

**Aviation Safety Investigation Report
199302151**

**Piper Aircraft Corp
Navajo**

20 July 1993

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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.

Occurrence Number: 199302151 **Occurrence Type:** Accident
Location: 18km NW Brisbane
State: QLD **Inv Category:** 3
Date: Tuesday 20 July 1993
Time: 1546 hours **Time Zone:** EST
Highest Injury Level: Fatal
Injuries:

	Fatal	Serious	Minor	None	Total
Crew	1	0	0	0	1
Ground	0	0	0	0	0
Passenger	0	0	0	0	0
Total	1	0	0	0	1

Aircraft Manufacturer: Piper Aircraft Corp
Aircraft Model: PA-31
Aircraft Registration: VH-UFO **Serial Number:** 31-7712060
Type of Operation: Non-commercial Pleasure/Travel
Damage to Aircraft: Destroyed
Departure Point: Archerfield QLD
Departure Time: 1540 EST
Destination: Caboolture QLD

Crew Details:

Role	Class of Licence	Hours on	
		Type	Hours Total
Pilot-In-Command	Private	35.0	531

Approved for Release: Wednesday, November 23, 1994

The aircraft, with only the pilot on board, was being flown from Archerfield to Caboolture via the light aircraft lane to the west of Brisbane in company with another aircraft. About five minutes after departing Archerfield, the pilot radioed that he was experiencing problems with both engines and that he was in an emergency situation. The pilot of the other aircraft advised him that there were suitable forced landing areas in and around a nearby golf course. However, the aircraft continued and slowly lost altitude before rolling inverted and diving steeply into the ground.

Ground witnesses reported hearing loud backfiring and fluctuating engine RPM from the aircraft. These sounds were accompanied by erratic rolling and yawing of the aircraft before it rolled to the left and inverted. The right wing was severed outboard of the engine as the aircraft impacted a large tree before crashing onto a road.

Wreckage examination revealed that the fuel selectors for both engines were set at the auxiliary tank positions, causing fuel for each engine to be drawn from the corresponding auxiliary tank in each wing. It was established that the aircraft had been refuelled to full main tanks prior to the flight. Further, the pilot had advised in a telephone conversation

with an engineer before the flight that the contents of both auxiliary tanks was 60 litres or less. All fuel tanks except the left auxiliary tank were ruptured during the impact sequence. About one litre of fuel was recovered from this tank.

Examination of the aircraft engines indicated that the right engine was under power at impact while the left engine was not. The mechanical condition of the engines indicated that they were capable of normal operation.

The PA-31 pilot's operating handbook states that the main fuel tanks must be selected for takeoff. However, the behaviour of the aircraft, the position of the fuel selectors, and the information concerning the contents of the auxiliary tanks suggest that the pilot probably commenced the flight with the auxiliary tanks selected. As the flight progressed and fuel was used, intermittent un-porting of the fuel outlet lines occurred. This caused temporary fuel starvation, resulting in engine surging. These interruptions to engine power would have caused the aircraft to lose altitude, as described by witnesses, and airspeed. The event in which the aircraft rolled to the left and inverted is consistent with the right engine suddenly surging to high power when the aircraft was flying at a low airspeed while the left engine was delivering little or no power.

The pilot gained a PA-31 type endorsement in July 1992. At the time of the accident he had logged a total of 37.8 hours flying multi-engine aircraft, including 35 hours on this aircraft type.

It was established that the pilot did not use a written checklist. Had such a checklist been used, the incorrect fuel tank selection may have been detected. Notwithstanding this, fuel system management is a basic and essential aspect of aircraft operation. In particular, fuel tank selection is a standard check item in the event of engine malfunction during flight. The pilot's apparent failure to select the main fuel tanks may be explained, at least in part, by his relatively low level of aeronautical experience, both overall and on type. Additionally, the pilot's information processing capacity may have been affected by the stressful situation in which he found himself. There were indications from the radio transmissions made by the pilot that he was in a highly anxious state when he reported that he was experiencing difficulties.

There were areas beneath the aircraft's flight path upon which a forced landing could have been conducted, albeit with probable aircraft damage. The pilot's failure to conduct a forced landing is considered a factor in the severity of the accident.

Evidence obtained during the investigation and the circumstances surrounding this occurrence suggest that the pilot did not have an adequate understanding of the aircraft systems.

Significant Factors

The following factors are considered relevant to the development of the accident:

1. The pilot did not use a written checklist.
2. The pilot operated the aircraft with the auxiliary tanks selected when the fuel contents of these tanks was low.
3. The pilot failed to conduct a forced landing.