

SERIOUS INCIDENT

Aircraft Type and Registration:	DHC-8-402 Dash 8, G-PRPK	
No & Type of Engines:	2 Pratt & Whitney Canada PW150A turboprop engines	
Year of Manufacture:	2008 (Serial no: 4203)	
Date & Time (UTC):	22 July 2019 at 0630 hrs	
Location:	En route from Edinburgh Airport to London City Airport	
Type of Flight:	Commercial Air Transport (Passenger)	
Persons on Board:	Crew - 4	Passengers - 56
Injuries:	Crew - None	Passengers - None
Nature of Damage:	None reported	
Commander's Licence:	Airline Transport Pilot's Licence	
Commander's Age:	57 years	
Commander's Flying Experience:	12,582 hours (of which 8,332 were on type) Last 90 days - 180 hours Last 28 days - 56 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

During a scheduled flight from Edinburgh Airport to London City Airport the CABIN PRESS warning illuminated and the crew initiated an emergency descent. The aircraft diverted to Birmingham and landed without further incident. Following some rectification work the aircraft was returned to service later that day.

During the ensuing weeks the aircraft experienced several more pressurisation events until the operator decided to withdraw it from service for in-depth engineering investigation, after which it was returned to service again. To date no more pressurisation events have been reported.

The operator has taken safety action intended to enhance the monitoring of recurring aircraft faults.

History of the flight

The aircraft was on a scheduled flight from Edinburgh Airport to London City Airport. While in the cruise at FL250, in the vicinity of Manchester, the CABIN PRESS warning illuminated. The flight crew checked the cabin pressurisation indications and noticed that the cabin altitude indicated 10,000 ft with no indication of it increasing. Also, there was no FAULT light illuminated on the pressurisation control panel.

The PF called for the appropriate checklist, the first item of which was to determine whether the cabin altitude exceeded 10,000 ft, before determining whether an emergency descent was required. As the cabin altitude was now indicating at or slightly above 10,000 ft with a slow rate of climb, the PF called for an emergency descent, which was initiated. After donning their oxygen masks the crew notified ATC and obtained clearance to descend, initially to FL200 and then to FL100 having declared MAYDAY.

During the descent, at about FL150, the CABIN PRESS warning light extinguished, and the cabin pressure indications appeared normal in terms of rate change and cabin pressure. This suggested to the flight crew that the pressurisation controller was still operating. During the descent, the PM called the cabin crew and updated them on the situation.

When level at FL100, the flight crew decided to divert to Birmingham and the senior cabin crew member was called to the flight deck and given a NITS¹ briefing. The cabin crew reported no injuries or concern from the passengers.

Once below FL100 the crew removed their oxygen masks. As pressurisation indications now appeared normal, the MAYDAY was cancelled, and the aircraft landed without further event at Birmingham. After shutdown, the flight crew isolated the CVR and FDR by pulling their respective circuit breakers in accordance with the operator's procedures.

Aircraft examination

Soon after being notified of the event the AAIB released the aircraft for maintenance action and entry back into service. The operator assumed this included the CVR and FDR. The CVR was subsequently overwritten after the aircraft returned to service and thus not analysed.

During the engineering investigation no faults were indicated on the cabin pressure control panel. Also, there were no messages on the central diagnostic system when the aircraft was pressurised in automatic and manual modes to the maximum permitted differential pressure. The aircraft was returned to service the same day when it flew from Birmingham to Edinburgh without event.

Additional events

Between 23 July 2019 and 17 September 2019, in the course of over 260 sectors, the aircraft had a further nine pressurisation events that caused the commander on each occasion to raise an entry in the aircraft's technical log pages (TLP). After each TLP entry some form of maintenance action was subsequently carried out. During this time there were several periods where the aircraft flew for over a week with no reported pressurisation issues.

On 17 September 2019, another pressurisation event resulted in another emergency descent in which the crew donned their oxygen masks. At this point the operator withdrew the aircraft from service for an in-depth engineering investigation.

Footnote

¹ A standard form of briefing that considers the Nature of the situation, Intentions, Timings and Special instructions (NITS).

As a result of the rectification work the aircraft was returned to service on 28 September 2019. From then until the time of writing this report the aircraft flew 109 sectors with no further pressurisation events reported.

Operations manual

Part A Section 2.3.6 of the operator's operations manual states:

'Any safety events occurring during ... aircraft operations are to be reported using the Company safety reporting processes [an Air Safety Report].'

Operator's investigation

During the operator's internal investigation into this and the additional nine pressurisation events it was noted that an Air Safety Report (ASR) had not been raised for six of these events. As a result, the operator issued a notice to all its flight crew (NOTAC 101/19) on 9 August 2019 with guidance on the reporting of such events.

However, there were four further events (not all involving the pressurisation system) involving this aircraft for which the crew did not raise an ASR. The operator reported that its safety team visited all its bases to reinforce to its crew and engineers that, without exception, safety reports must be submitted for all safety related events.

Engineering monitoring

The pressurisation events on G-PRPK reported between 23 July and 17 September 2019 were discussed during the operator's daily Technical Operations review meetings, but the aircraft continued to operate until it was withdrawn from service by the Duty Technical Manager in Maintenance Control.

These recurring events were not noted in the operator's Aircraft Maintenance and Engineering System (AMOS) maintenance database until 12 September 2019.

Engineering reliability programme

AMC (Acceptable Means of Compliance) to Annex I of Part M to Regulation (EU) No 1321/20141 states the following:

'M.A.302 (d) 6: Some approved aircraft maintenance programmes, ..., utilise reliability programmes. Such reliability programmes should be considered as a part of the approved maintenance programme.'

'M.A.302(f) 5: A reliability programme provides an appropriate means of monitoring the effectiveness of the maintenance programme.'

The operator commented that its reliability department did not discuss the pressurisation issue on this aircraft between July and October 2019.

Discussion

This pressurisation event and subsequent emergency descent on 22 July 2019 appear to have been handled appropriately, and the diversion to Birmingham was completed without further incident. However, the conduct of the crew could not be analysed because the CVR had been returned to service and overwritten.

Subsequent pressurisation events highlighted an inconsistency in the completion of ASRs by the operator's crews.

There were several periods during which the aircraft flew with no reported pressurisation issues. This may have led the engineers to believe they had resolved the issue.

After the ninth event, involving another emergency descent, the operator withdrew the aircraft from service and conducted an in-depth investigation into the recurring fault. Several bleed air and pressurisation components were replaced before the aircraft returned to service.

The absence of further reported pressurisation faults since the aircraft returned to service indicates that this intervention was successful. It is therefore possible that several events, including the second emergency descent, would have been avoided if this intervention had occurred sooner.

Safety actions

The operator has taken safety action in the following areas as a result of these occurrences:

The operator issued a notice to all its flight crew (NOTAC 101/19) on 9 August 2019 with guidance on the reporting of safety events. It also conducted a 'roadshow' for crews and engineers at all its bases, encouraging the submission of ASR reports.

The operator has initiated a review of its reliability program to, among other things, enable more robust monitoring of recurring defects.