

INCIDENT

Aircraft Type and Registration:	Boeing 747-436, G-CIVY	
No & Type of Engines:	4 Rolls-Royce RB211-524G2-19 turbofan engines	
Year of Manufacture:	1998	
Date & Time (UTC):	28 December 2005 at 1220 hrs	
Location:	Near Strumble Head, Wales	
Type of Flight:	Public Transport (Passenger)	
Persons on Board:	Crew - 18	Passengers - 2
Injuries:	Crew - None	Passengers - None
Nature of Damage:	None	
Commander's Licence:	Airline Transport Pilot's Licence	
Commander's Age:	40 years	
Commander's Flying Experience:	13,120 hours (of which 10,730 were on type) Last 90 days - 163 hours Last 28 days - 16 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot and further inquiries by AAIB	

Synopsis

The aircraft was inbound to London Heathrow Airport when, prior to descent, the cabin crew reported a smell of burning and a haze in the cabin, initially in the area of the first class galley but spreading throughout the whole lower deck. A precautionary diversion to Cardiff was carried out without incident, whereupon substantial food spillage was found in the galley ovens and this is considered to have been the likely source of the smell and haze.

History of the flight

The aircraft was inbound to Heathrow after a flight from New York JFK Airport. The passenger complement comprised only two people because the No 3 engine had ingested a bird when inbound to JFK and, whilst

the engine was inspected by borescope, most of the intended passengers had been dispersed to other flights. On takeoff from New York the crew could all smell a distinctive 'burnt bird' smell, with which they were familiar and which did not cause any concern. The smell dissipated shortly afterwards.

Over the Irish Sea, approaching Strumble, the commander received a call from a member of the cabin crew that they could smell burning in the first class galley. He asked them to check for food deposits or spills in the ovens as he knew that this was a regular occurrence. Some minutes later the Cabin Service Director (CSD) called to report the same matter again and the commander responded by asking her to personally check that his

previous request had been complied with. Meanwhile, the flight crew scanned the secondary Engine Indicating and Crew Alerting System (EICAS), circuit breakers and switches to see whether a technical problem might be developing whilst simultaneously requesting an early descent should a diversion to Cardiff be necessary.

As the descent started, the CSD called again to report that the smell was getting worse and that she could discern a haze. Almost simultaneously, a 'NUMBER 3 GALLEY BUS' caption illuminated on the secondary EICAS, giving a 'RT UTILITY BUS' message on the primary EICAS. Cabin crew at the rear of the aircraft now started reporting strong smells and fumes whilst those in the centre called to report the same, as well as a loud metallic "graunching and banging" noise from under the floor. The cabin crew were instructed to turn off all galley emergency power switches as well as the in-flight entertainment and seat systems. This initially seemed to lessen the smell and fumes but they returned shortly after and grew stronger. The CSD advised that the smell was electrical in nature and definitely not burning food.

A MAYDAY was declared and a diversion to Cardiff initiated: the cabin crew were briefed to have their smoke hoods with them and to prepare for a possible slide evacuation after landing. The flight crew, meanwhile, checked the Quick Reference Handbook for the drills for electrical fire/smoke and utility bus problems (no resets were attempted). During descent the fumes, as reported by the cabin crew, came and went, appearing most strongly at FL150. The flight crew stated that at no time were they aware of any symptoms on the flight deck, although they donned oxygen masks as a precaution. Unfortunately, the co-pilots's mask microphone was unserviceable and other methods of communication were established.

An uneventful landing ensued and the commander steered the aircraft off the runway at the high-speed turnoff directly onto the parking area. No emergency evacuation was required as the fumes had largely subsided and, by the time the fire services boarded the aircraft, only a hot, oily smell remained. No 'hotspots' were detected by the fire service thermal imaging equipment.

Analysis

The sequence of events described and the nature of the problems seems to vary with the perceptions of those involved in the event and subsequent trouble-shooting. From the flight crew's perspective, they did not experience any of the symptoms described to them by the cabin staff. This could be due to the fact that the flight deck receives a smaller proportion of recirculated air than the cabin. It was noted that the flight had been despatched with an Acceptable Deferred Defect related to one of the cabin pressurisation outflow valves. This required that only two of the three air conditioning packs be used. Although the commander's statement did not mention it, the operator's maintenance organisation understood that he had isolated No 2 ACM (Air Cycle Machine) in response to the mechanical noises reported and this led to removal of the unit at Cardiff.

The maintenance organisation, however, report that a considerable build-up of food debris was found in the first-class ovens and are of the opinion that this was the cause of the smell and haze. The ACM was subsequently found to have no defects, although it was possible that some factor in the actual installation may have caused the noises (relayed to them as a vibration and 'buzzing') which simple removal cured. Detailed inspection of the galley wiring did not reveal any defects which could cause the circuit breakers to trip and, after cleaning the ovens and extended ground-testing, the aircraft was returned to service and there have been no reports of similar problems since.