



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: May 19, 2009

In reply refer to: A-09-29

Mr. Billy Nolan
American Airlines
4601 Highway 360
MD 849 GSWFA
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The National Transportation Safety Board (NTSB) is an independent Federal agency charged by Congress with investigating transportation accidents, determining their probable cause, and making recommendations to prevent similar accidents in the future. We are providing the following information to urge your organization to take action on the safety recommendation in this letter. The NTSB is vitally interested in this recommendation because it is designed to prevent accidents and save lives.

This recommendation, which addresses American Airlines' Continuing Analysis and Surveillance System (CASS) program, is derived from the NTSB's investigation of the September 28, 2007, aviation accident at Lambert-St. Louis International Airport (STL), St. Louis, Missouri, and is consistent with the evidence we found and the analysis we performed. As a result of this investigation, the NTSB has issued nine safety recommendations, one of which is addressed to American Airlines. Information supporting the recommendation is discussed below. The NTSB would appreciate a response from you within 90 days describing the actions you have taken or intend to take to implement our recommendation

On September 28, 2007, about 1313 central daylight time, American Airlines flight 1400, a McDonnell Douglas DC-9-82 (MD-82),¹ N454AA, experienced an in-flight engine fire during departure climb from STL. During the return to STL, the nose landing gear failed to extend, and the flight crew executed a go-around, during which the crew extended the nose gear using the emergency procedure. The flight crew conducted an emergency landing, and the 2 flight crewmembers, 3 flight attendants, and 138 passengers deplaned on the runway. No occupant injuries were reported, but the airplane sustained substantial damage due to the fire. The scheduled passenger flight was operating under the provisions of 14 *Code of Federal*

¹ Boeing Commercial Airplane Group bought McDonnell Douglas.

Regulations Part 121 on an instrument flight rules flight plan. Visual meteorological conditions prevailed at the time of the accident.²

The NTSB determined that the probable cause of this accident was American Airlines' maintenance personnel's use of an inappropriate manual engine start procedure, which led to the uncommanded opening of the left engine air turbine starter valve (ATSV), and a subsequent left engine fire, which was prolonged by the flight crew's interruption of an emergency checklist to perform nonessential tasks. Contributing to the accident were deficiencies in American Airlines' CASS program.

A number of deficiencies in the performance and effectiveness of American Airlines' maintenance program contributed to the accident. Although the American Airlines CASS program is intended to provide a structured process to identify and correct factors that could lead to an accident, the investigation revealed that the program did not prevent recurring engine no-start failures from leading to an accident.

First, American Airlines' CASS program should have ensured that the inspection and maintenance program related to the accident airplane's engine start system was effective when followed. During the 12-day period preceding the accident, however, the left engine ATSV was deferred and/or replaced a total of six times without permanently resolving the engine no-start condition on the accident airplane. Over that time, technical services personnel, who are assigned to review and act on alert items reported by line maintenance personnel, issued three Actions to be Taken in response to the alerts, indicating that they were aware of the repeated engine start failures and subsequent ATSV changes, but these actions failed to address the overall system issue. Instead of forbidding additional ATSV replacements until maintenance personnel could adequately troubleshoot the problem, determine its cause, and correct the problem, personnel continued to allow the airplane to be dispatched with deferrals against the left engine start system. The NTSB is concerned that the company's maintenance alert system did not recognize the recurring failed engine starts, ATSV replacements, and minimum equipment list deferrals as a possible serious problem that needed to be addressed systemically and that these unresolved maintenance problems were not adequately addressed through daily conference calls with maintenance and engineering staff conducted as part of American Airlines' CASS program.

In addition, a CASS program is supposed to ensure that an operator is following its inspection and maintenance manuals and procedures. The investigation found that American Airlines maintenance personnel were not complying with a number of maintenance program requirements, including the requirement to use approved manual engine start procedures and appropriate tools, to perform ATSV-air filter cleaning procedures during C checks, and to correctly document the work accomplished on the accident airplane.

As a result, the NTSB concludes that American Airlines' maintenance personnel were using maintenance procedures that were not in accordance with written manuals and guidelines and that its CASS program did not adequately detect and correct these performance deficiencies

² For more information, see National Transportation Safety Board, *In-Flight Left Engine Fire, American Airlines Flight 1400, McDonnell Douglas DC-9-82, N454AA, St. Louis, Missouri, September 28, 2007*, Aircraft Accident Report NTSB/AAR-09/03 (Washington, DC: NTSB, 2009).

before they contributed to an accident. Although these findings alone do not suggest that American Airlines' CASS program is wholly inadequate, the NTSB is concerned that maintenance personnel could be using other unapproved procedures and/or that other recurring problems with American Airline's airplanes could occur without detection and that this could affect safety.

Therefore, the National Transportation Safety Board makes the following recommendation to American Airlines:

Evaluate your Continuing Analysis and Surveillance System program to determine why it failed to (1) identify deficiencies in its maintenance program associated with the MD-80 engine no-start failure and (2) discover the lack of compliance with company procedures. Then, make necessary modifications to the program to correct these shortcomings. (A-09-29)

The NTSB also issued safety recommendations to the Federal Aviation Administration.

In response to the recommendation in this letter, please refer to Safety Recommendation A-09-29. If you would like to submit your response electronically rather than in hard copy, you may send it to the following e-mail address: correspondence@ntsb.gov. If your response includes attachments that exceed 5 megabytes, please e-mail us asking for instructions on how to use our Tumbleweed secure mailbox procedures. To avoid confusion, please use only one method of submission (that is, do not submit both an electronic copy and a hard copy of the same response letter).

Acting Chairman ROSENKER and Members HERSMAN, HIGGINS, and SUMWALT concurred with this recommendation. Member Sumwalt filed a concurring statement, which is attached to the aviation accident report for this accident. He was joined by Acting Chairman Rosenker.

[Original Signed]

By: Mark V. Rosenker
Acting Chairman