

**Brief of Accident**

**Adopted 06/03/2002**

CHI00FA111  
File No. 11719                      04/14/2000                      St. Paul, MN                      Aircraft Reg No. N225LL                      Time (Local): 16:12 CDT

Make/Model: Bell / 222U  
Engine Make/Model: Lycoming / LTS101-750C-1  
Aircraft Damage: Substantial  
Number of Engines: 2  
Operating Certificate(s): On-demand Air Taxi  
Type of Flight Operation: Positioning; Air Medical (Unspecified)  
Reg. Flight Conducted Under: Part 91: General Aviation

	Fatal	Serious	Minor/None
Crew	0	0	1
Pass	0	0	1

Last Depart. Point: Same as Accident/Incident Location  
Destination: Local Flight  
Airport Proximity: Off Airport/Airstrip

Condition of Light: Day  
Weather Info Src: Weather Observation Facility  
Basic Weather: Visual Conditions  
Lowest Ceiling: None  
Visibility: 10.00 SM  
Wind Dir/Speed: 350 / 012 Kts  
Temperature (°C): 16  
Precip/Obscuration: No Obscuration; No Precipitation

Pilot-in-Command                      Age: 39

Flight Time (Hours)

Certificate(s)/Rating(s)  
Commercial; Private; Multi-engine Land; Single-engine Land; Helicopter

Total All Aircraft: 3406  
Last 90 Days: 87  
Total Make/Model: 359  
Total Instrument Time: UnK/Nr

Instrument Ratings  
Airplane; Helicopter

During cruise flight the pilot lost control of the helicopter and an uncontrolled forced landing was made onto the top of a two-story industrial warehouse. The pylon mounted actuator support assembly had separated from the transmission case. The support assembly, attachment hardware, and portions of the transmission case were sent to the NTSB Materials Laboratory for analysis. According to the NTSB Materials Laboratory Factual Report, "... all of the studs showed progressive fatigue cracking from multiple origins." The report stated, "All but one stud fracture ... showed progression from diametrically opposed sides, typical of reversed bending fatigue loads." The report stated that all of the stud and dowel holes in the actuator support were, "... elongated on opposite sides from contact with the respective dowel or stud." The report further stated, "In addition to the elongation of the holes, the faying surfaces of the support and the transmission case were severely worn from relative movement. The directions of indicated movements and wear correspond to the axis of elongation of the respective support holes." The lead mechanic for the helicopter reported that one of the dowel pins was found during routine maintenance approximately one year prior to the accident date and the maintenance staff did not determine the identify the source of the dowel pin.

Brief of Accident (Continued)

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Occurrence #1:    LOSS OF CONTROL - IN FLIGHT  
Phase of Operation: CRUISE

Findings

1. (C) FLIGHT CONTROL SYSTEM - FAILURE
  2. (C) FLIGHT CONTROL SURFACES/ATTACHMENTS - FATIGUE
  3. (C) AIRCRAFT CONTROL - NOT POSSIBLE - PILOT IN COMMAND
  4. (C) MAINTENANCE,INSPECTION - INADEQUATE - COMPANY MAINTENANCE PERSONNEL
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Occurrence #2:    IN FLIGHT COLLISION WITH OBJECT  
Phase of Operation: DESCENT - UNCONTROLLED

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

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The National Transportation Safety Board determines the probable cause(s) of this accident as follows.  
The loss of clamp-up force between the transmission case and the pylon mounted actuator support assembly which resulted in fatigue failure of the threaded studs and dowel pins, the failure of the flight control system, helicopter control not being possible after the flight control failure, and the inadequate maintenance procedures by the company maintenance personnel.