

AIRCRAFT SERIOUS INCIDENT SHORT REPORT

CA18/3/2/1189: ZS-MNS, Smoke in cockpit during flight.

Date and time : 1 January 2018 at 1410Z

Location : FL070 Radial 070 at 9 DME JSV

Occurrence category : Serious Incident

Aircraft registration : ZS-MNS

Aircraft manufacturer and model : Piper Aircraft Corporation PA31-310

Last Point of departure : Pafuri Camp, Kruger National Park, Limpopo Province

Next point of intended landing : OR Tambo International (FAOR), Gauteng Province

Location of accident site with reference to easily defined geographical points (GPS readings if possible) : RADIAL 070 at 9 DME JSV
(S26°06'21,47" E028°23'15,80") Elevation: 7000ft

Meteorological information : FAOR 24012KT 200V260 9999 FEW048 29/03 Q1013 NOSIG=

Type of operation : Commercial (Part 135)

Persons on board : 2 + 3

Injuries : No injuries

Damage to aircraft : Minor (The battery box top lid was burnt)

All times given in this report is 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 (2011) 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 blame or liability.***

Disclaimer:

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



Figure 1: Shows similar type of aircraft

(Source: Photograph was obtained from the internet)

Abbreviations

AOC	Air Operator Certificate
ATC	Air Traffic Control
AMO	Approved Maintenance Organisation
CPL	Commercial Pilot License
COA	Certificate of Airworthiness
CTR	Control Traffic Region
DME	Distance Measuring Equipment
DVOR	Doppler VHF Directional Range
FAOR	O R Tambo International Airport
IFR	Instrument Flight Rules
ILS	Instrument Landing System
Left Base	Segment of circuit pattern before final approach phase. Left indicating a left pattern
MPI	Minor Part Inspection
Nm	Nautical Mile
PAN PAN PAN	International standard urgency signal that crew use to declare a situation that is urgent but, for the time does not pose an immediate danger to anyone's life.
PIC	Pilot in Command
RADIAL 070	Navigational Aid (Imaginary vector measured 70 degrees from FAOR)
STAR	Standard Arrival Chart
VMC	Visual Meteorological Conditions
VOR JSV	VHF Omni Directional Range JSV

SYNOPSIS

The Piper PA31-310 departed Pafuri Camp (Kruger National Park) at 1205Z routing to OR Tambo International airport on a domestic charter flight.

The two crew and three passengers were experiencing some turbulence en-route. The flight was uneventful until 7DME to JSV. Some smoke started to appear in the cockpit. An emergency was declared by the crew and the aircraft's landing to OR Tambo was expedited.

The aircraft landed safely at OR Tambo International Airport with no injuries.

The investigation revealed that the turbulence experienced en-route to OR Tambo International Airport caused severe arching in the battery bay compartment. The battery terminals made contact with the metal box lid which created the smoke that appeared in the cockpit.

1. FACTUAL INFORMATION

1.1 History of Flight

- 1.1.1 On 1 January 2018, at about 1205Z, flight FDR963, a Piper PA31-310 aircraft with registration markings ZS-MNS, departed from Pafuri Camp in the Kruger National Park for OR Tambo International airport (FAOR) on an IFR domestic charter flight.
- 1.1.2 On board the aircraft were two pilots and three passengers. En-route to FAOR, ATC cleared flight FDR963 to enter the FAOR CTR at 7000 feet on a magnetic heading of 245°. ATC planned for flight FDR963 to enter the holding pattern on a left base for Runway 21 Left (RWY21L).
- 1.1.3 Smoke started entering the cockpit approximately at position 26°06'21,63" South 028°23'17,41" East (9nm inbound on RADIAL 070 JSV). The cause of the smoke was unknown to the flight crew at the time, but it was suggested that the smell of the smoke was of an electric nature.
- 1.1.4 The pilot flying (PF) declared PAN PAN PAN to ATC and opened the storm window in an attempt to get rid of the smoke in the cockpit. The PF took action by switching off the electric power.
- 1.1.5 Flight FDR963 was cleared for a visual approach due to the weather conditions adhering to VMC.
- 1.1.6 The aircraft landed safely on RYW21L at 1415Z. Aerodrome Rescue and Fire Fighting Services (ARFF) had been alerted and escorted flight FDR963, with vacating RWY21L, to V2 gate
- 1.1.7 The crew and occupants of the flight sustained no injuries.
- 1.1.18 Upon inspection of the aircraft, it was found that the battery terminals arched with the battery box metal lid and this created the smoke, which entered the cockpit. Due to a poorly secured battery housing, the battery was able to move whilst the aircraft encountered turbulence in-flight.

2. FINDINGS

2.1 The operator had a valid Air Operator Certificate (AOC), and ZS-MNS was duly authorised to operate under the Part 135 AOC, which expired 9 June 2018.

2.2 The aircraft was in possession of a valid certificate of airworthiness (CoA).

2.3 PILOT FLYING:

- a. Held a valid Commercial Pilot License (CPL)
- b. Held a valid class 1 medical
- c. Held appropriate type rating
- d. Total flying hours: 1 313.7

2.4 PILOT NOT FLYING:

- a. Held a valid CPL
- b. Held a valid class 1 aviation medical certificate
- c. Held appropriate type rating
- d. Total flying hours: 2 735.0

2.5 The airframe hours of the aircraft at the time of the incident were 9 849.1.

2.6 The last Mandatory Period Inspection (MPI) was certified on 14 July 2017 at 9 839.1 airframe hours.

2.7 The aircraft was equipped to utilise ILS, VOR and DME navigational aids. Flight FDR963 used STAR Instrument OKPIT 4B for Runway 21 Left and DVOR/DME JSV for the approach.

2.8 Burnt wires were found behind the circuit breaker panel and inside the nose area on the landing gear power pack system.

2.9 The circuit breakers were found to be old and corroded in the circuit breaker panel.

2.10 It was found that the battery had made contact with the metal lid when turbulence was encountered during the flight. The box top lid had burnt due to this. The battery box did not have a proper securing bracket to avoid this type of contact.

PROBABLE CAUSE / CONTRIBUTING FACTOR

The contact of the battery terminals due to turbulence and the metal box lid caused severe arcing in the battery bay compartment. This created the smoke in the cockpit where the crew requested priority landing and the aircraft was cleared to land and landed safely at FAOR.

REFERENCES USED IN THE REPORT

Maintenance report from the operator-(Report Number 2018-01)



Figure 2: The damage sustained by the battery, battery lid and damaged wires

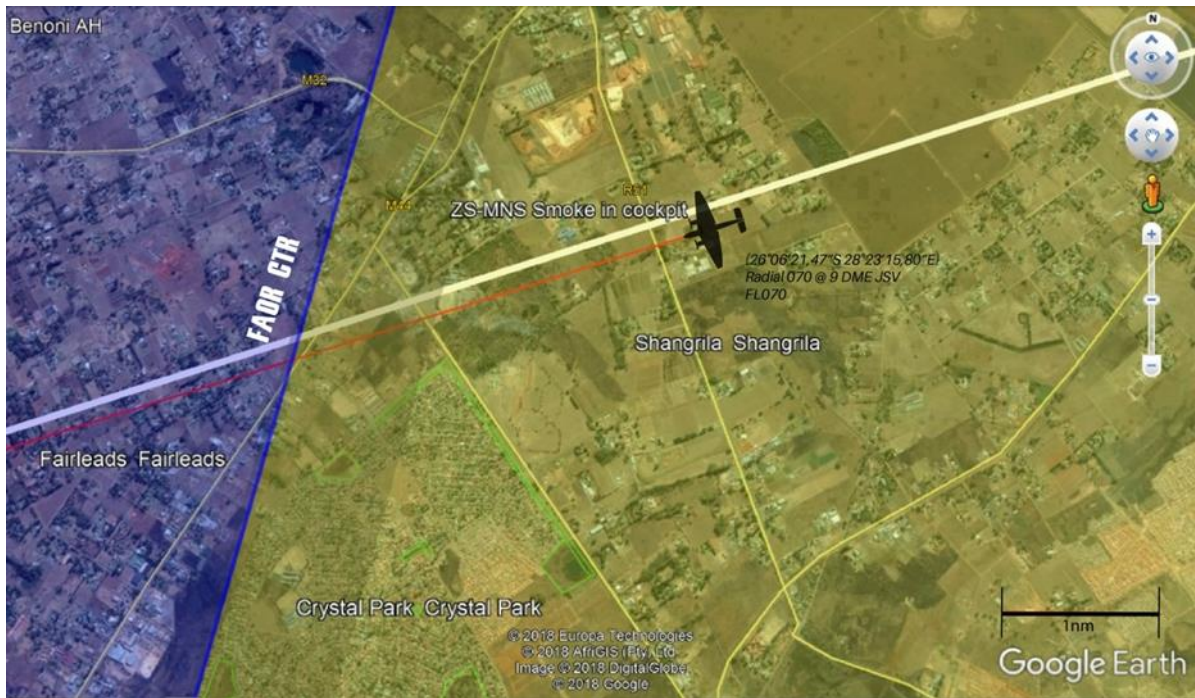


Figure 3: Google Earth overlay indicating the location of the incident-

SAFETY RECOMMENDATION

None

ORGANISATION

As a result of this incident, the operator has advised AIID that the following safety actions were undertaken with regard to the aircraft to ensure continuous airworthiness is not compromised in the future:

1. All burnt or damaged wiring were replaced.
2. Old corroded circuit breakers were replaced with new circuit breakers.
3. Corrosion was cleaned up on the circuit breaker panel.
4. New battery box was installed, which will ensure the battery is properly secured to avoid a re-occurrence of this incident.
5. Landing gear retractions and flap retractions inspection was satisfactory serviceability.
6. All electrical systems operated for 20 minutes with power to ensure no faults or failures occur.

SAFETY MESSAGE

The inspection of the battery and battery compartment during a pre-flight inspection by the pilot/crew should be a standard practice.