

**SERIOUS INCIDENT**

<b>Aircraft Type and Registration:</b>	Boeing 757-200, N605AA	
<b>No &amp; Type of Engines:</b>	2 Rolls-Royce RB211-535E4 turbofan engines	
<b>Year of Manufacture:</b>	1995 (Serial no: 27056)	
<b>Date &amp; Time (UTC):</b>	22 October 2013 at 1430 hrs	
<b>Location:</b>	100 nm south-east of Providenciales, Turks and Caicos Islands	
<b>Type of Flight:</b>	Commercial Air Transport (Passenger)	
<b>Persons on Board:</b>	Crew - 6	Passengers - 169
<b>Injuries:</b>	Crew - None	Passengers - None
<b>Nature of Damage:</b>	None	
<b>Commander's Licence:</b>	Airline Transport Pilot's Licence	
<b>Commander's Age:</b>	59 years	
<b>Commander's Flying Experience:</b>	Not known	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot	

**Synopsis**

The aircraft was en route to Miami when smoke started to fill the cockpit. The crew actioned the '*Smoke, Fumes and Fire*', and the '*Smoke Removal*' checklists and diverted to Providenciales without further incident. The smoke was attributed to a seal in a Low Pressure Fuel Pump that had failed, allowing fuel to enter the oil system and then the bleed air system. The engine manufacturer is conducting a detailed inspection of the fuel pump to determine the specific cause of failure, in accordance with its established continued airworthiness procedures.

**History of the flight**

The aircraft, which was en route to Miami, was 100 nm south-east of Providenciales when smoke started to fill the cockpit. The flight crew donned their oxygen masks and goggles, and actioned the QRH checklist. They requested an emergency descent from Miami ATC and initiated a diversion to Providenciales. A flight attendant informed the crew that smoke was coming from the left engine, but there was no sign of fire. The crew completed the '*Smoke, Fumes and Fire*', and the '*Smoke Removal*' checklist. Passing through 10,000 ft, the smoke had dissipated enough to allow them to remove their masks and goggles.

The aircraft landed at Providenciales Airport without further incident. Fluid was later observed to be leaking from the left engine.

## **Engine inspection**

The left engine was removed from the aircraft and inspected. The oil level was found to be low and there was a strong smell of fuel in the oil system. A significant amount of debris was found on the magnetic chip detectors (MCD), particularly the high-speed gearbox MCD. Subsequent investigation revealed that a seal on the Low Pressure (LP) fuel pump was leaking, allowing fuel to enter the high-speed gearbox and thence the oil system. The seal was found to be heavily damaged.

The fuel pump has a recommended maintenance interval of 12,000 hours. The failed pump had operated for 11,600 hours.

## **Source of the smoke**

Engine pneumatic bleed air is taken from two locations on the engine: the HP2 and the HP6 ports. The probable path of the smoke was from the main bearing seal in the Intermediate Pressure (IP) compressor section of the engine into the HP2 port, and then into the left air conditioning pack and air conditioning ducts.

## **Discussion**

This is believed to be the fifth occasion on this engine type of a fuel pump fault that has resulted in smoke entering the bleed air system. The engine manufacturer is conducting a detailed inspection of the fuel pump to determine the cause of failure, in accordance with its established continued airworthiness procedures.