

AIRCRAFT INCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/3/2/1066	
Aircraft Registration	ZS-NMO	Date of Incident	18 July 2014		Time of Incident	0400Z
Type of Aircraft	Bombardier Q400		Type of Operation		Commercial (Part 121)	
Pilot-in-command Licence Type		ATPL	Age	43	Licence Valid	Yes
Pilot-in-command Flying Experience		Total Flying Hours	3280.6		Hours on Type	2120.0
Last point of departure		Cape Town International Airport (FACT) Western Cape. Province				
Next point of intended landing		Braam Fischer Aerodrome (FABL) Bloemfontein. Free State. Province				
Location of the incident site with reference to easily defined geographical points (GPS readings if possible)						
Runway 01 at Cape Town International Airport (FACT) GPS Coordinates S33° 59'15.85" E018' 36,32.01" elevation						
Meteorological Information		Surface wind,320° at 10kt ,Visibility 6000 with light rain				
Number of people on board	2+2 + 19	No. of people injured	0	No. of people killed	0	
Synopsis						
<p>The Bombardier Dash 8-Q400 aircraft with the pilot-in-command, the 1st officer including 2 cabin crew-members and 19 passengers, departed from Cape Town International Airport on a scheduled commercial flight to Braam Fischer Airport (FABL) in Bloemfontein. Whilst climbing through flight level (FL) 160, a passenger informed the cabin crew that a cowling was missing at the left hand side of no. 2 engine. The cockpit crew then verified that the cowling at no 2 engine was missing, that most probably separated from the engine during the take-off roll or shortly thereafter. The cockpit crew continued with the flight to FABL, followed by an uneventful landing at Bloemfontein (FABL). It was observed that some damage was caused to the leading edge section, outboard of no 2 engine during the incident. No injuries were sustained.</p> <p>The engine cowling was located approximately 660 metres from threshold of Runway 01 at Cape Town International Airport (FACT) by the fire department (ARFF) at GPS Coordinates S33° 59'15.85" E018' 36,32.01". The lower two latches of the cowling were found unlatched and the two side latches in the latched position. The investigation revealed that the Pre-flight Inspection was not properly conducted by the maintenance and cockpit crew.</p>						
Probable Cause						
Right hand inboard engine cowling was not properly latched and locked during pre-flight inspection resulting in the separation from the aircraft during take-off.						
SRP Date	10 October 2017		Release Date	08 January 2018		

AIRCRAFT INCIDENT REPORT

Name of Owner : South African Express Airways (PTY) LTD
Name of Operator : South African Express Airways (PTY) LTD
Manufacturer : Bombardier INC
Model : DHC-8-402
Nationality : South African
Registration Marks : ZS-NMO
Place : During take-off at FACT
Date : 18 July 2014
Time : 0400Z

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 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.

1. FACTUAL INFORMATION

1.1 History of Flight

1.1 History of Flight

1.1.1 On 18 July 2014 at approximately 0400Z, the Bombardier Dash 8-Q400 aircraft with the pilot-in-command, the 1st officer including 2 cabin crew-members and 19 passengers, departed from Cape Town International Airport on a scheduled commercial flight to Braam Fischer Airport (FABL) in Bloemfontein. A scheduled "night-stop inspection" was performed on the aircraft the previous night, and a "pre-flight inspection" conducted on the aircraft prior to take-off from Runway 01 on the incident flight.

- 1.1.2 After the aircraft departed from Runway 01 at Cape Town International Airport and whilst climbing through flight level (FL) 160, a passenger seated in row 19, informed the cabin crew that a cowling on the left hand side of the right hand engine appeared to be missing. The cockpit crew then verified that the engine cowling was missing, that most probably separated from the engine during the take-off roll or shortly after the aircraft became airborne.
- 1.1.3 The cockpit crew elected to continue with the flight to FABL after consultation with FACT Maintenance Control Centre (MCC) and Operations Control Centre (OCC). An uneventful landing was performed at Bloemfontein (FABL).
- 1.1.4 It was noted after landing at Bloemfontein that the cowling that separated from the inboard side of number 2 engine, struck the leading edge section, outboard of no 2 engine, causing substantial damage to the leading edge and outer de-icing boot during the in-flight incident. No injuries were sustained.
- 1.1.5 The cowling was located at approximately 660 metres from threshold of Runway 01 at FACT by the (ARFF) Cape Town Fire Department. The cowling was inspected and it was established that the two lower latches were unlatched and the two side latches were in the closed and latched position.
- 1.1.6 The certified maintenance technician indicated that the assistant had conducted the engine oil uplifts on the engines. The certified technician stated that he was unsure whether he had conducted spot checks on the specific engine oil upliftment at the time before the incident occurred.
- 1.1.7 The assistant stated that it was raining when the incident aircraft landed at Cape Town International Airport during the night on 17 July 2014. He then performed a walk-around inspection of the aircraft and also uplifted the engine oil levels on the engines during the “night stop “inspection

1.2 Injuries to Persons

Injuries	Pilot	Crew	Pass.	Other
Fatal	-	-	-	-
Serious	-	-	-	-
Minor	-	-	-	-
None	1 + 1	2	19	-

1.3 Damage to Aircraft

- 1.3.1 The aircraft sustained damage to the last cowling section and the leading edge de-icing boot outboard of No2 engine.



Figure 1: Shows R/H leading edge & de-icer boot damaged



Figure 2: shows No 2 engine cowling position on a DHC-8-402



Figure 3: Shows position of the engine cowl on a DHC-8-402

1.4 Other Damage

1.4.1 There was no other damage.

1.5 Personnel Information

1.5.1 Pilot-in-command

Nationality	South African	Gender	Male	Age	43
Licence Number	0270439078	Licence Type	ATPL		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Instrument Night flight				
Medical Expiry Date	31 December 2014				
Restrictions	None				
Previous Accidents	None				

Flying Experience:

Total Hours	3280.6
Total Past 90 Days	180.0
Total on Type Past 90 Days	180.0
Total on Type	2120.0

1.15.2 First Officer

Nationality	South African	Gender	Male	Age	23
Licence Number	0272322355	Licence Type	CPL		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Instrument				
Medical Expiry Date	30 September 2015				
Restrictions	None				
Previous Accidents	None				

Flying Experience:

Total Hours	1050.1
Total Past 90 Days	251
Total on Type Past 90 Days	251
Total on Type	658.1

1.6 Aircraft Information

Airframe:

Type	DHC-8-402	
Serial Number	4122	
Manufacturer	Bombardier INC	
Year of Manufacture	2006	
Total Airframe Hours (At time of Incident)	17167.88	
Last MPI (Date & Hours)	14 April 2014	16801
Hours since Last Certificate of release to service	366.88	
C of A (Issue Date)	28 April 2006	
C of A (Expiry Date)	27 April 2015	
C of R (Issue Date) (Present owner)	South African Express Airways (PTY) LTD	
Operating Categories	Standard Part 121	

Engine No.1

Type	Pratt & Whitney PW150A
Serial Number	PCE-FA0283
Hours since New	16305.54
Hours since Overhaul	TBO not yet reached

Engine No.2

Type	Pratt & Whitney PW150A
Serial Number	PCE-FA0284
Hours since New	4774.80
Hours since Overhaul	TBO not yet reached

Propeller No.1

Type	Dowty R408/6-123-F/17
Serial Number	DAP 0275
Hours since New	16788.54
Hours since Overhaul	TBO not yet reached

Propeller No.2

Type	Dowty R408/6-123-F/17
Serial Number	DAP 0277
Hours since New	11592.94
Hours since Overhaul	TBO not yet reached



Figure 4: Shows the Bombardier DHC-8-402 aircraft

1.7 Meteorological Information

1.7.1 Weather information was obtained from the South African Weather Services (SAWS).

Wind direction	320° (NW)	Wind speed	10 knots	Visibility	6000m
Temperature	13°C	Cloud cover	Broken	Cloud base	2500 feet
Dew point	08°C				

1.8 Aids to Navigation

1.8.1 The aircraft was fitted with the following navigational aids:

- Standby magnetic compass
- Mode S transponder
- ADF (automatic direction finder)
- DME (distance measuring equipment) transceiver
- VOR (variable omni-range) finder
- ILS (instrument landing system)
- Weather radar
- TCAS (traffic collision avoidance system)

- ELT (emergency locator transmitter)

1.9 Communications.

1.9.1 The aircraft was equipped with standard communication equipment as required by the Regulator. There were no recorded defects to communication equipment prior to the flight. The crew communicated with ATC on the VHF frequency 118.1 MHz

1.10 Aerodrome Information

Aerodrome Location	Cape Town International Airport (FACT)	
Airport Co-ordinates	S33°58'10" E18°36'18"	
Airport Elevation	151 Feet AMSL	
Runway Designations	01/19	16/34
Runway Dimensions	3201 x 61	1701 x 46
Runway Used	01	
Runway Surface	Asphalt	
Approach Facilities	ILS, VOR, DME	

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 the regulations

1.12 Wreckage and Impact Information

1.12.1 The right hand engine cowling situated at the left hand side of the engine, became dislodged from the left-hand side of the engine during the take-off sequence and impacted the right hand leading edge and de-icer rubber boot just outboard of right hand engine, causing substantial damage to the leading edge.

1.12.2 The cowling was located by the Aerodrome Rescue & Fire Fighting (ARFF) personnel, approximately 660m from threshold of Runway 01 in the field at FACT. The cowling two lower latches were found unlatched and the two side latches in the closed and latched position.

1.13 Medical and Pathological Information

1.13.1 None

1.14 Fire

1.14.1 There was no evidence a pre- or post- impact fire.

1.15 Survival Aspects

1.15.1 The incident was considered survivable. As there was no damage to the cabin that could have endangered the passengers. Damage was limited to the right hand wing leading edge outboard of the right hand engine.

1.16 Tests and Research

1.16.1 None

1.17 Organizational and Management Information

1.17.1 The incident aircraft was on a scheduled commercial flight operated from Cape Town International Airport (FACT) to FABL. The operator was in possession of a valid air service licence as well as an AOC at the time of the incident.

1.17.2 The aircraft was maintained by an approved AMO that was in possession of a valid AMO approval certificate under AMO No.126. The AME could not remember if he inspected the work done by the assistance or not.

1.18 Additional Information

1.18.1 None

1.19 Useful or Effective Investigation Techniques

1.19.1 None.

2. ANALYSIS

2.1 Man

1. The pilot-in-command was the holder of a valid airline transport pilot licence (ATPL) and was properly licensed and qualified for the flight in accordance with existing regulations and was in compliance with the flight and duty time regulations stipulated by the operator.
2. The first officer was the holder of a valid commercial pilot licence and was also properly licenced and qualified for the flight in accordance with existing regulations and was in compliance with the flight and duty time stipulated by the operator.
3. During the flight the crew were informed by the cabin crew that a passenger reported that a cowling on the side of right hand engine was missing. After a

visual inspection by the pilot-in-command and the first officer, they decided to continue with the flight to Bloemfontein after consultation with FACT Maintenance Control Centre (MCC) and Operations Control Centre (OCC). An uneventful landing was performed at Bloemfontein (FABL).

4. The crew could not ensure that the engine cowling were properly latched as the aircraft is a high wing aircraft with engines attached to the wing .At the time of the pre-flight inspection it was raining.
5. The certified maintenance technician indicated that the assistant had conducted the engine oil uplifts on the engines. The certified technician stated that he was unsure whether he had conducted spot checks on the specific engine oil upliftment at the time before the incident occurred

2.2 Aircraft

1. The Bombardier Q400 aircraft landed at Cape Town International Airport the night before the incident where after a scheduled “night-stop inspection” was carried out on the aircraft. A “pre-flight inspection” was also carried out on the aircraft the following morning before the aircraft departed at 0400Z on a scheduled domestic flight to Bloemfontein.
2. The cowling failed during take-off and was found by ARFF at approximately 660 m from the runway threshold 01.

2.3 Mission

1. The pilot-in-command, first officer including 2 cabin crew-members and 19 passengers departed from Cape Town International Airport (FACT) on a scheduled domestic flight (Standard Part 121) to Bloemfontein International Airport (FABL) when the right Hand engine lost a cowling at the inboard side of the engine.

2.4 Environment

It was raining when the aircraft arrived at FACT. The South African Weather Service also reported broken (7/8) Stratocumulus or Cumulus cloud observed at minimum base of 2500ft with light rain with the (OAT) temperature of 13 C when the “night stop “ inspection was carried out. The pre-flight inspection was also carried out the following morning during rain, when the aircraft took off from FACT to FABL. The weather en route to Bloemfontein was fine.

3. CONCLUSION

The right hand engine left hand side cowling access cowling was not properly closed and latched when the engine oil uplifts were carried out during the “night stop” inspection. The Pre-flight inspection was also not properly conducted by the line maintenance and the flight deck crew prior to departure.

3.1 Findings

- 3.1.1 The pilot-in-command was the holder of a valid Airline Transport pilot licence (ATPL) and was properly rated on the aircraft type.
- 3.1.2 The pilot-in-command was in possession of a valid medical certificate which expired on 30 December 2014
- 3.1.3 The first officer was the holder of a valid Commercial pilot licence and was properly rated on the aircraft type.
- 3.1.4 The first officer was in possession of a valid medical certificate which expired on 30 September 2015.
- 3.1.5 The aircraft was maintained by an Aircraft Maintenance Organisation (AMO).
- 3.1.6 The last Mandatory Periodic Inspection was conducted on the 14 April 2014 at 16801.00 hours
- 3.1.7 The engine had flown a total of 366.88 hours since the last MPI inspection was carried out.
- 3.1.8 Weather was not a contributory factor to the incident although it was raining at the time of the incident.
- 3.1.9 The AME could not remember if he inspected the work done by the assistant or not.
- 3.1.10 The Pre-flight Inspection was not properly conducted.
- 3.1.11 The right hand engine inboard cowling was not properly latched and locked, the work was performed by assistant
- 3.1.12 The right hand engine left side cowling separated from the engine during the take-off run at FACT due to not being properly latched and locked.

3.2 Probable Cause/s

- 3.2.1 Right hand engine inboard cowling was not properly latched and locked during pre-flight inspection resulting in the separated from the aircraft during take-off.

4. SAFETY RECOMMENDATIONS

- 4.1 It is recommended that the Director of Civil Aviation through regular and ad-hoc oversight, review that maintenance on aircraft is not performed by unqualified personnel at AMOs. This incident occurred as a result of maintenance on the aircraft being performed by an assistant who is not qualified to perform any work on the aircraft.

5. APPENDICES

5.1 None.