

NTSB Identification: **LAX06GA254**

14 CFR Part 91: General Aviation

Accident occurred Friday, August 04, 2006 in Happy Camp, CA

Aircraft: Aviation International Rotors CH-54A, registration: N6156U

Injuries: 2 Fatal.

This is preliminary information, subject to change, and may contain errors. Any errors in this report will be corrected when the final report has been completed.

On August 4, 2006, at 1947 Pacific daylight time, an Aviation International Rotors (Sikorsky) CH-54A, N6156U, impacted terrain following an in-flight separation of a tail rotor blade while maneuvering near a dip site near Happy Camp, California. The Department of Agriculture (USDA), U.S. Forest Service (USFS), was utilizing the helicopter under contract as a public-use firefighting tool [heli-tanker (HT) 790] under the provisions of 14 CFR Part 91. The helicopter was registered to Heavy Lift Helicopters, Inc. (HLH), Apple Valley, California, and the flight crew was employed by HLH. The airline transport pilot (ATP) captain and ATP co-pilot both sustained fatal injuries. The helicopter was substantially damaged. Visual meteorological conditions prevailed and a USFS flight plan was filed. The flight was receiving flight following from the USFS dispatch personnel at the time of the accident.

The helicopter flown to the Happy Camp complex on July 29, 2006, to help suppress the Titus Fire. The helicopter was stationed at the Happy Camp helibase where it was maintained and dispatched.

On the morning of the accident, the helicopter went through a series of maintenance and flight tests after having its number 1 engine replaced the night before. The helicopter was returned to service at 1645 by the HLH mechanics and the USFS helicopter manager. The helicopter was then dispatched to the Titus fire where it conducted a number of water drops. After 2.2 hours of flight (at 1902), the helicopter returned to the helibase where it was refueled with approximately 500 gallons and examined by maintenance personnel. The helicopter departed for a second cycle of water drops at 1912, and never returned to the helibase.

The satellite tracking system that the USFS utilizes to provide real-time data on their flights indicated that the helicopter filled its water tanks at a dip site located in the Klamath River near the Independence Bridge. The helicopter conducted one uneventful dip and water drop during the second cycle and was in the process of conducting its second dip when the accident occurred.

A witness located near the accident site reported that he observed the helicopter come in and out of the same dip site that day filling the helicopter's water tanks. The helicopter was located over the dip site when the witness heard a "loud bang." He realized something was wrong with the helicopter and ran down his driveway toward the road that paralleled the river. When he reached the road he observed the helicopter flying over a stone riverbed toward the Independence Bridge. He then noticed a large piece fall off the helicopter, which was later identified as the tail rotor gearbox with three of the four tail

rotor blades attached to the hub. The helicopter pitched nose low at an approximate 45-degree nose down attitude while rotating around its vertical axis. The helicopter impacted the opposite side of the river/shoreline. The witness called the USFS over a radio to report the accident.

Review of the wreckage at the accident site revealed that the tail rotor gearbox (with three tail rotor blades attached) came to rest at a global positioning system (GPS) measured location of 41 degrees 39.707 minutes north latitude and 123 degrees 26.919 minutes west longitude. The helicopter fuselage, with its two engines, main rotor transmission, and main rotor hub attached, came to rest at a GPS measured location of 41 degrees 39.658 minutes north latitude and 123 degrees 26.895 minutes west longitude. Sections of the tail boom were located in the river. The pylon, with the horizontal stabilizer and intermediate gearbox attached were located on the opposite bank from the fuselage.

There are normally four tail rotor blades in the tail rotor assembly. Attached to the tail rotor hub is a spindle for each blade. A sleeve assembly is placed onto the spindle and secured by a threaded nut and lock washer. The blade is attached to the spindle via a collar located at the blade root. The collar is bolted to the sleeve assembly. Each blade is identified by a colored-coded attachment collar and spindle/sleeve (red, yellow, blue, and black). Examination of the tail rotor system revealed that the blade associated with the red collar/spindle was missing and has not been located at the time of this report's writing. The spindle (part number 65112-07002-047) was fractured inboard of where the sleeve assembly would attach to the spindle. The spindle fracture surface was flat in appearance and displayed arch-shaped marks that emanated from one of the edges through about half of the spindle material. It was noted that the location of the fracture would not normally be visible in an assembled component.

The fractured spindle was removed from the tail rotor hub and shipped to the National Transportation Safety Board Materials Laboratory in Washington, D.C., for further examination.

Initial review of the maintenance records, flight logs, and USFS daily diaries revealed that the helicopter accumulated a total of 6,191.6 hours as of the morning of the accident. On December 22, 2005, the tail rotor hub assembly underwent a 1,000-hour overhaul, which included the fluorescent penetrant inspection of the spindle. The tail rotor hub assembly was installed on the accident helicopter at a total time of 5,858.0 hours, about 323.6 hours following its last overhaul. The spindle was not a life limited component.