Dynamic Vertical Drop Test Facility, Building 214

R&D Facilities

The Federal Aviation Administration (FAA) is responsible for airplane crashworthiness standards. These standards increase the possibility of occupant survival in case of an accident and were established empirically using the results of prior airplane crash test programs.

In developing the crashworthiness standards, it was noted that the full-scale airplane impact test database was not representative of commuter category airplanes. To provide data for those size airplanes, the FAA initiated a full-scale vertical impact test program of commuter airplanes. As part of this program, a test of a Metro III airplane was conducted in April 1992, a Beech 1900 in October 1995, a Shorts 3-30 in September 1998, and an ATR42-300 in July 2003. The tests were structured to assess the impact response characteristics of airframe structures, seats, and the potential for occupant impact injury.

In addition, vertical impact tests on a series of transport category fuselage sections were conducted to determine the impact response characteristics of some typical items of mass such as overhead stowage bins, auxiliary fuel tanks, seats, and occupants. The results will be used to assess the adequacy of current design standards and regulatory requirements.

The FAA's Dynamic Vertical Drop Test Facility is used to obtain the empirical data needed to develop crashworthiness standards and to obtain other crashworthiness data as described above. The data from the tests conducted at this facility will enable quantitative evaluation of the effects of crash events on occupant survivability.

The Dynamic Vertical Drop Test Facility consists of the drop test tower and a building containing an instrumentation room, a calibration laboratory, and personnel offices.

The William J. Hughes Technical Center drop test tower is comprised of two 50-foot vertical steel towers connected at the top by a horizontal platform. An electrically powered winch is used to raise or lower the test article and is controlled from the base of one of the tower legs. The lifting capacity

of the winch is 30,000 pounds. Attached to the winch is the cable that is used to raise or lower the test article. A sheave-block assembly hanging from the free end of the reeved cable is engaged to a solenoid-operated release hook. A sling and turnbuckle assembly connects the release hook to the airframe with hooks bolted to the fuselage section.

To find out more about the Dynamic Vertical Drop Test Facility, contact:

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