# LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

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|---|---|---|---|---|---|---|---|---|---|
| **Reference Number** | CA18/3/2/1467 | | | | | | | | |
| **Classification** | Serious Incident | | **Date** | 18 January 2025 | | **Time** | 1420Z | | |
| **Type of Operation** | Private (Part 91) | | | | | | | | |
| **Location** | | | | | | | | | |
| Place of Departure | Swellendam Airfield (FASX), Western Cape Province | | Place of Intended Landing | | | Cape Town International Airport (FACT), Western Cape Province | | | |
| Place of Occurrence | On a field in Stikland Hospital situated 5nm north of Cape Town International Airport (FACT) | | | | | | | | |
| GPS Co-ordinates | Latitude | 33° 53' 42.4" S | Longitude | 018° 39' 25.8" E | | Elevation | 300 ft | | |
| **Aircraft Information** | | | | | | | | | |
| Registration | ZS-IDL | | | | | | | | |
| Make; Model; S/N | Cessna; C150 (Serial Number: A1500144) | | | | | | | | |
| Damage to Aircraft | None | | Total Aircraft Hours | 9478.45 | | | | | |
| **Pilot-in-command** | | | | | | | | | |
| Licence Type | Private Pilot Licence (PPL) | | Gender | Male | | Age | 21 | | |
| Licence Valid | Yes | Total Hours | 114.9 | Total Hours on Type | 74.2 | | | | |
| Total Hours 30 Days | 6.6 | | Total Flying on Type Past 90 Days | 6.6 | | | | | |
| **People On-board** | 1+1 | **Injuries** | 0 | **Fatalities** | 0 | **Other (on ground)** | 0 | | |

**What Happened**

On Saturday afternoon, 18 January 2025, a pilot and a passenger on-board a C150 aircraft with registration ZS-IDL took off on an hour-building flight from Swellendam Airfield (FASX) to Cape Town International Airport (FACT), both in the Western Cape province. The flight was conducted under visual meteorological conditions (VMC) by day and under the provisions of Part 91 of the Civil Aviation Regulations (CAR) 2011 as amended.

The aircraft initially took off from Cape Town International Airport (FACT) to FASX. Before departure from FACT, the aircraft was fuelled to capacity with 26 Gallons (98 litres) of Aviation Gasoline 100 Low Lead (AVGAS 100LL). The weather was clear at the time of the flight. Upon reaching FASX, the pilot parked the aircraft at an apron near a fuel bay. The pilot and the passenger had breakfast; thereafter, they prepared for their return flight to FACT. After the pre-flight check, the aircraft was refuelled with 13 Gallons (50 litres) of AVGAS 100LL which brought the total fuel to full capacity (26 Gallons). The pilot filed a new flight plan for the return flight.

At approximately 1045Z, the aircraft took off from FASX and routed to Oudtshoorn Airport (FAOH), which is about 88 nautical miles (nm) north-east of FASX. The aircraft turned overhead FAOH to return to FASX. Whilst overhead Riversdale, the pilot decided to head directly to FACT, flying past FASX and routing via Worcester Airport (FAWC) and Tulbagh. The aircraft approached FACT airspace, entering via Durbanville. At around 1400Z whilst flying over Bellville at 1500 feet (ft) above ground level (AGL) and about 5nm from FACT, the

engine spluttered and lost power. The pilot checked the instruments, and the fuel gauges indicated empty with no fuel flow pressure. The pilot declared a MAYDAY to FACT tower and advised the air traffic control (ATC) personnel of the engine failure and his intention to perform a forced landing.

The pilot scanned the area for a suitable landing site. He then advised the ATC personnel that he had identified a field near the Stikland Industrial area. He committed to a forced landing and successfully brought the aircraft down on the field in Stikland Hospital. The pilot then communicated to the ATC personnel that the aircraft was safely on the ground. After landing, the pilot and the passenger evacuated the aircraft before the pilot contacted the chief flight instructor (CFI) from his flight school via a cellular phone. He also updated the ATC personnel via a cellular phone with the exact location, which was confirmed to be Stikland Psychiatric Hospital.

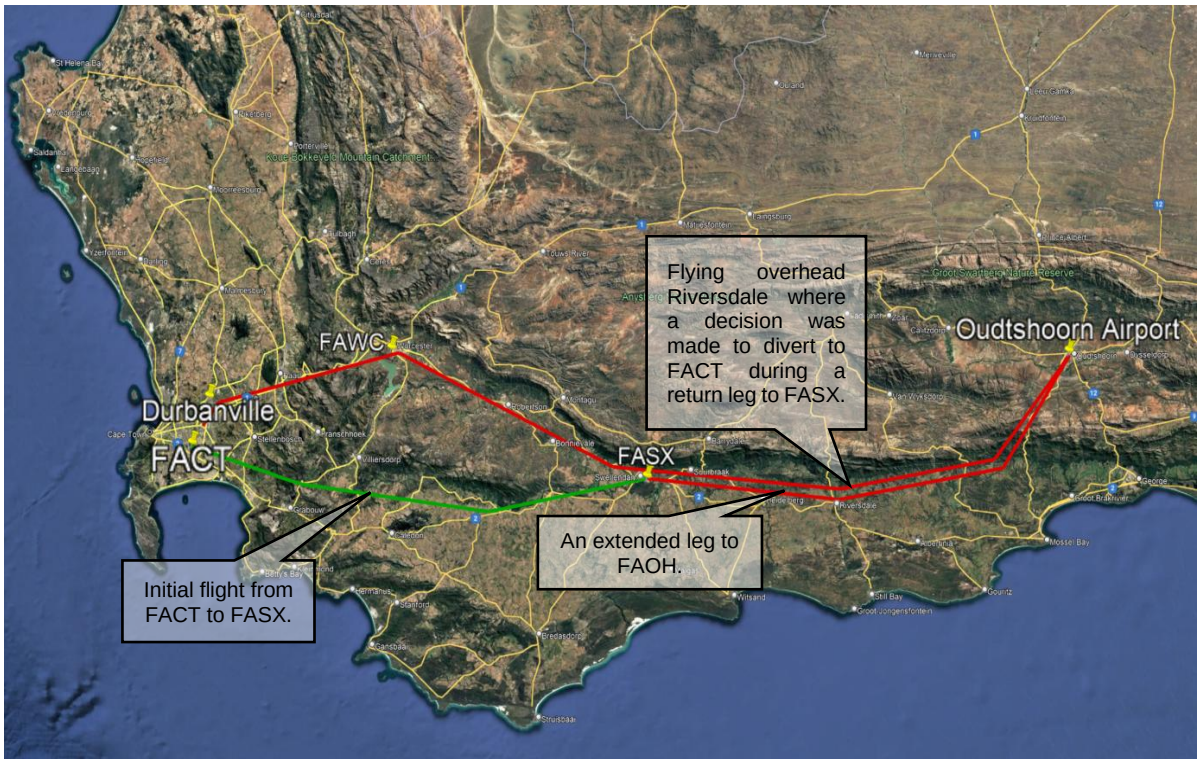


**Figure 1:** Plotted aircraft route. (Source: Google Earth Map))

In Figure 1, the green line represents the initial flight from FACT to FASX; the red line indicates the extended leg from FASX to FAOH after a new flight plan was filed. After reaching FAOH, the aircraft turned back toward FASX for a planned fuel uplift. However, whilst the aircraft was flying over Riversdale, the pilot diverted to FACT, bypassing the fuel stops along the route.

**Figure 2:** The aircraft after the forced landing. (Source: Pilot)

Fuel System (Source: Pilot's operating Handbook [POH])

*The airplane may be equipped with either a standard fuel system that consists of two vented fuel tanks (one in each wing), a fuel shutoff valve, a fuel strainer, a manual primer, and a carburettor. Fuel flows by gravity from the two wing tanks to a fuel shutoff valve. With the valve in the ON position, fuel flows through a strainer to the carburettor. From the carburettor, mixed fuel and airflow to the cylinders through intake manifold tubes. The manual primer draws its fuel from the fuel strainer and injects it into the intake manifold. A standard fitted fuel tank carries a total of 26 US Gallons (Gal) which is distributed evenly in both wing tanks carrying 13 Gal each. The total usable fuel for all flight conditions is 22.5 US Gal with a total unusable of 3.5 US Gal.*

*Fuel system venting is essential to system operation. Blockage of the venting system will result in a decreasing fuel flow and eventual engine stoppage. Venting is accomplished by an interconnecting line from the right fuel tank to the left tank. The left tank is vented overboard through a vent line which is equipped with a check valve and protrudes from the bottom surface of the left wing near the wing strut attach point. The right fuel tank filler cap is also vented. Fuel quantity is measured by two float-type fuel quantity transmitters (one in each tank) and indicated by two electrically operated fuel quantity indicators on the lower left portion of the instrument panel. An empty tank is indicated by a red line and the letter E. When an indicator shows an empty tank, approximately 1.75 gallons remain in a standard tank as unusable fuel. The indicators cannot be relied upon for accurate readings during skids, slips, or unusual attitudes. The fuel system is equipped with drain valves to provide a means for the examination of fuel in the system for contamination and grade. The system should be examined before the first flight of every day and after each refuelling, by using the sampler cup provided to*

*drain fuel from the wing tank sumps, and by utilizing the fuel strainer drain under an access panel on the right side of the engine cowling. The fuel tank should be filled after each flight to prevent condensation.*

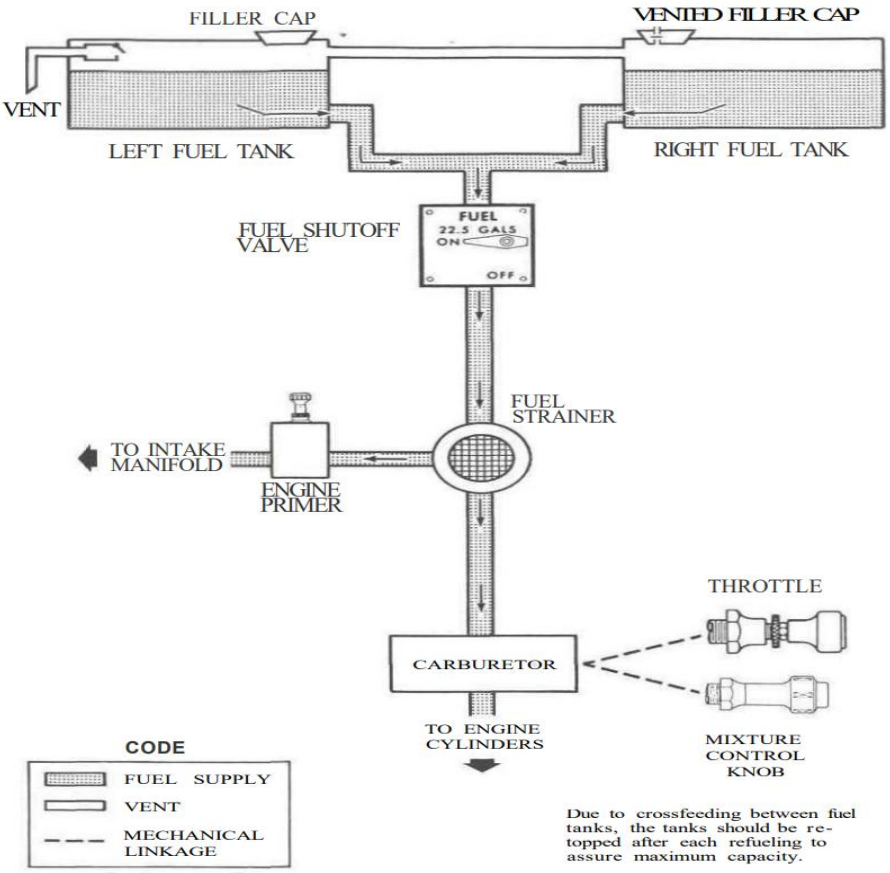


**Diagram 1:** Fuel system. (Source: POH)

Fuel Calculation

The flight from FACT to FASX was 90nm. The aircraft had 26 Gallons of fuel on departure from FACT, of which 22.5 Gallons was usable. The aircraft used 13 Gallons of fuel from FACT to FASX; the remaining usable fuel was 9.5 Gallons which was insufficient for the return flight to FACT (the remaining 9.5 Gallons could only fly a distance of 65nm). At FASX, the aircraft was refuelled with 13 Gallons which brought the total fuel to 26 Gallons (with 22.5 usable fuel). The pilot extended the flight leg by 88nm to FAOH. On the return leg, the pilot bypassed both FASX and FAWC without refuelling. This, therefore, meant that there was insufficient fuel to reach FACT.

| **Point of Start** | **Fuel at Start US Gallons** | **Point of Next Landing** | **Distance (nm)** | **Fuel Remaining** | **Fuel uplifted US Gallons** |
|---|---|---|---|---|---|
| FACT | 26 | FASX | 90 nm | 9 | 13 |
| FASX | 26 | FAOH | 88 nm | 12.7 | 0 |
| FAOH | 12.7 | FACT | 178nm | 000 | |

The aircraft required a total of 23 US Gallons to sustain a flight from FAOH to FACT which was approximately 178nm.

**Findings**

Man

1. The pilot, an Indian national, had a Private Pilot Licence (PPL) that was issued by the Regulator (SACAA) on 15 October 2024 with an expiry date of 31 October 2025. His Class 2 aviation medical certificate was issued on 27 March 2024 with an expiry date of 27 March 2025 with no restrictions.

2. The aircraft type was endorsed on the pilot's licence. The pilot had a total of 114.9 hours of which 74.2 hours were on the aircraft type.

3. The pilot decided to divert to FACT (on the return leg from FAOH) without refuelling at FASX or FAWC. This indicated a lack of understanding of the aircraft's limitations, as well as poor flight planning and fuel management.

Machine

4. The aircraft had a valid Certificate of Airworthiness (C of A) that was issued by the Regulator on 27 February 2024 with an expiry date of 28 February 2025. The aircraft's Certificate of Registration (C of R) was issued to the current owner on 8 January 2025.

5. The latest mandatory periodic inspection (MPI) of the aircraft was conducted on 15 January 2025 at 9 477.75 airframe hours after which a Certificate of Release to Service (CRS) was issued with an expiry date of 14 January 2026 or at 9 577.75 airframe hours, whichever comes first. The aircraft had a total of 9 501.56 airframe hours at the time of the accident; it had accrued 23.11 hours since the last MPI. The aircraft was certified and serviceable at the time of the flight.

6. The aircraft maintenance organisation (AMO) that conducted MPI on the aircraft had an AMO Certificate that was issued on 24 October 2024 with an expiry date of 31 October 2025. The aircraft type was endorsed on the AMO's operational specifications.

7. The aircraft was operated under the approved training organisation (ATO) with an ATO Certificate that was issued by the Regulator on 25 January 2024 with an expiry date of 31 March 2025.

Environment

8. Good weather conditions prevailed at the time of the flight; the weather did not contribute to this accident.

9. After the initial leg from FACT to FASX, the aircraft had 9.5 Gallons of usable fuel remaining which was insufficient for the return to FACT. At FASX, the aircraft was uplifted with 13 Gallons, bringing the total fuel to 26 Gallons of which 22.5 Gallons was usable. The pilot then filed a new flight plan, extending the route by 88nm to FAOH. On the return leg, the pilot diverted to FACT via Tulbagh without refuelling at either FASX or FAWC. Therefore, there was inadequate fuel to FACT which led to engine stoppage due to fuel exhaustion.

| **Probable Cause(s)** |
|---|
| In-flight engine stoppage due to fuel exhaustion. |
| **Contributing Factor(s)** |
| 1. Inadequate fuel management and flight planning. |
| **Safety Action(s)** |
| None. |
| **Safety Message and/or Safety Recommendation/s** |
| Pilots should ensure accurate navigational flight planning, including fuel planning, particularly when flying long distances. |
| **About this Report** |
| *The decision to conduct a limited investigation is based on factors including whether the cause is known and the evidence supporting the cause is clear, the level of safety benefit likely to be obtained from an investigation, and that will determine the scope of an investigation. For this occurrence, a limited investigation has been conducted, and the Accident and Incident Investigations Division (AIID) has relied on the information submitted by the affected person/s and organisation/s to compile this limited report. The report has been compiled using information supplied in the initial notification, as well as from follow-up desktop inquiries to bring awareness of potential safety issues to the industry in respect of this occurrence, as well as possible safety action/s that the industry might want to consider in preventing a recurrence of a similar occurrence.*<br><br>*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*** |
| *In terms of Regulation 12.03.1 of the Civil Aviation Regulations (CAR) 2011 and ICAO Annex 13, 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 apportion blame or liability.* |
| **Disclaimer** |
| *This report is produced without prejudice to the rights of the AIID, which are reserved.* |

**This report is issued by:**

**Accident and Incident Investigations Division**
**South African Civil Aviation Authority**
**Republic of South Africa**