# National Transportation Safety Board
# Aviation Accident Data Summary

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| **Location:** | STITES, ID | **Accident Number:** | SEA00TA013 |
| **Date & Time:** | 11/02/1999, 1118 PST | **Registration:** | N5388V |
| **Aircraft:** | Hiller UH-12E | **Injuries:** | 2 Serious, 1 None |
| **Flight Conducted Under:** | Public Aircraft | | |

## Analysis

During a low-altitude fish survey, the helicopter experienced a separation of a control rotor while leveling off from a climb to about 400 feet above ground level (AGL). The pilot initiated an emergency descent but, due to severely reduced cyclic controllability resulting from the separation, was unable to avoid power lines in the aircraft's emergency descent flight path. The helicopter struck the power lines about 50 feet AGL and fell to the ground, landing hard but upright. Post-accident examination disclosed a fatigue failure in the cuff which retains the control rotor blade. The fatigue originated on two opposite sides of a retaining bolt hole that appeared to have been unevenly hand chamfered or deburred during original manufacture of the cuff, with gouging and sharp-bottomed dents visible at the origins. However, while a company mechanic had signed off an Airworthiness Directive (AD) requiring recurring inspection of the cuff about two months/56 flight hours before the accident, post-accident examination disclosed evidence indicative of inadequate inspection and maintenance of the assembly, including: old dried grease between the cuff and control rotor blade spar, large areas of the spar missing required paint with associated corrosion areas, and zinc chromate primer in corrosion pits. The FAA-approved Hiller service bulletin referenced by the AD contains procedures for inspection of spar tube retention bolt holes for 'elongation, corrosion, burrs, pitting or fretting' and associated repair procedures, but does not contain any instructions to inspect or repair bolt holes in the control rotor cuff for those same conditions.

## Probable Cause

The National Transportation Safety Board determines the probable cause(s) of this accident to be: Inadequate inspection of the control rotor cuff by a company mechanic and subsequent fatigue fracture of the cuff, resulting in an inflight separation of the control rotor blade. Factors contributing to the accident were: inadequate quality control during manufacture; insufficiently defined manufacturer's inspection and repair procedures; inadequate FAA approval of the manufacturer's inspection and repair procedures; power lines in the helicopter's emergency descent flight path; and reduced aircraft controllability following the control rotor separation.

## Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: CLIMB - TO CRUISE

Findings
1. (C) ROTOR SYSTEM,MAIN ROTOR BLADE CUFF - FATIGUE
2. (C) MAINTENANCE,INSPECTION - INADEQUATE - COMPANY MAINTENANCE PERSONNEL
3. (F) INADEQUATE QUALITY CONTROL - MANUFACTURER
4. (F) CONDITION(S)/STEP(S) INSUFFICIENTLY DEFINED - MANUFACTURER

5. (F) INADEQUATE CERTIFICATION/APPROVAL,AIRCRAFT - FAA(ORGANIZATION)
6. ROTOR SYSTEM,MAIN ROTOR BLADE - SEPARATION
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Occurrence #2: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: DESCENT - EMERGENCY

Findings
7. (F) OBJECT - WIRE,TRANSMISSION
8. (F) AIRCRAFT CONTROL - REDUCED
9. CLEARANCE - NOT MAINTAINED - PILOT IN COMMAND
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Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

## Pilot Information

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| **Certificate:** | Commercial | **Age:** | 63 |
| **Airplane Rating(s):** | Single-engine Land | **Instrument Rating(s):** | Airplane; Helicopter |
| **Other Aircraft Rating(s):** | Helicopter | **Instructor Rating(s):** | None |
| **Flight Time:** | 32275 hours (Total, all aircraft), 22000 hours (Total, this make and model), 228 hours (Last 90 days, all aircraft), 87 hours (Last 30 days, all aircraft), 6 hours (Last 24 hours, all aircraft) | | |

## Aircraft and Owner/Operator Information

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| **Aircraft Make:** | Hiller | **Registration:** | N5388V |
| **Model/Series:** | UH-12E UH-12E | **Engines:** | 1 Reciprocating |
| **Operator:** | JAMES R. POPE | **Engine Manufacturer:** | Lycoming |
| **Operating Certificate(s) Held:** | On-demand Air Taxi (135) | **Engine Model/Series:** | VO-540-C2A |
| **Flight Conducted Under:** | Public Aircraft | | |

## Meteorological Information and Flight Plan

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| **Conditions at Accident Site:** | Unknown | **Condition of Light:** | Day |
| **Observation Facility, Elevation:** | , 0 ft msl | **Weather Information Source:** | Pilot |
| **Lowest Ceiling:** | None / 0 ft agl | **Wind Speed/Gusts, Direction:** | Calm / , |
| **Temperature:** | 18°C | **Visibility** | 50 Miles |
| **Precipitation and Obscuration:** | | | |
| **Departure Point:** | CLARKSTON, WA | **Destination:** | GRANGEVILLE, ID |

## Wreckage and Impact Information

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| **Crew Injuries:** | 2 Serious, 1 None | **Aircraft Damage:** | Substantial |
| **Passenger Injuries:** | N/A | **Aircraft Fire:** | None |
| **Ground Injuries:** | N/A | **Aircraft Explosion:** | None |
| **Latitude, Longitude:** | | | |

## Administrative Information

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| **Investigator In Charge (IIC):** | GREGG NESEMEIER | **Adopted Date:** | 05/16/2001 |
| **Investigation Docket:** | NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at http://dms.ntsb.gov/pubdms/. | | |