AIRCRAFT ACCIDENT REPORT NO 5/89

## REPORT ON THE ACCIDENT TO BOEING 747-136 G-AWNM ON APPROACH TO RUNWAY 27L AT LONDON (HEATHROW) ON 11 SEPTEMBER 1988

The Inspector's report on this accident was submitted to the Secretary of State for Transport on the 16 November 1989. He has agreed to its publication and a report is now available from HMSO Bookshops and accredited agents.

This British Airways scheduled flight, from Abu Dhabi to London, had proceeded normally until the final stages of an instrument landing system approach to runway 27L at Heathrow. Shortly after 30° of flap had been extended, there was a noticeable "thump" and the aircraft immediately started to yaw and roll to the right. The commander, who was the handling pilot, maintained control by the use of considerable control wheel deflection and the aircraft was landed without further incident. Examination of the aircraft after landing revealed that a failure of a flap track on the starboard wing had occurred. The report concludes that the direct cause of the failure was stress-corrosion cracking initiation from a corroded bolt hole, which induced fast brittle fractures of the steel track at a point where the design was not fail-safe.

A contributory cause was the failure of a special inspection to detect such cracking before full fracture occurred despite many revisions of its requirements following other incidences of flap track cracking and failure. The occurrence had similarities with two others to British Airways 747 aircraft in Chicago in 1988 and in Boston in 1985. Whilst in all three cases the aircraft landed safely, the possibility of a loss of control exists if the flap failure causes damage to the aircraft's hydraulic system or tail unit. Six safety recommendations were made:-

1 The CAA should continue to liaise with the Boeing Airplane Company with the aim of bringing forward the 30 April 1992 deadline for replacement of flap tracks on those Boeing 747 aircraft which are currently fitted with the early standard of tracks.

2 The CAA should review the current inspection requirements applicable to Boeing 747 aircraft fitted with the latest production standard of flap tracks, with a view towards ensuring that such inspection techniques and frequencies can be relied upon to prevent future failure of such tracks.

3 The CAA should initiate action with the FAA with the aim of placing a requirement upon the Boeing Airplane Company that it undertakes modification of Boeing 747 aircraft to achieve a full fail-safe design of flap track assemblies.

4 The CAA, in conjunction with the FAA, should carry out a detailed audit of significant structure in Boeing 747 aircraft, and other large transport aircraft, where ultra high tensile strength steels are used in order to establish those points where the structure does not fully

comply with fail-safe philosophy.

5 The CAA should formulate a requirement for special corrosion inspections, including corrosion protection condition, within those areas of transport aircraft structures where ultra high tensile strength steel components are used.

6 The CAA should re-assess the capability of existing inspection procedures to successfully detect, under realistic inspection conditions, potentially critical defects and cracks in ultra high tensile strength steel structure.