Aviation Safety Investigation Report 199604019

Beech Aircraft Corp Super King Air

05 December 1996

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NOTE: All air safety occurrences reported to the ATSB are categorised and recorded. For a detailed explanation on Category definitions please refer to the ATSB website at www.atsb.gov.au.

Aviation Safety Investigation Report

199604019

The Bureau did not conduct an on scene investigation of this occurrence. The information presented below was obtained from information supplied to the Bureau.

Occurrence Number: 199604019 **Occurrence Type:** Incident
Location: 90km NW Perth, Aerodrome
State: WA **Inv Category:** 4
Date: Thursday 05 December 1996
Time: 0930 hours **Time Zone** WST
Highest Injury Level: None

Aircraft Manufacturer: Beech Aircraft Corp
Aircraft Model: 200
Aircraft Registration: VH-LKF **Serial Number:** BB-660
Type of Operation: Charter Passenger
Damage to Aircraft: Nil
Departure Point: Youanmi WA
Departure Time: 0829 WST
Destination: Perth WA

Crew Details:

Role	Class of Licence	Hours on Type	Hours Total
Pilot-In-Command	Commercial	1000.0	9000

Approved for Release: Tuesday, January 14, 1997

The pilot reported that he completed some pre-planning for the flight on the evening before the occurrence. As the forecast passenger load was less than expected he rang the refuelling agent and requested an additional 200 lb of fuel be added to the aircraft to bring the total fuel load to 1850 lb. The additional fuel was not added as the programmed aircraft became unserviceable prior to refuelling. The replacement aircraft contained 1650 lb which was the standard load for the flight.

The pilot prepared a flight plan for the flight using his personal flight planning program. A comparison between this plan and one prepared using the operator's flight planning program indicates the pilot's fuel-burn figures were some 6% better than the operators. The pilot's figures indicated the aircraft would use 679 lb for the flight to Youanmi, excluding any use of reserve fuel, and it would need a minimum of 1,266 lb, on taxi at Youanmi, to meet all requirements, including reserves, for the return flight. Expected fuel burn for the return flight was 895 lb. As the aircraft taxied with 1,650 lb at Perth, approximately 300 lb needed to be added at Youanmi to meet the requirements. The pilot requested that 300 lb of fuel be provided at Youanmi, during his standard radio report to the operator on departure from Perth.

At Youanmi, fuel is supplied in 200 L drums. It is the pilot's responsibility to move the drums and pump the fuel into the aircraft. The pilot reported that he did not add the extra fuel as the gauges indicated there was 1,270 lb of fuel remaining and this was more than the minimum requirement. Although there was a discrepancy between the expected fuel burn on the flight up and the apparent actual burn he indicated he did not consider it was significant. He assumed the difference was the result of a minor gauging problem. The pilot had a 15 minute wait before the passengers arrived and he was able to depart for Perth.

The return flight was uneventful until top of descent. As the pilot commenced descent the right engine lost all power. During his trouble checks the pilot noted that both fuel gauges read 240 lb. He was unable to restart the right engine and the flight was continued on one engine. The pilot reported the engine shutdown to air traffic services and indicated that he suspected fuel starvation. The aircraft was cleared direct to Perth. Although the pilot believed fuel might be the problem he decided not to divert into Pearce air force base but instead continued to Perth. He did however, request to track via overhead Pearce. The pilot later observed that had the second engine failed, he could have glided safely to either Pearce or Perth.

Following the aircraft's arrival in Perth, and after the passengers had disembarked, the fuel gauge indications were reported as 40 lb on the left and fluctuating between 100 and 180 lb on the right. The aircraft was defuelled and 15 L (26 lb) removed from the left tank and 3 L (5 lb) from the right. When all fuel was drained from the aircraft the left gauge read 0 lb and the right gauge 125 lb.

The pilot's fuel planning figure indicated the aircraft would use 1,574 lb of fuel for the return flight to Youanmi, without including any of the variable and fixed reserves. The fuel drain indicated the aircraft actually used 1,619 lb. The pilot's flight plan indicates that the time intervals for some of the legs flown were longer than planned. In addition there was the 6% difference in fuel burn between the two flight planning programs considered. It is not possible to determine, without additional research, the accuracy of the program used by the pilot. These differences probably account for the additional fuel used.

An engineering investigation determined that both fuel gauges had been replaced 3 days prior to the occurrence and a fuel calibration completed. This calibration had been completed using a system common to general aviation (the gauges were reset to zero and known amounts of fuel added to check the accuracy of the indications) but not recommended by the manufacturer. The gauging system was reported as serviceable after this calibration. Following the occurrence, the right gauge was reset to zero and another calibration was completed using the general method. A subsequent calibration using the manufacturer approved method (special test equipment) found that the right gauge was under-reading by 25 lb.

The reason for the false reading reported on the right gauge during and following the occurrence was not identified.

One of the purposes of fuel flight planning is to provide pilots with a means of cross checking the accuracy of their fuel gauges. It would be unlikely that any aircraft would burn 43% less fuel than expected on any one flight (379 instead of 679 lb). Consequently, it should have been obvious to the pilot that the gauge readings were unreliable when he checked the quantities at Youanmi, particularly in the light of his general and type experience. Why the pilot did not identify the discrepancy as significant could not be determined from the evidence available.