



# National Transportation Safety Board

Washington, D.C. 20594

## Safety Recommendation

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**Date:** December 10, 2001

**In reply refer to:** A-01-71 and -72

Honorable John J. Kelly, Jr.  
Assistant Administrator for Weather Services and  
Director of the National Weather Service  
Department of Commerce, NOAA  
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On June 1, 1999, at 2350:44 central daylight time,<sup>1</sup> American Airlines flight 1420, a McDonnell Douglas DC-9-82 (MD-82), N215AA, crashed after it overran the end of runway 4R during landing at Little Rock National Airport in Little Rock, Arkansas. Flight 1420 departed from Dallas/Fort Worth International Airport, Texas, about 2240 with 2 flight crewmembers, 4 flight attendants, and 139 passengers aboard and touched down in Little Rock at 2350:20. After departing the end of the runway, the airplane struck several tubes extending outward from the left edge of the instrument landing system localizer array, located 411 feet beyond the end of the runway; passed through a chain link security fence and over a rock embankment to a flood plain, located approximately 15 feet below the runway elevation; and collided with the structure supporting the runway 22L approach lighting system. The captain and 10 passengers were killed; the first officer, the flight attendants, and 105 passengers received serious or minor injuries; and 24 passengers were not injured. The airplane was destroyed by impact forces and a postcrash fire. Flight 1420 was operating under the provisions of 14 *Code of Federal Regulations* Part 121 on an instrument flight rules flight plan.<sup>2</sup>

The National Transportation Safety Board determined that the probable causes of this accident were the flight crew's failure to discontinue the approach when severe thunderstorms and their associated hazards to flight operations had moved into the airport area and the crew's failure to ensure that the spoilers had extended after touchdown. Contributing to the accident were the flight crew's (1) impaired performance resulting from fatigue and the situational stress associated with the intent to land under the circumstances, (2) continuation of the approach to a landing when the company's maximum crosswind component was exceeded, and (3) use of reverse thrust greater than 1.3 engine pressure ratio after landing.

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<sup>1</sup> Unless otherwise indicated, all times in this report are central daylight time, based on a 24-hour clock.

<sup>2</sup> For more information, see National Transportation Safety Board. 2001. *Runway Overrun During Landing, American Airlines Flight 1420, McDonnell Douglas MD-82, N215AA, Little Rock, Arkansas, June 1, 1999*. Aircraft Accident Report NTSB/AAR-01/02. Washington, DC.

## Center Weather Service Unit Staffing

Flight 1420 was handled by the Memphis air route traffic control center before the flight entered Little Rock airspace. The controllers at this center did not have access to real-time weather radar data, and no internal meteorological support was available to them because the Center Weather Service Unit (CWSU), which was not staffed for 24-hour operation, had closed about 2130, even though severe weather was predicted to affect the center's airspace. The CWSU meteorologists have access to Weather Surveillance Radar 1988 Doppler (WSR-88D)<sup>3</sup> weather products and thus could have provided the center controller with better information regarding the line of thunderstorms moving into the area. However, the availability of this information likely would not have affected the outcome of the accident because of the flight crew's impaired performance.

In its final report on the accident involving USAir flight 1016, which collided with trees and a private residence after executing a missed approach to runway 18R at Charlotte/Douglas International Airport, Charlotte, North Carolina, the Safety Board issued Safety Recommendations A-95-48 and -52.<sup>4</sup> These recommendations asked the Federal Aviation Administration (FAA) and the National Weather Service (NWS), in cooperation with each other, to reevaluate the CWSU program and develop procedures to enable meteorologists to immediately disseminate information about rapidly developing hazardous weather conditions to terminal radar approach control and tower facilities. On October 22, 2001, and August 7, 2001, the Board acknowledged that the FAA and NWS, respectively, were working to address the actions specified in the recommendations but expressed concern that the work was not scheduled to be completed in a timely manner. Pending completion of the FAA's and NWS' planned actions, Safety Recommendations A-95-48 and -52 were classified "Open—Acceptable Response" and "Open—Unacceptable Response," respectively.

Even after the FAA and the NWS have completed actions to address these recommendations, their intent cannot be fully achieved unless the CWSUs are adequately staffed at all times when rapidly developing hazardous weather conditions are possible. (In letters to the Safety Board regarding the progress in implementing these safety recommendations, neither agency has described such staffing for CWSUs.) The Safety Board concludes that CWSUs should be staffed at all times when any significant weather is predicted to affect their areas of operation, even if the weather is predicted to occur before or after normal operating hours. Therefore, the Safety Board believes that the NWS, in cooperation with the FAA, should ensure that CWSUs are adequately staffed at all times when any significant weather is forecast.

## Automated Surface Observing System Lockout Period

Weather observations at Little Rock National Airport are made by an Automated Surface Observing System (ASOS), which is maintained by the NWS. The ASOS records continuous

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<sup>3</sup> A WSR-88D system located in North Little Rock (6 miles north-northwest of the airport) provides a three-dimensional volume scan of the atmosphere at varying degrees of elevation and within a range of 240 miles.

<sup>4</sup> For detailed information, see section 1.18.5 in National Transportation Safety Board. 2001. *Runway Overrun During Landing, American Airlines Flight 1420, McDonnell Douglas MD-82, N215AA, Little Rock, Arkansas, June 1, 1999*. Aircraft Accident Report NTSB/AAR-01/02. Washington, DC.

information on wind speed and direction, cloud cover, temperature, precipitation, and visibility. The ASOS transmits an official meteorological aerodrome report (known as a METAR) at 53 minutes past each hour and a special weather observation (known as a SPECI) as conditions warrant; such conditions include a wind shift, change in visibility, and change in ceiling (cloud cover or height). The system is prevented from issuing any reports between 47:20 and 53:20 after the hour (known as the lockout period) so that the hourly observation can be prepared, edited, and transmitted.

The lockout feature on the ASOS prevented the system from issuing pertinent weather information for the flight crew. If the lockout had not been in place, the system would have issued a special observation when the reduced visibility, heavy rain, and strong gusting winds associated with the thunderstorm were detected. An additional special observation would have been issued when the visibility was further reduced.<sup>5</sup> (The ASOS edit log indicated that a special observation at 2347:22 was canceled, and a 2350:31 special observation was recorded but not disseminated.)

The canceled observation would have likely indicated that the thunderstorm was at the airport and provided the flight crew with critical situational awareness information about the intensity of the storm. Because the accident airplane did not touch down until 2350:20, the information in the canceled 2347:22 special observation would have provided the flight crew with another indication that it was unsafe to land. The NWS advised the Safety Board that the next ASOS software implementation would eliminate the lockout period but that a target date for implementation has not been established because of problems with the software. The Safety Board concludes that the ASOS lockout period can prevent the relay of critical weather information to flight crews. Therefore, the Safety Board believes that the NWS should eliminate the ASOS lockout feature as soon as possible.

Therefore, the National Transportation Safety Board recommends to the National Weather Service:

In cooperation with the Federal Aviation Administration, ensure that Center Weather Service Units are adequately staffed at all times when any significant weather is forecast. (A-01-71)

Eliminate the Automated Surface Observing System lockout feature as soon as possible. (A-01-72)

Also as a result of its investigation, the Safety Board issued Safety Recommendations A-01-49 through -70 to the Federal Aviation Administration.

The National Transportation Safety Board is an independent Federal agency with the statutory responsibility “to promote transportation safety by conducting independent accident investigations and by formulating safety improvement recommendations” (Public Law 93-633).

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<sup>5</sup> For detailed meteorological information, see section 1.7 in National Transportation Safety Board. 2001. *Runway Overrun During Landing, American Airlines Flight 1420, McDonnell Douglas MD-82, N215AA, Little Rock, Arkansas, June 1, 1999*. Aircraft Accident Report NTSB/AAR-01/02. Washington, DC.

The Safety Board is interested in any action taken as a result of its safety recommendations. Therefore, we would appreciate a response from you within 90 days regarding action taken or contemplated with respect to the recommendations in this letter. Please refer to Safety Recommendations A-01-71 and -72 in your reply.

Chairman BLAKEY, Vice Chairman CARMODY, and Members HAMMERSCHMIDT, GOGLIA, and BLACK concurred in these safety recommendations.

By: Marion C. Blakey  
Chairman