

No: 12/92

Ref: EW/C92/9/2

Category: 4

Aircraft Type and Registration: BAe ATP, G-BTPM
No & Type of Engines: 2 PW126A turboprop engines
Year of Manufacture: 1991
Date & Time (UTC): 21 September 1992 at 0925 hrs
Location: Sumburgh Airport, Shetland Isles
Type of Flight: Public Transport
Persons on Board: Crew - 4 Passengers - 43
Injuries: Crew - None Passengers - None
Nature of Damage: None
Commander's Licence: Airline Transport Pilot's Licence
Commander's Age: 36 years
Commander's Flying Experience: 6,971 hours (of which 349 hours were on type)
Last 90 days - 126 hours
Last 28 days - 28 hours
Information Source: AAIB Field Investigation

The aircraft was on a public transport flight from Aberdeen to Sumburgh with 43 passengers on board. As some of the cargo consisted of bundles of newspapers which were secured to seats at the rear of the cabin, the majority of passengers were seated in the centre and front seats.

The flight departed Aberdeen at 0827 hrs with the commander as the handling pilot, and the climb to FL 150, cruise and descent were completed without incident. The Sumburgh weather was reported as surface wind 160°/12 kt, visibility 45 km, with 1 okta of cloud at 700 feet and 6 oktas at 4,000 feet, and the commander elected to make a visual approach to runway 15. This also proceeded normally until the aircraft descended below 900 feet when the No 1 cabin crew member reported that there was smoke and a smell of burning in the passenger cabin. Shortly afterwards the smoke was reported to be getting thicker, and Sumburgh ATC were requested to alert the emergency services to provide fire cover after the aircraft had landed. A full flap landing was carried out and the aircraft decelerated by use of wheel brakes and reverse thrust, during which the engines responded normally. At the end of the landing run the aircraft was turned onto the taxiway and parked on a heading of about 340°.

The response from the emergency services was immediate and as the appliances came out of their bay door the aircraft was touching down. The fire officer in charge reports that at this time he observed smoke coming from the aircraft's right side engine. As the aircraft decelerated the amount of smoke was observed to increase and the fire officer advised the Sumburgh ATC controller that the aircraft should stop immediately and evacuate. This message was relayed to the commander who promptly ordered an emergency evacuation of the aircraft. The engines were shut down and the flaps left in the fully down position.

The BAe ATP has five emergency exits; the forward left side passenger door and two rear doors which are equipped with automatically inflatable escape slides, and two overwing exits which must be manually operated. Instructions on their operation are illustrated on diagrams attached to the back of all four seats in the row immediately forward of the overwing exits. These instructions clearly show that after release the emergency windows should be disposed of through the exits and thrown outside the aircraft. Immediately following the commander's order to evacuate the aircraft the cabin crew members repeated the command and opened the front left side and rear right side doors. Both doors opened normally and the slides inflated automatically. Passengers opened the overwing emergency exits but did not fully carry out the instructions and instead dropped the exit windows onto the cabin floor. This did not impede the evacuation, which was completed in an estimated 35 seconds. The majority of passengers exited via the overwing exits. The cabin crew member who was stationed at the rear of the aircraft has stated that she did not open the rear left side door, as due to the speed of the evacuation there appeared to be no need. There were no reportable injuries although one female passenger did subsequently report that she had suffered minor bruising.

The right hand engine had lost approximately 2 litres of oil since the check before the first flight of the day; by comparison the left hand engine oil quantity was approximately the same as on the morning check. The engine nacelle and wing surfaces around the right hand engine were contaminated with engine oil, and a pool of oil had formed at the bottom of the right hand intake. The right hand engine turbomachinery magnetic chip detector was contaminated with thin slivers of steel; these were subsequently analysed and found to be predominantly bearing seal material, with a small amount of bearing cage material. The engine had run 1,280 hours from new, and had a life 4,000 hours.

The engine was stripped at the manufacturer's facility and examination of the components revealed that the No 5 roller bearing cage had fractured axially at two non-adjacent roller pockets; additional damage was found on various air and oil seals associated with the HP rotor in the area of the No 5 bearing. No signs of oil starvation related distress was observed on the bearing components. The bearing was to the Mk 2 standard, which does not give prior warning of failure through the spectromatic oil analysis programme.

It was concluded that the reported smoke in the cabin occurred as a result of oil leakage past the HP rotor air seals and subsequent contamination of the gas path. The oil leak was as a result of the No 5 bearing cage fracture, which caused loss of rotor radial support. The PW 126A engines used by this operator have now suffered a total of eight No 5 bearing failures and the bearing is the subject of a continuing airworthiness programme involving the manufacturer. The operator has introduced a programme to change the No 5 bearings to the Mk 3 standard within a calendar year.