Aviation Safety Investigation Report 199400683

Piper Aircraft Corp
Aztec

19 March 1994

Readers are advised that the Australian Transport Safety Bureau investigates for the sole purpose of enhancing transport safety. Consequently, Bureau reports are confined to matters of safety significance and may be misleading if used for any other purposes.

Investigations commenced on or before 30 June 2003, including the publication of reports as a result of those investigations, are authorised by the Executive Director of the Bureau in accordance with Part 2A of the Air Navigation Act 1920.

Investigations commenced after 1 July 2003, including the publication of reports as a result of those investigations, are authorised by the Executive Director of the Bureau in accordance with the Transport Safety Investigation Act 2003 (TSI Act). Reports released under the TSI Act are not admissible as evidence in any civil or criminal proceedings.

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

199400683

Occurrence Number: 199400683 **Occurrence Type:** Accident
Location: Bellenden Ker Range
State: QLD **Inv Category:** 3
Date: Saturday 19 March 1994
Time: 0958 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	3	0	0	0	3
Total	**4**	**0**	**0**	**0**	**4**

Aircraft Manufacturer: Piper Aircraft Corp
Aircraft Model: PA-23-250
Aircraft Registration: VH-BOC **Serial Number:** 27-7854059
Type of Operation: Charter Passenger
Damage to Aircraft: Destroyed
Departure Point: Cairns QLD
Departure Time: 0946 EST
Destination: Palm Island QLD

Crew Details:

Role	Class of Licence	Hours on Type	Hours Total
Pilot-In-Command	Commercial	23.9	4561

Approved for Release: Thursday, May 2, 1996

FACTUAL INFORMATION

Circumstances

The pilot of the Piper Aztec submitted flight plan details by telephone to Cairns Tower for a visual flight rules (VFR) charter flight from Cairns to Palm Island via Innisfail. The plan indicated an initial track of 153 degrees M at an altitude of 5,000 ft.

The aircraft departed Cairns at 0946 hours EST and the pilot advised Cairns Approach that he was tracking on the 153 omni radial from Cairns. At 0954.35 he reported maintaining 5,000 ft. At 0956.02 a regular public transport (RPT) aircraft inbound to Cairns from the south reported approaching 7,000 ft and was subsequently cleared to descend to 6,000 ft. At 0956.59, after the potential confliction with the Aztec was resolved, the RPT aircraft was cleared to descend to 4,100 ft. At this time the Aztec was 23 NM from Cairns at 4,600 ft and about 2 NM right of track. A short time later the approach controller noticed that the radar returns from the Aztec had ceased.

Terrain in the area is known to cause shielding and the loss of radar returns. The controller assumed that shielding had caused the Aztec to disappear from radar so he instructed the pilot of the Aztec to call the area flight service frequency, as there was no further requirement to remain on the approach frequency. No reply to this transmission was received and this was also thought to be due to terrain shielding. A short time later other aircraft in the area reported the operation of an emergency beacon. A distress phase was initiated and the wreckage of the Aztec was subsequently located on the western side of a blind valley north-west of Bellenden Ker Centre Peak at about 4,200 ft above mean sea level (AMSL) by a search helicopter.

Examination of the recorded radar data indicated that the aircraft gradually drifted right of track during the climb to 5,000 ft. At top of climb, some 15 NM south of Cairns Airport, it was about 0.75 NM right of track. At around this point, the track deviated further right by about 12 degrees. This track remained relatively constant until the aircraft was about 24 NM from Cairns where it again turned right. The aircraft maintained 5,000 ft to about 19 NM from Cairns after which it descended to 4,800 ft and remained between 4,800 and 4,700 ft until about 23 NM from Cairns. From this position it commenced further descent which continued for about 1 minute until the radar return ceased at a recorded altitude of 4,200 ft. During the descent the computed groundspeed of the aircraft decreased from 137 kt to 105 kt.

Examination at the accident site indicated that the aircraft struck the rainforest canopy at 4,200 ft AMSL with a descent angle of about 8 degrees and banked about 22 degrees to the right. The aircraft track at impact was about 196 degrees M.

Wreckage Examination

Examination of the aircraft wreckage did not reveal any abnormality which might have contributed to the accident.

Other than a complete set of Instrument Approach and Landing Charts, no other maps or charts were found in the wreckage.

The Pilot

The pilot held a commercial pilot licence and was endorsed to fly PA-23 aircraft. Although his instrument rating had expired he had conducted some instrument flying practice during the day prior to the accident.

The pilot had only limited flying experience in the Cairns area. This experience consisted of a short check flight at Cairns on 27 February 1994, a flight from Palm Island to Cairns on 17 March 1994, and two check flights at Cairns on 17 and 18 March 1994. The accident flight was the first recorded occasion of the pilot flying from Cairns to another destination.

The aircraft operator indicated that the pilot had not been given any specific briefing on the Cairns area as he considered that a pilot with 4,500 flying hours experience would not require such a briefing.

The post-mortem examination revealed some coronary artery occlusion which was considered to be too minor to have adversely affected the performance of the pilot.

Weather

The weather forecast for the area indicated a fresh to strong south-easterly airflow over the area with isolated showers over the coast and ranges. Broken stratus cloud was forecast from 1,000 to 3,000 ft in precipitation, along with scattered cumulus from 2,000 to 10,000 ft. Rain showers with 4 km visibility and occasional moderate turbulence below 7,000 ft near the ranges were also forecast.

The weather recorded on the Cairns Automatic Terminal Information Service (ATIS) at 0849 was wind 160 degrees M at 10-15 kts, temperature 25 degrees C, two oktas of cloud at 2,500 ft with lower patches and three oktas at 3,500 ft. There were showers in the area. Cairns Tower controllers stated that the top 500 ft of Mt Bellenden Ker appeared to be covered by cloud around the time of the accident.

Operating requirements

Aeronautical Information Publication (AIP) Australia RAC - 50a para 43.5.1 addresses flight under the VFR. The requirements include, inter alia:

a. the pilot in command of a VFR flight in controlled airspace must navigate by visual reference to the ground or water; and

b. when operating at or below 2000 ft above the ground or water, the pilot in command must be able to navigate by continuous visual reference to the ground or water or by the use of approved radio navigation apparatus as specified in CAO 20.8.

Under the VFR, AIP RAC - 33 requires that for the track being flown by the accident aircraft, the appropriate altitude would have been odd thousands of feet plus 500 ft for example 5,500 ft or 7,500 ft.

RAC CTL - 1 para 14.1 states, inter alia that a pilot must not deviate from track or change level without obtaining ATC approval when in controlled airspace.

The Approach Controller's duties included a requirement to maintain general radar surveillance of his area of responsibility insofar as the performance of other functions permitted. As part of this monitoring function, the controller was required to advise the pilot of a radar identified aircraft when that aircraft was observed to deviate beyond the normal navigational tolerance from the intended track. This tolerance is defined in the Manual of Air Traffic Services (MATS) as plus or minus 2 NM when an aircraft is 2,001 to 5,000 ft AGL and is navigating by visual tracking and position fixing.

MATS indicates that assigned cruising levels shall whenever practicable be in accordance with the level selected by the pilot and assigned levels shall normally conform to the appropriate table of cruising levels. Levels not conforming to these tables may be assigned when air traffic or other circumstances require. Prior to assigning an aircraft a non-standard level the controller shall consider workload and coordination implications along with the effect on aircraft already operating at standard levels.

Air Traffic Control

After the pilot had reported maintaining 5,000 ft he did not request a clearance to descend or alter heading.

A significant proportion of air traffic in the Cairns area operates in the VFR category. These flights often operate in an environment involving inclement weather and high terrain. The Cairns air traffic controllers reported that, particularly during the wet season (December-March), local weather conditions are frequently such that aircraft operating VFR are required to deviate from track to remain clear of cloud or avoid high terrain. In this environment the controllers become accustomed to aircraft operating adjacent to high terrain or deviating off track and it is not unusual for radar and radio contact with VFR aircraft to be lost because of terrain shielding.

The final 30 seconds of VH-BOC's descent were observed by a supervising controller who was randomly monitoring a radar screen in the control tower. On seeing the radar return from VH-BOC disappear he immediately returned to the Approach Control Centre to check the status of the aircraft, which by this time was no longer in radio contact.

Flight Planning

The pilot was not asked by the briefing officer or the air traffic controller why he chose to fly at 5,000 ft. No explanation was found as to why the pilot chose to fly the route at 5000 ft. There was no requirement for air traffic control to query the cruise altitude nominated by the pilot even though the controllers were aware that 5000 ft was not normally used by VFR traffic in the area. Aircraft operating in the VFR category in the Cairns area normally cruise below 2,000 ft or above 6,500 ft due to the prevalence of cloud on the ranges.

ANALYSIS

The recorded radar data showed a distinct change in aircraft track at about 16 NM from Cairns shortly after top of climb. The forecast winds were fairly constant from 2,000 ft to 7,000 ft so the track change seems unlikely to have been due to wind. It is possible that the pilot deliberately altered heading towards the blind valley west of Bellenden Ker Centre Peak in an attempt to avoid the deteriorating weather conditions along the intended track.

The descent pattern flown by the aircraft could also indicate that the pilot was manoeuvring the aircraft to remain clear of cloud. Having limited familiarity with the area and apparently no topographical maps on board the aircraft the pilot was not well placed to safely navigate the aircraft. The final descent and right turn made by the aircraft were possibly an attempt to remain clear of cloud.

Once VH-BOC had passed the inbound regular public transport traffic, when traffic separation considerations were no longer a factor, ongoing surveillance of the aircraft reverted to becoming part of the controller's normal monitoring function. A number of considerations influenced the controller's subsequent monitoring of the aircraft. There was other traffic, including IFR traffic, under the controller's jurisdiction which required his attention. The aircraft remained within 2 NM of the Cairns-Innisfail track until about one minute 30 seconds before radar contact was lost. The aircraft was not significantly beyond 2 NM right of track until 30 seconds or so before radar contact was lost. Because of the terrain and weather conditions generally prevailing in the Cairns area, controllers can in effect, become desensitised to track and altitude deviations by aircraft operating in the VFR category.

Had the pilot reported to ATC that he was deviating to the right of track and/or descending or that he was experiencing difficulties with weather conditions, he would have alerted the controllers and been provided with navigation assistance.

CONCLUSION

Significant factors

The following factors were considered relevant to the development of the accident.

1. The pilot was not familiar with the area.

2. The pilot apparently did not have with him in the aircraft any relevant topographical maps or charts covering the route being flown.

3. The pilot did not advise air traffic control that he was deviating from track and/or descending nor that he was encountering weather difficulties.