NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: July 10, 1974

Forwarded to:

Honorable Alexander P. Butterfield
Administrator
Federal Aviation Administration
Washington, D. C. 20591

SAFETY RECOMMENDATION(S)

A-74-55

On October 28, 1973, Piedmont Air Lines Flight 20, a B-737, was involved in an accident at the Greensboro-High Point-Winston Salem Regional Airport, at Greensboro, North Carolina. The flight was attempting a precision approach (ILS) to runway 14. The accident occurred during darkness, a heavy rainshower, and restricted visibility.

Two similar accidents have also occurred recently. On November 27, 1973, a Delta Air Lines DC-9-32 was involved in an accident at Chattanooga, Tennessee, and on December 17, 1973, an Iberian DC-10-30 was involved in an accident at Logan International Airport, in Boston, Massachusetts. Both aircraft were making precision approaches during meteorological conditions that included low ceilings and limited visibility. The investigations of these accidents revealed an area in the approach-to-landing phase of flight that can be made safer by additional approach guidance.

Although vertical guidance was provided in each case by an electronic glide slope, no visual approach slope indicator (VASI) system was installed for any of the approaches. Therefore, the crew had to rely only on visual cues during the final critical stage of the approach. The Safety Board realizes that a VASI is not required; however, the Board believes that the installation of a VASI in conjunction with a full ILS should not be considered a duplication of equipment, as these accidents indicate that additional vertical guidance is needed to complement the electronic glide slope.

The installation of a VASI on a precision approach runway would not replace the glide slope as the primary means of vertical guidance, nor would it change the intent of 14 CFR 91.117 regarding descent below decision height (DH). A VASI would, however, do much to enhance the safety factor by allowing the pilot to transfer to the visual portion of the approach and still retain a display of his approach path, since during periods of low visibility, the visual cues available from the approach lights and the approach end of the runway may be inadequate.

In replies to previous NTSB recommendations concerning altitude and ground warning systems, the Administrator apparently agreed in stating: "The VASI would provide vertical guidance at normal descent rates for the visual segments of the approach. This result would be a greater degree of altitude awareness through the procedure."

The captain of the Delta DC-9 stated that he believed the approach was normal until just before impact, when his sight picture suddenly flattened. Possibly, he was experiencing an optical illusion caused by the heavy rain on the aircraft windshield. Had there been a VASI available, the captain would have been warned that the aircraft was descending below glidepath.

Several major airports have been certificated which have precision approaches where the glide slope is unusable below DH. Logan International Airport and Los Angeles International Airport are only two of these airports. If a VASI were available for approaches of this type, more positive vertical guidance would be available from DH to landing. In addition, VASI could also be used when the approach becomes visual before the aircraft reaches DH. The pilot who knows that the glide slope will exceed tolerances below DH should integrate the VASI into his normal scan pattern and use the VASI to monitor the final stages of the approach.

The Safety Board believes the VASI can be a valuable supplement to any ILS approach, even under minimum weather conditions, and therefore recommends that the Federal Aviation Administration:

> Continue to install VASI's on all ILS runways, but with the first priority being assigned to runways where the glide slope is unusable below DH and to those runways used by air carrier aircraft.

REED, Chairman, McADAMS, THAYER, and BURGESS, Members, concurred in the above recommendation. HALEY, Member, was absent, not voting.

By: John H. Reed
Chairman

THIS RECOMMENDATION WILL BE RELEASED TO THE PUBLIC ON THE ISSUE DATE SHOWN ABOVE. NO PUBLIC DISSEMINATION OF THE CONTENTS OF THIS DOCUMENT SHOULD BE MADE PRIOR TO THAT DATE.