## National Transportation Safety Board Washington, DC 20594

## **Brief of Accident**

## Adopted 05/18/2001

DEN01LA012							
File No. 851	10/30/2000	MESA VERDE, CO	Aircraft Reg No.	N613	Tim	ie (Local): 11:30 MDT	
Make/Mode Engine Make/Mode Aircraft Damage Number of Engines Operating Certificate(s Type of Flight Operatior Reg. Flight Conducted Unde	el: Bell / 206L-1 el: Allison / C30P e: Substantial s: 1 ): None h: Public Use r: Part 91: General Avia	ation	Crew Pass	Fatal 0 0	Serious 0 0	Minor/None 1 0	
Last Depart. Point: Same as Accident/Incident Location Destination: Local Flight Airport Proximity: On Airport/Airstrip Airport Name: Runway Identification: 0 Runway Length/Width (Ft): Unk/Nr Runway Surface: Concrete Runway Surface Condition: Dry			Condition of Light: Day Weather Info Src: Witness Basic Weather: Visual Conditions Lowest Ceiling: None Visibility: .00 SM Wind Dir/Speed: 180 / 010 Kts Temperature (°C): 10 Precip/Obscuration:				
Pilot-in-Command Ag	ie: 51			Flight T Tota	Time (Hours)	237	
Airline Transport; Flight Instructor; Single-engine Land; Helicopter Instrument Ratings Airplane: Helicopter			Last 90 Days: 140 Total Make/Model: 3009 Total Instrument Time: 750				

During approach to land on a helipad at the completion of a seeding flight, the helicopter began, what the pilot described as, an unusual vibration. The pilot conducted a normal landing and during inspection following shutdown, the pilot found that one tail rotor blade had shed the trailing edge counterweight and trailing edge skin. He also found that three of the four mounting points for the tail rotor gearbox had fractured. Both tail rotor blades, which had accumulated approximately 30.8 hours since new, were sent to the NTSB Materials Laboratory for examination. The helicopter was repaired and when the shipping container containing new tail rotor blades was opened and the blades unpacked, the repair station rejected one blade for visual abnormalities in the area of the trailing edge counterweight. The rejected blade was also sent to the laboratory for examination. The laboratory for examination provided evidence the tail rotor blade failed due to fatigue in the inboard and outboard skins initiating at the root near the trailing edge counterweights. The fatigue initiated due to buckling deformation of the inboard skin, which was found to be thinner than that specified in the manufacturer's drawings. The rejected tail rotor blade examination provided evidence of uneven bonding of the inboard counterweight and deformation due to the riveting process. Deformation was also noted on the outboard counterweight. Composite Structures, LLC, Monrovia, California, manufactured all the tail rotor blades.

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Occurrence #1: Phase of Operation:	AIRFRAME/COMPONENT/SYSTEM FAIL APPROACH - VFR PATTERN - FINAL AF	URE/MALFUNCTION PPROACH		
Findings 1. ROTOR SYST 2. ROTOR SYST 3. (C) INADEQU	TEM,TAIL ROTOR BLADE - FATIGUE TEM,TAIL ROTOR BLADE - FAILURE,PAR ATE QUALITY CONTROL - MANUFACTU	RTIAL RER		

4. (C) MATERIAL INADEQUATE, IMPROPER - MANUFACTURER

Findings Legend: (C) = Cause, (F) = Factor

The National Transportation Safety Board determines the probable cause(s) of this accident as follows.

The manufacturer's use of improper materials, and inadequate quality control of the tail rotor blades during the manufacturing process, which resulted in fatigue failure of the blade.