NASA Glenn Success Stories

Ice Contamination Effects Flight Training Device

Bihrle Applied Research & University of Tennessee Space Institute

TECHNOLOGY

The Ice Contamination Effects Flight Training Device (ICEFTD) is a flight simulation device that demonstrates the ability to accurately represent an iced airplanes flight characteristics, a variable not realistically recreated in present day flight training simulators. The ICEFTD was developed as a concept demonstrator, utilizing an engineering process to develop flight simulation models that incorporate the degrading aerodynamic effects of ice on the an airplane's performance and stability and control. The flight models represent a DeHavilland DHC-6 Twin Otter. NASA verified the flight models through flight tests.

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COMMERCIAL APPLICATION

- This device introduces the capability for including icing effects into flight training simulators.
- The simulator can be utilized to train pilots in recognizing and recovering from aircraft handling anomalies that result from airframe ice formations.

SOCIAL / ECONOMIC BENEFIT

- Improved icing simulation will better equip pilots to employ the correct procedures and techniques to affect a recovery to a safe flight condition.
- Through more accurate simulations, pilots will develop a better understanding of the potential problems icing can cause, thus improving flight safety.

NASA APPLICATIONS

- NASA's Aviation Safety Program 1, System-Wide Accident Prevention project developed technologies to reduce accidents, in part through better training methods. The ICEFTD was successfully demonstrated to over 150 pilots at seminars and short courses held by the University of Tennessee Space Institute and at Flight Safety International – the developer and trainers of many flight simulators.
- The ICEFTD continues to be used in the current Aviation Safety Program to develop and test airplane health monitoring systems for the early detection of adverse icing effects.

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