

PRELIMINARY REPORT ON THE SERIOUS INCIDENT INVOLVING A BOEING 737-500 AIRCRAFT WITH NATIONALITY AND REGISTRATION MARKS 5N-BUJ OWNED AND OPERATED BY AIR PEACE LIMITED WHICH OCCURRED ENROUTE SAM MBAKWE AIRPORT, OVERRI ON 5TH NOVEMBER, 2019

| | |
|--|--|
| Aircraft Accident Report No.: | AIRPEACE/2019/11/05/D |
| Registered Owner and Operator: | Air Peace Limited |
| Aircraft Type and Model: | Boeing 737-500 |
| Manufacturer: | The Boeing Company |
| Date of Manufacture: | 1997 |
| Nationality and Registration Marks: | 5N-BUJ |
| Serial Number: | 28721 |
| Location: | FL230 enroute Sam Mbakwe Airport, Owerri |
| Date and Time: | 5th of November, 2019 at about 07:46 h <i>(All times in this report are local time (UTC+1) unless otherwise stated)</i> |

INTRODUCTION

Accident Investigation Bureau (AIB) was notified of the serious incident by the Operator on 5th November, 2019; the day of the occurrence. Investigators were deployed same day to the General Aviation Terminal (GAT) of Murtala Muhammed Airport, where the aircraft was parked after making an air return to commence post occurrence assessments, under the provisions of the Civil Aviation (Investigation of Air Accidents and Incidents) Regulations 2019 and International Civil Aviation Organization (ICAO) Annex 13. All other relevant stakeholders were notified.



The purpose of this preliminary report is to provide details of the initial facts, discussions and findings surrounding the occurrence; it includes information gathered from witness

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statements, flight recorders, Air Traffic Control (ATC) reports, weather reports, and preliminary inspection of the aircraft.

The investigation is ongoing.

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1.0 FACTUAL INFORMATION

1.1 History of the Flight

On the 5th of November 2019, at about 07:35 h; a Boeing 737-500 aircraft with nationality and registration marks 5N-BUJ owned and operated by Air Peace Limited departed Murtala Muhammed International Airport (DNMM), Lagos as flight APK7004 for Sam Mbakwe Airport (DNIM), Owerri. It was a scheduled flight on an Instrument Flight Rules (IFR) flight plan with six (6) crew members and eighty-four (84) passengers on board. The First Officer was the Pilot Flying (PF) while the Captain was the Pilot Monitoring (PM).

The flight crew stated that they resumed for duty at 06:00 h, as required to operate the flight, which was the first sector for the day. The crew carried out the pre-flight inspection and waited to receive the current destination weather before requesting Operations Control Center (OCC) to call for boarding. The crew then requested for Engine start up clearance and approval was granted by the ATC. Parameters for the two engines were reported to be normal. Taxi clearance was thereafter requested and approval granted after the crew completed the appropriate checklists.

At 07:35:27 h, the aircraft was airborne.

At 07:40:16 h, the aircraft was in contact with the Lagos Area Control Centre (ACC) which cleared it to climb to FL310 and proceed direct to ARAGU¹.

According to the first officer, who was the PF at the time, "At about 23,000 ft, I heard a loud bang and the automation went off and the airplane veered a little to the right. The second bang came few seconds after the first and we quickly glanced at the primary engine instrument panel and noticed that N2 indication was zero, N1 was also rapidly decreasing and was at about 30% while we were climbing."

Post occurrence inspection revealed the malfunctioned engine to be No. 2.

The flight crew identified the occurrence as 'severe engine damage' and in response, carried out memory items before consulting the Quick Reference Handbook (QRH). The

¹ARAGU, a reporting point along the route

Captain took control of the aircraft and requested that the APU be started.

At 07:46:32 h, the crew declared 'MAYDAY' (emergency) to ACC, requesting to stop climbing and make an air return to Lagos which was granted. The ACC cleared the aircraft to descend to FL220 and proceed to Lagos. The Captain briefed the passengers about the situation while the First Officer notified the Airline's OCC.

At 07:48:44 h, ACC further cleared the aircraft to descend to FL160, proceed direct to Lagos, to contact Approach Control and was acknowledged by the crew.

At 07:49:57 h, when the aircraft was in contact with Approach Control, the crew downgraded the emergency declaration to a 'PAN PAN PAN'. They also requested to use runway 18R for landing.

At 07:50:15 h, Approach Control cleared the aircraft as follows: "APK7004 IDENTIFY AT 62 NMS. EAST LAG EXPECT RADAR VECTOR FOR RNAV APPROACH RUNWAY 18R OR VOR/DME APPROACH FOR RUNWAY 18R DESCEND FL 50"

At 07:50:33 h, the crew responded as follows: "DESCENDING FL50 WE HAVE AN EMERGENCY WE CAN NOT DO A VOR APPROACH WE HAVE AN EMERGENCY WE LOST AN ENGINE WE CAN'T DO A VOR APPROACH"

Approach Control cleared the aircraft to fly direct to Lagos and further descended it to 2,200 ft before being transferred to the Control Tower at 8NM to touchdown.

At 08:03:07 h, the aircraft was in contact with Control Tower and was cleared to land.

At 08:06:47 h, the aircraft landed safely on runway 18R. It was escorted by all waiting emergency vehicles as it taxied on its own power to the General Aviation Terminal (GAT) apron where it parked and passengers were disembarked with no injury.

1.2 Injuries to Persons

| Injuries | Crew | Passengers | Total in the aircraft |
|----------|------|------------|-----------------------|
| Fatal | Nil | Nil | Nil |
| Serious | Nil | Nil | Nil |
| Minor | Nil | Nil | Nil |
| None | 6 | 84 | 90 |
| Total | 6 | 84 | 90 |

1.3 Damage to Aircraft

The aircraft was slightly damaged.

1.4 Other Damage

Nil.

1.5 Personnel Information

1.5.1 Captain

| | |
|---------------------|--|
| Nationality: | Nigerian |
| Age: | 42 years |
| License Type: | ATPL (A) |
| License Validity: | 18th January, 2021 |
| Aircraft Ratings: | B737-300/500, Dash-8, CRJ-700/900, Dornier-328-300 |
| Medical Validity: | 5th March, 2020 |
| Simulator Validity: | 7th January, 2020 |
| Total Flying Time: | 8,900 h |

| | |
|----------------|---------|
| Total on Type: | 4,000 h |
| Last 90 Days: | 90 h |
| Last 28 Days: | 40 h |
| Last 24 Hours: | 3:05 h |

1.5.2 First Officer

| | |
|---------------------|---------------------|
| Nationality: | Nigerian |
| Age: | 33 years |
| License Type: | ATPL (A) |
| License Validity: | 26th August, 2023 |
| Aircraft Ratings: | B737-300/500 |
| Medical Validity: | 15th August, 2020 |
| Simulator Validity: | 29th February, 2020 |
| Total Flying Time: | 3,353 h |
| Total on Type: | 3,047 h |
| Last 90 Days: | 84:25 h |
| Last 28 Days: | 37:40 h |
| Last 24 Hours: | 04:10 h |

1.6 Aircraft Information

1.6.1 General Information

| | |
|-----------------|-------------------------|
| Type: | Boeing 737-5L9 |
| Manufacturer: | The Boeing Company, USA |
| Owner/Operator: | Air Peace Limited |
| Airframe time: | 41,792 h |

| | |
|------------------------------------|---------------------|
| Cycles since new: | 30,978 |
| Serial Number: | 28721 |
| Category: | Transport |
| Year of Manufacture: | 1997 |
| C of A Validity: | 5th August, 2020 |
| Certificate of Insurance Validity: | 31st December, 2019 |
| Certificate of Registration: | 1st August, 2016 |
| Noise Certificate: | 1st August, 2016 |



Figure 1: Photo of the aircraft parked at G.A.T Apron after the Air Return

1.6.2 Engines

| | No. 1 | No.2 |
|-------------------|------------------------|------------------------|
| Serial No.: | 858739 | 720461 |
| Type: | CFM 56-3C1 | CFM 56-3B1 |
| Manufacturer : | CFM International, USA | CFM International, USA |
| Time Since New: | 39,553:23 h | 84,197:2 h |
| Cycles Since New: | 30,611 | 77,223 |

On 22nd June, 2018, the incident engine, S/N 720461 was removed from an aircraft in Air Peace Limited fleet, 5N-BQQ at a Time Since New (TSN) of 83,611:31 h and Cycle Since New (CSN) of 76,567.

On 11th April, 2019, Authorised Release Certificate (EASA Form 1) was issued by Jordan Airmotive Limited Company in respect of a repair work done on the incident engine, S/N 720461 at a TSN of 83,611:31 h.

On 17th April, 2019, the repaired engine, S/N 720461 was installed at the Right Hand (No. 2) position on 5N-BUJ at a TSN of 83,611:31 h and CSN of 76,567.

On 17th June, 2019, the first flight with the repaired engine installed on 5N-BUJ was conducted.

On 5th November, 2019, at a TSN of 84,197:6 h and CSN of 77,222, the No. 2 engine, S/N 720461 N1 and N2 gauges indicated below normal values in flight from Lagos enroute Owerri at about FL230.

On 19th October, 2019 a deferred defect on 'ENG.2 EGT ERRATIC' was entered in the Deferred Defect Log book and action taken to clear the defect on 20th October, 2019 was 'ENG. 2 EGT Harness'.

The No. 2 engine limiter as at 4th November, 2019 was 4,359 cycles.

Fuel Type: Jet A1



Figure 2: Photo of metal debris from the malfunctioned No. 2 engine

1.7 Meteorological Information

The weather report for Lagos (DNMM) obtained from the Nigerian Meteorological Agency (NiMET) is as follows:

| | |
|----------------|-------------------------------|
| Time: | 0600UTC |
| Wind: | Calm |
| Visibility: | 10 km |
| Weather: | Slight Drizzle |
| Cloud: | SCT 330m, Few 600m, CB (NW-N) |
| Temp/Dewpoint: | 27°C/25°C |
| QNH: | 1014hPa |
| Trend: | NOSIG |

Time: **0700UTC**
 Wind: Variable at 2kts
 Visibility: 7 km
 Weather: Nil
 Cloud: SCT 330m, Few 600m, CB (NW-W)
 Temp/Dewpoint: 27°C/26°C
 QNH: 1014hPa
 Trend: NOSIG

1.8 Aids to Navigation

Equipment status in Lagos where the aircraft took off and landed were as follows:

| | | | | |
|-------|---------|-----------|---------|-----|
| 'LAG' | VOR/DME | 113.7 MHz | | -S- |
| 'ILA' | ILS/DME | 110.3 MHz | RWY 18L | -S- |
| 'ILB' | ILS/DME | 108.1 MHz | RWY 18R | -S- |

1.9 Communications

There was effective communication between the aircraft and various ATC units. The status of the equipment on the day of the occurrence were as follows:

| | | |
|------------------------------|----------------|-------|
| Lagos Radar/Approach Control | VHF 124.7 MHz: | -S- |
| Lagos Area Control | VHF 127.3 MHz: | -S- |
| Lagos Tower Control | VHF 118.1 MHz: | - S - |

1.10 Aerodrome Information

Murtala Muhammed International Airport, Lagos was the departure airfield where the aircraft took off and landed after the air return.

The aerodrome has two parallel runways 18L/36R and 18R/36L serving the domestic and international wings of the airport, respectively.

The airport elevation is 135 ft and runway length of 18L/36R is 9,006 ft (2,745 m) while 18R/36L is 12,795 ft (3,900 m).

The airport is rated CAT 9 in fire coverage capabilities.

1.11 Flight Recorders

The aircraft is fitted with Flight Data Recorder (FDR) and a Cockpit Voice Recorder (CVR) with following details:

| | Flight Data Recorder | Cockpit Voice Recorder |
|----------------------|-----------------------------|-------------------------------|
| Manufacturer | Allied Signal | Lockheed Martin |
| Model | SSFDR | Fairchild Model A200S |
| Part Number | 980-4700-003 | S200-0012-00 |
| Serial Number | 6293 | 01002 |

Both recorders were retrieved in good condition and their data were successfully downloaded at AIB flight safety laboratory, Abuja.

1.12 Wreckage and Impact information

Metal debris were found around the tail cone of No. 2 engine during post-occurrence inspection.

Initial Findings

Investigation so far revealed the following:

1. The pilots were qualified and licensed to fly the aircraft.
2. The First Officer was the Pilot Flying (PF) and the Captain was the Pilot Monitoring (PM).
3. The Captain took control of the aircraft at FL230 after the loud bang and yaw.
4. The aircraft had a valid Certificate of Airworthiness.
5. On 22nd June, 2018, the incident engine, S/N 720461 was removed from an aircraft in Air Peace Limited fleet, 5N-BQQ at a Time Since New (TSN) of 83,611:31 h and Cycle Since New (CSN) of 76,567.
6. On 11th April, 2019, Authorised Release Certificate (EASA Form 1) was issued by Jordan Airmotive Limited Company in respect of a repair work done on the incident engine, S/N 720461 at a TSN of 83,611:31 h.
7. On 17th April, 2019, the repaired engine, S/N 720461 was installed at the Right Hand (No. 2) position on 5N-BUJ at a TSN of 83,611:31 h and CSN of 76,567.
8. On 17th June, 2019, the first flight with the repaired engine installed on 5N-BUJ was conducted.
9. On 5th November, 2019, at a TSN of 84,197:6 h and CSN of 77,222, the No. 2 engine, S/N 720461 N1 and N2 gauges indicated below normal values in flight from Lagos enroute Owerri at about FL230.
10. Metal debris were found around the tail cone of No. 2 engine during post-occurrence inspection.
11. The Time Since Repair (TSR) and Cycles Since Repair (CSR) of Engine S/N 720461 was 586.29 h and 655, respectively at the time of the occurrence.
12. On 19th October, 2019 a deferred defect on 'ENG.2 EGT ERRATIC' was entered

in the Deferred Defect Log book and action taken to clear the defect on 20th October, 2019 was 'ENG. 2 EGT Harness'.

13. The No. 2 engine limiter as at 4th November, 2019 was 4, 359 cycles.
14. At 07:46:32 h, the crew made a 'MAYDAY' (Emergency) call to ATC.
15. At 07:49:57 h, the crew declared 'PAN PAN PAN' to Approach Control and requested runway 18R for landing.
16. At 08:06:47 h, the aircraft landed safely on runway 18R.
17. The aircraft was escorted by emergency vehicles as it taxied on its own power to the General Aviation Terminal (G.A.T) apron and parked.
18. The crew and passengers disembarked normally without any injury.

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