

PRELIMINARY SERIOUS INCIDENT REPORT

Accident and Incident Investigations Division

Serious Incident
- Preliminary Report -
AIID Ref No: CA18/3/2/1454



Figure 1: The file picture of the ZS-OUV aircraft.

(Source: <https://www.planespotters.net/photo/296749/zs-ouv-airlink-embraer-erj-135lr>)

Description:

On Thursday afternoon, 22 August 2024, an Embraer ERJ-135LR aircraft with registration ZS-OUV was on a scheduled flight 4Z779 from O.R. Tambo International Aerodrome (FAOR) in Gauteng province to Sishen Airport (FASS) in the Northern Cape province. Three crew members comprising two pilots, one cabin crew member and 14 passengers were on-board the aircraft. The captain was the pilot flying (PF), and the first officer (FO) was the pilot monitoring (PM).

The aircraft took off from Runway 21R at 1354Z. During the climb at 24 500 feet (ft) before reaching 24 600ft as per the flight plan and whilst overhead Potchefstroom in North West province, the crew noticed a burning smell in the cockpit, and after a few minutes, observed a white smoke. The crew donned their oxygen masks and continued to climb to 24 600ft after confirming with air traffic control (ATC) personnel. Thereafter, the crew referenced the aircraft's Quick Reference Handbook (QRH). Later, the FO declared a PAN PAN PAN and the PF piloted the aircraft back to FAOR. The Airport Rescue and Firefighting (ARFF) personnel at FAOR were on standby. Approximately 51 minutes after the initial take-off, the aircraft landed safely on Runway 21L. The ARFF personnel inspected the aircraft for signs of external damage, and none was found. The passengers and the crew were unharmed.

Occurrence Details

Reference Number : CA18/3/2/1454
Occurrence Category : Serious Incident (Category 2)
Type of Operation : Air Transport Operation, Passenger (Part 121)
Name of Operator : Airlink
Aircraft Make and Model : Embraer ERJ-135LR
Nationality : South African
Registration marking : ZS-OUV
Place : Overhead Potchefstroom
Date and Time : 22 August 2024 at 1445Z
Injuries : None
Damage : None

Purpose of the Investigation

In terms of Regulation 12.03.1 of the Civil Aviation Regulations (CAR) 2011, this report was compiled in the interest of the promotion of aviation safety and the reduction of the risk of aviation accidents or serious incidents and not to apportion blame or liability.

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.

Investigation Process

The Accident and Incident Investigations Division (AIID) was notified of the occurrence involving an Embraer ERJ-135LR incident which occurred at 24 500 feet (ft) near Potchefstroom in North West province, on 22 August 2024. The occurrence was classified as a serious incident according to the CAR 2011 Part 12 and the International Civil Aviation Organisation (ICAO) STD Annex 13 definitions.

The AIID has appointed an investigator-in-charge to conduct a full investigation. The investigator did not dispatch to the serious incident site. Notifications were sent to the State of Design and Manufacturer in accordance with the CAR 2011 Part 12 and the ICAO Annex 13 Chapter 4. The States did not appoint an accredited representative and/or advisor. The AIID will lead the investigation and issue the final report.

The information contained in this preliminary report is derived from the information gathered during the on-going investigation into the occurrence. Later, an interim report or the final report may contain altered information in case new evidence is found during the on-going investigation that requires changes to the information depicted in this report.

The AIID reports are made available to the public at:

<https://www.caa.co.za/industry-information/accidents-and-incidents/#occurrence-reports>

Notes:

- Whenever the following words are mentioned in this report, they shall mean the following:*
Serious Incident — this investigated serious incident
Aircraft — the Embraer ERJ-135LR involved in this serious incident
Investigation — the investigation into the circumstances of this serious incident
Pilot — the pilot involved in this serious incident
Report — this serious incident report
- Photos and figures used in this report were taken from different sources and may have been adjusted from the original for the sole purpose of improving clarity of the report. Modifications to images used in this report were limited to cropping, magnification, file compression; or enhancement of colour, brightness, contrast; or addition of text boxes, arrows, or lines.*

Disclaimer

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

Table of Contents

Executive Summary	1
Occurrence Details	2
Disclaimer	2
Contents Page	3
Abbreviations	4
1. FACTUAL INFORMATION	5
1.1. History of Flight	5
1.2. Injuries to Persons	6
1.3. Damage to Aircraft	7
1.4. Other Damage	7
1.5. Personnel Information	7
1.6. Aircraft Information	8
1.7. Meteorological Information	9
1.8. Aids to Navigation	9
1.9. Communication	9
1.10. Aerodrome Information	9
1.11. Flight Recorders	10
1.12. Wreckage and Impact Information	10
1.13. Medical and Pathological Information	10
1.14. Fire	10
1.15. Survival Aspects	11
1.16. Tests and Research	11
1.17. Organisational and Management Information	11
1.18. Additional Information	11
1.19. Useful or Effective Investigation Techniques	11
2. FINDINGS	11
3. ON-GOING INVESTIGATION	13
4. SAFETY RECOMMENDATIONS	13
5. APPENDICES	13

Abbreviation	Description
°	Degrees
°C	Degrees Celsius
AIID	Accident and Incident Investigations Division
AMM	Aircraft Maintenance Manual
AMO	Aircraft Maintenance Organisation
ARFF	Aircraft Rescue and Firefighting
ATC	Air Traffic Control
ATPL	Airline Transport Pilot Licence
CAR	Civil Aviation Regulations
C of A	Certificate of Airworthiness
C of R	Certificate of Registration
CRS	Certificate of Release to Service
CVR	Cockpit Voice Recorder
FAOR	O.R. Tambo International Aerodrome (ICAO designation)
FASS	Sishen Aerodrome (ICAO designation)
FDR	Flight Data Recorder
FL	Flight Level
Ft	Feet
GPS	Global Positioning System
hPa	Hectopascal
Kg	Kilogram/s
Kt	Knots
M	Metres
METAR	Meteorological Aerodrome Report
MTOW	Maximum Take-off Weight
NSC	No Significant Clouds
PF	Pilot Flying
PIC	Pilot-in-Command
PM	Pilot Monitoring
PSI	Pounds per Square Inch
QNH	Barometric Pressure adjusted to Sea Level
QRH	Quick Reference Handbook
SACAA	South African Civil Aviation Authority
SAWS	South African Weather Service
TBO	Time Between Overhaul
UTC	Co-ordinated Universal Time (GMT)
Z	Zulu (Term for Universal Co-ordinated Time - Zero Hours Greenwich)

1. FACTUAL INFORMATION

1.1. History of Flight

- 1.1.1. On Thursday afternoon, 22 August 2024, the crew which comprised two pilots, one cabin crew member and 14 passengers were on-board an Embraer ERJ-135LR aircraft with registration ZS-OUV. This was a scheduled commercial passenger flight operating as flight 4Z779 from O. R. Tambo International Aerodrome (FAOR) in Gauteng province to Sishen Airport (FASS) in Northern Cape province. The flight was conducted under instruments flight rules (IFR) by day and under the provisions of Part 121 of the Civil Aviation Regulations (CAR) 2011 as amended.
- 1.1.2. The captain, who was the pilot flying (PF), stated that the aircraft departed FAOR at 1354Z. Whilst overhead Potchefstroom in North West province and climbing through 24 500 feet (ft) above mean sea level (AMSL) to reach 24 600ft as per the flight plan, the crew noticed a burning smell in the cockpit. The captain called the cabin crew member via the intercom and asked her to check for smoke or fire in the cabin. After checking, the cabin crew member reported no sign of smoke or fire in the cabin. The first officer (FO) who was the pilot monitoring (PM) notified the FAOR air traffic control (ATC) about the smoke in the cockpit on very high frequency (VHF) 118.10 Megahertz (MHz) and requested to level off the aircraft at 24 600ft. The FO's request was granted, and the aircraft levelled off at 24 600ft. The crew then referenced the aircraft's Quick Reference Handbook (QRH) under 'Cockpit / Cabin Smoke / Fumes' to follow the prescribed procedure and complete the normal procedures and emergency checks.
- 1.1.3. Thereafter, the FO declared a PAN PAN PAN distress call with FAOR ATC. The captain piloted the aircraft back to FAOR. The Airport Rescue and Firefighting (ARFF) personnel at FAOR were on standby. Approximately 51 minutes after the initial take-off, the aircraft landed safely on Runway 21L. The ARFF personnel inspected the aircraft for signs of external damage, and none was found. The crew and the passengers were unharmed. The passengers disembarked from the aircraft and were transported to the terminal building. Later, they boarded another aircraft with a different crew to their destination.
- 1.1.4. The cabin crew member stated that whilst the aircraft was in a climb phase and the seatbelt sign was off, the interphone rang and the red emergency indicator light illuminated. Upon answering, the captain asked if she could identify smoke or burning smell in the cabin. She then inspected the cabin and lavatory and found nothing abnormal. The captain later informed her that they were returning to FAOR due to a technical issue, and that he was prioritising safety. The cabin crew confirmed the captain's instructions; thereafter, secured the cabin as instructed.

1.1.5. The serious incident occurred during daytime at Global Positioning System (GPS) coordinates determined to be 26° 51.63' South 027°25.23' East whilst flying through 24 500ft.

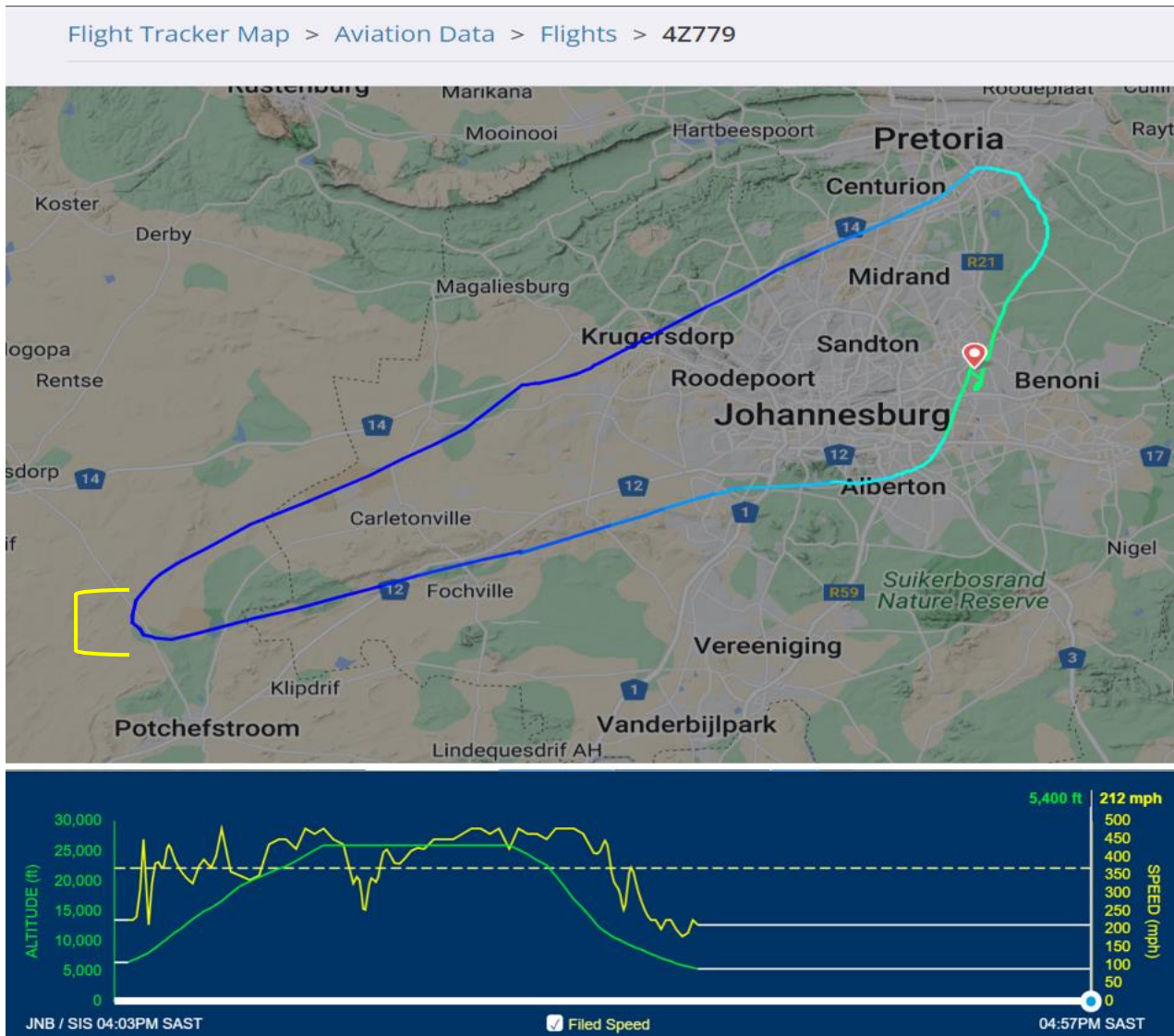


Figure 2: The aircraft's flight path and an air turn back to FAOR. The yellow mark on the map indicates the point at which the crew initiated the air turn back. (Source: Flight Aware)

1.2. Injuries to Persons

Injuries	Pilot	Crew	Pass.	Total On-board	Other
Fatal	-	-	-	-	-
Serious	-	-	-	-	-
Minor	-	-	-	-	-
None	2	1	14	17	-
Total	2	1	14	17	-

Note: Other means people on the ground.

1.3. Damage to Aircraft

1.3.1. None.

1.4. Other Damage

1.4.1. None.

1.5. Personnel Information

Captain (Pilot Flying)

Nationality	South African	Gender	Male	Age	31
Licence Type	Airline Transport Pilot Licence (ATPL)				
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	Instrument				
Medical Expiry Date	31 March 2025				
Restrictions	VML, Corrective Lense to wear				
Previous Incidents	None				

Note: Previous serious incidents refer to past serious incidents the pilot was involved in, when relevant to this serious incident.

Flying Experience:

Total Hours	4 182.3
Total Past 24 Hours	Unknown
Total Past 7 Days	Unknown
Total Past 90 Days	215.4
Total on Type Past 90 Days	215.4
Total on Type	1 257.8

1.5.1. The captain was initially issued an Airline Transport Pilot Licence (ATPL) on 24 November 2020 under the provisions of Part 61 of the CAR 2011. The licence was revalidated on 12 April 2024 with an expiry date of 30 April 2025.

1.5.2. The captain was issued a Class 1 medical certificate on 24 March 2024 with an expiry date of 31 March 2025.

First Officer (Pilot Monitoring)

Nationality	South African	Gender	Female	Age	32
Licence Type	Airline Transport Pilot Licence (ATPL)				
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	Instruments and Flight Instructor Grade II				
Medical Expiry Date	31 March 2025				

Restrictions	None
Previous Incidents	None

Note: Previous serious incidents refer to past serious incidents the pilot was involved in, when relevant to this serious incident.

Total Hours	4 899.2
Total Past 24 Hours	0
Total Past 7 Days	4.7
Total Past 90 Days	169.7
Total on Type Past 90 Days	167.9
Total on Type	800

1.5.3. The FO was initially issued an Airline Transport Pilot Licence (ATPL) on 8 November 2022 under the provisions of Part 61 of the CAR 2011. The licence was revalidated on 30 June 2024 with an expiry date of 30 June 2025.

1.5.4. The FO was issued a Class 1 medical certificate on 26 March 2024 with an expiry date of 31 March 2025.

1.6. Aircraft Information

1.6.1. Embraer 135LR (Source: www.skybrary.aero)

The Embraer ERJ-135LR is a long-range version of the original ERJ 135, featuring upgraded engines. It is a twin-engine regional jet produced by Embraer, a Brazilian aerospace company. The aircraft has a fixed-wing design with a low-wing configuration and is equipped with a tricycle undercarriage. The ERJ 135LR is typically configured with a 37-seat interior.

Airframe:

Manufacturer/Model	Embraer / ERJ-135LR	
Serial Number	145493	
Year of Manufacture	2001	
Total Airframe Hours (At Time of Serious Incident)	44 805.15	
Last Maintenance Inspection (Date & Hours)	21 June 2024	44 465.44
Hours Since Last Maintenance Inspection	339.71	
CRS Issue Date	21 June 2024	
C of A (Issue Date & Expiry Date)	22 January 2008	31 January 2025
C of R (Issue Date) (Present Owner)	13 March 2018	
Type of Fuel Used	Jet A1	
Operating Category	Commercial (Part 121)	
Previous Serious Incidents	None	

Note: Previous serious incidents refer to past serious incidents the pilot was involved in, when relevant to this serious incident.

Engine 1:

Manufacturer/Model	Rolls Royce / AE3007
Serial Number	CAE312124
Part Number	23070402
Hours Since New	37 150:54
Hours Since Overhaul	TBO not yet reached

Engine 2:

Manufacturer/Model	Rolls Royce / AE3007
Serial Number	CAE312178
Part Number	23070407
Hours Since New	37 990:35
Hours Since Overhaul	TBO not yet reached

1.7. Meteorological Information

1.7.1 The weather information below was obtained from the pilot questionnaire, completed on 22 August 2024.

Wind Direction	190°	Wind Speed	05kt	Visibility	9999m
Temperature	25°C	Cloud Cover	Unknown	Cloud Base	No Significant Clouds (NSC)
Dew Point	Unknown	QNH	Unknown		

1.8. Aids to Navigation

1.8.1. The aircraft was equipped with standard navigational equipment as approved by the Regulator (SACAA). There were no records indicating that the navigational equipment was unserviceable before the flight.

1.9. Communication

1.9.1. The aircraft was equipped with a standard communication system as approved by the Regulator. There were no recorded defects with the communication system before the flight. The flight transcripts have been requested from the Air Traffic Navigation Services (ATNS) and will be presented in the final report.

1.10. Aerodrome Information

1.10.1. The serious incident occurred whilst the aircraft was in a climb at 24 500ft and overhead Potchefstroom in North West province.

Aerodrome Name	O.R. Tambo International Aerodrome (FAOR)	
Aerodrome Location	Gauteng Province	
Aerodrome Status	Licensed	
Aerodrome GPS coordinates	26°08'01.30" South 028°14'32.38" East	
Aerodrome Elevation	5 558ft	
Runway Headings	03L/21R	03R/21L
Dimensions of Runway Used	4 436 x 60m	3 410 x 60
Heading of Runway Used	21L	
Surface of Runway Used	Asphalt	
Approach Facilities	DVOR/DME, ILS LOC, ILS GP, Runway lights, PAPI's	
Radio Frequency	ATIS: 126.20, 115.20 Apron: 122.65 Tower East: 118.60 Tower West: 118.10 Approach South: 124.50 Approach East: 124.50 Approach West: 123.70 SMC: 121.90	

Note*: The FAOR layout chart is attached to this report as Appendix A.

1.11. Flight Recorders

1.11.1. The aircraft was equipped with a flight data recorder (FDR) and a cockpit voice recorder (CVR) as required by regulations to be fitted to the aircraft type. The CVR data could not be retrieved for download because the recording was overwritten during troubleshooting which was conducted by maintenance personnel during engine ground runs.

1.12. Wreckage and Impact Information

1.12.1. None.

1.13. Medical and Pathological Information

1.13.1. None.

1.14. Fire

1.14.1. The source of smoke is still under investigation and will be discussed in the final report.

1.15. Survival Aspects

1.15.1 None.

1.16. Tests and Research

1.16.1. To be discussed in the final report.

1.17. Organisational and Management Information

1.17.1. This was a scheduled passenger commercial flight operated under the provisions of Part 121 of the CAR 2011 as amended.

1.17.2. The operator was issued a Class I Air Service Domestic Licence by the Air Service Licensing Council on 23 February 2005 for Category A1, A2 and A3 aircraft. The operator was also issued a Class II Air Service Domestic Licence on 24 January 2018 for Category A1, A2, A3, A4 and H2 aircraft.

1.17.3. The operator had a valid Air Operating Certificate (AOC) that was issued by the Regulator on 23 April 2024 with an expiry date of 30 April 2025.

1.17.4. The aircraft was maintained by the SACAA-approved aircraft maintenance organisation (AMO). The AMO was issued an AMO Certificate on 30 April 2024 with an expiry date of 30 April 2025.

1.18. Additional Information

1.18.1. To be discussed in the final report.

1.19. Useful or Effective Investigation Techniques

1.19.1. To be discussed in the final report.

2. FINDINGS

2.1. General

From the available evidence, the following preliminary findings were made with respect to this serious incident. These shall not be read as apportioning blame or liability to any organisation or individual.

To serve the objective of this investigation, the following sections are included in the conclusions heading:

- **Findings** — are statements of all significant conditions, events, or circumstances in this serious incident. The findings are significant steps in this serious incident sequence, but they are not always causal or indicate deficiencies.

2.2. Findings

The pilots (crew)

- 2.2.1. The captain was initially issued an Airline Transport Pilot Licence (ATPL) on 24 November 2020 under the provisions of Part 61 of the CAR 2011. The licence was revalidated on 12 April 2024 with an expiry date of 30 April 2025.
- 2.2.2. The captain was issued a Class 1 medical certificate on 29 September 2023 with an expiry date of 30 March 2024.
- 2.2.3. The first officer (FO) was initially issued an Airline Transport Pilot Licence (ATPL) on 8 November 2022 under the provisions of Part 61 of the CAR 2011. The licence was revalidated on 30 June 2024 with an expiry date of 30 June 2025. The FO had the instrument and instructor Grade 2 ratings.
- 2.2.4. The FO was issued a Class 1 aviation medical certificate on 26 March 2024 with an expiry date of 31 March 2025.
- 2.2.5. The FO declared a PAN PAN PAN distress call that there was smoke in the cockpit.

The aircraft

- 2.2.6. The aircraft was issued a Certificate of Registration on 13 March 2018.
- 2.2.7. The last maintenance inspection that was conducted on the aircraft before the serious incident flight was certified on 21 June 2024 at 44 465.44 airframe hours. The aircraft had accrued 339.71 airframe hours since the said inspection.
- 2.2.8. The aircraft was issued a Certificate of Airworthiness (C of A) on 22 January 2008. The latest C of A had an expiry date of 31 January 2025.
- 2.2.9. The aircraft was issued a Certificate of Release to Service (CRS) on 21 June 2024 at 44 465.44 airframe hours with an expiry date of 12 January 2025 or at 44 960.10 airframe hours,

whichever occurs first. There were no defects recorded in the flight folio at the time of the flight.

Environment

2.2.10. Fine weather conditions prevailed at the time of the flight; the weather conditions had no bearing on this serious incident.

Aerodrome

2.2.11. FAOR is a licensed aerodrome with two parallel runways. The aircraft used Runway 21R for take-off, which is 4 421m long and 60m wide. On their return, the aircraft landed on Runway 21L.

3. ON-GOING INVESTIGATION

3.1 The AIID investigation is on-going, and the investigator will investigate other aspects of this occurrence which may or may not have safety implications.

4. SAFETY RECOMMENDATIONS

4.1. General

The safety recommendations listed in this report are proposed according to paragraph 6.8 of Annex 13 to the Convention on International Civil Aviation and are based on the conclusions listed in heading 3 of this report. The AIID expects that all safety issues identified by the investigation are addressed by the receiving States and organisations.

4.2. Safety Recommendation/s

4.2.1. None.

5. APPENDICES

5.1. Appendix A: FAOR layout chart.

**This report is issued by:
Accident and Incident Investigations Division
South African Civil Aviation Authority
Republic of South Africa**

Appendix A

