

**INCIDENT**

<b>Aircraft Type and Registration:</b>	BAe 146-300, D-AEWB	
<b>No &amp; Type of Engines:</b>	4 Lycoming ALF502 R5-103A turbofan engines	
<b>Year of Manufacture:</b>	1990	
<b>Date &amp; Time (UTC):</b>	19 February 2007 at 1335 hrs	
<b>Location:</b>	After departure from Birmingham	
<b>Type of Flight:</b>	Commercial Air Transport (Passenger)	
<b>Persons on Board:</b>	Crew - 5	Passengers - 61
<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>	42 years	
<b>Commander's Flying Experience:</b>	7,666 hours (of which 1,519 were on type) Last 90 days - 438 hours Last 30 days - 148 hours	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot and enquiries by the AAIB	

**Synopsis**

Approximately 15 minutes after takeoff, the flight crew noticed an unusual smell in the cockpit and shortly thereafter began to feel unwell. They immediately donned oxygen masks, after which their condition improved significantly. An emergency was declared and the aircraft returned to Birmingham, where an uneventful landing was completed. The cause of the incident was found to be an oil leak from the No 1 engine, which had allowed oil fumes to enter the cockpit and cabin air supply.

**History of the flight**

In the climb, approximately 15 minutes after departing Birmingham, with the No 1 and No 4 engines selected to

supply bleed air to the air-conditioning packs, the flight crew became aware of an unusual smell in the cockpit. They described it as a 'burnt' or 'exhaust' smell, but it was not accompanied by any visible smoke. Soon after, both crew members began to experience symptoms of tunnel vision, loss of balance and loss of feeling in the hands and lower arms. They immediately donned their oxygen masks, breathing 100% oxygen, which improved their condition noticeably. Two of the three cabin crew members also reported similar symptoms. An emergency was declared and the aircraft returned to Birmingham.

During the descent, the crew actioned the 'SMOKE/FUMES ON FLIGHT DECK/CABIN' abnormal checklist.

The landing at Birmingham was completed without incident and the aircraft was brought to a stop on Taxiway 'C' to allow the Airport Fire Service to investigate. The passengers were disembarked normally and taken to the terminal by bus.

The weather at Birmingham at the time was dry, with a wind direction/speed of 170°/8 kt and a visibility of 9 km.

#### **Personnel information**

Both flight crew members were suitably qualified and adequately trained to carry out the flight. They held current Class 1 medical certificates, with no restrictions. They both had a rest period of over 13 hours prior to flight on the day of the incident.

After the flight, all five crew members attended a local hospital for health checks. There was no evidence that they had suffered any long-term ill effects from the inhalation of the fumes.

#### **Aircraft information**

The aircraft was a British Aerospace BAe 146-300, serial number 3183, manufactured in 1990. It had completed 23,311 flying hours and 25,015 cycles since new.

After the incident, the aircraft was inspected in accordance with the aircraft manufacturer's Inspection Service Bulletins 21-150 and 21-156, which describe the inspections to be performed following a report of contamination of the cabin/cockpit air supply.

Evidence of oil leakage was found on the bleed band of the No 1 engine, suggesting that engine oil had been

ingested into the bleed air system. The engine, serial number LF05407AC, was replaced at Birmingham. It had completed 6,973 hours/8155 cycles since new and 964 hours/1,131 cycles since its previous service. Subsequent checks confirmed the cabin/cockpit air supply to be free from contamination and the aircraft was returned to service.

#### **Additional information**

The problem of fumes in the cockpit and/or cabin on the BAe 146 and other aircraft is not a new one and has been the subject of much industry discussion. AAIB Formal Report 1/2004 presented the findings of an extensive investigation into the problem of contamination of cockpit/cabin air supply by engine oil fumes and included the results of studies into the physiological effects of such fumes. In December 2000, The UK CAA issued Flight Operations Department Communication (FODCOM), number 17/2000, providing valuable safety advice on the use of flight crew oxygen masks in the event of smoke or fumes entering the cockpit. Further updated safety advice was provided in FODCOM's 14/2001 and 21/2002.

The German Federal Bureau for Air Accident Investigation (BFU) has reported on two other incidents of oil fumes in the cockpit air supply on BAe 146 aircraft, both of which occurred in January 2007. These are described in BFU reports 5X001-0/07 and 5X003-0/07.

This incident and others, show that prompt action by the crew in donning the oxygen masks at the first signs of adverse symptoms can have significant safety benefits.