Preliminary Report on the Incident involving Hawker 900XP aircraft with nationality and registration marks 5N-KAL operated by Flybird Aircraft Management Services Limited, which occurred during climb out from Nnamdi Azikiwe International Airport (DNAA), Abuja, Nigeria to Kotoka International Airport (DGAA), Accra; Ghana on 6 December 2024

Operator:	Flybird Aircraft Management Services Limited
Aircraft type and model:	Hawker 900XP
Manufacturer:	Textron Aviation, USA
Year of manufacture:	2010
Nationality and registration marks:	5N-KAL
Serial number:	HA-158
Location:	FL 260 during climb out of Nnamdi Azikiwe International Airport (DNAA)
Date and time:	6 December 2024 at about 17:51 h (All times in this report are local time, equivalent to UTC+1 unless otherwise stated)

INTRODUCTION

The Nigerian Airspace Management Agency (NAMA) notified the Nigerian Safety Investigation Bureau (NSIB) of the occurrence. Investigators were dispatched to the aircraft the next day. They commenced post-occurrence assessment under the provisions of Civil Aviation (Investigation of Air Accidents and Incidents) Regulations 2023 and Annex 13 to the Convention on International Civil Aviation.

This Preliminary Report aims to provide details of the initial facts gathered so far, including discussions and findings surrounding the occurrence, information gathered from the witness accounts, and post-occurrence inspection of the aircraft.

This report presents the current status of the notification processing. Its content may still change, and it does not necessarily bind the conclusions published in the investigation's Final Report.

The investigation is ongoing.

1.0 FACTUAL INFORMATION

1.1 History of the flight

On 6 December 2024, a Hawker 900XP aircraft with nationality and registration marks 5N-KAL, operated by Flybird Aircraft Management Services Limited, was on a charter flight from Nnamdi Azikiwe International Airport, Abuja (DNAA), Nigeria, to Kotoka International Airport, Accra (DGAA), Ghana. The flight was operated under Instrument Flight Rules. Three crew members and one passenger were on board, and the fuel endurance was four hours and thirty minutes. The First Officer was the Pilot Flying while the Captain was the Pilot Monitoring.

At 17:39 h, 5N-KAL departed DNAA on Runway 22. At 17:40:03 h, Abuja Approach cleared 5N-KAL for a right turn on course Vonuk[1] and to continue to climb to FL 280. At 17:43:56 h, climbing out of FL 135, Abuja Approach cleared 5N-KAL to proceed with Kano Control on 128.5 MHz. At 17:44:50 h, Kano Control cleared 5N-KAL to proceed with Lagos Control on 127.3 MHz. At 17:51:13 h, climbing out of FL 260, the crew heard a loud bang from Engine Number 2.

According to the flight crew, Engine Number 2 temperature indication was increasing. After reducing the engine's power to idle, the crew felt vibrations from the same engine.

At 17:51:28 h, the flight crew declared an emergency to Lagos Control and requested a diversion to DNAA at 17:51:40 h. 5N-KAL was then instructed to contact Kano Control, after which the Captain took over the controls and relinquished the radio communication to the First Officer.

[1] Vonuk is a reporting point.

At 17:52:44 h, upon contacting Kano Control, 5N-KAL was cleared to descend to FL 180 and to turn left direct to Pokmo [2]. At 17:57:03 h, Kano Control transferred 5N-KAL to Abuja Approach. At 17:57:57 h, Abuja Approach cleared 5N-KAL to fly direct to Pokmo and descend to FL 065 and subsequently FL 050. At 18:02:31 h, the First Officer observed that the aircraft was 48 nm to Pokmo and advised that descent should be halted as the aircraft was "BELOW."

At 18:03:57 h, the flight crew accomplished the Engine Failure checklist.

At 18:12:08 h, with the aircraft at 5000 ft, the First Officer established visual contact with the ground following which the Engine Number 2 was secured.

At 18:12:15 h, the Captain declared, "NUMBER TWO IS OUT", and the First Officer replied, "NUMBER ONE IS OUT, NUMBER TWO IS OUT" at 18:12:18 h, the Captain declared "LET'S GO FINAL".

At 18:12:19 h, 5N-KAL declared emergency for the second time, declaring that "WE HAVE LOST TWO ENGINES". At 18:13:01 h, 5N-KAL was cleared to land Runway 22 on short finals. Abuja Radar cleared 5N-KAL to land and to contact Abuja Tower on 118.6 MHz. At 18:14:10 h, Abuja Tower cleared 5N-KAL to land Runway 22 with reported wind, calm. At 18:14:22 h, "ONE THOUSAND FEET" audio annunciation sounded, and the First Officer advised that the aircraft was to be configured for flaps 25, which the Captain concurred.

At 18:14:31 h, the First Officer observed the aircraft's speed as 185 kt, called out "LANDING GEARS DOWN AND LOCKED," and advised that the aircraft

[2] Pokmo is a reporting point.

was coming in hot and that the Captain should check speed and ensure "ALL WHITE." The Captain responded, "CHECKED…GOING DOWN."

At 18:14:53 h, the first officer called "FLAPS 25 DEPLOYED".

At 18:14:57 h, an aural annunciation of "THREE HUNDRED" was heard, followed by "TOO LOW TERRAIN TOO LOW TERRAIN" and then "ONE HUNDRED". The aural annunciations for 30 ft above ground level, 20 ft and 10 ft were heard, and then the First Officer called out "FLAPS FOURTY FIVE" and at 18:15:26 h, advised Abuja Tower that 5N-KAL was "SAFE ON GROUND."

At 18:15:35 h, 5N-KAL advised Abuja Tower that it had lost both engines and needed to be towed. Abuja Tower also advised 5N-KAL that an ambulance was stationed at link Alpha 4. At 18:15:44 h, 5N-KAL advised Abuja Tower that it had been cleared off the active runway. During the post-occurrence interview, the flight crew stated that Engine Number 1 regained response to thrust commands after landing.

5N-KAL taxied to the International Terminal Apron and was parked without further incident. All occupants disembarked unhurt.

The incident occurred at 17:51 h, daytime and Instrument Meteorological Conditions (IMC) prevailed.

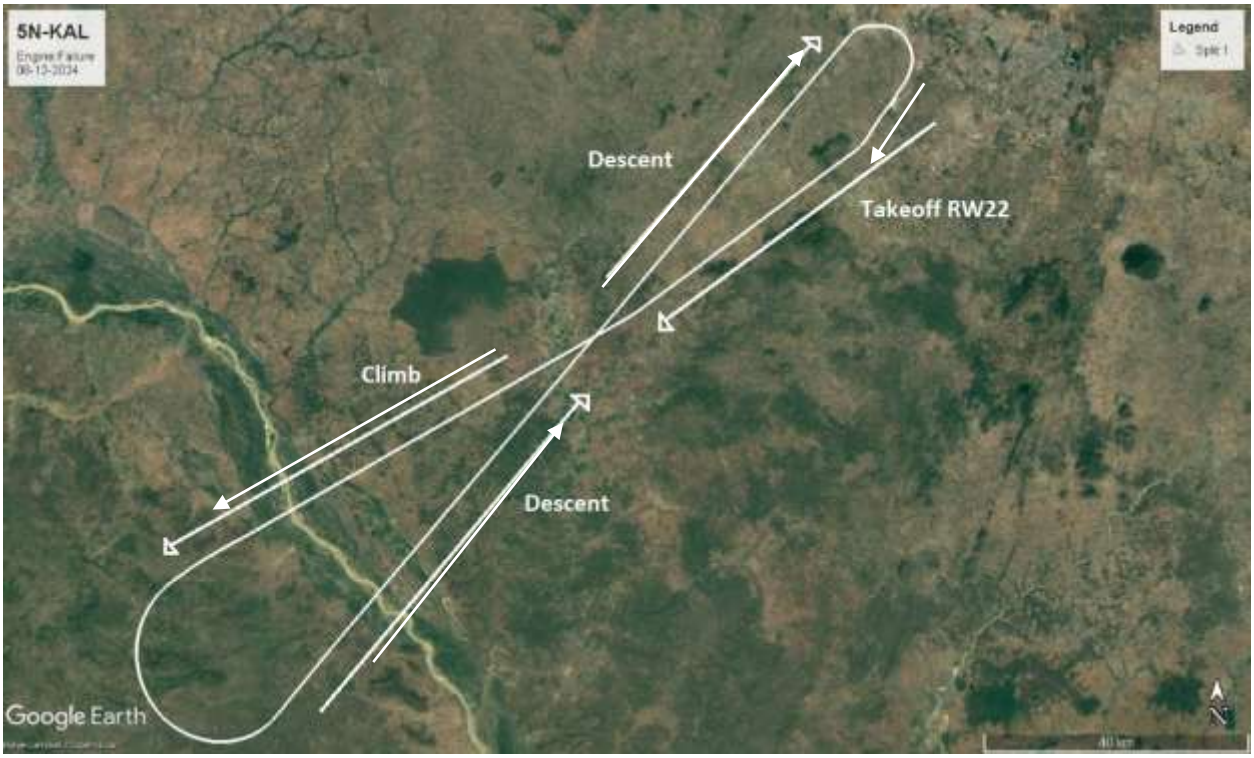

Figure 1: Flight track for 5N-KAL as obtained from position data from the Flight Data Recorder

1.2 Injuries to persons

Injuries	Crew	Passengers	Total in the aircraft	Others
Fatal	Nil	Nil	Nil	Nil
Serious	Nil	Nil	Nil	Nil
Minor	Nil	Nil	Nil	Nil
None	3	1	4	Nil
Total	3	1	4	Nil

1.3 Damage to aircraft

The aircraft was not damaged.

1.4 Other damage

Nil.

1.5 Personnel information

1.5.1 Captain

Nationality:	Nigerian
Age:	31 years
License type:	Airline Transport Pilot License (Aeroplane)
License:	Valid till 31 January 2025
Aircraft ratings:	B737-NG, HS-125/800XP
Medical Certificate:	Valid till 31 January 2025
Instrument rating:	Valid till 26 July 2025
Proficiency check:	Valid till 26 July 2025
Total flying time:	3221 h
Total on type:	134 h
Total on type (PIC):	58:04 h
Last 90 days:	120:03 h
Last 28 days:	39:04 h
Last 7 days:	01:05 h

1.5.2 First Officer

Nationality:	Nigerian
Age:	36 years
License type:	Commercial Pilot License (CPL)
License:	Valid till 4 September 2029
Aircraft ratings:	HS-125/800XP
Medical Certificate:	Valid till 18 June 2025
Instrument rating:	Valid till 10 June 2025

Proficiency check:	Valid till 10 June 2025
Total flying time:	945 h
Total on type:	281 h
Total on type (PIC):	120 h
Last 90 days:	55 h
Last 28 days:	18 h
Last 7 days:	03:05 h

1.5.3 Engineer

Nationality:	Nigerian
Age:	31 years
License type:	Aircraft Maintenance Engineer's License (AMEL)
License:	Valid till 6 January 2027
Aircraft ratings:	TB-9, HS 125 700/800/800XP/ 850XP/900

This was the Engineer that released the aircraft to service on the day of occurrence.

1.6 Aircraft Information

1.6.1 General information

Type:	Hawker 900XP
Manufacturer:	Textron Aviation, USA
Year of manufacture:	2010
Serial number:	HA-158
Air Operator Certificate	Valid till 7 June 2027
Certificate of Airworthiness:	Valid till 19 November 2025

Certificate of Insurance:	Valid till 17 February 2025
Certificate of Registration:	Issued 5 October 2023
Total airframe time:	3851:06 h
Total landing cycles:	2256

Figure 2: 5N-KAL parked post-occurrence

1.6.2 Engines

Engine	**Number 1**	**Number 2**
Manufacturer	Honeywell Inc., USA	Honeywell Inc., USA
Type/Model	TFE-731-50R	TFE-731-50R
Serial number	P122369	P122370
Time since new	3316:48 h	3320:50 h
Cycles since new	2256	2256

Fuel used: Jet A1

1.7 Meteorological information

There was no reported adverse weather at any phase of the flight.

1.8 Aids to navigation

The status of the navigational aids at Nnamdi Azikiwe International Airport (DNAA), Abuja, on the day of the occurrence was as follows:

"ABC" VOR/DME 116.3 MHz	'Serviceable'
"IAB" ILS/DME 109.3 MHz -	'Serviceable'
"IAC" ILS/DME 111.9 MHz -	'Serviceable'
MSSI Wind Indicator -	'Serviceable'
Aerodrome Beacon -	'Serviceable'
Radar & FPL Monitor -	'Serviceable'
ALDIS Lamp and AFL Display-	'Serviceable'

1.9 Communication

There was effective communication between 5N-KAL and all the Air Traffic Control stations it was in contact with: Abuja Tower, Abuja Approach, Kano Control and Lagos Control.

The status of the communication equipment at Nnamdi Azikiwe International Airport (DNAA) on the day of the occurrence was as follows:

VHF 118.6 MHz Tower Primary Frequency -	'Serviceable'
VHF 118.6 MHz Tower Secondary Frequency -	'Serviceable'
VHF 127.9 MHz App/Radar Primary Frequency -	'Serviceable'
VHF 119.8 MHz App/Radar Secondary Frequency -	'Serviceable'
VHF 121.9 MHz Ground Frequency -	'Serviceable'
VHF 127.05 MHz ATIS Frequency -	'Serviceable'
VHF 121.5 MHz Emergency Frequency -	'Serviceable'
Frequentis Smartstrip Main & Backup -	'Serviceable'

Voicecom 1,2, & 3 - 'Serviceable'

Panasonic Table Phone & Techno Mobile – 'Serviceable'

1.10 Aerodrome information

The Nnamdi Azikiwe International Airport, Abuja (DNAA), has aerodrome reference points 09°000'25"N, 007°15'47"E, and elevation 1123 ft with runway orientation 04/22. The runway has a length of 3610 m and a width of 60 m, an asphalt/concrete surface, and a blast pad of 65 m at both ends.

1.11 Flight recorders

The aircraft is fitted with a Solid-State Flight Data Recorder (FDR) and a Solid-State Cockpit Voice Recorder (CVR) with the following particulars:

Recorders	**Flight Data Recorder**	**Cockpit Voice Recorder**
Manufacturer	Honeywell, USA	Universal Avionics, USA
Model	AR-FDR	CVR-120
Part number	980-4710-003	1603-02-12
Serial number	02403	2446

The plots below are select parameters for the flight obtained from the Flight Data Recorder.

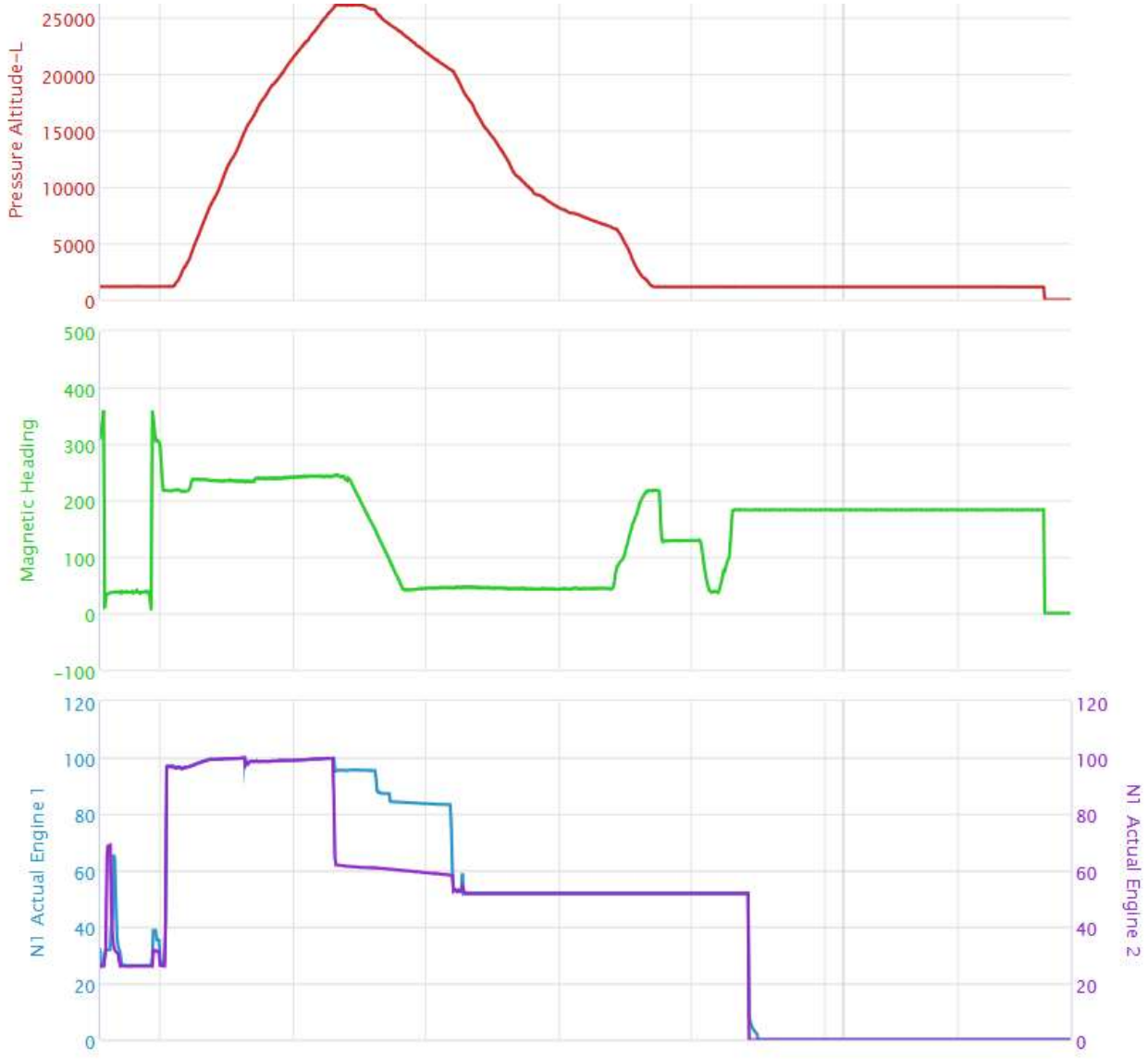

Figure 3: Flight and Engine parameters for the flight

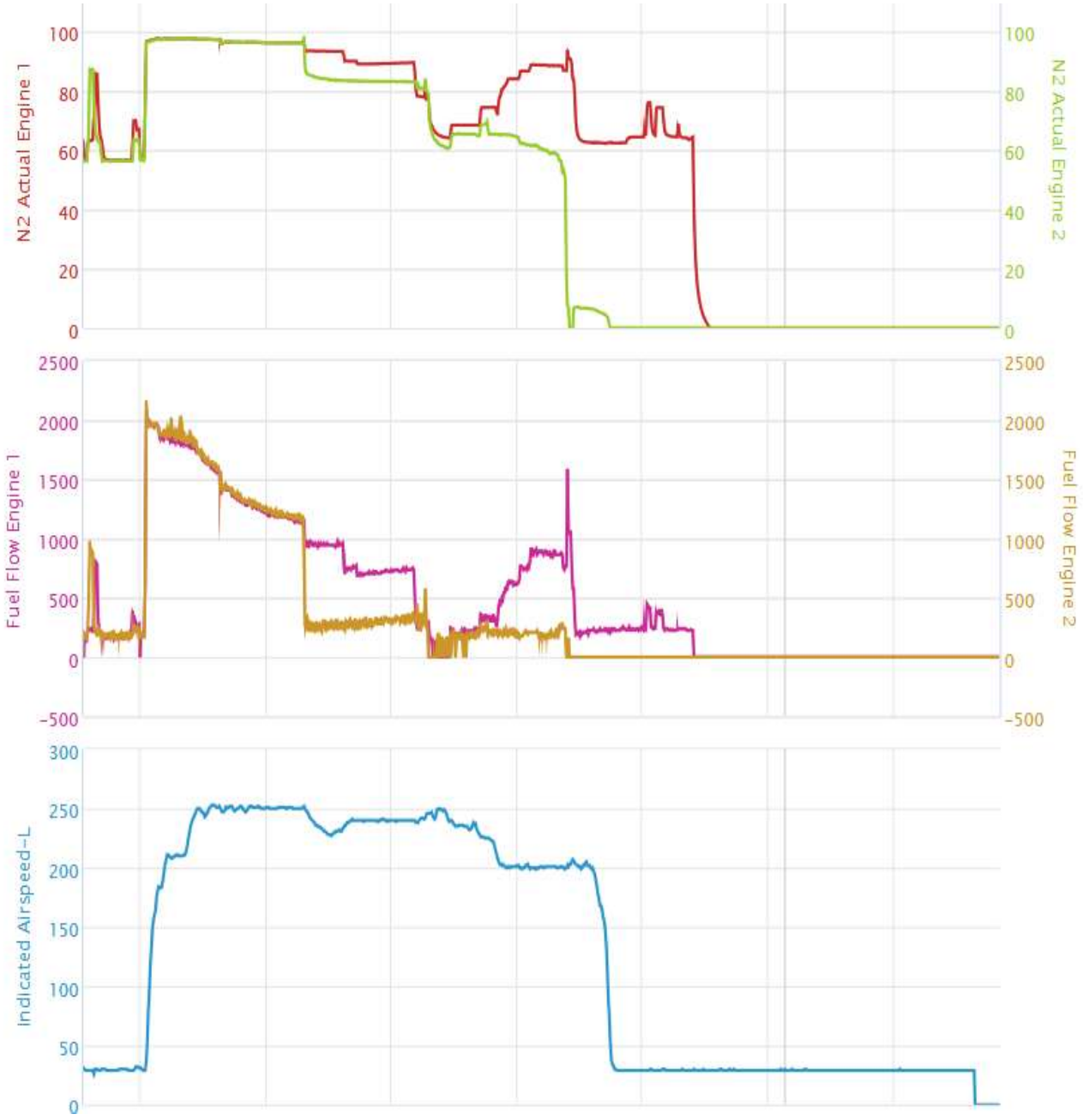

Figure 4: Flight and Engine parameters for the flight (cont'd)

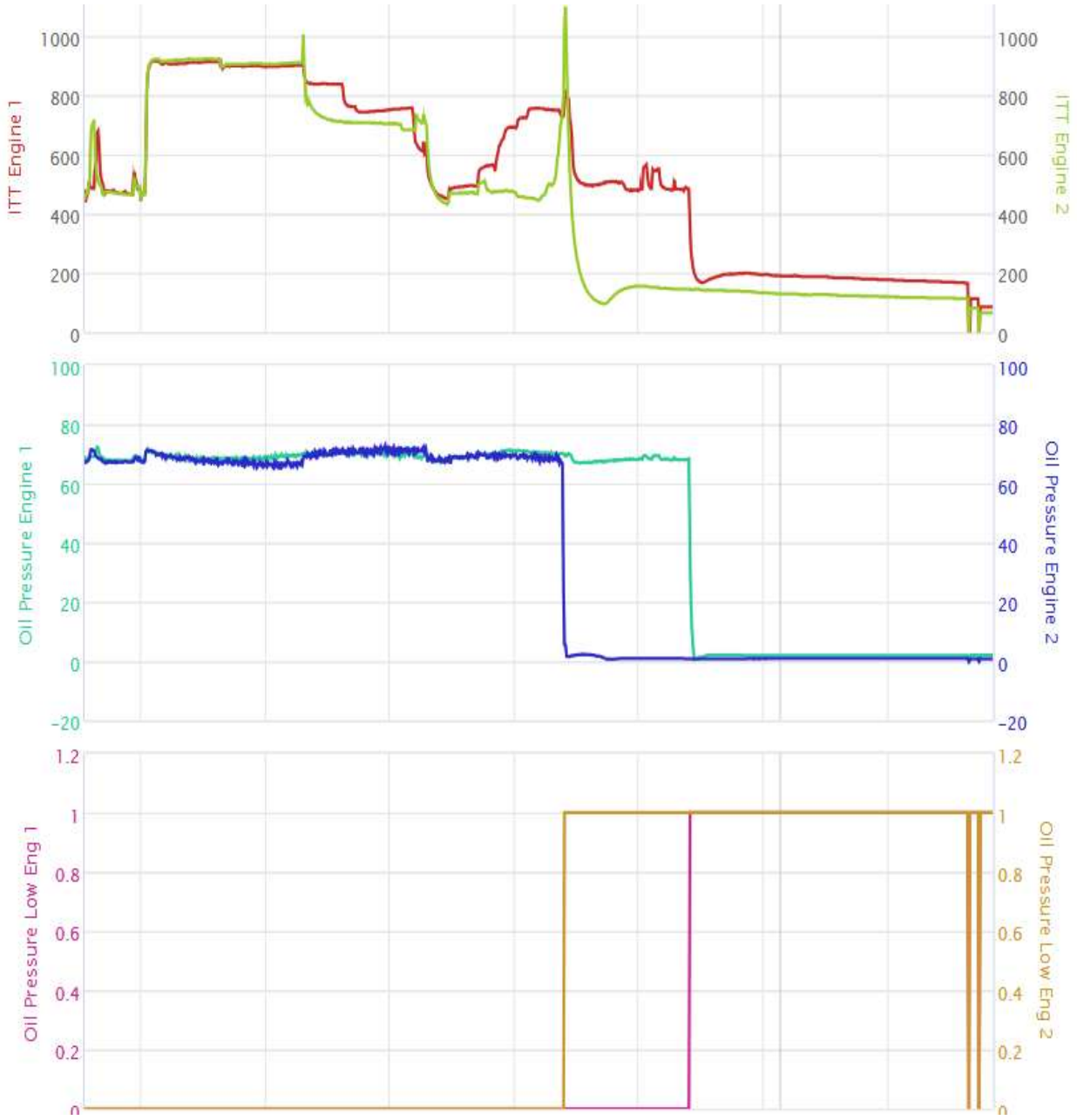

Figure 5: Flight and Engine parameters for the flight (cont'd)

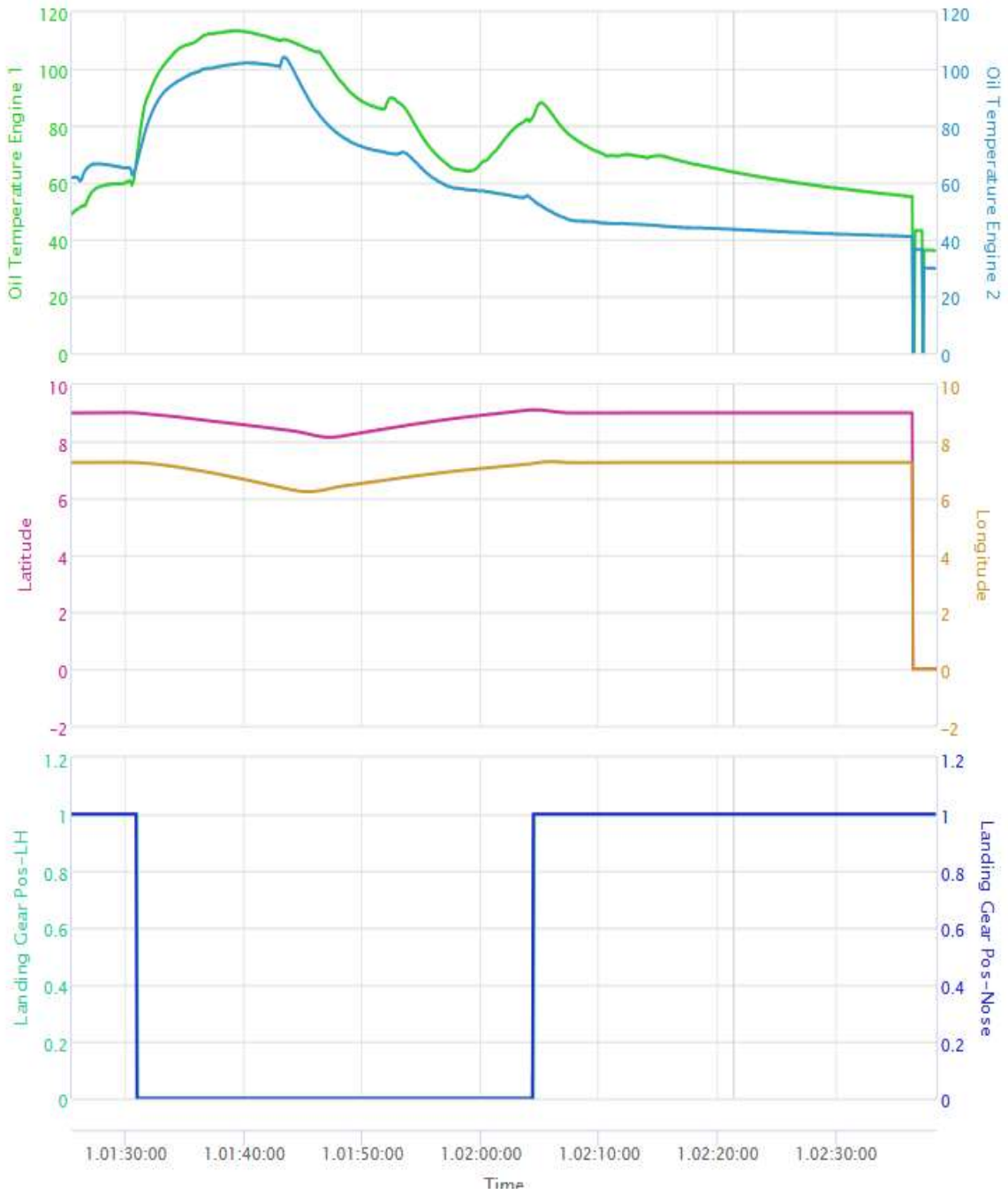

Figure 6: Flight and Engine parameters for the flight (cont'd)

From the parameters above, a spike in the Inter-Turbine Temperature (ITT) for Engine Number 2 could be observed around FL 260; ITT Engine 1 was 906˚C, and ITT Engine 2 was 1014 ˚C.

Without the Thrust Lever Angle (TLA) parameter, the engine thrust commands are not readily apparent to the investigation. However, the Fuel Flow, Oil Pressure Engine, and Inter-Turbine Temperature indications were observed during the flight and assessed to determine the state of the engines during the flight.

A reduction in Engine Number 2 parameters N1 and Fuel Flow, from 99.68% and 1200 lb/h to 61.56% and 224 lb/h, respectively, immediately after the first ITT spike indicates a possible reduction in the TLA for the associated engine, as the associated parameters for Engine Number 1 remained at 95.43% and 944 lb/h even after the first spike for Engine Number 2.

Also, the ITT for Engine Number 2 spiked to 1098 ˚C from 910˚C during descent to FL 065.

1.12 Wreckage and impact information

Visual examination of Engine Number 2 revealed some damage around the exhaust, the extent of which is being determined by the investigation.

Figure 7: Exhaust section of Engine Number 2

1.13 Medical and pathological information

Not applicable.

1.14 Fire

There was no fire.

1.15 Survival aspect

The incident was survivable as the engine failure was contained, and the fuselage integrity was not compromised. The aircraft landed safely on Runway 22, where the Aerodrome Rescue and Fire Fighting Services (ARFFS) was on standby with fire-fighting vehicles/equipment and an ambulance.

1.16 Test and research

Nil.

1.17 Organizational and management information

1.17.1 Flybird Aircraft Management Services Limited

Flybird Aircraft Management Services Limited is a Nigerian aviation company specializing in aircraft management, charter services, sales, acquisitions, and maintenance oversight. Registered with the Corporate Affairs Commission (CAC) in Abuja, it is a strategic partner with Flybird Aviation GmbH, based in Berlin, Germany.

Flybird Aircraft Management Services Limited obtained an Air Operator's Certificate (AOC) with number FAMSL/AOC/06-24/001 from the Nigeria Civil Aviation Authority (NCAA) on 6 June 2024, authorizing it to conduct chartered flight operations.

1.17.2 Nigeria Civil Aviation Authority

Per Section 8 (3) of the Civil Aviation Act 2022, the Nigeria Civil Aviation Authority (NCAA) is Nigeria's sole civil aviation regulatory body, notwithstanding anything contained in any other law.

It became autonomous with the passing into law of the Civil Aviation Act 2022 by the National Assembly and its assent by the President of the Federal Republic of Nigeria. The Act not only empowers the Authority to regulate Aviation Safety without political interference but also to carry out oversight functions of Airports, Airspace, Meteorological Services, etc., as well as economic regulations of the industry.

The NCAA uses a series of well-coordinated procedures and rules to ensure safety and economic regulatory standards in the aviation industry, including Inspection, Operation, Certification, Licensing, Monitoring, Sanctions, and Enforcement.

Currently, the country has about 31 airports. There are about 39 AOC holders (for scheduled and non-scheduled flight operations), and about 28 foreign airlines operate in Nigeria.

Going by the Licence Crew Data for Total Current (With Valid License) as of April 2024: License Pilots, 2,049; Certification of validation for Pilots, 63; Aircraft Maintenance Engineer's Licence, 2,061; Aircraft Maintenance Engineer's Licence with validation, 102; Aircraft Dispatchers' Licence, 840; Air Traffic Controllers (ATC), 420; Cabin Crew Licence, 3,770; Air Traffic Safety Electronic Personnel Licence, 443; and Aeronautical Station Operators' Licence, 161.

2.0 INITIAL FINDINGS

1. The flight crew were certified to conduct the flight.
2. The aircraft had a valid Certificate of Airworthiness.
3. The flight crew heard a loud bang and observed a rise in Engine Number 2 engine temperature while passing FL 260 for FL 280.
4. The Inter-Turbine Temperature (ITT) for Engine Number 2 spiked to 1014°C.
5. The flight crew noticed vibrations from Engine Number 2.
6. The flight crew declared an emergency and requested to make an air return (divert) to Nnamdi Azikiwe International Airport (DNAA).
7. The flight crew executed the Engine Failure checklist.
8. The Inter-Turbine Temperature (ITT) for Engine Number 2 spiked the second time to 1098°C.
9. During Approach, the flight crew noted that engine Number 1 was not responding to thrust commands.
10. 5N-KAL landed DNAA at 18:16 h.
11. After landing, the flight crew noted that engine number 1 responded to thrust commands.
12. The aircraft taxied to the International Terminal and was parked without further incident.

FURTHER INVESTIGATIVE ACTIONS

1. Conduct of detailed inspection of both engines to identify the fault(s) and the associated root causes of the failure and thrust anomaly.
2. Review the maintenance records of the engines.