

AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/9359	
Aircraft Registration	ZS-EJB	Date of Accident	15 September 2014		Time of Accident	1710Z
Type of Aircraft	Cessna 210 (Aeroplane)		Type of Operation		Commercial	
Pilot-in-command Licence Type		Commercial	Age	68	Licence Valid	Yes
Pilot-in-command Flying Experience		Total Flying Hours	1625		Hours on Type	180
Last point of departure		Nelspruit Aerodrome (FANS), Mpumalanga Province				
Next point of intended landing		Nelspruit Aerodrome (FANS), Mpumalanga Province				
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)						
Approximately 20km North East of Nelspruit Aerodrome at the GPS: S25 17q56.8+E031 04q10.7+Elevation 870m.						
Meteorological Information		Surface wind North Easterly at 10knots. Visibility: Fair. Temperature: 30C.				
Number of people on board	1 + 0	No. of people injured	1	No. of people killed	0	
Synopsis						
<p>On 15 September 2014 the pilot took off from FANS (Nelspruit Aerodrome) for a fire fighting operation flight as a spotter. The pilot stated that after flying for approximately 3.2 hours the aircraft engine started sputtering. The pilot stated that he realized that he was running out of fuel, he then switched from the right tank to the left tank, which had fuel, but he omitted to switch the fuel pump selector to the ON position when changing tanks, this resulted in fuel starvation. Pilot attempted to execute a forced landing, during the landing the aircraft collided with the hidden tree stump and nosed over. According to the placard inside the aircraft it is the requirement to prevent fuel starvation by switching the fuel pump selector to the ON position prior to changing tanks.</p> <p>The pilot sustained minor injuries.</p> <p>The aircraft sustained extensive damage to the wings, propeller, vertical stabilizer, horizontal stabilizer, and the nose wheel broke off.</p>						
Probable Cause						
<p>Unsuccessful forced landing due to fuel starvation</p> <p>Contributory factor</p> <p>The pilot omitting to switch ON the fuel pump prior to changing tanks to ensure positive fuel flow which resulted in a fuel starvation.</p>						
IARC Date				Release Date		

AIRCRAFT ACCIDENT REPORT

Name of Owner : FFA Assets (PTY) LTD
Name of Operator : FFA Assets (PTY) LTD
Manufacturer : Cessna Aircraft Company
Model : T210F
Nationality : South African
Registration Marks : ZS-EJB
Place : 20km North East of Nelspruit Aerodrome
Date : 15 September 2014
Time : 1710Z, daytime.

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 produced without prejudice to the rights of the CAA, which are reserved.

1. FACTUAL INFORMATION

1.1 History of Flight

- 1.1.1 On the 15th September 2014 the pilot took off from Nelspruit Aerodrome for a fire fighting operation at Yaverland near White River town. The pilot (who was a spotter pilot on the day of the accident) was working with two fixed wing aircraft and two helicopters. At approximately 1710Z daytime, after about 3.2 hours of flying, the aircraft engine sputtered. The pilot immediately switched fuel tanks but omitted to switch the fuel pump to the ~~ON~~ while changing tanks this resulted in fuel starvation. The aircraft was operating at approximately 800qAGL (above ground

level), therefore the pilot opted to execute a forced landing on an open field. During landing the nose wheel broke off after colliding with the hidden tree stump causing the aircraft to nose over. The location of the accident was GPS S25 17q56.8+E031 04q10.7+Elevation 870m.

1.2 Injuries to Persons

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

1.3 Damage to Aircraft

1.3.1 The aircraft sustained extensive damage to the wings, propeller, vertical stabilizer, horizontal stabilizer, and the nose wheel broke off.

1.4 Other Damage

1.4.1 None.

1.5 Personnel Information

Nationality	South African	Gender	Male	Age	68
Licence Number	0270411291	Licence Type	Commercial		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Instrument				
Medical Expiry Date	30 June 2015				
Restrictions	None				
Previous Accidents	None				

Flying Experience:

Total Hours	1625
Total Past 90 Days	44.8
Total on Type Past 90 Days	9.8
Total on Type	180

1.6 Aircraft Information

1.6.1 Airframe:

Type	C210	
Serial Number	T210-0080	
Manufacturer	Cessna Aircraft Company	
Year of Manufacture	1965	
Total Airframe Hours (At time of Accident)	3450.2	
Last MPI (Date & Hours)	10 July 2014	3420
Hours since Last MPI	30.2	
C of A (Issue Date)	08 January 1987	
C of A (Expiry Date)	07 January 2015	
C of R (Issue Date) (Present owner)	28 June 2012	
Operating Categories	Standard part 135	

Engine:

Type	Continental STIO 520
Serial Number	178643R
Hours since New	378.5
Hours since Overhaul	TBO not yet reached

Propeller:

Type	Mc Cauley D3A32C88M
Serial Number	748774
Hours since New	2702.3
Hours since Overhaul	299.1

- 1.6.2 The right hand tank was empty and the left-hand tank had approximately more than 5 litres usable avgas fuel, which was drained into a container. During transfer of fuel to the container some spilled onto the ground.



Figure 1: Fuel which was drained from the left wing.

1.7 Meteorological Information

- 1.7.1 Weather information as obtained from the pilot's questionnaire:

Wind direction	North East	Wind speed	10 knots	Visibility	Fair
Temperature	30C	Cloud cover	Nil	Cloud base	Nil
Dew point	Unknown				

1.8 Aids to Navigation

- 1.8.1 The aircraft was equipped with standard navigation instruments as per the manufacturer's design. None were reported unserviceable prior to or during the accident.

1.9 Communications.

- 1.9.1 The aircraft was equipped with standard communication equipment as required by the regulator. There were no recorded defects to communication equipment prior to

the flight.

1.10 Aerodrome Information

1.10.1 The accident did not occur within the boundary of an Aerodrome.

1.11 Flight Recorders

1.11.1 The aircraft was not equipped with a flight data recorder (FDR) or a cockpit voice recorder (CVR). Neither was required by regulation to be fitted to this aircraft type.

1.12 Wreckage and Impact Information

1.12.1 The aircraft touched down in a Southerly direction with the nose wheel first. It then collided with the hidden tree stump and nosed over and came to rest in an inverted position on open. The nose wheel broke off but the aircraft remained intact.



Figure 2: Wreckage of the aircraft

1.13 Medical and Pathological Information

1.13.1 The pilot was taken to hospital for treatment of shock. He was not admitted and was discharged after treatment.

1.14 Fire

1.14.1 There was no pre- or post- impact fire.

1.15 Survival Aspects

1.15.1 The occupant was properly restrained with the aircraft equipped safety harnesses, and due to the low impact force associated with the accident, it was considered survivable.

1.16 Tests and Research

1.16.1 During the onsite investigation it was discovered that the fuel pump selector was set to OFF. The left-hand wing contained fuel but due to the fact that the selector was not ON the fuel was not pumped to the engine. The manufacturer requires the pump to be switched ON when changing from a dry tank to a tank containing fuel, as per placard inside the aircraft.



Figure 3: Fuel pump selector in the OFF position



Figure 4: Indicate fuel selector on the left wing

1.17 Organizational and Management Information

1.17.1 This was a fire fighting operation.

1.17.2 The Aircraft Maintenance Organisation (AMO) was in possession of a valid approval certificate.

1.18 Additional Information

1.18.1 The fuel capacity of the aircraft in question is approximately 146 litres in each tank which makes a total of 292 litres.

1.18.2 Fuel is supplied to the engine from two integral fuel tanks, one in each wing. Fuel from each tank flows through a reservoir tank to the fuel selector valve. Depending upon the setting of the selector valve, fuel from the left or right fuel tank and reservoir tank flows through a by-pass in the electric fuel pump (when it is not operating) and the fuel filter to the engine-driven fuel pump. From here fuel is distributed to the engine cylinders via a control unit and manifold. Fuel cannot be used from both fuel tanks simultaneously.

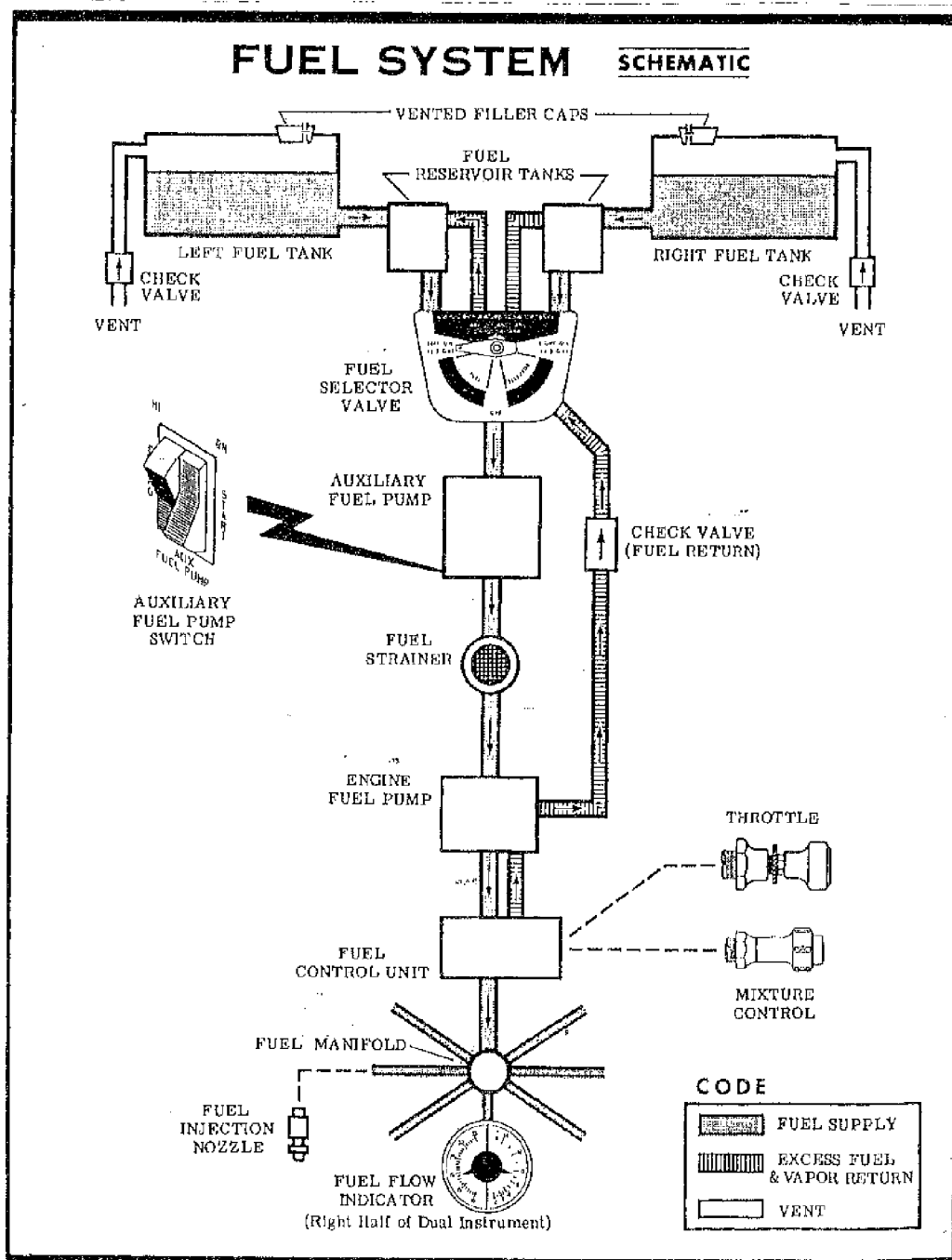


Figure 5: Schematic diagram of a fuel system

1.19 Useful or Effective Investigation Techniques

1.19.1 None.

2. ANALYSIS

- 2.1 On 15 September 2014 the pilot took off from FANS (Nelspruit Aerodrome) for a fire fighting operation flight. After flying for approximately 3.2 hours the aircraft experienced an engine sputter. The pilot realized that he was running out of fuel and he then switched from the right tank to the left tank, which had fuel, but he omitted to switch the fuel pump selector to the ~~ON~~ON+ position as per the placards inside the aircraft. This resulted in fuel starvation.
- 2.2 According to available maintenance records, the aircraft was properly maintained. The Mandatory Periodic Inspection was conducted as per regulations. No defect or malfunction was observed that could have contributed to or caused the accident.
- 2.3 The available information revealed that fine weather conditions prevailed at the time of the accident. Therefore it is concluded that weather was not a contributory factor.

3. CONCLUSION

3.1 Findings

- 3.1.1 The pilot had a valid commercial pilot licence and was properly rated on the aircraft type.
- 3.1.2 The pilot had a valid medical certificate, expiring on 30 June 2015.
- 3.1.3 According to available records, the aircraft was properly maintained.
- 3.1.4 The aircraft certificate of airworthiness was valid at the time of the accident.
- 3.1.5 The pilot executed an unsuccessful forced landing on an open field.
- 3.1.5 The pilot omitted to switch the fuel pump selector to the ~~ON~~ON+ position when changing tanks this resulted in fuel starvation.
- 3.1.6 Fine weather conditions prevailed at the time of the accident.

3.2 Probable Cause/s

3.2.1 Unsuccessful forced landing due to fuel starvation

3.3 Contributory factor

3.3.1 The pilot omitting to switch ~~ON~~ the fuel pump prior to changing tanks to ensure positive fuel flow resulted in a fuel starvation.

4. SAFETY RECOMMENDATIONS

4.1 None.

5. APPENDICES

5.1 None.