Wake Turbulence Separation Standards for Aircraft

Increasing Capacity and Making Air Travel Safer, Greener

A key component of the Next Generation Air Transportation System

As airlines move the air, counter-rotating horizontal tailwashes are generated off the wings. This phenomenon, known as wake turbulence, poses a potentially dangerous situation for trailing aircraft. The Federal Aviation Administration (FAA) counts on experts at Volpe, the National Transportation Systems Center, to better understand the behavior of wake turbulence and to recommend critical adjustments to aircraft separation standards.

Success in Minneapolis: Transforming the Nation’s Air Traffic Control System

- Aircraft at Minneapolis International Airport, home of the Polaris World Hub, can now safely depart less than 1,000 feet behind an aircraft that just before. In November 2012, controllers at the Minneapolis Tower and Terminal Radar Approach Control Facilities began testing to see if the arrival aircraft spacing criteria, known as RECAT-M, could improve the safety and efficiency of Minneapolis airport operations.

The data collected under RECAT-M, known as Volpe Turbulence Mitigation for Minneapolis (VTMMP), was analyzed to determine the best way to implement the new wake turbulence separation criteria.

14 extra planes per hour

Across the nation, other airports may see an average increase of 7 – 10% depending on the size of aircraft.

In Minneapolis, airport capacity has increased 19%.

A New Air Traffic Management Tool to Reduce Delay, Improve Safety

The new tool, known as Volpe Turbulence Mitigation for Minneapolis (VTMMP), offers a unique opportunity to expand safety.

The tool calculates the expected separation between aircraft based on meteorological and aircraft characteristics.

Before: 4 planes, 3 mile queue

After: 3 planes, 9 mile queue

Closely Spaced Runways Can Be Used More Frequently

- Research to improve understanding of wake turbulence led to greater capacity and improved safety in airports with closely spaced parallel runways — less than 2,500 feet apart.

- The FAA is moving to change the operational procedures at 68 airports to allow for more departures and fewer delays, under specific conditions.

Advancements in Sensor Technology

- Wake turbulence detection improves by using a return on investment analysis of the wake turbulence measurements.

75 publications authored by Volpe’s experts have been identified as seminal works on wake turbulence.

Volpe collects data at or near airports, often using non-intrusive methods and equipment used to contact the observers.

Volpe analyzes the data, the systems, and the procedures to identify FAA policy and regulations.

Volpe supports the efforts to successfully implement new wake turbulence procedures around the globe.

Volpe is the only organization in the U.S. that monitors and displays wake measurement sites and their capabilities, and performs an analysis of the wake turbulence data.

- 384,000 measurements per year

- 85,000 measurements per year

- 116,000 measurements per year

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Source: Volpe Center