No: 9/92 Ref: EW/C92/7/1 Category: 1a

Aircraft Type and Registration: Fokker F27-200 Friendship, G-STAN

No & Type of Engines: 2 Rolls-Royce Dart 528-7E turboprop engines

Year of Manufacture: 1959

Date & Time (UTC): 8 July 1992 at 0650 hrs

Location: On approach to London Heathrow Airport

Type of Flight: Public Transport

Persons on Board: Crew - 4 Passengers - 28 + 1 infant

Injuries: Crew - 1 serious Passengers - None

Nature of Damage: None

Commander's Licence: Airline Transport Pilot's Licence

Commander's Age: 40 years

Commander's Flying Experience: 3,060 hours (of which 700 were on type)

Information Source: AAIB Field Investigation

The aircraft was on a scheduled flight from Guernsey returning to London Heathrow. The approach radar controller had cleared it to descend to FL 80 towards Ockham VOR, for radar positioning to the ILS on runway 09L. Immediately preceding the F27 was a Boeing 747 (B747) which was descending to 4,000 feet, also being positioned under radar direction to land on runway 09L. At 0650 hrs, the F27 was re-cleared to 4,000 feet and at 0651 hrs, the B747 was re-allocated runway 09R. For convenience runway 09R, the usual runway in use for take-offs, is used for landing aircraft which are going to park at Terminal 4. This meant that the F27, whilst aligning on final approach to 09L, would pass behind the B747.

At 0652 hrs, both aircraft were cleared to descend to 3,000 feet and were separated horizontally by 8 nm. At 0653 hrs the B747, flying at 160 kt, was establishing on the 09R ILS, whilst the F27, to the south of it, was flying at 180 kt and turning right onto a radar heading of 060°. At 0654 hrs, the F27 was cleared to descend to 2,500 feet and the separation had reduced to 4.5 nm. By 0655 hrs, when the F27 crossed the 09R centreline, the horizontal separation was about 3 nm and the F27 was at 2,500 feet which was 700 feet higher than the B747. The F27 encountered the wake vortex of the B747 some 500 feet below the height at which the B747 had been some one and a half minutes earlier.

As a consequence of the wake vortex induced turbulence which lasted only a few seconds, the No. 2 cabin attendant was thrown into the air from the jump seat but landed back on it. The No. 1, who was closing the flight deck door, having reported that all the passengers were secure, was thrown into the air and landed awkwardly on the floor breaking her leg. She remained on the floor in considerable pain until after the aircraft had landed some two minutes later. Emergency services met the aircraft at its parking stand and the No. 1 cabin attendant was taken by ambulance to Hillingdon Hospital.

The Manual of Air Traffic Services Part 2 sets out the criteria for London Heathrow giving the minimum separation for wake vortex as 5 miles for crossing traffic and 6 miles for following traffic. Wake vortex incidents are recorded by the ATC Evaluation Unit of NATS at Bournemouth (Hurn) Airport. Since records began in about 1972 until June 1990 there were 1089 reports of wake vortex incidents, of which 85% were at London Heathrow and 90% of those occurred during the final approach. Since 1982, when the separation criteria were revised, there have been 515 incidents, of which 392 were at Heathrow. Whilst the greatest number of these occurred between 500 and 100 feet, a significant number occurred between 2,000 and 4,000 feet.