Safety Regulation Group
Safety Investigation and Data Department

Follow-up Action on Occurrence Report

ACCIDENT TO RAF 2000, G-BWAE, AT HALL FARM STRIP, NEAR LICHFIELD ON 5 FEBRUARY 2003
(AIRCRAFT CRASHED AFTER LIFT OFF DUE TO FAILURE OF A ROTOR HEAD CONTROL ROD)

CAA FACTOR NUMBER	:	F13/2004
FACTOR PUBLICATION DATE	:	16 March 2004
OPERATOR	:	Private
CAA OCCURRENCE NUMBER	:	2003/00679
AAIB REPORT	:	Bulletin 2/2004

SYNOPSIS

(From AAIB Report)

The aircraft, built from a kit by its previous owner, had suffered at least one roll over accident and the rotor blades had been replaced twice before it was sold to the pilot. He fitted new parts including further new rotor blades and the aircraft subsequently completed about 60 hours of flying without incident.

Not long before the accident flight, chord-wise cracks had been found in both of the composite main rotor blades and the aircraft had been grounded. The AAIB commissioned a detailed material examination of the cracks as they were thought to be related to a fatal accident involving another RAF 2000. The examination indicated that the cracks, that were not relevant to the earlier fatal accident, were a result of 'lay-up' issues which were subsequently taken up by the CAA with the kit manufacturer.

A further set of new blades for G-BWAE were received from the manufacturer, and these were fitted. A new, taller teeter block was also obtained. While attempting to fit this however, some damage was found to bolts in the assembly. This was considered to have been damage undetected after the roll over accident and consequently a complete new gimbal head was procured. Much effort was expended carefully aligning the new rotor hub bar and gimbal head, in order to achieve low vibration levels. Ultimately the gimbal head was successfully fitted to the aircraft and signed off by a PFA inspector who was also a gyroplane instructor.

The aircraft was inspected on the morning of the accident and issued with a flight release note by the PFA inspector. The inspector then carried out two solo flights, in calm wind conditions, during which the aircraft performed well with no undue vibration. The third flight was flown dual with the inspector being accompanied by the owner.

A handling check, carried out after a normal takeoff and climb to 1,500 feet, showed no problems and the flight was continued as a circuit training detail at a local microlight airfield. The aircraft landed back on its home grass strip without incident 1 hour and 15 minutes later. The aircraft was then refuelled and prepared for a further flight.

After the usual checks, including control checks, the aircraft was positioned for takeoff, the pre-rotator engaged and the takeoff commenced. The aircraft lifted into a level attitude and the owner, who was handling, gently eased the stick forward to increase airspeed. As expected the aircraft maintained a level attitude as the speed increased until, at an estimated height of approximately 10 feet, it developed a marked nose down attitude and rolled slightly right. The instructor felt the pilot compensate but considered, from the attitude of the aircraft, that he had not been

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positive enough with the controls, and so pulled firmly and fully aft. The aircraft did not respond and hit the ground hard breaking off the nose gear and coming to rest upright with the engine still running. The aircraft was shut down and the occupants vacated the cockpit without injury. The pilot and instructor both felt that there had been no response to the controls, and that the stick had moved without the usual resistance from normal control forces.

FOLLOW UP ACTION

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

Recommendation 2003-130

It is recommended that the CAA and PFA ensure that the 'eye end' fittings of the RAF 2000 rotor head control rods are manufactured from material of a suitable specification to prevent failure during operation within the certified flight envelope.

CAA Response

The CAA accepts this Recommendation.

The CAA will establish whether the eye end fittings of the RAF 2000 rotor head control rods are manufactured from material of a suitable specification to prevent failure during operation within the certified flight envelope. The CAA is currently discussing this with the Manufacturer and anticipates the necessary structural analysis will be concluded by June 2004.

CAA Status - Open