

**AIRCRAFT ACCIDENT REPORT**  
**OCCURRENCE NUMBER 03/249**  
**PIPER TOMAHAWK PA-38-112**  
**ZK-USA**  
**RAUMATI SOUTH**  
**31 JANUARY 2003**



**Glossary of abbreviations used in this report:**

AC	Advisory Circular
C	Celsius
E	east
MHz	Megahertz
NZDT	New Zealand Daylight Time
S	south
UTC	Coordinated Universal Time

## AIRCRAFT ACCIDENT REPORT

### OCCURRENCE No 03/249

<b>Aircraft type, serial number and registration:</b>	PA 38-112, 38-79A0010, ZK-USA
<b>Number and type of engines:</b>	One Lycoming O-235-L2C
<b>Year of manufacture:</b>	1979
<b>Date and time:</b>	31 January 2003, 1310 hours <sup>1</sup> (approx)
<b>Location:</b>	Raumati South Latitude <sup>2</sup> : S 40° 56.5' Longitude: E 174° 58.7'
<b>Type of flight:</b>	Training
<b>Persons on board:</b>	Crew: 1
<b>Injuries:</b>	Crew: 1 (Fatal)
<b>Nature of damage:</b>	Aircraft destroyed
<b>Pilot-in-command's licence:</b>	None (see 1.5)
<b>Pilot-in-command's age:</b>	41 years
<b>Pilot-in-command's total flying experience:</b>	57.5 hours 33.6 on type
<b>Information sources:</b>	Civil Aviation Authority field investigation
<b>Investigator in Charge:</b>	Mr Michael A Carrelli

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<sup>1</sup> Times are NZDT (UTC + 13 hours)

<sup>2</sup> NZ Geodetic datum 1949 co-ordinates

## Synopsis

The Civil Aviation Authority was notified of the accident at 1320 hours on Friday 31 January 2003. The Transport Accident Investigation Commission was in turn notified shortly thereafter, but declined to investigate. A CAA site investigation was commenced later the same day.

The pilot was on a solo circuit after being checked out by an instructor and authorised for the flight. The aircraft reached the approximate point for a turn from downwind onto base leg when it was observed to spiral out of the sky and crash into the front yard of a residential property. The first person at the scene of the accident found the pilot dead.

## 1. Factual information

### 1.1 History of the flight

- 1.1.1 On 21 January 2003, the student pilot had scheduled a solo training sortie with a Paraparaumu-based training organisation. On his arrival at the aerodrome, he discussed the flight with his instructor, particularly with regard to the suitability of the wind conditions for circuit work.
- 1.1.2 It was agreed that the instructor would accompany the student initially, to confirm that the wind strength was acceptable for the student's level of experience.
- 1.1.3 After two circuits using runway 34, the instructor was satisfied that the student was competent to continue on his own, and sent him solo.
- 1.1.4 The first circuit resulted in a go-around. During the second circuit the aircraft had reached a late downwind position from where it normally would have turned on to base leg, and was next seen in a spin or spiral towards the ground.
- 1.1.5 The aircraft collided with a wooden power pole at the front of a residential property and continued at a steep angle of descent into the front yard of the property. The pilot was killed in the impact sequence.
- 1.1.6 The accident occurred in daylight, at approximately 1310 hours NZDT, at Raumati South, at an elevation of 60 feet. Grid reference 260-R26-765280, latitude S 40° 56.5', longitude E 174° 58.7'.

### 1.2 Injuries to persons

<i>Injuries</i>	<i>Crew</i>	<i>Passengers</i>	<i>Other</i>
Fatal	1	0	0
Serious	0	0	0
Minor/None	0	0	

### **1.3 Damage to aircraft**

1.3.1 The aircraft was destroyed.

### **1.4 Other damage**

1.4.1 The top 1.9 meters of the power pole was broken off, falling and damaging a wall in the garden. A large gouge was made in the lawn from the engine impact, and the area was doused in fuel.

### **1.5 Personnel information**

1.5.1 The pilot held a valid Class 1 medical certificate, which permitted him to undertake supervised solo flight. He had yet to complete the flight time requirements for the issue of a Private Pilot Licence (Aeroplane).

1.5.2 Up to 31 January 2003, the pilot had flown a total of 57.5 hours, comprising 50.6 hours dual and 6.9 hours solo. His time on the PA-38 type was 33.6 hours, and the balance of 23.9 hours was on Cessna 152 aircraft.

### **1.6 Aircraft information**

1.6.1 Piper PA 38-112 Tomahawk, serial number 38-79A0010 was manufactured in 1979.

1.6.2 The aircraft was imported into New Zealand in 1994, registered as ZK-USA and was issued with a non terminating Certificate of Airworthiness in the private and aerial work categories on 21 July 1994.

1.6.3 Up to 31 January 2003, ZK-USA had accrued a total time in service of 2604.3 hours. The most recent maintenance was a 100-hour check performed at 2536 airframe hours on 10 October 2002. An annual review of airworthiness had been carried out on 31 October 2002.

1.6.4 The engine, a Lycoming O-235-L2C serial number L-17392-15 had run 2604.3 hours since new. The most recent maintenance was a 100-hour check carried out on 10 October 2002. Engine time since inspection was 68.3 hours.

1.6.5 The engine had been run for 2604.3 hours which is 604.3 hours over the manufacturer's recommended overhaul time, as is allowed by AC 43-5A, which specifies the parameters for running 'on condition.'

### **1.7 Meteorological information**

1.7.1 Actual recorded weather from the Paraparaumu Aerodrome automatic weather station showed that throughout the day the surface wind was northerly, 12-14 knots with a maximum gust of 24 knots. At the time of the accident the sky was overcast at 4000 feet, temperature was 21° C, dew point 14° C, with no precipitation.

1.7.2 Weather is considered not to be a factor in this accident.

## **1.8 Aids to navigation**

1.8.1 Not applicable.

## **1.9 Communications**

1.9.1 The aerodrome operator has a voice recording system, which records transmissions on the aerodrome frequency of 118.3 MHz. Replay of the relevant recordings confirmed the pilot was making the required calls in the circuit; these were also heard by the training organisation staff on their base station.

## **1.10 Aerodrome information**

1.10.1 The aircraft was considered to be within gliding distance of a large parkland area, and the beach, which the students were taught to use in the event of an engine failure if appropriately situated for its use. The beach, which is many kilometres long and flat, is usable for at least 60% of the circuit distance.

## **1.11 Flight recorders**

1.11.1 Not applicable.

## **1.12 Wreckage and impact information**

1.12.1 The ground impact marks and aircraft damage indicated that the aircraft had collided with, and broken off the top 1.9 meters of a wooden power pole. It then continued with a nose low, wings level attitude for a further 10 meters where it made a ground scar 3 meters long before striking the base of a tree. The propeller broke off the crankshaft, at the base of the tree. The aircraft struck the ground in a northerly direction and overturned, coming to rest inverted and facing in an easterly direction, in the front yard of a residential property.

1.12.2 The propeller showed very little sign of rotational damage. However the tachometer needle was trapped at 1700 RPM.

1.12.3 The engine was forced back into the cockpit area severely reducing the occupiable space. All accessories below the engine were severely damaged.

1.12.4 The aft movement of the engine forced the flight control runs, located on the floor of the cabin, through the wing main spar.

1.12.5 The whole rear of the fuselage broke away circumferentially at the manufacturing joint just aft of the cabin area.

1.12.6 All flight control runs were found to be intact although severely damaged. The flap setting could not be conclusively determined from the wreckage.

1.12.7 The continuity of all the engine controls was found to be intact but again the settings could not be determined.

1.12.8 The engine was stripped and found to be worn as could be expected for an engine running 'on condition'. The engine had not suffered any mechanical failure.

1.12.9 The centre of gravity was within the prescribed limits.

### **1.13 Medical and pathological information**

1.13.1 Post-mortem examination of the pilot revealed that he died of traumatic injuries sustained at the time of impact. The post mortem examination did not reveal any medically incapacitating condition that may have contributed to the accident. Toxicology testing did not reveal any substances that may have contributed to the accident.

### **1.14 Fire**

1.14.1 There was no fire, even though the aircraft was carrying approximately 80 litres of fuel, and the fuel tanks were ruptured on impact.

### **1.15 Survival aspects**

1.15.1 The impact was not survivable.

### **1.16 Tests and research**

1.16.1 Not applicable.

### **1.17 Organisational and management information**

1.17.1 Not applicable.

### **1.18 Additional information**

1.18.1 The engine had been run for a total of 2604.3 hours which is 604.3 hours over the manufacturer's recommended overhaul time, as is allowed by AC 43-5A. The engine had not failed in flight, however it showed signs of excessive wear particularly on the camshaft lobes. In addition the engine logbooks did not reflect that the specific checks required by AC 43-5A for running an engine 'on condition' had been carried out.

### **1.19 Useful or effective investigation techniques**

1.19.1 Nil.

## **2. Analysis**

2.1 There was no physical evidence of any pre-accident failure of the airframe or engine. In any event, an engine failure or partial power loss should not have resulted in the accident, as the aircraft was considered to be within gliding distance of a large parkland area and the beach. Both of these were suitable for a forced landing.

- 2.2 A power loss due to carburettor icing was considered unlikely given the conditions of the day. Wind shear and mechanical turbulence were also considered unlikely considering the wind direction relative to the local topography.
- 2.2 Witness observations indicate that the aircraft entered a spin while turning from downwind on to base leg. This could have resulted from an unbalanced turn, too low an airspeed in the turn, or a combination of both.
- 2.3 The ground impact was consistent with a spin and possible partial recovery.
- 2.4 It was not possible to determine, from the evidence available, the reason why the aircraft entered a spin, and for this reason it was not practicable to make any useful safety recommendations.

### **3. Conclusions**

- 3.1 The pilot was properly authorised, rated and apparently fit for the flight undertaken.
- 3.2 The aircraft had been subjected to regular maintenance and appeared to be airworthy prior to the accident.
- 3.3 The aircraft did not recover from an unintentional spin manoeuvre and collided with the ground.
- 3.4 There was no evidence of pilot in-flight incapacitation.
- 3.5 The accident was not survivable.
- 3.6 It was not possible to determine a conclusive cause for the accident.

Report written by:

Authorised by:

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Safety Investigator

Richard White  
Manager Safety Investigation

Date