NTSB Identification: CEN09IA032, 14 CFR Part 91: General Aviation

Incident occurred Sunday, October 19, 2008 in Amherst, TX

Probable Cause Approval Date: 08/13/2009

Aircraft: MD Helicopter Inc MD 900, registration: **N902NM,** Injuries: 4 Uninjured.

NTSB investigators used data provided by various sources and may not have traveled in support of this investigation to prepare this aircraft incident report.

While in cruise flight, the helicopter experienced a hard right yaw and subsequent pitching moment up and down. The pilot was able to regain control of the helicopter and land without further incident. Examination revealed that the left vertical stabilizer control system adapter had failed. Metallurgical examination revealed that the failure mode was reverse bending fatigue. The vertical stabilizer control system adapter has been replaced with an improved design. Further, the Federal Aviation Administration has issued an Airworthiness Directive (AD) requiring all MD900 helicopter operators with the old VSCS tube adapters to comply with airspeed and autopilot restrictions. If an operator replaces the old VSCS tube adapter with the new design, the AD is not applicable.

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

The failure of the vertical stabilizer control adapter due to reverse bending fatigue.

Full narrative available:

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On October 19, 2008, approximately 1600 central daylight time, an McDonnell Douglas Helicopter Inc MD 900, N902NM, piloted by an airline transport pilot and operated by Aero Care, experienced a violent yaw while in cruise flight near Amherst, Texas. Visual meteorological conditions prevailed at the time of the event. The positioning flight was being conducted under the provisions of Title 14 Code of Federal Regulations Part 91 without a flight plan. No injuries were reported. The flight was en route to Clovis, New Mexico, and had departed Lubbock, Texas, approximately 1528.

According to the accident report form submitted by the operator, during cruise flight with the autopilot off, the helicopter encountered a violent yaw to the right. The pilot regained control of the helicopter and returned to Lubbock without further incident. An examination of the helicopter revealed that the left vertical stabilizer control rod had separated from the actuator at the adapter.

The left actuator adapter was removed from the helicopter and sent to the NTSB Materials Laboratory in Washington, D.C., for further examination. Examination of the fracture face revealed two distinct opposing zones displaying crack arrest marks and ratchet marks, consistent with reverse bending fatigue.

According to MDHI, at least three other helicopters encountered similar failures of the VSCS actuator, (Please reference NTSB case number SEA08SA170, DEN08RA132, and CEN09IA003) all within a six-month period of time. On October 17, 2008, MDHI issued Service Bulletin (SB) 900-110 "Operational Restrictions Concerning VSCS Tube Adapters." This SB was directed at all MD900 helicopters within a specific serial number range. The SB required owners and operators to reduce the operational airspeed of their helicopters to 100 knots indicated airspeed, or Velocity Never Exceed Speed (whichever was less), in visual meteorological conditions, with the autopilot off, VSCS on, until the VSCS adapters could be replaced. Aero Care was in compliance with this SB at the time of their event.

On December 3, 2008, MDHI issued SB 900-110R1 "Operational Restrictions and Replacement of VSCS Tube Adapters." This SB superseded the SB 900-110 and directed operators to replace the two VSCS tube adapters with the "improved" tube adapters. Once this SB had been complied with, the operational airspeed and autopilot restrictions were no longer applicable.

On December 17, 2008, Airworthiness Directive (AD) 2008-22-53 issued by the Federal Aviation Administration became effective. This AD required all MD900 helicopter operators with the old VSCS tube adapters to comply with airspeed and autopilot restrictions. If the operator had replaced the old VSCS tube adapter with the new “improved” design, the AD was not applicable.

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