

**Aviation Safety Investigation Report
199600012**

**Piper Aircraft Corp
Lance**

03 January 1996

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Occurrence Number: 199600012 **Occurrence Type:** Accident
Location: 3km N Boddington
State: WA **Inv Category:** 3
Date: Wednesday 03 January 1996
Time: 1045 hours **Time Zone** WST
Highest Injury Level: Fatal
Injuries:

	Fatal	Serious	Minor	None	Total
Crew	1	0	0	0	1
Ground	0	0	0	0	0
Passenger	3	0	0	0	3
Total	4	0	0	0	4

Aircraft Manufacturer: Piper Aircraft Corp
Aircraft Model: PA-32RT-300
Aircraft Registration: VH-KTC **Serial Number:** 32R-7885125
Type of Operation: Non-commercial Pleasure/Travel
Damage to Aircraft: Substantial
Departure Point: Margaret River WA
Departure Time: 1000 WST
Destination: Boddington WA

Crew Details:

Role	Class of Licence	Hours on Type	Hours Total
Pilot-In-Command	Private	2000.0	3920

Approved for Release: Wednesday, November 27, 1996

FACTUAL INFORMATION

Sequence of events

The occupants of the Piper Lance aircraft had planned an overnight stop at a farm house near the proposed landing area. The pilot in command spoke to his contact (another pilot) at Boddington by telephone at least three times on matters related to the landing area. Landing area details were discussed in depth and the contact indicated that the pilot in command should land towards the east in the paddock he recommended. It was also recommended that he complete a right circuit at 1,800 ft above mean sea level (1,000 ft above ground level) to remain clear of the surrounding terrain. Immediately prior to departure the pilot in command was told that the wind at the landing area was a north-westerly at 15 kts. During one conversation the pilot in command indicated that he would land at Narrogin if the landing area at Boddington was unacceptable.

The aircraft circled Boddington for 15 minutes before it made an apparent approach to land. During this time it made a low pass alongside the proposed landing area.

The pilot in command did not follow instructions. He completed a left circuit at 500 ft above ground level and approached from the north-west at 45 degrees to the proposed landing direction. The aircraft descended to within 3 m of the ground, with landing gear and full flap extended. Power was then applied and a go-around commenced. The aircraft turned slightly left, passed between trees and continued to climb over rising ground. It was observed to veer towards the right during the climb.

Evidence indicates that the landing gear and flap remained extended during the climb. The aircraft collided with a tree 900 m from the go-around point. The collision occurred 25 m above the ground and 3 m below the top of the tree. The aircraft was extensively damaged by the collision. It then crashed in a dam 50 m beyond the tree and to the right of the original flight path.

Damage to the aircraft

Damage to the aircraft indicated that its flying characteristics were adversely affected by the tree collision. Tree impact had severely damaged both wings and destroyed the control system located in the aircraft's lower fuselage. The pilot in command could not have exercised any control after that point.

Weight and balance

The aircraft's weight at the time of the accident was estimated at 1450 kg. Maximum weight was 1633 kg.

Personnel information

Despite the pilot in command's considerable flying experience, information provided by his associates indicates that he had always flown into and out of landing areas that were marked as flight strips. As a result the pilot in command had not previously been confronted with the complexities of assessing whether a farm paddock met terrain clearance and aircraft performance requirements.

Post-mortem examinations did not disclose any medical condition that might have contributed to the accident.

Meteorological information

The weather conditions were recorded as fine, temperature 28 degrees Celsius with a wind from the north-west at approximately 8 kts.

Proposed landing area information

The paddock chosen for the landing was aligned east-west across a valley and included a grassed area 1,200 m long and 100 m wide. There were no other suitable paddocks in the immediate area. The grassed area was clear of obstructions but was not marked out as a landing strip. The proposed landing area sloped up from a river, towards the east and was contained within the grassed area. The slope was two degrees (3.4%) for the first 900 m, increasing to four degrees (6.8%) at the eastern end. There were ridges, 35-45 m higher than the surrounding terrain, at each end of the landing area. A displaced threshold, to assist the pilot in command during his approach over the high ground and trees, was marked by a car parked 300 m in from the western edge of the paddock. The car was also parked facing into wind, as arranged with the pilot in command, to indicate the wind direction. It was expected by the ground party that the pilot in command would make an approach for a landing towards the east (uphill). This direction meant the aircraft would land downwind.

A post-accident inspection of the paddock and an assessment using the approved landing weight chart indicates the proposed landing area did not meet the specifications contained in Civil Aviation Advisory Publication No. 92-1(1), Guidelines for Aeroplane Landing Areas. The average longitudinal slope was 5%. This exceeded the maximum of 2%. The landing distance available, after object clearance requirements were considered, was 530 m. This was 190 m less than the minimum distance calculated from the landing weight chart for the prevailing conditions. The pilot in command did not attempt to use the proposed landing area although it had been recommended to him by another pilot.

The approach direction used by the pilot in command was along the valley rather than across it. This allowed the pilot in command to fly a shallower approach than would have been the case had he used the direction recommended. It also provided a better climb-out route in the event of a go-around. However, fences and a dry watercourse reduced the actual landing distance available in this direction to 300 m, much less than the distance required.

Wreckage information

The wreckage was examined at the accident site and after removal to storage. The inspection of the airframe did not disclose any defects that may have contributed to the accident sequence.

Witnesses reported that the engine sounded normal during the climb-out after the go-around. Inspection of the engine indicated it was capable of normal operation and was developing power at the time of impact with the water.

An anomaly was found with the rear wing spar attachment points that might have affected the structural integrity of the aircraft. Post-accident inspection of the wreckage disclosed that the rear wing spar attachment points had been modified some time prior to the accident. The attachments had been cut to turn bolt holes into slots. The aircraft manufacturer has not approved this type of modification. There were indications that one attachment had been loose prior to the accident. No records were found relating to the modification. Discussion with one of the aircraft's owners indicated that the modification had not affected the aircraft's performance. It compared favourably with other PA32s also flown by the owner of the accident aircraft.

Aircraft performance

Performance calculations based on flight manual and manufacturer's information, indicate that the aircraft should have been capable of climbing clear of the terrain and trees following the go-around with the landing gear and flaps extended.

ANALYSIS

Proposed landing area

The recommendation by the ground contact and the acceptance by the pilot in command that the proposed landing site was suitable, indicates that neither had an adequate understanding of the parameters for an acceptable aeroplane landing area as set out in GAAP 92-1(1).

The pilot in command did not attempt to land in the paddock recommended by his ground contact at Boddington. This was probably because a later assessment from the air indicated that it was unsuitable.

The investigation could not determine why the pilot in command was not aware of the landing distance limitation on his actual approach path. It is possible that the obstructions did not become apparent until late in the approach as the fences and the dried watercourse would have blended into the surrounding dry grass. The attempted go-around probably indicates that the pilot in command realised the area was unsuitable during the latter part of the approach.

Go-around and climb performance

During the go-around the pilot in command did not retract either the flaps or the landing gear. The investigation could not determine the reason for this.

Performance calculations indicate that the aircraft should have been capable of climbing clear of the terrain and trees following the go-around. Why it did not could not be determined. Nor could it be determined why the pilot in command did not turn the aircraft further right, away from the trees and towards lower ground. The Piper Lance has an extended forward fuselage, restricting forward and downward visibility during a climb. It is possible that the pilot in command was not aware of the aircraft's proximity to the tree and that the collision was completely unexpected.

Wing spar attachment modification

It was not possible to determine when or why the holes in the wing rear spar attachments had been modified. It could not be determined what effect the modification and/or the loose wing spar attachment might have had on the structural integrity of the aircraft, particularly during the collision.

SIGNIFICANT FACTORS

1. A landing was planned and attempted in an area where there were no suitable landing sites.
2. The aircraft's climb performance was less than it should have been during the climb-out from the go-around.

SAFETY ACTION

As a result of the investigation into this occurrence, the Bureau of Air Safety Investigation advised the Civil Aviation Safety Authority of the details of the wing spar attachment modification.