Safety Regulation Group
Safety Investigation and Data Department

Follow-up Action on Occurrence Report

SERIOUS INCIDENT INVOLVING HS125-700A, N-125XX, AT LONDON LUTON AIRPORT ON 13 JUNE 2003
(UNCONTAINED ENGINE FAILURE DURING TAKE OFF)

CAA FACTOR NUMBER	:	F28/2004
FACTOR PUBLICATION DATE	:	13 July 2004
OPERATOR	:	Foreign
CAA OCCURRENCE NUMBER	:	2003/03646
AAIB REPORT	:	Bulletin 6/2004

SYNOPSIS

(From AAIB Report)

The aircraft suffered an uncontained failure of the right engine, at 60 kt during the take-off roll, on Runway 26 at Luton Airport. The takeoff was abandoned, the engine was shutdown and the aircraft taxied clear. Subsequent examination revealed high cycle fatigue failure of the 1st stage Low Pressure Turbine (LPT) disc.

The engine had undergone a Major Periodic Inspection (MPI) and Compressor Zone inspection some 107 hours before the incident. This identified the requirement to replace the LPT 1 disc and nozzle assembly. The replacement LPT 1 disc was a new item from the manufacturer. The replacement nozzle assembly, manufactured as a one piece ring of 67 vanes, was an item overhauled by a FAR Part 145 approved repair station, not on the manufacturer's list of authorised organisations, operating under a Designated Engineering Representative (DER) system. During overhaul the nozzle assembly is 'tuned' by deflecting the trailing edges of individual vanes, opening or closing the area of each nozzle throat, to ensure the correct total effective area of the nozzle ring. A computer programme called 'NAPOLI', developed by the manufacturer in response to previous fatigue failures of nearly-new discs, fed with flow rig measurements and the measured distances between vanes, calculates the vane deflection required and which vanes need adjusting.

Inappropriate nozzle adjustment could create LPT 1 disc resonance initiating and propagating fatigue. Service Bulletins (SBs), issued by the manufacturer, detailed instructions for correct nozzle adjustment and highlighted the possible consequences if this was not carried out correctly. The repair station, not being authorised by the manufacturer, were not aware of the contents of the SBs and were ignorant of the manufacturer's requirement for vane adjustment and the 'NAPOLI' programme.

The AAIB has recommended that the Federal Aviation Administration (FAA) ensure that 'FAR Part 145' repair stations are in possession of all the manufacturer's documentation covering the tasks for which they are approved.

FOLLOW UP ACTION

The one Safety Recommendation, made by the AAIB following their investigation, is reproduced overleaf, together with the CAA's response.

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Recommendation 2004-34

The Federal Aviation Administration should ensure that 'FAR Part 145' repair stations are in possession of all the manufacturer's documentation covering the tasks for which they are approved.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed