NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: August 8, 1978

Forwarded to:

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

SAFETY RECOMMENDATION(S)

A-78-51 and -52

On June 3, 1977, Continental Air Lines, Inc., Flight 63 struck powerlines and utility poles after takeoff from runway 21 at the Tucson International Airport, Tucson, Arizona. Although the aircraft was damaged substantially, it returned to the airport and landed safely; there were no injuries. The Safety Board's investigation of the accident disclosed that the flightcrew failed to use the 500-foot displaced threshold area which was available for the takeoff.

The takeoff analysis data page of operating gross weights for the Tucson International Airport disclosed that,because of obstructions in the initial climb segment, the maximum allowable takeoff weight for the accident aircraft for runway 21 was limited. In this case, at zero wind velocity, the aircraft was too heavily loaded for takeoff on runway 21, and at least a minimum headwind of about 4 knots was required to fulfill the takeoff weight requirements. Although at the time of takeoff the headwind component was greater than required, the captain did not consult the takeoff data pages that may have permitted him to use a takeoff distance that did not include the displaced threshold length. The Safety Board believes that the flightcrew of Flight 63 was not aware that the allowable weight depended on the use of the additional 500 feet of displaced threshold, which was beyond the landing threshold.

The Tucson air traffic controller who was on duty at the time of the accident testified that about 50 percent of air carrier flights took off from runway 21 without using the full runway; instead, they took off from the intersection of the runway and the taxiway. This intersection adjoins the runway about 500 feet from the runway's end; beyond this intersection, the displaced threshold symbols are painted on the runway surface. This taxiway configuration is uncommon to most

runways. Usually, taxiways join the takeoff surface at the runway's end, and flightcrews are not concerned about the displaced threshold when they align the aircraft for takeoff. However, the Safety Board is concerned that under certain conditions, such as reduced visibility, darkness, atypical taxiway-runway configurations, or pilot oversight, flightcrews may not realize that takeoff surfaces beyond a displaced threshold are available for takeoff and may be critical to a successful takeoff. We believe that uncommon taxiway-runway design, where the displaced threshold symbols do not immediately adjoin the runway entrance and aircraft must be backtracked to the start of the takeoff area or where threshold lights designate the beginning of the landing surface and the aircraft must be taxied past the threshold lights to the displaced threshold area, can lead to flightcrew unawareness of available runway lengths and result in unnecessary hazardous situations.

The Safety Board recognizes that airport diagrams, which are contained in readily available approach chart manuals, illustrate displaced threshold symbols. However, there may be instances when there is no need for flightcrews to consult the airport diagram before takeoff; therefore, we believe that other informational means should be provided to alert flightcrews that a displaced threshold is part of the runway plan.

Accordingly, the National Transportation Safety Board recommends that the Federal Aviation Administration:

> Require that all takeoff analysis data pages of operating gross weights in air carrier manuals be footnoted to identify those runways which contain a displaced threshold. (Class III, Longer Term Action) (A-78-51)
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> Require that all operators of certificated airports where runway designs feature a displaced threshold and taxiways enter the runway at points other than the runway's end install an easily visible intersection sign which displays a displaced threshold notation. (Class III, Longer Term Action) (A-78-52)

KING, Chairman, McADAMS, HOGUE, and DRIVER, Members, concurred in these recommendations.

By: James B. King
Chairman