



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: February 26, 1998

In reply refer to: A-98-24

Honorable Jane F. Garvey
Administrator
Federal Aviation Administration
Washington, D.C. 20591

On November 24, 1996, the flightcrew of Northwest Airlines (NWA) flight 211, an Airbus A-320-211, N310NW, experienced stiff rudder pedals approximately 50 feet above the ground before landing at Detroit Metropolitan Airport, Michigan. The flight, which was operating under the provisions of Title 14 Code of Federal Regulations Part 121 as a regularly scheduled passenger flight from Ft. Lauderdale, Florida, to Detroit, landed without further incident. The 6 crewmembers and 141 passengers were not injured. Instrument meteorological conditions prevailed at the time of the incident.

The captain of the flight stated that he had disengaged the autopilot (A/P) approximately 15 miles from the airport and was flying a manual approach. No problems were observed with the rudder or yaw damper during this time. However, when the captain attempted to use the rudder to compensate for a crosswind just before landing, he discovered that the rudder pedals were "locked in the neutral position." The captain used aileron inputs to keep the airplane aligned with the runway centerline through the touchdown and differential braking to steer the airplane during the landing roll until he engaged nosewheel steering at 80 knots. After exiting the runway, the captain performed several A/P disconnects, with no change in the rudder pedal force. He and the first officer then made several attempts to free the rudder pedals. After manipulating the rudder for approximately 15 seconds, the rudder pedal movement returned to normal.

Following the incident, NWA maintenance personnel examined the rudder and A/P systems. No anomalies were observed and no evidence of water or ice was found on the rudder cable assemblies. The rudder A/P artificial feel and trim solenoid was removed and replaced, and the airplane was returned to service the day after the incident. Subsequent Safety Board analysis of the flight data recorder readout confirmed that the A/P was disengaged when the captain experienced stiff rudder pedals.

At the request of the Safety Board, the rudder artificial feel and trim unit from the airplane was tested at an Airbus laboratory under supervision of the French Bureau Enquete Accidents. Although the unit's solenoid functioned properly, excessive forces were required to rotate the unit's A/P-mode engagement/disengagement lever. This occurred during testing at ambient and cold temperatures (-40° F).

A review of the service history on the A-320 rudder system revealed Airbus Service Bulletin (SB) A320-27-1042; dated March 21, 1992, titled "Flight Controls - Rudder - Increase Radial Play of Lever Bearing in the Artificial Feel and Trim Unit." The SB was prompted by 10 incidents in which the artificial feel and trim unit did not disengage from the A/P mode (stiff pedal operation) and return to normal pedal operating forces during approach and landing. These failures were attributed to increased operating forces in the bearing of the A/P engagement/disengagement lever in the artificial feel and trim unit and may have been aggravated by exposure to cold temperatures. The SB introduced a modified lever with a larger radial play of the bearing to eliminate the problem. On April 30, 1997, Airbus sent a telex to A-320 operators citing two recent incidents involving stiff rudder pedals and strongly recommending that the SB action be incorporated. The Direction Generale De L'Aviation Civile, the French aviation authority, has not issued an airworthiness directive (AD) to require the SB modification (which is not mandatory).

The NWA A-320 involved in the November 24, 1996, incident had not been modified in accordance with the SB. Because an unexpected restriction of the rudder pedals could cause a loss of control during a critical phase of flight, the Safety Board believes that the Federal Aviation Administration should issue an AD to require the installation of a modified engagement/disengagement lever in the rudder artificial feel and trim unit on all Airbus A-320 airplanes, in accordance with Airbus SB A320-27-1042, to ensure that the correct operating force exists at the rudder pedals. Although the SB modification has been incorporated on most of the A-320 airplanes operating in the United States, America West has indicated that some of its airplanes have probably not been modified. Full fleet compliance is necessary to ensure that none of the remaining airplanes are affected by this known system problem. The Safety Board is also concerned that A-320 airplanes could enter into U.S. service in the future without the SB modification.

Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Issue an airworthiness directive to require the installation of a modified engagement/disengagement lever in the rudder artificial feel and trim unit on all Airbus A-320 airplanes, in accordance with Airbus Service Bulletin A320-27-1042, to ensure that the correct operating force exists at the rudder pedals. (A-98-24)

Chairman HALL, Vice Chairman FRANCIS, and Members HAMMERSCHMIDT, GOGLIA, and BLACK concurred in this recommendation.

By:


Jim Hall
Chairman