Safety Regulation Group
Safety Data

Follow-up Action on Occurrence Report

ACCIDENT TO AS332L2 SUPER PUMA, G-REDL, 11NM NE OF PETERHEAD, SCOTLAND, ON 01 APRIL 2009

FACTOR F9/2011 has been reissued to reflect the CAA's revised response to Safety Recommendation 2011-042

CAA FACTOR NUMBER	:	F9/2011 **Issue 2**
FACTOR PUBLICATION DATE	:	30 August 2012
NATURE OF FLIGHT	:	Commercial Air Transport
CAA OCCURRENCE NUMBER	:	2009/03003
AAIB REPORT	:	2/2011

SYNOPSIS
From AAIB Report

The accident occurred whilst the helicopter was operating a scheduled passenger flight from the Miller Platform, in the North Sea, to Aberdeen. Whilst cruising at 2,000 ft amsl and some 50 minutes into the flight, there was a catastrophic failure of the helicopter's Main Rotor Gearbox (MGB). The helicopter departed from cruise flight and shortly after this the main rotor separated from the fuselage. The helicopter then struck the surface of the sea with a high vertical speed.
An extensive and complex investigation revealed that the failure of the MGB initiated in a single second stage planet gear in the epicyclic module. The planet gear had fractured as a result of a fatigue crack, the precise origin of which could not be determined. However, it is thought to have occurred in the loaded area of the planet gear bearing outer race.

FOLLOW UP ACTION

The seventeen Safety Recommendations made by the AAIB, following their investigations, are reproduced below, together with the CAA's responses.

Recommendation 2011-032

It is recommended that, in addition to the current methods of gearbox condition monitoring on the AS332 L2 and EC225, Eurocopter should introduce further means of identifying in-service gearbox component degradation, such as debris analysis of the main gearbox oil.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2011-033

It is recommended that Eurocopter review their Continued Airworthiness programme to ensure that components critical to the integrity of the AS332 L2 and EC225 helicopter transmission, which are found to be beyond serviceable limits are examined so that the full nature of any defect is understood.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2011-034

It is recommended that the European Aviation Safety Agency (EASA) review helicopter Type Certificate Holder's procedures for evaluating defective parts to ensure that they satisfy the continued airworthiness requirements of EASA Part 21.A.3.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2011-035

It is recommended that the Federal Aviation Administration review helicopter Type Certificate Holder's procedures for evaluating defective parts to ensure that they satisfy the continued airworthiness requirements of Federal Aviation Regulation Part 21.3.0.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2011-036

It is recommended that the European Aviation Safety Agency (EASA) re-evaluate the continued airworthiness of the main rotor gearbox fitted to the AS332 L2 and EC225 helicopters to ensure that it satisfies the requirements of Certification Specification (CS) 29.571 and EASA Notice of Proposed Amendment 2010-06.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2011-041

It is recommended that the European Aviation Safety Agency research methods for improving the detection of component degradation in helicopter epicyclic planet gear bearings.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2011-042

It is recommended that the Civil Aviation Authority update CAP 753 to include a process where operators receive detailed component condition reports in a timely manner to allow effective feedback as to the operation of the Vibration Health Monitoring system.

CAA Response

The CAA does not accept this Recommendation. Whilst the CAA fully supports the need for component findings to be fed back into the qualification of any VHM system and to update CAP 753, the regulation of initial and continued airworthiness in the UK is subject to EASA codes Part 21, CS 29, Part M, and Part 145. These define the requirements in respect of occurrence reporting, investigation reports, data collection, analysis and corrective actions to assure continued airworthiness. EASA is to amend CS-29 as a result of NPA 2010-12 "Vibration Health Monitoring"; CAA commented on this NPA, emphasising the need for a method for component findings to be fed back into the qualification of any VHM system. Rather than amend CAP 753, therefore, the CAA continues to believe that the focus should be maintained on this EASA work and suggests that the Safety Recommendation be made to EASA.

The CAA will, of course, continue to monitor, and provide comment as appropriate to the EASA rulemaking activities and will review and, where appropriate, amend CAP 753 to address changes made by EASA, and as considered necessary by CAA.

CAA Status – Closed

Revised response to Recommendation 2011-042

During follow-up discussions with AAIB concerning CAA's response to 2011-042, CAA explained that although it was at liberty to update the guidance material in CAP 753 in line with the recommendation, its status as guidance material would be strictly limited without appropriate changes to the requirements in CS-29, Part M, Part 145 and Part 21 for the regulation of initial and continued airworthiness, which are now the responsibility of EASA.

Until such EASA rulemaking tasks have been completed, it is recognised that CAP 753 is the only means at CAA's disposal to support the CAA's own requirements for the UK fleet in this area, even though this would not affect other European VHM operators. Therefore CAA has decided to revise its response to 2011-042 as follows:-

Revised response 2011-042

CAA will, by 31 December 2012, update the guidance material in CAP 753 to include a process where operators receive detailed component condition reports in a timely manner to allow effective feedback as to the operation of the Vibration Health Monitoring System.

CAA Status - Open

Recommendation 2011-043

It is recommended that Eurocopter introduce a means of warning the flight crew, of the AS332 L2 helicopter, in the event of an epicyclic magnetic chip detector activation.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2011-045

It is recommended that the European Aviation Safety Agency require the 'crash sensor' in helicopters, fitted to stop a Cockpit Voice Recorder in the event of an accident, to comply with EUROCAE ED62A.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2011-046

It is recommended that the Federal Aviation Administration require the 'crash sensor' in helicopters, fitted to stop a Cockpit Voice Recorder in the event of an accident, to comply with RTCA DO204A.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2011-047

It is recommended that the Civil Aviation Authority update CAP 739, and include in any future Helicopter Flight Data Monitoring advisory material, guidance to minimise the use of memory buffers in recording hardware, to reduce the possibility of data loss.

CAA Response

The CAA accepts this Recommendation and will include advice on minimising the use of memory buffers in Flight Data Monitoring (FDM) recording hardware. This advice will be published in the Autumn 2012 update of CAP739: Flight Data Monitoring – *A Guide to Good Practice*. The major update to this CAP will, for the first time, include Helicopter FDM. Both Rotary and Fixed-wing sections will refer to the issue of memory buffers.

The CAA will also take every opportunity to make FDM equipment manufacturers and operators running FDM programmes aware of the issue, *specifically*:-

The CAA will brief the membership of the UK FDM Operators Meeting which includes both Rotary and Fixed Wing Operators. This process has already started and will be expanded to include all UK AOC holders required to have FDM programmes.
This action will be complete by 31 January 2012.

The CAA will contact FDM Quick Access Recorder manufacturers to inform them of the concern and also obtain information on the scale of the issue in current equipment.
This action will be complete by 31 January 2012.

CAA Status - Open

Recommendation 2011-048

It is Recommended that Eurocopter issue an Alert Service Bulletin to require all operators of AS332 L2 helicopters to implement a regime of additional inspections and enhanced monitoring to ensure the continued airworthiness of the main rotor gearbox epicyclic module.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2011-049

It is Recommended that the European Aviation Safety Agency (EASA) evaluate the efficacy of the Eurocopter programme of additional inspections and enhanced monitoring and, when satisfied, make the Eurocopter Alert Service Bulletin mandatory by issuing an Airworthiness Directive with immediate effect.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2011-050

It is Recommended that Eurocopter improve the gearbox monitoring and warning systems on the AS332 L2 helicopter so as to identify degradation and provide adequate alerts.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2011-051

It is recommended that Eurocopter, with the European Aviation Safety Agency (EASA), develop and implement an inspection of the internal components of the main rotor gearbox epicyclic module for all AS332 L2 and EC225LP helicopters as a matter of urgency to ensure the continued airworthiness of the main rotor gearbox. This inspection is in addition to that specified in EASA Emergency Airworthiness Directive 2009-0087-E, and should be made mandatory with immediate effect by an additional EASA Emergency Airworthiness Directive.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2011-074

It is recommended that the European Aviation Safety Agency, in conjunction with Eurocopter, review the instructions and procedures contained in the Standard Practices Procedure MTC 20.08.08.601 section of the EC225LP and AS332 L2 helicopters Aircraft Maintenance Manual, to ensure that correct identification of the type of magnetic particles found within the oil system of the power transmission system is maximised.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2011-075

It is recommended that the European Aviation Safety Agency, in conjunction with Eurocopter, urgently review the design, operational life and inspection processes of the planet gears used in the epicyclic module of the Main Rotor Gearbox installed in AS332 L2 and EC225LP helicopters, with the intention of minimising the potential of any cracks progressing to failure during the service life of the gears.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed