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National Transportation Safety Board

Washington, D.C. 20594
Safety Recommendation

Date: October 16, 1987

In reply refer to: A-87-112 and -113

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On October 25, 1986, Piedmont Airlines flight 467, a Boeing 737-222, N752N, was a regularly scheduled flight operating under 14 CFR 121 from Newark International Airport to Myrtle Beach, South Carolina, with an en route stop at Charlotte Douglas International Airport, Charlotte, North Carolina. There were 114 passengers and 5 crewmembers on board. The flight was routine until its arrival into the Charlotte area, where instrument meteorological conditions prevailed. At 2004:17, the flight was cleared for the instrument landing system approach (ILS) to runway 36R. The airplane touched down at 2007:19 and about 2007:43 it departed the runway. The airplane struck the localizer antenna array located about 300 feet from the departure end of the runway, struck a concrete culvert located 18 feet beyond the localizer, and continued through a chain link fence. It came to rest upon the edge of railroad tracks located 440 feet from the departure end of the runway. The airplane was destroyed, 3 passengers sustained serious injuries, and 3 crewmembers and 28 passengers sustained minor injuries in the accident. 1/

After it left the runway, the airplane struck and broke off the localizer antenna array from its frangible moorings. However, about 18 feet beyond the antenna was a concrete culvert which caused almost all the damage to the airplane and injuries to those who were injured. The Safety Board believes that the presence of the concrete culvert created a more destructive and severe accident than what it otherwise would have been without the culvert.

In lieu of regulatory guidance concerning extended runway safety areas, Advisory Circular (AC) 150/5335-4, Change 2 to Airport Design Standards—Airports Served by Air Carriers" emphasizes the need for establishment of extended runway safety areas. The AC states that "for existing runways . . . extended runway safety zones should be provided wherever physically feasible and economically possible . . ." The AC states that the extended runway safety area is a rectangular area centered on the extended runway

1/ For more detailed information, read Aviation Accident Report—"Piedmont Airlines Flight 467, Boeing 737-222, N752N, Charlotte Douglas International Airport, Charlotte, North Carolina, October 25, 1986" (NTSB/AAR-87/08).

centerline. It begins at the end of the runway safety area and extends 800 feet to a point 1,000 feet from the runway end. Its width is the same as the runway safety area. It further stipulates that "the extended runway safety area should be cleared and free of structures, objects, abrupt surface irregularities, ditches, soft spots, and ponding areas. All objects, which, because of their function, must be maintained within the extended runway safety area, should be constructed with frangibly mounted supporting structures of minimum practical heights."

With respect to the extended runway safety area at the departure end of runway 36R at Charlotte Airport, the Safety Board takes a critical view of the location of a concrete culvert on the extended runway centerline 318 feet beyond the runway end. In fact, this culvert was allowed to exist 18 feet behind a localizer antenna that was made frangible at considerable expense.

Unless physically impossible or economically impossible, the extended runway safety area should be maintained beyond the end of the runway. In the case of Charlotte Airport, although it would be impractical to move the railroad tracks located approximately 450 feet beyond the end of runway 36R, the concrete culvert could have been placed out of the extended runway safety area or could have been covered at little expense. Therefore, the Safety Board believes that airport managers should repair and/or remove, at the earliest opportunity, obstacles, such as concrete culverts, that are adjacent to airport areas.

The lack of acceptable friction in portions of the runway increased the severity of the accident because the airplane departed the runway at a higher speed than it probably would have had there been adequate grooving and drainage in the departure end of the runway. The evidence indicates that PI 467 experienced hydroplaning before it departed the runway, as indicated by the reverted rubber marks found on the four main landing gear tires and the "steam clean" marks found on the departure end of the runway. Although runway friction was, according to FAA-recommended standards, not acceptable only near its departure end, the Safety Board concludes that the runway condition was not a primary cause of the accident because of the excessive speed of the airplane as it entered the last 1,500 feet of the runway; but the poor friction did contribute to the severity of the accident.

Although the Safety Board concludes that the condition of runway 18L/36R did not contribute to the cause of the accident, the evidence indicates that the runway did not meet the maintenance standards recommended in FAA Advisory Circular (AC) 150/5320-12A, dated July 11, 1986. The circular also indicates that the Charlotte Airport Authority did not comply with 14 CFR 139.83 regarding the prevention of ponding on runway pavement areas.

Currently, airports that are certificated under 14 CFR Part 139 are responsible for their own "self-inspection" program that, among other things, requires them to ensure that the airport pavement surface is adequately maintained. The Charlotte Airport Operations Manual (AOM) was examined subsequent to the accident. It stated that "the runways have been designed to provide 1 1/2 percent crown . . . all of the runways are grooved full length and width to facilitate runoff." Because of the deficiencies that were found in the condition of runway 36R (i.e., it did not have 1 1/2 percent crown in over half the length, the grooving was substantially collapsed in the last 1,500 feet, there were ruts (which were conducive to ponding) for almost the entire length, and the measured friction over the last 1,500 feet was substandard), the Safety Board believes that the airport operator failed to maintain the runway surface to standards specified in the AOM or to the criteria recommended in AC 150/5320-12A.

The deteriorated condition of runway 36R at the Charlotte Airport is indicative of failures on the part of the airport operator and the FAA inspectors to identify and correct runway conditions that could adversely affect the safety of air carrier operations during inclement weather conditions. Further, the Safety Board believes that the recently revised AC 150/5320-12A should serve as a basis for an aggressive runway inspection and maintenance program.

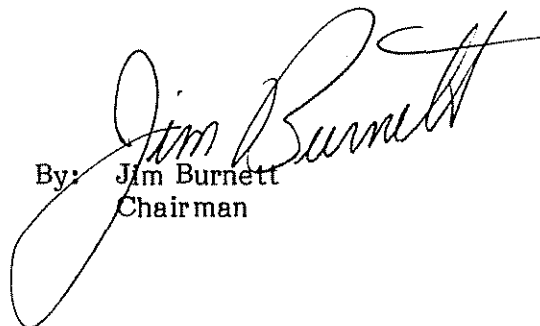
Therefore, as a result of its investigation, the National Transportation Safety Board recommends that the American Association of Airport Executives and the Airport Operator's Council International, Inc.:

Inform its membership of the circumstances of the aircraft accident at Charlotte Douglas International Airport on October 25, 1986, and request its membership to repair areas and/or remove obstacles, such as concrete culverts, that are adjacent to airport operating areas. Such repairs should be performed at the earliest opportunity. (Class II, Priority Action) (A-87-112)

Inform its membership of the circumstances of the aircraft accident at Charlotte Douglas International Airport on October 25, 1986, and request its membership to identify deficient runway conditions, to use approved friction-measuring devices to measure the dry runway coefficients of friction, and to correct (or provide appropriate notice to users) runway conditions that do not meet the criteria recommended in Advisory Circular 150/5320-12A. (Class II, Priority Action) (A-87-113)

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). The Safety Board is vitally interested in any actions taken as a result of its safety recommendations and would appreciate a response from you regarding action taken or contemplated with respect to the recommendations in this letter. Please refer to Safety Recommendations R-87-112 and -113 in your reply.

BURNETT, Chairman, GOLDMAN, Vice Chairman, and LAUBER, NALL and KOLSTAD, Members, concurred in these recommendations.

By: 
Jim Burnett
Chairman

