

Follow-up Action on Occurrence Report

ACCIDENT TO MD83, EC-FXI, AT LIVERPOOL AIRPORT ON 10 MAY 2001
(RIGHT MAIN LANDING GEAR COLLAPSED ON LANDING)

CAA FACTOR NUMBER : F38/2003
FACTOR PUBLICATION DATE : 21 November 2003
OPERATOR : Spanair
CAA OCCURRENCE NUMBER : 2001/03026
AAIB REPORT : AAR 4/2003

SYNOPSIS

The aircraft carried out an automatic landing at Liverpool at 1232 hrs with the first officer (FO) being the pilot flying. The right main landing gear collapsed on touchdown and the commander took over control shortly afterwards. The aircraft continued travelling along the runway, maintaining approximately the centreline, and came to rest with the right wing in contact with the ground. A successful passenger evacuation was carried out using the forward escape slides and the left overwing emergency exit.

The following causal factors were identified :

1. The right Main Landing Gear (MLG) cylinder failed immediately upon touchdown due to the application of spin-up drag loads on a section of the cylinder containing a major fatigue crack 3.2 mm long and 1.0 mm deep and several other associated smaller cracks.
2. The origins of these fatigue cracks could not be identified but other embryonic cracks were found which were associated with surface irregularities arising from a grit-blasting process during manufacture. Abnormal loading, possibly due to an occurrence of a mode of fore-and-aft vibration known as 'gear walking' is thought to have been responsible, at some time in the aircraft's history, for propagating the cracks to a depth at which continued growth was possible under normal loading. Alternatively, some abnormal loading may have relaxed the beneficial compressive surface stresses induced by shot-peening at the critical section and allowed propagation from the same surface defects.
3. Inspection and other mandatory preventive measures taken following two similar accidents did not prevent the occurrence of this third accident. This was probably due to the small size of cracks which are required to be detected before reaching a critical dimension.

FOLLOW UP ACTION

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

Recommendation 2001-54

The Federal Aviation Authority and the Boeing Commercial Airplane Group urgently review the continued airworthiness of the MD-83 MLG strut. In particular, the need for repeat inspection of the strut in the critical area be considered and the ability of the mandated NDE inspection to detect embryonic fatigue cracks in the material, given the small critical crack size, should be reassessed.

CAA Response

This recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2003-44

It is recommended that the Joint Aviation Authorities amend the relevant sections of JAR-OPS 1 with a view to requiring that all aircraft fitted with a Cockpit Voice Recorder record, without interruption, the audio signals received from each boom and mask microphone in use.

CAA Response

This recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2003-45

It is recommended that the FAA and the CAA should promote an industry study into the possibility that beneficial residual stress fields induced by shot-peening could be relaxed under in-service conditions.

CAA Response

Since 28 September 2003, responsibility for the matters addressed in this Recommendation has passed to EASA under Regulation (EC) 1592/2002 and the Recommendation should be addressed to that Agency. Therefore, the CAA's position on this Recommendation is that it is not addressed to the CAA.

However, the CAA has promoted an industry study to examine the effects of in-service conditions on surface treatments, such as shot-peening and this is the subject of a CAA research project. Several European manufacturers have undertaken to participate in the study.

CAA Status - Closed

Recommendation 2003-47

It is recommended that the Boeing Commercial Airplane Group should conduct an ultimate load test on a suitable MD-80 series main landing gear cylinder in order to determine the strength of the component and to verify the figures used in both the original static strength and in the fatigue life calculations.

CAA Response

This recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2003-48

It is recommended that the CAA, JAA and the FAA should provide guidance as to the recommended best practice for the evacuation of infants and small children down escape slides with minimum delay.

CAA Response

The CAA accepts its part of this Recommendation.

The CAA is not aware of any (preferably scientifically-based) guidance that could be promulgated to Industry. The Air Accident Report makes reference to the CAMI trial DOT/FAA/AM-01/18. The CAA believes this trial to be based on the results of a study of one aircraft type, the B737, which has a relatively low sill height. It is not known whether the results of a similar study conducted on other aircraft types would provide similar results. Also, the CAMI trial did not reach a conclusion as to what is the 'recommended best practice for the evacuation of infants and small children down escape slides with minimum delay'.

Therefore, the CAA will propose to the International Cabin Safety Research Technical Group that consideration should be given to conducting further research into the subject. The CAA will further propose that the aim of this work should facilitate the provision of guidance as to the recommended best practice. The CAA will review the results of the work with the intention of publishing guidance as to the recommended best practice for the evacuation of infants and small children down escape slides with minimum delay.

Note: The International Cabin Safety Research Technical Group is a multi national authority group, reporting to a Management Group consisting of members from the UK CAA, FAA and Transport Canada.

CAA Status - Open