Aviation Safety Investigation Report 199202579

Robinson Helicopter Co R22

15 June 1992

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Aviation Safety Investigation Report

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Occurrence Number: 199202579 **Occurrence Type:** Accident
Location: 20km SE Julia Creek
State: QLD **Inv Category:** 3
Date: Monday 15 June 1992
Time: 0705 hours **Time Zone** EST
Highest Injury Level: Fatal
Injuries:

	Fatal	Serious	Minor	None	Total
Crew	1	0	0	0	1
Ground	0	0	0	0	0
Passenger	0	0	0	0	0
Total	**1**	**0**	**0**	**0**	**1**

Aircraft Manufacturer: Robinson Helicopter Co
Aircraft Model: R22 BETA
Aircraft Registration: VH-HBK **Serial Number:** 546
Type of Operation: Miscellaneous Ferry
Damage to Aircraft: Destroyed
Departure Point: Congewoi Station QLD
Departure Time: 0620 EST
Destination: Taldora Station QLD

Crew Details:

Role	Class of Licence	Hours on Type	Hours Total
Pilot-In-Command	Commercial	772.0	1035

Approved for Release: Thursday, August 25, 1994

When the helicopter had not arrived at its destination, a search was commenced. The wreckage was found the following morning close to the intended route for the flight. The main rotor hub with the blades attached was found approximately 140 m from the burnt out fuselage which had bounced several metres after impacting the ground in a steep nose-down attitude.

There were no witnesses to the accident. The pilot was reported to have been fit and well rested prior to the flight. On ferry flights, he generally flew the helicopter at about 1500 ft above ground level (AGL). The weather in the area on the morning of the accident was reported to have been fine and calm.

The relative positions of the main rotor hub assembly and the fuselage indicated that separation of the main rotor occurred during flight. Examination of the main rotor mast showed that the mast failed in torsional overload between the swash plate and the hub assembly. One of the elastomeric blocks on the teeter stop assembly had been subjected to a compressive force of sufficient magnitude to fracture the elastomeric block retaining strap. However, the area of the mast behind the teeter stop had not experienced any deformation. The damage to the teeter stop and the mode of failure of the mast is the type of damage that might be caused by a mast bump.

Among the causes of mast bump are pilot manipulation of the flying controls and failure of one or more of the control linkages to the main rotor. Examination of the control linkages indicated that they failed in overload, consistent with main rotor assembly separation. Pilot induced mast bump can occur if the main rotor disc loading is reduced to less than 0.5g. Under such conditions, the main rotor can travel outside its normal limits and bump against the mast.

On this occasion the reason(s) for a reduction in g loads could not be determined. There were no known aircraft, with which the helicopter might have conflicted, operating in the area at the time. Information from another local aircraft operator indicated that large concentrations of birds were not uncommon in the area at that time of the year. However, notwithstanding the severe fire damage to the fuselage, no evidence was found in the wreckage of the helicopter having struck a bird. Further, the drive train between the engine and gearbox were inspected on site, and the engine and main rotor gearbox were stripped and inspected in a workshop. No faults which could have contributed to the accident were found.

Factors

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

1. For reasons which could not be determined, a mast bump occurred during flight.

2. The main rotor mast failed due to torsional overload as a result of the mast bump.