

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: April 19, 1974

Forwarded to:

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

SAFETY RECOMMENDATION(S)

A74-30 thru 34

A review by the National Transportation Safety Board of weather-involved approach and landing accidents has revealed persistent problems which have resulted from imprecise and nonrepresentative airport meteorological observations and attendant inadequacies in operational meteorological minimums.

The Safety Board has recommended repeatedly to the Federal Aviation Administration that Decision Heights below 200 feet should not be established and that descent below Decision Heights or Minimum Descent Altitude should not be authorized, unless the runway threshold is in sight. The Safety Board's recommendations were based on the accident/incident record which clearly demonstrates the inadequacies of the weather observation program and the human limitations in regard to detection, evaluation, and response times. Terminology in the Federal Aviation Regulations, such as, "objects identifiable with the runway" or "runway environment" is not adequate since such terms are vague or at best, imprecise. "Runway threshold," on the other hand, is specific and cannot be misconstrued.

Several years ago, because of recognized inadequacies in the ceiling and prevailing visibility concepts, the runway visibility (RVV) and runway visual range (RVR) concepts were developed. However, when operational RVR minimums were lowered, it was necessary to reduce the transmissometer baseline used in the measurement of RVR to 250 feet.

Furthermore, such transmissometer installations are not adjacent to the runway, but are parallel to it and at a considerable distance from it (500 feet in Boston). Clearly, it is not realistic to assume that RVR measurements represent conditions along the entire 10,000 feet or more of runways, much less represent conditions in the approach zone.

On November 30, 1962, an Eastern Air Lines DC-7B crashed during an attempted go-around following an ILS approach to runway 4R at New York's Kennedy International Airport. The causal statement associated with that accident included the phrase: "Fog conditions inadequately reported." As a result of the accident, several recommendations were made to the FAA and to the Weather Bureau intended to improve terminal weather observations. One such improvement involved the use of certified runway observers when the RVR transmissometer was inoperative.

In December 1963, when Western Air Lines Flight 221 was involved in an accident at Los Angeles International Airport, the transmissometer baseline was 500 feet rather than the present 250 feet. Even then, when the baseline was longer, the accident report issued by the Civil Aeronautics Board contained the following:

"Both the Board and the Administrator are aware of the possible detriments to take-off and landing caused by unreported weather phenomena such as the thick patches of fog encountered by WAL Flight 221 after touchdown. It is recognized that non-homogeneous fog conditions when existing beyond an RVR installation or outside of the sphere of visual observation points used for determining prevailing visibility can, under the present methods of measuring visibility, remain unreported. However, as outlined in the FAA Advisory Circular ACC 00-13A, effective February 24, 1965, plans are now in effect to improve the 'state of the art' in these areas. It is anticipated that in the future one or more additional transmissometers may be located on other portions of the runway for the purpose of providing more representative reports."

Although two or three transmissometers are now installed along some runways, readings from the additional instruments are not used in connection with operational meteorological minimums. Only the readings from the transmissometer nearest the threshold are used in connection with such minimums.

From 1963 to 1973, the National Transportation Safety Board and the Civil Aeronautics Board have urged repeatedly that safety buffers be applied in the establishment of operational meteorological minimums primarily because of the inadequacies in the terminal weather observation program.

The FAA Notice of Proposed Rule Making, 72-17, suggested amending 14 CFR 91.116 to prohibit a pilot from initiating an approach to an airport when the official ground-based visibility measurement was below prescribed minimums. In the Board's comments on the proposal, it stated, in part:

"If present weather reporting facilities were adequate or if current weather observing deficiencies were correctable in the near future, the proposed restriction on the initiation of approaches would be the most appropriate course of action."

Although direct observation of slant visual range is still in the developmental stage, there is no technical reason that measurements of visibility cannot be made in the approach area.

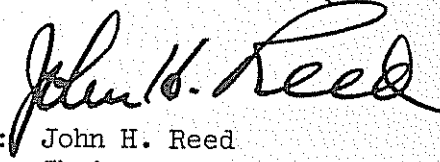
Consequently, the Safety Board recommends that the Federal Aviation Administration:

1. Install conventional transmissometers or other visibility measuring devices in the approach areas of instrument runways.
2. Install ceilometers in the approach areas of instrument runways.
3. Combine the approach zone transmissometer or visibility readings with the ceilometer readings to produce estimates of "threshold contact height."
4. Employ runway observers to take cloud height and visibility observations in the approach area whenever the prevailing visibility becomes 1 mile or less at those locations having minimums of less than 1 mile. These observers should be used until the instruments described in 1. above are installed in the approach area.
5. Reassess the operational meteorological minimums to make full use of the new observations.

Honorable Alexander P. Butterfield (4)

Members of our Bureau of Aviation Safety staff will be available for consultation in the above matters, if desired.

REED, Chairman, McADAMS, THAYER, BURGESS, and HALLEY, Members, concurred in the above recommendations.



By: John H. Reed
Chairman

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