National Transportation Safety Board Washington, DC 20594

Brief of Accident

Adopted 09/14/1993

LAX92LA319 File No. 2684	07/28/1992	HAYFORK, CA	Aircraft Reg No. N89NW		Time (Local): 08:00 PDT	
Engine Make/Model Aircraft Damage Number of Engines Operating Certificate(s) Type of Flight Operation	1 Aircraft External Load		Crew Pass	Fatal 0 0	Serious 0 0	Minor/None 1 0
Destination	Same as Accident/Incident Loc Local Flight Off Airport/Airstrip	ration	Condition of Light: Day Weather Info Src: Pilot Basic Weather: Visual Conditions Lowest Ceiling: None Visibility: 20.00 SM Wind Dir/Speed: Light and Variable Temperature (°C): 27 Precip/Obscuration:			
Pilot-in-Command Age: 41		Flight Time (Hours)				
Certificate(s)/Rating(s) Flight Instructor; Commercial; Single-engine Land; Helicopter Instrument Ratings Airplane; Helicopter			Total All Aircraft: 13000 Last 90 Days: 300 Total Make/Model: 3000 Total Instrument Time: 120			

THE PILOT HAD JUST DROPPED OFF A LOAD OF LOGS AND WAS EN ROUTE BACK TO THE CUTTING AREA WHEN HE HEARD A LOUD BANG CONCURRENT WITH A LEFT YAW AND A RAPID LOSS OF ROTOR SPEED. THE PILOT ENTERED AN AUTOROTATION AND COLLIDED WITH TREES DURING THE DESCENT. EXAMINATION REVEALED THAT THE MAIN ROTOR DRIVE SHAFT HAD FAILED. EXAMINATION OF THE SHAFT REVEALED EVIDENCE OF A LOSS OF GREASE FROM THE SHAFT'S BOOT, WHICH RESULTED IN AN OVERHEATING CONDITION AND CATASTROPHIC FAILURE OF THE UNIT. THE 'O' RING, WHICH PROVIDES THE GREASE SEAL FOR THE SHAFT FOUND WITH EVIDENCE THAT BEEN SLUNG FROM THE BOOT. THE MAIN ROTOR DRIVE SHAFT HAD BEEN REMOVED FOR BOOT, WAS DEFORMED GREASE HAD MAINTENANCE AND REPLACED THREE DAYS AND 6 HOURS PRIOR TO THE ACCIDENT. THE MAINTENANCE INSTRUCTIONS CALL FOR A NEW 'O' RING TO BE THE SHAFT AND REASSEMBLED. ACORDING TO THE BELL LABORATORY, THE 'O' RING APPEARED TO HAVE NOT BEEN INSTALLED WHEN DRIVE BOOT ARE REPLACED.

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Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION Phase of Operation: HOVER

Findings

- 1. (C) LUBRICATING SYSTEM, OIL SEAL LOOSE
- 2. (C) LUBRICATING SYSTEM, OIL SEAL LEAK
- 3. (C) MAINTENANCE, INSTALLATION IMPROPER COMPANY MAINTENANCE PERSONNEL
- 4. (C) ROTOR DRIVE SYSTEM, ENGINE TO TRANSMISSION DRIVE OVERTEMPERATURE
- 5. (C) ROTOR DRIVE SYSTEM, ENGINE TO TRANSMISSION DRIVE FAILURE, TOTAL
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Occurrence #2: FORCED LANDING Phase of Operation: DESCENT - EMERGENCY

Findings

- 6. AUTOROTATION INITIATED PILOT IN COMMAND
- 7. (F) TERRAIN CONDITION NONE SUITABLE
- 8. (F) TERRAIN CONDITION MOUNTAINOUS/HILLY
- 9. (F) TERRAIN CONDITION TREE(S)

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER Phase of Operation: DESCENT - EMERGENCY

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

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

THE FAILURE OF THE MAIN ROTOR DRIVE SHAFT DUE TO THE IMPROPER INSTALLATION BY COMPANY MAINTENANCE PERSONNEL OF AN 'O' RING SEAL, WHICH ALLOWED THE PACKING GREASE TO ESCAPE AND CAUSED THE OVER TEMPERATURE FAILURE OF THE DRIVE SHAFT. A FACTOR IN THE ACCIDENT WAS THE LACK OF SUITABLE TERRAIN IN WHICH TO PERFORM AN AUTOROTATION.