Aviation Safety Investigation Report 199402749

Robinson Helicopter Co R44

25 September 1994

Readers are advised that the Australian Transport Safety Bureau investigates for the sole purpose of enhancing transport safety. Consequently, Bureau reports are confined to matters of safety significance and may be misleading if used for any other purposes.

Investigations commenced on or before 30 June 2003, including the publication of reports as a result of those investigations, are authorised by the Executive Director of the Bureau in accordance with Part 2A of the Air Navigation Act 1920.

Investigations commenced after 1 July 2003, including the publication of reports as a result of those investigations, are authorised by the Executive Director of the Bureau in accordance with the Transport Safety Investigation Act 2003 (TSI Act). Reports released under the TSI Act are not admissible as evidence in any civil or criminal proceedings.

NOTE: All air safety occurrences reported to the ATSB are categorised and recorded. For a detailed explanation on Category definitions please refer to the ATSB website at www.atsb.gov.au.

Aviation Safety Investigation Report

199402749

The Bureau did not conduct an on scene investigation of this occurrence. The information presented below was obtained from information supplied to the Bureau.

Occurrence Number: 199402749 **Occurrence Type:** Accident
Location: Winton
State: VIC **Inv Category:** 4
Date: Sunday 25 September 1994
Time: 1530 hours **Time Zone** EST
Highest Injury Level: None

Aircraft Manufacturer: Robinson Helicopter Co
Aircraft Model: R44
Aircraft Registration: VH-APM **Serial Number:** 0044
Type of Operation: Charter Passenger
Damage to Aircraft: Substantial
Departure Point: Winton VIC
Departure Time: 1530 EST
Destination: Winton VIC

Crew Details:

Role	Class of Licence	Hours on Type	Hours Total
Pilot-In-Command	Commercial	85.0	85

Approved for Release: Monday, October 31, 1994

The pilot was conducting joy flights in the vicinity of an active car race track. The helicopter type was recently introduced into Australia and is a relatively new design. VH-APM had accrued only 128 hours total time since new.

The pilot took off into a 15 knot wind with three passengers on board. The helicopter was operating at less than maximum gross weight, with a significant power margin. The pilot advised that when the helicopter was about 100 feet above the ground, climbing at about 55 knots, he felt a slight airframe vibration and heard the engine noise increase slightly. The vibration level continued to worsen. The pilot had no idea what was causing the vibration or how serious it was. He elected to land the helicopter as soon as possible. As there was no suitable landing site immediately ahead, he turned back to the departure helipad and instigated a power-on (needles joined) autorotative descent. Nearing the ground the pilot flared the helicopter, which was facing downwind, and applied maximum power, but was unable to eliminate the rate of descent. The helicopter sank through the flare and landed heavily, tail low, short of the helipad, in the clear takeoff departure path area, with five to 10 knots groundspeed.

Subsequently engineers discovered that the engine cooling fan had come loose on its shaft thereby causing the vibration. A crack was also discovered on the forward face of the fanwheel.

CONCLUSIONS

Findings

1. The engine cooling fan came loose on its drive shaft.

2. The loose cooling fan caused a vibration through the airframe.

3. The loose fan may have caused the engine to "hunt".

4. The pilot did not know what was causing the worsening vibration.

5. The nearest suitable site for a landing was the departure helipad.

6. In an attempt to land the helicopter as soon as possible, the pilot entered a power on autorotation and terminated with a downwind flare.

7. The helicopter landed heavily with the tail low.

Significant Factors

The following factors were considered relevant to the development of the accident:

1. The pilot reacted quickly to a sudden, unusual, worsening vibration in flight.

2. Because of the tailwind effect, combined with a rapid descent plus a nose high flare, versus the available power, the pilot was unable to arrest the descent.

SAFETY ACTION

The helicopter manufacturer issued R44 Service Bulletin #2 on 24 October 1994 to all R44 owners, operators and service centres for an inspection to be done on cooling fans within 10 flight hours and thereafter every 25 hours until the fanwheel is replaced with a D174-1 Rev. G or later fanwheel.