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Wake Turbulence Overview for Training Aid Users



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Wake Turbulence - Overview for Training Aid Users

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1.0 Introduction

Airframe manufacturers, aircraft associations, airlines, pilot groups, air traffic controllers, government and regulatory agencies, and other organizations and individuals have developed this training resource dedicated to reducing the number of wake-turbulence accidents and incidents. The training package consists primarily of this document. A condensed version of this aid can be found in Section 3, Appendix 3-A, Pilot and Air Traffic Controller Guide - Pullout Section. Additionally, a companion video developed by the Wake Turbulence Training Aid Industry Team is also available.

Wake-turbulence accidents and incidents have been, and continue to be, a significant contributor to the worldwide safety statistics. The National Transportation Safety Board (NTSB), in a report on safety issues related to wake-vortex encounters, stated that data shows that between 1983 and 1993, there were at least 51 accidents and incidents in the United States that resulted from probable encounters with wake vortices. As a result of these encounters, 27 occupants were killed, 8 were seriously injured, and 40 aircraft were substantially damaged or destroyed. In this report, the NTSB raised concern over “the adequacy of air traffic control procedures” and “pilot knowledge related to the avoidance of wake vortices.”

Key points raised by the NTSB recommendations and findings can be summarized as follows:

- 1) Current air traffic control procedures and pilot reactions can result in aircraft following too closely behind larger aircraft while on a visual approach to landing.
- 2) Pilots of arriving visual flight rules (VFR) aircraft and instrument flight rules (IFR) aircraft cleared for visual approach often do not have sufficient information to maintain adequate separation distances or to determine relative flightpaths.
- 3) Pilots are not provided adequate training related to the movement and avoidance of wake vortices or for determining relative flightpaths and separation distances.
- 4) Annual refresher training is needed for air traffic controllers regarding wake-turbulence separation and advisory criteria.

The Wake Turbulence Training Aid Industry Team unanimously concluded that the enhancement of pilot and air traffic controller awareness and knowledge via training offers the highest probability of significantly improving the wake turbulence safety record.

This training aid is intended to be a comprehensive training package which users can use in their training programs. It is structured in a manner which should allow either stand-alone use, incorporation into existing programs, or customizing by users to meet unique requirements. Whether users choose to adopt the Wake Turbulence Training Aid as the foundation of their training program or extract portions of the material into their existing training program, a significant and measurable benefit is expected.

It is anticipated that the cost of implementing this enhanced training will be minimal. A user who is already doing a credible job of training will find the implementation of this training aid to be principally a change in emphasis, not a replacement of existing training. In the final analysis, the individual pilot and air traffic controller actions are the last chance to prevent a wake-turbulence accident or incident. They must be aware and prepared to take those actions.

1.1 General Goal and Objectives

The goal of the Wake Turbulence Training Aid is to reduce the number of wake-turbulence related accidents and incidents by improving the pilot's and air traffic controller's decision making and situational awareness through increased and shared understanding and heightened awareness of the factors involved in wake turbulence.

The objectives of the Wake Turbulence Training Aid are to summarize and communicate key wake-turbulence related information to all pilots and air traffic controllers.

The Wake Turbulence Training Aid can be summarized by the following three objectives:

- Educate pilots and air traffic controllers on wake turbulence and avoidance of the phenomena.
- Increase the wake-turbulence situational awareness of pilots and air traffic controllers.
- Provide usable information to develop a ground training program.

1.2 Documentation Overview

In addition to this section, the package consists of the following:

Section 2 Pilot and Air Traffic Controller Guide to Wake Turbulence

Section 3 Example Pilot and Air Traffic Controller Wake Turbulence Training Program

Section 4 Wake Turbulence Training Aid - Background Data

Video *Wake Turbulence Avoidance - A Pilot and Air Traffic Controller Briefing*

Section 2 - Pilot and Air Traffic Controller Guide to Wake Turbulence, is a comprehensive look at wake-turbulence history, accidents, characteristics, guidelines, responsibilities, and recommended procedures and techniques. The guide is a highly readable, concise treatment of pilot and air traffic controller issues, written by and for pilots and controllers. It is intended for self study or classroom use.

Section 3 - Example Pilot and Air Traffic Controller Wake Turbulence Training Program is a stand-alone resource designed to serve the needs of the individual pilot and air traffic controller or a training department. Appendix 3-A contains a Pilot and Air Traffic Controller Guide - Pullout Section which is a short and concise review of the information found in Section 2. Additionally, this section contains Appendix 3-B, Wake Turbulence Training Aid Examination containing a student examination, an instructor examination guide, and a summary of answers; Appendix 3-C is the Wake Turbulence Safety Briefing; Appendix 3-D is the Wake Turbulence Safety Training Aid - Video Script: *Wake Turbulence Avoidance—A Pilot and Air Traffic Controller Briefing* that supports the VHS video described below.

Section 4 - Wake Turbulence Training Aid - Background Data provides additional background data for instructors and training designers or interested readers regarding wake turbulence; Section 4 includes Appendices 4-A through 4-F. Appendix 4-A is the NTSB Report of Wake Turbulence, with appendices; Appendix 4-B is a 1991 Report of Where We Are Today in Wake Turbulence; Appendix 4-C is the Wake Turbulence Training Aid Guidelines and Issues offered and addressed by the Wake Turbulence Training Aid Industry Team; Appendix 4-D is the FAA Integrated Wake Vortex Program Plan; Appendix 4-E is a bibliography; and Appendix 4-F presents Wake Turbulence Take-Off Gross Weight Categories and IFR Separation Distances.

VHS Video - *Wake Turbulence Avoidance—A Pilot and Air Traffic Controller Briefing* is a stand-alone video for use in an academic program in conjunction with Section 2, the Pilot and Air Traffic Controller Guide to Wake Turbulence. Although the video is specifically designed to be used in a briefing scenario, it can also be used to heighten the awareness of all people who are involved in areas which are impacted by wake turbulence.

1.3 Resource Utilization

This document has been designed to be of maximum utility both in its current form and as a basis for pilots or air traffic controllers to modify current programs.

This academic training material should be employed as needed to achieve balanced and effective training. The training aid material specifically addresses the need for a shared understanding of how all parties involved in this issue need to work together to prevent wake-turbulence accidents and incidents. For some users, the adoption of the Wake Turbulence Training Aid will require little more than a shift in emphasis. For others, this training aid will readily provide the foundation for a thorough and efficient program.

The allocation of training time will vary from user to user. The pullout section (Appendix 3-A) provides an easy to read condensed version of this training material for the individual user. It consists of 30 pages. The entire document provides an extensive resource of information, question material, and review items for training managers and instructors to design training to the depth required. The 25-minute video provides a stand-alone overview of the material.

1.4 Summary

This document and the video are intended to assist air traffic controllers and pilots in developing an understanding and awareness of wake turbulence. Increased awareness and education will reduce wake-turbulence accidents and incidents. Training programs for pilots and air traffic controllers should include wake-turbulence training.

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