Safety Regulation Group
Safety Information and Data Department

Follow-up Action on Occurrence Report

SERIOUS INCIDENT INVOLVING BOEING B747-436, G-BNLG, EN ROUTE LAX TO LHR
ON 20 FEBRUARY 2005
(AIRCRAFT CONTINUED FLIGHT TO UK AFTER ENGINE SHUT DOWN)

CAA FACTOR NUMBER	:	F23/2006
FACTOR PUBLICATION DATE	:	11 August 2006
OPERATOR	:	BA
CAA OCCURRENCE NUMBER	:	2005/01140
AAIB REPORT	:	Bulletin 6/2006

SYNOPSIS

(From AAIB Report)

Immediately after the aircraft took off on a night flight from Los Angeles to London, a banging sound was heard and passengers and ATC reported seeing flames from the No 2 engine. The symptoms and resultant turbine over-temperature were consistent with an engine surge; the crew completed the appropriate checklist, which led to the engine being shut down. After assessing the situation, and in accordance with approved policy, the commander decided to continue the flight as planned rather than jettison fuel and return to Los Angeles. Having reached the east coast of the USA with no indications of further abnormality and with adequate predicted arrival fuel, the crew decided to continue to the UK. The winds and available flight levels were subsequently less favourable than anticipated and, nearing the UK, the crew decided to divert to Manchester in order to maintain the required arrival fuel reserve.

In the latter stages of the flight the crew encountered difficulties in balancing the fuel quantities in the four main tanks. They became concerned that the contents of one tank might be unusable and declared an emergency in accordance with the operator's procedures. The aircraft landed with low contents in both outboard main tanks, although the total fuel quantity was in excess of the planned reserve. The fuel system, in the configuration selected, should have continued to feed the operating engines until all tanks emptied.

The investigation determined that the engine surge had been due to excessive wear to the high-pressure compressor casing and, with the standard of fuel controller software installed, this resulted in turbine over-temperature damage. There was no evidence of fuel system malfunction and it was possible to maintain fuel tank quantities in balance by the selective use of fuel pumps. The evidence suggested that the operator should ensure that flight crews are provided with relevant instruction on 3-engined fuel handling during initial and recurrent training, and that the regulators should review the policy on flight continuation for public transport aircraft operations, following an in-flight shutdown of an engine, in order to provide clear guidance to the operators. Eight recommendations are made, six of which relate to flight data recorders.

FOLLOW UP ACTION

The eight Safety Recommendations, made by the AAIB following their investigation, are reproduced overleaf, together with the CAA's responses.

Recommendation 2006-18

It is recommended that the Civil Aviation Authority and the Federal Aviation Administration, in conjunction with other relevant agencies, should review the policy on flight continuation for public transport aircraft operations, following an in-flight shutdown of an engine, in order to provide clear guidance to the operators.

CAA Response

The CAA accepts this Recommendation. The CAA will engage with the Federal Aviation Administration and other relevant agencies and review current policy on public transport flight continuation following an engine shutdown in-flight. Appropriate guidance to operators will be provided as part of the review.

CAA Status - Open

Recommendation 2006-19

It is recommended that British Airways include relevant instruction on 3-engined fuel handling during initial and recurrent training.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2006-22

It is recommended that the Federal Aviation Administration should require that Honeywell modify the appropriate Return to Service test procedures, to ensure the detection of a fault which prevents a series 980-4100 model of flight recorder from retaining the appropriate minimum duration of recorded data proscribed by regulation.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2006-23

It is recommended that the Federal Aviation Administration should require that Honeywell modify the design and operation of its automated equipment used for testing the series 980-4100 model of flight data recorder, to ensure the detection of a fault which prevents such a model of flight recorder from retaining the appropriate minimum duration of recorded data proscribed by regulation.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2006-24

It is recommended that the Federal Aviation Administration should require that Honeywell alert all users of Acceptance Test Unit part number 964-0434-042, utilising test software part number 998-1513-513, to make them aware that the equipment will not detect a short circuit fault between one or more tracks on the distribution board of the series 980-4100 model of flight data recorder.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2006-25

It is recommended that the Federal Aviation Administration should require Honeywell to amend the Maintenance Manual for the series 980-4100 model of flight data recorder to include a specific inspection of the underside of the distribution board for the presence of short circuits and detached wiring following the replacement of components.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2006-26

It is recommended that the United Kingdom Civil Aviation Authority should require that operators of United Kingdom registered aircraft, installed with the series 980-4100 model of flight data recorder, review the annual flight recorder readout records for those aircraft in order to determine compliance with the applicable requirements for duration of recording.

CAA Response

The CAA does not accept this Recommendation. It is believed the only currently known risk that would cause a model 980-4100 flight data recorder not to record for the full duration will be adequately mitigated by the corrective actions required in Safety Recommendations 2006-022, 023, 024 and 025.

The CAA will however publish a Letter to Operators (LTO), by mid July 2006. The LTO will be directed towards operators who have such an FDR installed (or one of similar technology) to warn them of the possible shortcomings in the current testing arrangements, and to ensure that their maintenance providers take due account in the interim until such time as the instructions for continued airworthiness are amended. The LTO will also call for a one-off review of the last downloaded recording to ensure it was complete.

CAA Status - Open

Recommendation 2006-27

It is recommended that the Federal Aviation Administration, European Aviation Safety Agency and the United Kingdom Civil Aviation Authority should require that, as part of any flight recorder readout procedure mandated by regulation, an assessment is conducted to ensure that the quantity and quality of all data recovered from the FDR is correct for the data rate of the system and the recorder part number concerned.

CAA Response

The CAA accepts this Recommendation. The recommendation is already addressed by the guidance published in CAA CAP 731, Approval, Operational Serviceability and Readout of Flight Data Recorder Systems. This document is currently being amended and the opportunity will be taken to confirm that the issues are adequately covered. The revised CAP is planned to be published by July 31st 2006.

CAA Status - Open