



Section/division

Occurrence Investigation

Form Number: CA 12-12a

AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/8813	
Aircraft Registration	ZS-EXW	Date of Accident	27/07/2010		Time of Accident	0519Z
Type of Aircraft	Piper PA32-300		Type of Operation	Private		
Pilot-in-command Licence Type	Commercial	Age	58		Licence Valid	Yes
Pilot-in-command Flying Experience	Total Flying Hours	3047.0		Hours on Type	1800.0	
Last point of departure	Louis Trichardt Aerodrome (FALO) in Limpopo					
Next point of intended landing	Kruger Mpumalanga Aerodrome (FAKN) in Mpumalanga					
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)						
At 23°03.221' E 29°52.683' in Louis Trichardt						
Meteorological Information	Surface Wind: calm; Visibility: CAVOK; Temperature: Unknown					
Number of people on board	1 + 1	No. of people injured	2		No. of people killed	0
Synopsis						
<p>The pilot, accompanied by a passenger, flew the aircraft on a private flight in visual flight rules from Louis Trichardt Aerodrome with the intention to fly to Kruger Mpumalanga International Aerodrome. The pilot reported that she was cleared for takeoff from Runway 10 and to climb to 8000 ft directly to Kruger Mpumalanga International Aerodrome. After takeoff, during the climb at 300 ft above ground level (AGL), they experienced an engine stoppage.</p> <p>The pilot decided to change the fuel supply but the engine could not restart. She conducted the after-takeoff engine failure emergency procedure in an attempt to restart the engine. The engine failed to restart and the pilot carried out an unsuccessful forced landing in an open area north of the runway.</p> <p>The pilot sustained minor injuries and the passenger was seriously injured. The aircraft sustained substantial damage.</p>						
Probable Cause						
Unsuccessful forced landing due to fuel starvation						
<u>Contributory factor:</u> Improper fuel management						
IARC Date			Release Date			



AIRCRAFT ACCIDENT REPORT

Name of Owner/Operator : Rio Ridge 1027 CC
Manufacturer : Piper Aircraft Corporation
Model : PA-32-300
Nationality : South African
Registration Marks : ZS-EXW
Place : Louis Trichardt
Date : 27 July 2010
Time : 0519Z

All times given in this report are Co-ordinated Universal Time (UTC) and will be denoted by (Z). South African Standard Time is UTC plus 2 hours.

Purpose of the Investigation :

*In terms of Regulation 12.03.1 of the Civil Aviation Regulations (1997) this report was compiled in the interest of the promotion of aviation safety and the reduction of the risk of aviation accidents or incidents and **not to establish legal liability.***

Disclaimer:

This report is given without prejudice to the rights of the CAA, which are reserved.

1. FACTUAL INFORMATION

1.1 History of Flight

- 1.1.1 The pilot, accompanied by a passenger, flew the aircraft on a private flight in visual flight rules from Louis Trichardt Aerodrome with the intention to fly to Kruger Mpumalanga International Aerodrome. The pilot reported that she was cleared to take off from Runway 10 at Louis Trichardt Aerodrome and to climb to 8000 ft directly to Kruger Mpumalanga International Aerodrome. After takeoff, during the climb at 300 ft above ground level (AGL), the engine RPM started to fluctuate and the engine eventually stopped.
- 1.1.2 The pilot decided to change the fuel supply but the engine would not restart. She conducted the after-takeoff engine failure emergency procedure in an attempt to restart the engine. The engine to restart and the pilot carried out an unsuccessful forced landing in an open area north of the runway.
- 1.1.3 The forced landing took place in an open field suitable for the forced landing, which was on the northern side of the aerodrome. During the forced landing the aircraft sustained substantial damage. The pilot and passenger were injured during the accident.

1.2 Injuries to Persons

Injuries	Pilot	Crew	Pass.	Other
Fatal	-	-	-	-
Serious	-	-	1	-
Minor	1	-	-	-
None	-	-	-	-

1.3 Damage to Aircraft

1.3.1 The aircraft sustained substantial damage.



Figure1 shows damage caused to aircraft.

1.4 Other Damage

1.4.1 There was no other damage.

1.5 Personnel Information

Nationality	South African	Gender	Female	Age	58
Licence Number	0270184773	Licence Type	Commercial		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Instrument and night rating				
Medical Expiry Date	30 November 2010				
Restrictions	Corrective lenses				
Previous Accidents	Nil				

Flying Experience :

Total Hours	3047.0
Total Past 90 Days	47.0
Total on Type Past 90 Days	47.0
Total on Type	1800.0

1.6 Aircraft Information**Airframe :**

Type	PA32-300	
Serial Number	32-40088	
Manufacturer	Piper Aircraft Corporation	
Date of Manufacture	1971	
Total Airframe Hours (At time of Accident)	3419.63	
Last MPI (Date & Hours)	23 September 2009	3325.60
Hours since Last MPI	94.11	
C of A (Issue Date)	12 June 2010	
C of R (Issue Date) (Present owner)	03 July 2008	
Operating Categories	Standard Part 91	

Engine :

Type	Lycoming IO-540-KIA5
Serial Number	44355-48
Hours since New	3419.63
Hours since Overhaul	50.73

Propeller :

Type	Hartzell-C3YR-IRF
Serial Number	DY6947B
Hours since New	341.41
Hours since Overhaul	TBO not reached (2400)

1.6.1 The maintenance documentation of the aircraft was reviewed during the investigation process and no anomalies were identified.

1.6.2 The aircraft was appropriately maintained and airworthy on the day.

1.6.3 The pilot performed a pre-flight inspection prior to the flight to check the overall condition of the aircraft and she was satisfied that it was serviceable. However, the pilot could not remember which fuel tank she had initially selected for the takeoff.

- 1.6.4 On-site inspection of the wreckage revealed that all of the structural damage was consistent with the impact; nothing was found to suggest that there had been any pre-impact failure of the primary structure. The fuel selector was found selected on the left-hand main tank. The right-hand tank was still full and had detached from the aircraft; and the left-hand tank was empty and intact.
- 1.6.5 The wreckage was recovered to an approved aircraft maintenance facility for further investigation. A ground run was performed with the engine still installed to the airframe. The engine started normally and performed satisfactorily. During the engine run, the fuel gauges were serviceable.
- 1.6.6 All fuel lines and fittings were inspected for cracking, leaks and loose attachments, and none were found.
- 1.6.7 An engine strip was carried out and there were no anomalies found.
- 1.6.8. According to the Pilot Operating Handbook, the standard fuel capacity of the Cherokee Six is 84 US gallons (318 litres), all of which is usable except for approximately one pint (0.473 litres) in each of the four tanks. The two main inboard tanks hold 25 US gallons each (95 litres) and the tip tanks hold 17 gallons each (64.4 litres). The aircraft burns 15.8 US gallons per hour (60 litres/hour).

1.7 Meteorological Information

- 1.7.1 The following weather information was reported by the pilot:

Wind direction	calm	Wind speed	calm	Visibility	CAVOK
Temperature	3°C	Cloud cover	nil	Cloud base	nil
Dew point	unknown				

1.8 Aids to Navigation

- 1.8.1 The aircraft was equipped with standard navigational equipment as approved by the Regulator for the aircraft type and their navigation equipment was serviceable.

1.9 Communications

- 1.9.1 The aircraft was equipped with VHF radio communication. There were no recorded defects prior to or during the flight with the radio equipment.

1.10 Aerodrome Information

- 1.10.1 The accident did not occur on an aerodrome but occurred in a bushy area north of Runway 10 at the GPS reading 23°03.221' E 29°52.683', 1.21 km north of Louis Trichardt Aerodrome at an elevation of 3023 ft.

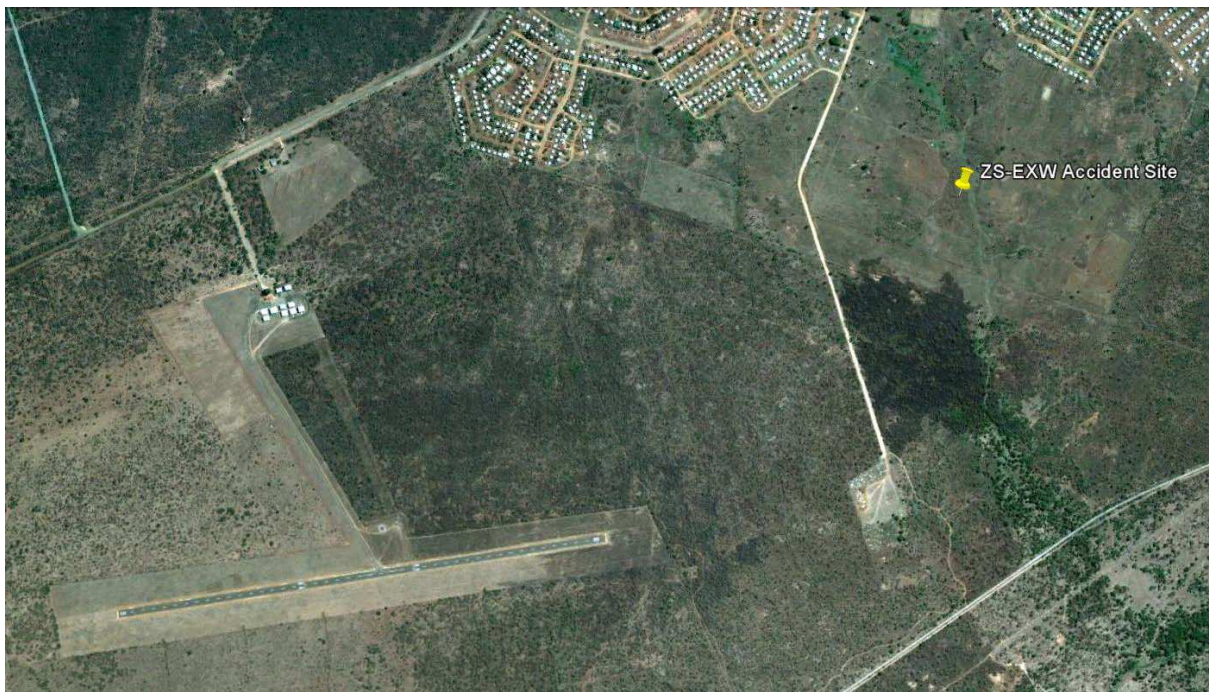


Figure 2 shows Louis Trichardt Aerodrome and the location of the accident site.

1.11 Flight Recorders

1.11.1 The aircraft was not fitted with a Cockpit Voice Recorder (CVR) or a Flight Data Recorder (FDR) and neither was required by regulations.

1.12 Wreckage and Impact Information

1.12.1 During the forced landing, the aircraft touched down and went through a stream where the landing gear sustained damage. The right side wing struck a thorn tree and separated from the aircraft. The aircraft ended up swinging around through 90 degrees and then it came to a stop.

1.13 Medical and Pathological Information

1.13.1 None.

1.14 Fire

1.14.1 There was no evidence of a pre- or post-impact fire.

1.7 Survival Aspects

1.7.5 The accident was considered to be survivable, as all occupants were securely fastened with their safety belts.

1.15.2 The pilot assisted the passenger to evacuate the aircraft through the back door.

1.15.3 Emergency services were dispatched to the accident site.

1.8 Tests and Research

1.8 See 1.6

1.9 Organisational and Management Information

1.17.1 This was a private flight and was flown in compliance with the applicable regulations.

1.17.2 The aircraft maintenance organisation (AMO) that had certified the last mandatory periodic inspection (MPI) on the aircraft prior to the accident had a valid AMO approval and had authority to perform maintenance on the aircraft type.

1.18 Additional Information

1.18.1 An interview with the pilot revealed that the day before the accident, the aircraft had flown a 92-minute flight from Wonderboom Aerodrome to Louis Trichardt Aerodrome (Makhado). On the same day, the pilot had refuelled 224 litres (59.2 US gallons) of fuel from Wonderboom Airport prior to her departure for Makhado. The amount of fuel that was used for the 92-minute flight is calculated to have been approximately 24.2 US gallons (91.6 litres).

1.18.2 From the calculations above, the fuel used for the Wonderboom-Louis Trichardt flight (approximately 91.6 litres) amounts to the capacity of the one tank (95 litres per tank).

1.18.3 According to the Pilot Operating Handbook, the takeoff should be made on the tank with the highest quantity of fuel to assure the best fuel flow, and this tank should be selected before or immediately after starting, in order to allow the fuel flow to be adequately established before takeoff.

1.19 Useful or Effective Investigation Techniques

1.19.1 None

2 ANALYSIS

2.1 It was reported that the flight was normal until the engine stoppage occurred. After the engine stoppage, the pilot switched the fuel supply from one tank to another and attempted an engine restart, but the engine failed to restart. The pilot spotted an open field north of the aerodrome and executed an unsuccessful forced landing, during which the aircraft sustained substantial damage.

2.2 The pilot was the holder of a Commercial Pilot's licence, which was valid at the time of the accident. She was also in possession of a valid medical certificate.

- 2.3 Fine weather prevailed at the time of the occurrence and the weather was therefore not considered to be a factor in this accident.
- 2.4 Both the engine run and the engine strip down showed no anomalies of the engine.
- 2.5 The possibility exists that the engine could not be restarted after the tanks were switched, since the fuel lines were still empty and they needed some time to fill up and allow the fuel flow to be adequately established.
- 2.4 Despite the fact that the pilot could not remember which fuel tank had been selected for takeoff, the available information obtained from the recovery and the conclusion of the engine run and engine strip suggests that the left-hand tank was used for the 92-minute flight a day before the accident, and the same fuel tank was used and ran dry shortly after takeoff for the flight to Kruger Mpumalanga.

3. CONCLUSION

3.1 Findings

- 3.1.1 The pilot was the holder of a valid commercial pilot's licence and aviation medical certificate and had the aircraft type endorsed in her logbook.
- 3.1.2 The aircraft was properly certified, equipped and maintained in accordance with current SACAA regulations and no mechanical malfunction/defect could be found that could have contributed to or caused the accident.
- 3.1.5 The AMO that had certified the last MPI on the aircraft prior to the accident had a valid AMO approval and had authority to perform maintenance on the aircraft type.
- 3.1.6 Fine weather conditions prevailed at the time of the occurrence and the weather was therefore not considered to be a factor in this accident.
- 3.1.7 The pilot executed an unsuccessful forced landing on an open field and the aircraft sustained substantial damage.
- 3.1.8 On recovery, the right-hand tank was found to be full and the left one empty.

3.2 Probable Cause/s

- 3.2.1 Unsuccessful forced landing due to an engine failure.
- 3.2.2 Contributory factor: improper fuel management

4. SAFETY RECOMMENDATIONS

4.1 None

5. APPENDICES

5.1. None

Compiled by: Ms Boya

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For: Director of Civil Aviation

Date:

Investigator-in-charge:

Date:

Co-Investigator:

Date: