertaken. As his logbook had been destroyed by the post-crash fire, an accurate calculation of his total flying hours could not be determined. At the time of his most recent aviation medical examination in November 1993, he had accumulated 120 flying hours, most of which were flown in the accident aircraft. Since that time he had flown infrequently. His most recent flight was to Dalgety some 4-6 weeks prior to the accident. In the 72 hours leading up to the accident, the pilot had been engaged in routine duties associated with the running of the family business. Family members reported that he had taken a normal rest period the evening before the accident flight and appeared to be in good spirits.

ANALYSIS

The severe weather conditions and the pilot's relative inexperience were considered to be significant factors in the development of this accident.

In conditions such as those associated with strong lee-wave activity, aircraft are likely to experience large airspeed fluctuations and reduced attitude and directional control. It is probable that the maximum climb performance of the aircraft was not capable of overcoming the strong downdrafts in the area at the time of the accident. As the pilot flew parallel to the ridgeline, the aircraft would have remained under the influence of the lee-wave activity.

Whilst the investigation could not clearly establish why the aircraft turned left toward the ridgeline following the abrupt nose-attitude change, it is likely that the pilot was experiencing difficulty in maintaining adequate control of the aircraft and was unable to manoeuvre it to a safer area.

Following the left turn, the aircraft commenced to track downwind. At this time it was in close proximity to the ground and continuing to lose height. With a tailwind of some 40-50 kts, the speed of the aircraft over the ground would have been approximately 120 kts. The pilot may have been influenced by a false impression of excessive airspeed and a concern about the possibility of colliding with the ground. Consequently, he may have instinctively pulled back on the control column in an attempt to raise the nose of the aircraft into a climbing attitude. Such an action would have further reduced the aircraft's airspeed and may have induced a stall, consistent with witness observations.

Whilst the pilot was familiar with operations from the airstrip and had considerable experience in the accident aircraft, his overall experience was low. It is unlikely that he had encountered such severe weather conditions on previous flights. In addition, he may not have been alerted to the possibility of the existence of lee waves, given the surface winds at the airstrip were not strong and the absence of lenticular clouds above the ridgeline.

SIGNIFICANT FACTORS

1. The synoptic situation in the area at the time of the accident was conducive to the formation of strong lee waves.

2. The aircraft's flight path was such that it probably remained under the influence of the lee-wave activity.

3. It is possible that, whilst experiencing difficulty maintaining control of the aircraft, the pilot reacted inappropriately to a false impression of excessive airspeed and a concern about the possibility of colliding with the ground.

4. The aircraft stalled at a height from which it was not possible to recover.