Human Factors

research and technology division

Smart Training for In-Flight Icing

Objective

Ice that accumulates on aircraft while in flight has been the cause of several major airline accidents. Many smaller aircraft are lost each year due to in-flight icing. To help pilots learn to make better decisions about in-flight icing, researchers at NASA are building a series of training programs focused on in-flight icing, in collaboration with icing experts at NASA Glenn Research Center, Human Factors experts at NASA Ames Research Center, weather experts at the National Center for Atmospheric Research and the Federal Aviation Administration, and cognitive science and media experts at the U. of Oregon.

Approach

A Pilot's Guide to In-Flight Icing is a multimedia computer-based training program which contains practical information for professional pilots who may encounter icing conditions during normal operations. The program presents pilots with operational information on how to avoid ice, detect ice, minimize exposure to dangerous conditions, and exit icing conditions during each phase of flight. The effects of icing on aircraft performance, control upsets (wing and tail stalls), and recovery procedures are also discussed.

This self-guided training aid contains imagery captured on NASA icing research flights, animation, pilot testimonials, case studies, and interactive demonstrations. In addition, interactive exercises allow the user to assess his or her operational understanding of key points.

Impact

A Pilot's Guide to In-Flight Icing takes advantage of developments in cognitive science, education, and multimedia technology to provide thorough training that is designed to not only convey information, but help pilots to remember what they have learned and use it effectively when they need it in flight and on the ground.

Web-based training products that can provide greater opportunities for integrative pilot training are under development. Future products are planned that will include an intelligent teaching system to guide the learner and enhanced opportunities to practice making operational decisions through "virtual experience" training scenarios.

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