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NATIONAL TRANSPORTATION SAFETY BOARD  
DEPARTMENT OF TRANSPORTATION  
WASHINGTON, D.C. 20591

January 17, 1969

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Mr. David D. Thomas  
Acting Administrator  
Federal Aviation Administration  
Department of Transportation  
Washington, D. C. 20590

Dear Mr. Thomas:

Accidents which occur during the approach and landing phase of flight continue to be among the most numerous. They are again highlighted by some of the events of the past month that have aroused nationwide interest in air safety. Most approach and landing accidents have been attributed to improper operational procedures, techniques, distractions, and flight management. In many cases vertical/horizontal wind shear, forms of turbulence, and altimetry difficulties were, or could have been contributing factors. The phenomenon of breaking out into visual flight conditions and subsequently becoming involved in patches of fog, haze, rain, blowing snow and snow showers and other visibility obscuring forms of precipitation seems to be fairly common occurrence. The sensory illusion problem associated with night approaches over unlighted terrain or water is another likely factor about which more is being learned daily.

Other related factors are the handling characteristics of our transport type aircraft in day-to-day operations, the absence or outage of glide slope facilities, cockpit procedures, possible effects of snow or rain on dual static port systems as they could affect altimetry accuracy, and altitude awareness. These are all factors which may exist singularly or in combination. The inability to detect or obtain positive evidence, particularly such evidence as ice accretion or moisture which becomes lost in wreckage, makes it difficult, if not impossible, in many cases to reach conclusions based upon substantial evidence. It is clear that had all ground and airborne navigational systems been operating accurately and had the flight crews been piloting with meticulous reference to properly indicating flight instruments, these accidents would not have occurred.

In this light, and with the number and frequency of approach and landing phase accidents under similar weather and operating environments, we believe that certain immediate accident prevention measures need to be taken. We believe that preliminary to the successful completion of our investigations into the factors and causes of the recent rash of accidents, renewed attention to, and emphasis on recognized good practices will tend to reduce the possibilities of future accidents.

Pilots, operators and the regulatory agencies should renew emphasis on -- and improve wherever possible -- cockpit procedures, crew discipline, and flight management. It is recommended that both the air carrier industry and the FAA review policies, procedures, practices, and training toward increasing

crew efficiency and reducing distractions and nonessential crew functions during the approach and landing phase of the flight. It is specifically recommended that crew functions not directly related to the approach and landing, be reduced or eliminated, especially during the last 1000 feet of descent. Accomplishment of the in-range and landing check lists as far as possible in advance of the last 1,000-foot descent will allow for more intense and perhaps more accurate cross checking and monitoring of the descent through these critical altitudes.

It is also recommended that during the final approach one pilot maintain continuous vigilance of flight instruments - inside the cockpit - until positive visual reference is established.

In order to induce a renewed altitude awareness during approaches where less than full precision facilities exist, it is recommended that there be a requirement that during the last 1000' of final approach the pilot not flying call out altitudes in 100-foot decrements above airport elevation (in addition to airspeed and rate-of-descent). To further enhance altitude awareness within the cockpit, it is recommended that there be a requirement to report indicated altitude to Air Traffic Control at various points in the approach procedure such as the outbound procedure turn and at the outer marker position.

Consistent with and in support of the concept inherent in your Notice of Proposed Rulemaking No. 67-53, the Board urges the aviation community to consider expediting development and installation of audible and visible altitude warning devices and the implementation of procedures for their use. Additional improvements, although desirable now, are attainable only through continued research and development.

The reassessment of altimetry systems with particular regard to their susceptibility to insidious interference by forms of precipitation needs to be the subject of attention by the highest level of aeronautical research facilities and personnel. Toward this end, we are meeting with members of your staff, the National Aeronautics and Space Administration and various segments of the aviation community to initiate an assessment of possible failure modes and effects within the static system.

The possibility of development of additional altitude warning systems - external to the aircraft - needs to be explored by the aviation community. One such possibility would be a high intensity visual warning red light beam - projected up along and slightly below the desired approach glide slope - to warn of flight below the desired path.

Likewise, development is needed in the fields of radio/radar, and inertial altimetry and CRT/microwave pictorial display approach aids as possible improved replacement of the barometric altimetry system in the near future.

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Modified use of existing approach radar should be further studied with regard to its adaptability as a surveillance--accident prevention--tool for nonprecision instrument approach.

During the time that we press for answers as to the causes of a number of these recent accidents, the Board urges increased surveillance, more frequent and more rigorous inspection and maintenance of altimetry systems by both the air carrier operators and the FAA; and urges also that the FAA reexamine certification requirements and procedures to determine if there is a possibility of a single failure mode of nominally dual systems which, when combined with an already existent passive failure or inadequate cockpit procedures, can invalidate dual failure protection features.

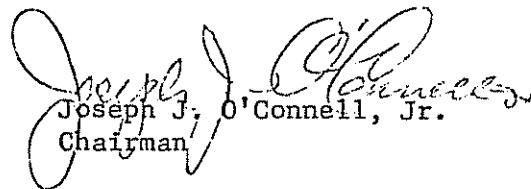
Whereas these problems have been highlighted by air carrier accidents, they should not be construed as being unique to air carrier aviation. The Safety Board considers that they are applicable to all forms of air transportation.

We know that your Administration, as well as other responsible segments of the aviation community, have been working extensively in all of these areas.

We appreciate your continuing emphasis on the safety of air carrier operations as evidenced by recent communications with your inspectors and airline management.

Your views regarding the implementation of our suggestions will be welcome.

Sincerely yours,

  
Joseph J. O'Connell, Jr.  
Chairman