UNITED STATES OF AMERICA

NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C.

ISSUED: December 20, 1972

Adopted by the NATIONAL TRANSPORTATION SAFETY BOARD
at its office in Washington, D. C.
on the 29th day of November 1972

FORWARDED TO:
Honorable John H. Shaffer
Administrator
Federal Aviation Administration
Washington, D. C. 20591

SAFETY RECOMMENDATIONS A-72-213 thru 218

On August 24, 1972, the National Transportation Safety Board completed a public hearing on the Delta Air Lines, Inc., DC-9-14, N3305L, accident which occurred at Fort Worth, Texas, on May 30, 1972.

In the Safety Board's letter to you on June 30, 1972, preliminary evidence disclosed that the DC-9 had entered into the vortex turbulence generated by a preceding DC-10 airplane which had been making a "touch-and-go" landing at Greater Southwest Airport.

During the Board's public hearing, which was completed on August 24, 1972, testimony presented by Federal Aviation Administration and industry personnel involved in the research and operational aspects of vortex turbulence outlined the extensive efforts that are in progress to establish a vortex detection and avoidance system. However, implementation of such a system may not be possible for at least 2 years. The Board commends the Federal Aviation Administration for this research and urges continuation and acceleration of this project.

The air traffic control procedures which describe terminal area operations with respect to the wake vortex hazard were derived from data obtained during a 1970 flight test program. Our review of these studies indicates that there may be a requirement to extend, under certain conditions, the established separation in the terminal area. There is evidence that vortices do not always dissipate within the time frame prescribed in the present separation standards and that vortices generated by medium- and long-range air carrier aircraft not included in the "heavy" category offer a substantial threat to following aircraft. The Board understands that an unqualified increase in existing separation standards is not the answer to the vortex avoidance problem.

The behavior characteristics of a vortex in ground effect can be reasonably well predicted if the surface winds are known, and we believe that this knowledge should be applied to the formulation of interim separation standards for both IFR and VFR terminal area operations.

The VFR or visual approaches are of particular concern to the Board. The adequacy of information available to pilots regarding vortex existence and their ability to avoid trailing vortices are questionable. The testimony indicates that it is very difficult for a pilot to judge the distance separating his from a preceding aircraft, to estimate the preceding aircraft's vertical descent path, or to determine the preceding aircraft's touchdown point.

A lack of information exists regarding the vortex turbulence problem in civil aviation as it pertains to other than general aviation aircraft. In addition, there is a lack of definitive information regarding the vortex-generating characteristics of the various aircraft operating in the National Airspace System.

The Board believes that the vortex turbulence problem merits intensified accident prevention effort. This phenomenon can have an adverse effect upon both VFR and IFR operations of all categories of aircraft and preventive measures should be sufficiently broad in scope to apply to all affected operations. Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

1. Revise appropriate publications to assure that they describe more specifically the desirable avoidance techniques (e.g., following aircraft maintain approach path above VASI or ILS glide slope, extending downwind leg, etc.).

2. Define and publish the meteorological parameters which cause trailing vortices to persist in the vicinity of the landing runway.

3. Include wake turbulence warnings on the ATIS broadcasts whenever the meteorological conditions identified in Recommendation 2, above, indicate that vortices will pose an unusual hazard to other aircraft.

4. Develop, on an expedited basis, new ATC separation standards which consider the relative span loadings of the vortex-generating aircraft and the following aircraft under meteorological conditions defined as being conducive to the persistence of trailing vortices.

5. Pending the development of the standards referred to in Recommendation 4, above, instruct controllers to increase separation times of controlled aircraft to at least 3 minutes whenever the meteorological conditions defined under Recommendation 2, above, exist.

6. Develop methods for tower controllers to aid pilots of flights in the traffic pattern to maintain adequate separation to avoid wake turbulence encounters. Such methods might include the use of local geographic landmarks, radar or time separation over fixed points.

Our technical staff is available for further discussion or clarification of these recommendations, if desired.

These recommendations 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.

Reed, Chairman, McAdams, Burgess and Haley, Members, concurred in the above recommendations. Thayer, Member, was absent, not voting.

By: John H. Reed
Chairman