Full-Scale Fire Test Facility, Building 275

Completed in 1980, the Full-Scale Fire Test Facility is the largest U.S. Government-operated facility of its kind. A 40-foot-high, fire-hardened ceiling allows testing with large pool fires under controlled conditions.

Currently, there are two aircraft fuselages inside the facility that can be set up to simulate a variety of test conditions. The narrow-body Boeing 707 test article can be configured for cabin water mist, seat flammability comparison, cargo compartment fire and smoke detection, and burnthrough tests. The 132-foot-long hybrid McDonnell Douglas DC-10 test article has the added capability of supporting cargo compartment fire simulations in three fully instrumented sections. Continuous gas sampling, temperature measurements, smoke levels, heat flux, and acid gases can be monitored in each of the test sections. The data obtained from the fire tests can be transferred into hazard models designed to generate estimated survival times at particular cabin locations.

All testing is conducted from a remote area that contains state-of-the-art video-monitoring equipment for continuous observation. Both in-flight and postcrash fire scenarios have been studied, which has led to the development of vastly improved fire safety standards for aircraft cabin interiors and cargo compartments.

In addition to the two test articles, there are small test chambers located within the facility that are capable of supporting existing and new laboratory-scale tests, as well as quick mockup work often required during accident investigations. A full-length attached warehouse serves as an enclosure for the many aircraft components and test equipment required to support the full-scale tests.

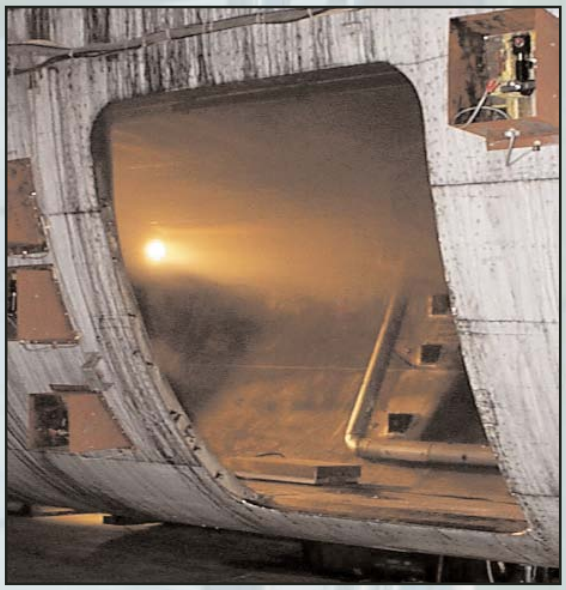
Currently, there are three major research tasks underway at this facility: halon replacement, cargo compartment fire and smoke detection, and very large transport aircraft fire safety.

The main product from the halon replacement work is a minimum performance standard against which the effectiveness of replacement agents or systems can be compared with the present level of protection provided by halon. All four of the full-scale fire test scenarios, specified in the cargo compartment performance standard, are conducted in the DC-10 test article.

The goal of the cargo compartment fire and smoke detection work is to develop consistent requirements for detector performance, including new detector

designs that discriminate between real fire and sources of false alarms. Cargo fire tests support this goal, as well as the development of a mathematical model for predicting the transport and distribution of heat, smoke, and gases during a cargo compartment fire. The model would be helpful in setting detector alarm levels and determining optimal detector locations.

The DC-10 test article is currently under modification to add a full-length upper deck. When completed, this will provide the unique capability to conduct fire tests under conditions similar to the new very large transport aircraft, such as the Airbus A380.



To find out more about the Full-Scale Fire Test Facility, contact:

Airport and Aircraft Safety Research and Development Division, Fire Safety Branch

Federal Aviation Administration
William J. Hughes Technical Center
Atlantic City International Airport, NJ 08405
Phone: (609) 485-5620
Fax: (609) 485-5784
http://airportaircraftsafetyrd.tc.faa.gov