

## DHC-8-402, G-JEDI

<b>AAIB Bulletin No: 8/2004</b>	<b>Ref: EW/G2004/04/13</b>	<b>Category: 1.1</b>
<b>INCIDENT</b>		
<b>Aircraft Type and Registration:</b>	DHC-8-402, G-JEDI	
<b>No &amp; Type of Engines:</b>	2 Pratt & Whitney Canada PW150A turboprop engines	
<b>Year of Manufacture:</b>	2001	
<b>Date &amp; Time (UTC):</b>	21 April 2004 at 1457 hrs	
<b>Location:</b>	Birmingham Airport, West Midlands	
<b>Type of Flight:</b>	Public Transport (Passenger)	
<b>Persons on Board:</b>	Crew - 4	Passengers - 69
<b>Injuries:</b>	Crew - None	Passengers - None
<b>Nature of Damage:</b>	Minor to nose gear bay	
<b>Commander's Licence:</b>	Airline Transport Pilot's Licence	
<b>Commander's Age:</b>	58 years	
<b>Commander's Flying Experience:</b>	24,000 hours (of which 1,700 were on type)	
	Last 90 days - 67 hours	
	Last 28 days - 41 hours	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot and further AAIB enquiries	

The aircraft landed on Runway 15 at Birmingham after a passenger flight from Edinburgh. During the approach ATC transmitted to an aircraft on the ground "AFTER THE LANDING DASH 8 LINE UP 15" and, as the incident aircraft descended through 500 feet agl, a further aircraft also approaching Runway 15, reported at 8 miles from touchdown. After a normal touchdown and deceleration G-JEDI continued towards the turn off at the far end of the runway. ATC advised the aircraft lining up that "TAKEOFF WILL BE IN ABOUT 10 SECONDS" and told the aircraft on approach to expect a late landing clearance.

The commander of G-JEDI reported that on reaching the extreme end of the runway at a normal, if expeditious speed, a left turn was commenced. As the nose of the aircraft turned through approximately 30° off the runway heading, the nose wheel began to slide and with insufficient runway remaining for corrective action, the aircraft ran off the paved runway/taxiway intersection and sank up to its axles in the soft ground beyond. ATC instructed the next landing aircraft, now on short final, to 'go-around' and the runway was declared closed.

The surface wind reported at the time of the incident was 180°/14 knots gusting to 22 knots, visibility 9,000 metres in light rain, overcast at 300 feet, temperature +12°C and QNH 1002 mbs. The runway was assessed as wet. A friction test carried out by the airport operator one hour after the incident indicated that braking action was good.

## **Runway information**

Runway 15/33 at Birmingham is 2,605 metres long and 46 metres wide with mostly a grooved asphalt surface. The landing distance available on Runway 15 is 2,279 metres, of which approximately the last 150 metres are concrete. The shorter Runway 06/24 bisects Runway 15/33 and is sometimes used as a taxiway to the main passenger terminal south-east of this intersection. The only other taxiway serving the terminal directly is at the extreme end of, and perpendicular to, Runway 15. Aircraft landing on Runway 15 unable to turn off at the intersection with Runway 06/24 must continue for approximately 1,000 metres to this final exit in order to vacate the runway, often expeditiously to avoid delaying subsequent runway movements.

Following a previous incident, in which a Boeing 767 ran off the paved surface at the end of Runway 15 (AAIB Bulletin 11/2003, Ref: EW/C2002/10/04), Birmingham Airport Limited commissioned Cranfield Aerospace Limited to carry out a runway friction classification survey of Runway 15/33. This indicated that the runway had good friction properties throughout its length. However, CAP 683 titled '*The Assessment of Runway Surface Friction for Maintenance Purposes*' defines the following:

*Maintenance Planning Level (MPL)* - the friction level below which a runway maintenance program should be undertaken.

*Minimum Friction Level (MFL)* - the friction level below which a runway shall be notified as "may be slippery when wet".

It was noted that friction values over some runway painted markings fell below the MFL, as a result of which these surfaces were renovated with friction paint. There was also an area of the concrete section at the southern end of the runway, not associated with the painted threshold markings, where the friction coefficient was below the MPL. One point near the turnoff was below the MFL.

## **Flight data recorder information**

A printout of information from the Flight Data Recorder (FDR) was obtained from the operator. This included calibrated airspeed and magnetic heading recorded continuously from before touchdown until after the incident took place. From this information it was possible to determine that the airspeed of the aircraft at the start of the turnoff was approximately 40 kt. As the turn continued through 30° left of the runway heading the airspeed was approximately 34 kt.

## **Conclusion**

Increasingly, in order to reduce runway occupancy time to a minimum, aircraft commanders are faced with the need to carry out a clearance from an active runway as expeditiously as possible. In this incident the commander only had two runway exits available. The first exit, the cross Runway 06/24, was some 1,300 metres from the displaced threshold of Runway 15. The second, and only remaining exit, was at the end of the runway. The commander was aware that there was an aircraft lined up for departure and a further aircraft on or approaching short final. In these circumstances the commander attempted to make a 90° left turn where the combination of speed and reduced surface friction resulted in the loss of nose wheel steering effectiveness.

## **Follow-up action**

The operator has issued a Notice to Aircrew, with the following general advice:

*'Reduce aircraft speed to attain normal taxiing speed well before attempting any sharp turns to exit a runway'.*

*'Be extra cautious on concrete surfaces especially when they are wet'.*

*'Do not feel pressurised to expedite a runway clearance due to ATC pressure'.*

*'Avoid the use of excessive steering angles other than at very low speed'.*

Birmingham Airport Limited also intends to construct an additional runway turnoff approximately 420 metres from the southern end of Runway 15.