



LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL
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Reference Number	CA18/2/3/10228						
Classification	Accident		Date	20 September 2022		Time	1435Z
Type of Operation	Part 93 (Corporate Operations)						
Location							
Place of Departure	Pietermaritzburg Airport (FAPM), KwaZulu-Natal Province			Place of Intended Landing	King Shaka International Airport (FALE), KwaZulu-Natal Province		
Place of Occurrence	On Runway 16 at Pietermaritzburg Airport (FAPM)						
GPS Co-ordinates	Latitude	29°38'48.44" S	Longitude	030°23'51.98" E	Elevation	2 423 feet	
Aircraft Information							
Registration	ZS-PKR						
Make; Model; S/N	Dassault Aviation, Falcon 2000 (Serial Number: 114)						
Damage to Aircraft	Substantial			Total Aircraft Hours	3 482.7		
Pilot-in-command							
Licence Type	Airline Transport Pilot Licence (ATPL)		Gender	Male		Age	70
Licence Valid	Yes	Total Hours	13 860		Total Hours on Type	3 500	
Total Hours Past 30 Days	13.9		Total Flying Hours on Type Past 90 Days			21.4	
People On-board	2 + 9	Injuries	0	Fatalities	0	Other (on ground)	0
What Happened							
<p>On Tuesday afternoon, 20 September 2022 at 1435Z, two pilots and nine passengers on-board a Falcon 2000 aircraft with registration ZS-PKR took off on a non-scheduled domestic flight from Pietermaritzburg Airport (FAPM) in KwaZulu-Natal province with the intention to land at King Shaka International Airport (FALE), also in KwaZulu-Natal province. An instrument flight rules (IFR) plan was filed for this flight, which was conducted in instrument meteorological conditions by day. The flight was also conducted under the provisions of Part 93 of the Civil Aviation Regulations (CAR) 2011 as amended. Clear weather conditions prevailed at the time of the flight.</p> <p>According to the pilot-in-command (PIC) who was also the pilot-flying (PF), the aircraft was cleared to taxi, enter and backtrack on Runway 16 after completing the after-start checks. The take-off weight was calculated to be 13 403 kilograms (kg) (29 550 pounds [lbs]). The maximum take-off weight (MTOW) for this aircraft is 16 238kg (35 798 lbs). The required computed take-off distance was 1 241 metres (m) (4 073 feet [ft]). Runway 16 at FAPM is 1 537m (5 043 ft) long. The V-speed was calculated with V1 (maximum speed at take-off at which the pilot must take the first action) at 111 knots (kts), rotation speed (Vr) at 115 kts, and V2 (take-off safety speed) at 118 kts, whilst the threshold speed (Vt) was at 128 kts. At 1435Z, the aircraft was cleared for take-off by air traffic control</p>							

(ATC). The first part of the take-off roll was uneventful. At 80 kts, the first officer (FO) who was the pilot monitoring (PM) called out the speed and the PF moved his left-hand from the tiller to the control column in preparation to apply back pressure when Vr speed is reached.

Shortly thereafter, at a speed of approximately 90-95 kts a bird, likely to be a Spur Winged Goose, was seen getting airborne from the right-side of the runway that was overgrown with grass (the PIC estimated the grass length to be approximately 15-20 centimetres in height). A moment later, the crew heard a loud thud from the right-side of the aircraft, which caused the aircraft to vibrate and subsequently veer off to the right-side of the runway centreline. The PF immediately called for a rejected take-off (RTO). He retarded both throttle levers and applied maximum brakes to stop the aircraft on the remaining runway surface. The PM extended the airbrakes whilst notifying the tower about the RTO. After the aircraft came to a stop, the crew checked the engine parameters and it was noted that the number 2 engine fuel flow indicated zero.

Following the RTO, the crash alarm was activated by the ATC and two Aerodrome Rescue and Firefighting (ARFF) trucks dispatched to the scene. Once it was confirmed that the area around the aircraft was safe, the passengers disembarked unassisted via the main cabin door. There were no injuries recorded. The aircraft was taxied to the apron with the remaining operative engine.

Following an external inspection of the aircraft, it was found that several of the number 2 engine compressor fan blades had been damaged, and that some of the engine hardware (fractured compressor blades) had penetrated the upper right-side of the fuselage, approximately 15 centimetres (cm) in front of the aft pressurised baggage compartment bulkhead. This was due to the bird flying into the engine.

According to the airport management, to monitor and manage wildlife hazards *“requires application of control techniques which need to be conducted in a co-ordinated and accountable manner. On a daily basis, there are four scheduled inspections which are (carried out) along the runway and surroundings. Prior to a scheduled aircraft landing, a runway inspection is conducted. In peak wildlife seasons, inspections are conducted 10 minutes prior to arrival and 10 minutes prior to departure. ATC may request fire and rescue to remove or chase away any wildlife as and when spotted”*. According to the roster on the day of the accident, the inspection was carried out at 1400Z, which was 35 minutes prior to departure of the ZS-PKR aircraft.

Apart from damage to the No.2 engine and the area where the fuselage was damaged by the fractured engine hardware, no other damage was caused to the aircraft.

Engine:

Manufacturer/Model	Honeywell/CFE738-1-1B
Serial Number	P105368
Part Number	30550000-5
Hours Since New	3404.4
Hours Since Overhaul	Modular assembly



Figure 1: The file picture of the ZS-PKR aircraft. (Source: www.jetphotos.com)



Figure 2: An arrow showing damage to the fuselage. (Source: Operator)

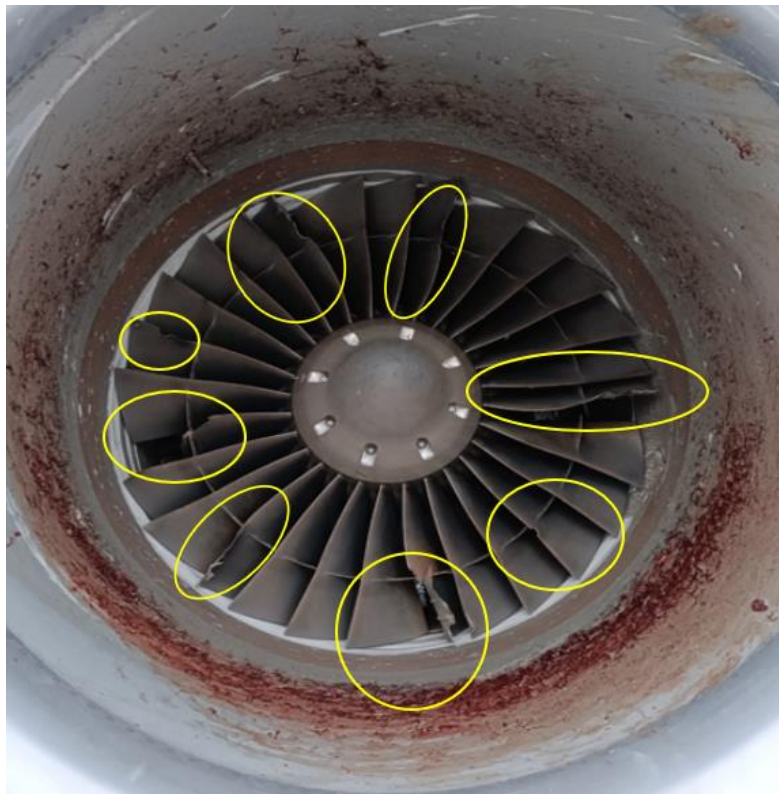


Figure 3: The damaged No.2 engine fan blades: (Source: Operator)

REJECTED TAKE-OFF (Source: F2000 QRH2)

Yawing tendency

BELOW V1: REJECTED TAKE-OFF

- BrakesMax, pressure
- Power levers.....IDLE
- AIRBRAKES.....Position 2

Findings

- The PF was reissued an Airline Transport Pilot Licence (ATPL) on 2 August 2022 with an expiry date of 31 August 2023. The aircraft's rating was endorsed on his licence.
- The PF was issued a Class 1 medical certificate on 18 May 2022 with an expiry date of 30 November 2022, and with a medical waiver to wear corrective near vision (VNL) lenses.
- The PM was reissued an ATPL on 24 February 2022 with an expiry date of 28 February 2023.
- The PM was issued a Class 1 medical certificate on 26 June 2022 with an expiry date of 31 December 2022, and with a medical waiver to wear corrective lenses.
- The last 12-month/800-hour inspection was carried out on 14 January 2022 at 3 469.6 airframe hours, and a Certificate of Release to Service (CRS) was issued on 14 January 2022 with an expiry date of 14 January 2023 or at 3 587.1 hours, whichever comes first.
- The Certificate of Airworthiness (C of A) was initially issued on 11 July 2000. The latest reissued C of A had an expiry date of 31 July 2023.
- The aircraft maintenance organisation (AMO), licensed by the Regulator (SACAA), had a certificate that was issued on 5 November 2021 with an expiry date of 30 November 2022.
- The Certificate of Registration (C of R) was issued to the present owner on 8 July 2022.
- Following the bird strike, the ARFF inspected the runway and the bird carcass was removed. According to the safety report by the airport manager, "*In peak wildlife seasons, inspections are conducted 10 minutes prior to arrival and 10 minutes prior to departure. ATC may request fire and rescue services to remove or chase away any wildlife as and when spotted. A vehicle equipped with a 2-way radio is always made available to the fire crew to attend to wildlife management call outs*". The report stated that the type of bird was likely a Spur Winged Goose or Hadeda Ibis, however, the investigation could not determine the type of bird due to pending engine inspection by the manufacturer. The AMO stated that the engine will be shipped to the manufacturer for repairs and a DNA analysis will be conducted to determine

the exact bird species. At the time of finalising the report, the engine was not yet shipped to the manufacturer.

- According to the bird inspection roster that was made available to the investigator, an inspection was conducted at 1400Z on Runway 16/34 and no birds were spotted during this inspection.
- The airport was issued a Category 6 licence on 1 December 2021 with an expiry date of 31 December 2022.
- The airport had a bird control procedure in place, which includes the appointment of a wildlife control officer. At the time of the accident, the officer was not yet appointed, and the airport was managing this risk by relying on ATC and ARFF personnel to check for birds. This was not in line with the wildlife control procedure.

Probable Cause(s)

During the take-off roll, the No.2 engine spooled down to zero after suffering substantial damage after a bird flew into the engine; the crew conducted a successful RTO.

Contributing Factor

Non-appointment of a wild life control officer.

Safety Action(s)

None.

Safety Message and/or Safety Recommendation/s

Operators are encouraged to comply with wild life procedures to avoid such accidents from occurring.

About this Report

The decision to conduct a limited investigation 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 desk top enquiries 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.

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

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