COMMONWEALTH OF AUSTRALIA DEPARTMENT OF TRANSPORT

AIRCRAFT ACCIDENT INVESTIGATION SUMMARY REPORT

Publication of this report is authorised by the Secretary under the provisions of Air Navigation Regulations 283 (1)

Reference No. 81/781/1059

1. LOCATION OF OCCURRENCE

	Height a.m.s.l.	Date	Time (Local)	Zone
3.5 km north-northwest of Mount Isa Airport, Qld.	1100 feet	26.10.78	1428 hours	EST

2. THE AIRCRAFT

Make and Model	Registration	Certificate of Airworthiness
Bell 206B Helicopter	VH-FJT	Valid from 16.7.76

Certificate of Registration issued to	Operator	Degree of damage to aircraft
		Destroyed
		Other property damaged: Nil

Defects discovered

Failure of the engine to transmission main drive shaft (Part No. 206-040-100-13) after its load bearing capacity had been reduced by fatigue cracking.

3. THE FLIGHT

Last or intended departure point	Time of departure	Next point of intended landing	Purpose of flight	Class of operation
Mount Isa	1415 hours	Mount Isa	Aerial Survey	Aerial Work

4. THE CREW

Name	Status	Age	Class of licence	Hours on type	Total hours	Degree of injury
	Pilot	34	Commercial Helicopter	368	7315	Minor

5. OTHER PERSONS (All passengers and persons injured on ground)

Name	Status	Degree of injury	Name	Status	Degree of injury
	Observer	Serious		Observer	Nil
	Observer	Serious		Observer	Nil

6. RELEVANT EVENTS

The helicopter was engaged in an aerial inspection of the Spear Creek area, to the north-northwest of Mt. Isa Airport. Several runs were made over the area, at various heights between 100 and 700 feet above ground level, whilst photographs were taken. A systematic visual inspection pattern was then commenced until, after some five minutes, a sighting of potential interest was made. The pilot commenced to orbit the area, at a height of about 125 feet and at an airspeed of approximately 30 knots.

The pilot's first awareness of a malfunction was a loud bang from the rear of the cabin. This was followed by a muffled grating sound. Because of the helicopter's low height and speed a transition to autorotational flight was not possible. However, the pilot lowered the collective control and then pulled it up again just prior to ground contact. At the same time, he attempted to steer the helicopter between the trees.

The helicopter struck a tree and pivoted through approximately 180 degrees. It then bounced about 15 metres and came to rest with the cabin broken open. There was no fire. The accident was seen by personnel at the Airport and emergency services were alerted.

Examination of the main drive shaft established that the failure sequence was initiated by excessive wear in the forward shaft coupling. This restricted flexibility of the coupling, thereby producing bending loads in the shaft forward flange. Fatigue cracking resulted from the abnormal bending loads and had propagated through some 80 percent of the shaft cross-sectional area before the final overload failure occurred.

The main drive shaft assembly had operated for a total of some 1456 hours. The helicopter maintenance records indicated all required maintenance had been carried out on the assembly. No reason was found for the excessive wear in the forward coupling.

7. OPINION AS TO CAUSE

The probable cause of the accident was that the helicopter experienced a main drive shaft failure at a height and airspeed combination that precluded the safe completion of an autorotational landing.

Approved for publication	(G.V. Hughes) Delegate of the Secretary	Date
		5.5.81