Aviation Safety Investigation Report 198304358

Cessna 501

5 December 1983

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Occurrence Number: 198304358 Occurrence Type: Accident

Location: 10 Km NE of Kalgoorlie WA

Date: 5 December 1983 **Time:** 642

Highest Injury Level: Nil

Injuries:

	Fatal	Serious	Minor	None
Crew	0	0	1	1
Ground	0	0	0	-
Passenger	0	0	0	5
Total	0	0	0	6

Aircraft Details: Cessna 501 **Registration:** VH-BNK

Serial Number:

Operation Type: Business **Damage Level:** Substantial **Departure Point:** Adelaide SA

Departure Time: 0642

Destination: Kalgoorlie WA

Approved for Release: 11th July, 1985

Circumstances:

The pilot returned to Essendon at about 1700 hrs ESuT on 4 December after having operated for some time in Tasmania. On his arrival he refuelled the aircraft and completed a flight plan for the flight to Adelaide and Kalgoorlie the following morning. At about 0430 hours ESuT the next morning the pilot submitted the flight plan to Melbourne Briefing Office prior to obtaining a forecast of the upper winds for the route and terminal area forecasts for Adelaide and Kalgoorlie. To calculate the time intervals for the two legs of the proposed flight the pilot had assumed a headwind component of 50 Knots. However, the forecast given to the pilot indicated that the headwind component for the Essendon to Adelaide leg at the planned level, flight level 310, was about 90 knots, and for the Adelaide to Kalgoorlie leg at planned level, flight level 370, was about 100 knots. The flight plan also gave the fuel endurance of the aircraft as 200 minutes ex Essendon and 300 minutes ex Adelaide. The aircraft subsequently departed Essendon and arrived in Adelaide after an apparently uneventful flight. The pilot left a note to instruct the aircraft refuellers to refuel the aircraft to full tanks and proceeded to the Adelaide Briefing Office. At the Briefing Office the pilot obtained updated weather forecasts which indicated that Kalgoorlie required an alternate. The pilot then advised the Briefing Officer that he would nominate Perth as the alternate. When he was then told that the fuel endurance necessary to plan Perth as an alternate would be 302 minutes, the pilot changed the flight plan to indicate that the fuel endurance of the aircraft ex Adelaide was 320 minutes. At the flight levels planned a fuel endurance of 320 minutes could not be obtained. The pilot also decided to fly the leg at flight level 290 as the head winds at that level were less than at the higher level, although still almost twice the strength of the flight planned headwind. When the pilot returned to the aircraft he found that it had not been refuelled as requested. He then assisted the refuellers to refuel the aircraft by adding the anti-icing agent to the fuel during the operation. Because of the delay the normal fuelling procedure was not carried out and as a result the fuel tanks were not filled to capacity. About an hour after departing Adelaide the aircraft entered cloud and encountered icing conditions. The pilot switched on the

engine anti-ice and the cruise was continued at flight level 290 for about 30 minutes before climbing to flight level 310, clear of cloud where anti-icing was turned off. Operating with engine anti-ice on increases the fuel consumption by 8 percent. As the aircraft approached the mid-point of the flight the pilot became concerned that he may not have sufficient fuel to continue the flight from Kalgoorlie to the alternate, Perth. He decided to continue the flight towards Kalgoorlie and if the alternate requirement was not lifted when he was at a point along track that was 30 minutes beyond Caiguna, he would return to and land at Caiguna. Shortly afterwards the alternate requirement was lifted on Kalgoorlie. When 185 kilometres east of Kalgoorlie the pilot commenced the descent and at flight level 250 the aircraft entered cloud and the engine anti-ice was again switched on. During the descent the fuel low level warning light illuminated and the left engine surged and flamed out at 10,000 feet. The pilot unsuccessfully attempted to restart the engine. As the aircraft broke clear of cloud at 1000 feet above ground level the right engine also flamed out. The pilot made a distress call and landed the aircraft, gear up, on a fire break. After touchdown the aircraft skidded 400 metres before coming to rest. The examination of the aircraft found that during the landing the left fuel tank had been breached, however no evidence was found of any significant fuel spillage. Approximately five litres of fuel was recovered from each of the left and right fuel tanks. The engine fuel filters and fuel lines provided only a small amount of residual fuel. The inspection of the remainder of the aircraft did not reveal any defects that could have contributed to the accident.

Significant Factors:

- 1. The flight was inadequately planned; the aircraft had insufficient fuel capacity to complete the flight at the planned levels.
- 2. The refuelling of the aircraft at Adelaide was rushed and as a result the tanks were not filled.
- 3. During the flight insufficient attention was given to fuel management.
- 4. The engines flamed out due to fuel exhaustion.