

NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

ISSUED: January 5, 1981

Forwarded to:

Honorable Langhorne M. Bond  
Administrator  
Federal Aviation Administration  
Washington, D.C. 20591

SAFETY RECOMMENDATION(S)

A-80-132 through -138

On June 12, 1980, an Air Wisconsin, Inc., Swearingen SA-226 Metro crashed near Valley, Nebraska, killing 13 persons and seriously injuring 2 others. The aircraft encountered an area of severe thunderstorms while at an altitude of less than 6,000 ft and experienced a simultaneous loss of power to both engines because of massive water ingestion. During its investigation of the accident, the National Transportation Safety Board found numerous deficiencies in the implementation of air traffic control procedures which affected the acquisition of weather data and the dissemination of that information to sector air traffic controllers and pilots. The Safety Board also discovered that the capabilities of airborne weather radar on the aircraft to detect severe weather echoes were limited significantly by rain-induced two-way attenuation, but that the pilots were probably not aware of the reduced capability of the radar.

The thunderstorm activity had been in the vicinity of the accident site for several hours, and a severe storm warning had been issued for the Omaha area. The meteorologists in the Minneapolis Air Route Traffic Control Center (ARTCC) had alerted supervisory air traffic control personnel of the severity of the weather conditions at various times before the accident; however, that information was not disseminated to the controllers or to the flightcrew. Furthermore, the two team supervisors and the two flow control/weather coordinators did not determine if the severe weather was affecting the air traffic in the low-altitude sectors, although the flow controllers had acknowledged that the high-altitude traffic was rerouted because of the thunderstorms.

The Safety Board is concerned since adequate personnel, procedures, and units were available to provide adequate ATC services to the flightcrew. However, the weather information that was critical to the sector controllers was not passed by the ATC supervisors, who assumed that other supervisors had passed the information along. In addition, the four supervisors were not in agreement regarding the responsibilities for assessing the impact of severe meteorological conditions on low-altitude air traffic flow. Finally, one weather coordinator indicated that he was not trained properly to fulfill the weather coordinator duties.

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The aircraft separation requirements of the ATC system were also examined during the investigation. Controllers and air traffic control supervisors testified at the public hearing that the air traffic system was not required to separate aircraft from hazardous weather conditions. The Safety Board agrees that the avoidance of hazardous weather conditions is a pilot responsibility. However, the future ATC system should consider the feasibility of actively separating aircraft from known meteorological conditions when adequate weather intelligence exists. We urge the Federal Aviation Administration to undertake an experimental program to analyze and evaluate the technical and operational feasibility of the ATC system providing separation between aircraft from severe meteorological conditions.

The Safety Board is also concerned by the limitations of airborne weather radar. Testimony at the public hearing indicated that the capability of the aircraft radar was limited severely by rain-induced two-way attenuation. Based on the circumstances existing at the time of the accident, the attenuation limited the range of the radar set in contour mode to about 15 miles in moderate rainfall and to about 1 mile in heavy precipitation. Consequently, the flightcrew, which probably depended on the airborne radar to avoid the strongest weather echoes, had no way to determine the location or the intensity of the weather echoes ahead of the aircraft until they were too close to avoid the hazardous conditions. The Safety Board believes that further study on the effects of attenuation is required and that airline and general aviation training programs must be changed to provide additional information to pilots about the effects of attenuation on X-band airborne weather radar.

Finally, the investigation revealed that the aircraft emergency exits were not installed so they could be opened from outside the aircraft by rescuers. Immediate access to the passenger cabin was available through the rear pressure bulkhead and breaks in the fuselage. However, if rapid access had been necessary, the lack of adequate markings and opening mechanisms would have hampered rescuers.

Therefore, the National Transportation Safety Board reiterates the following safety recommendations:

Amend 14 CFR 23.785(f) to require dynamic testing of seats to insure more realistic protection of occupants from serious injury in a minor crash. (Class III, Longer Term Action) (A-75-51)

Expedite the development and implementation of an aviation weather subsystem for both en route and terminal area environments, which is capable of providing a real-time display of either precipitation or turbulence, or both, and which includes a multiple-intensity classification scheme. Transmit this information to pilots either via the controller as a safety advisory or via an electronic data link. (Class II, Priority Action) (A-77-63)

Formulate rules and procedures for the timely dissemination by air traffic controllers of all available severe weather information to inbound and outbound flightcrews in the terminal area. (Class II, Priority Action) (A-77-68)

Initiate research to determine the attenuating effects of various levels of precipitation and icing on airborne radomes of both X- and C-band radar, and disseminate to the aviation community any data derived concerning the limitations of airborne radar in precipitation. (Class II, Priority Action) (A-78-1)

As a further result of this investigation, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Undertake an experimental program to analyze and evaluate the technical and operational feasibility of requiring that air traffic control provide separation between aircraft and severe meteorological conditions when the nature and location of the meteorological conditions can be determined. (Class III, Longer Term Action) (A-80-132)

Review the relationship and duties of ARTCC team supervisors to flow controllers/weather coordinators to insure that the nature of each job function is understood and accomplished. (Class III, Longer Term Action) (A-80-133)

Require that the subject accident report be reviewed by air traffic control specialists and supervisors. (Class III, Longer Term Action) (A-80-134)

Require that flow controllers and supervisory personnel assess the potential effects of hazardous weather on low-altitude en route traffic and use the evaluation to adjust air traffic flow as necessary. (Class II, Priority Action) (A-80-135)

Require that the effect of precipitation-induced attenuation on X-band airborne weather radar be incorporated into airline training programs and that airborne weather radar manufacturers include attenuation data in radar operators handbooks. (Class II, Priority Action) (A-80-136)

Amend 14 CFR 23.807, Emergency Exits, to require all emergency exits on Part 23 air taxi and commuter aircraft with a capacity of 10 or more passenger seats manufactured after a specified date to be installed so that each could be opened from outside the aircraft. (Class III, Longer Term Action) (A-80-137)

Evaluate procedures which govern the transmission of SIGMET's on nav aids to determine what additional steps are necessary to provide timely dissemination, and take necessary corrective measures to insure that they are issued according to the procedures. (Class II, Priority Action) (A-80-138)

KING, Chairman, DRIVER, Vice Chairman, McADAMS, GOLDMAN, and BURSLEY, Members, concurred in these recommendations.

  
By: James B. King  
Chairman

