NIAR Deploys State-of-the-Art MTS Crash Simulator

The National Institute for Aviation Research (NIAR) has earlier this week installed a state-of-the-art horizontal acceleration crash simulator, located on the campus of Wichita State University in Kansas.

The simulator, produced by the MTS Systems Corporation, was installed as part of the modernization of the Crash Dynamics Laboratory which also involved other improvements.

This $3 million upgrade not only improves the lab's ability to conduct crash tests for the aviation industry, but also allows for expansion into the automotive industry. Testing on air bags, child safety seats and other various components will be possible, in addition to the current aviation testing abilities. The 4,500 square foot Crash Dynamics Laboratory provides a facility for affordable research, testing, and certification of aircraft and non-aviation components under dynamic impact (simulated crash) conditions.

A spokesperson for NIAR stated that the FAA and industry are generating high-rate proponents of composites to be used in models for aircraft in component crashworthiness. Hopefully, after a number of years, utilization of the crash sled will be key to validating those models.

NIAR is deploying the simulator in its Crash Dynamics Laboratory to enhance its ability to host proprietary research, testing, and certification of aircraft components under dynamic impact conditions.

"Acquiring the MTS crash simulator is integral to our efforts to maintain our status as the premier dynamic testing facility for the nation's aircraft and aircraft component manufacturers," said Dr. John Tomblin, executive director of NIAR. "The capabilities we gain from this system will help us realize our long-term goal of having all U.S. aircraft seat manufacturers utilize our Crash Dynamics Laboratory."

The crash simulator employs a servohydraulic drive to achieve speeds of 81 km/h with a 1500 kg payload. Impact pulse peak profiles can be adjusted to reach accelerations of 65 g's with the same payload, or 75 g's with a 1000 kg payload. The system features state-of-the-art data acquisition capabilities, and employs a high-resolution digital video system to capture high-velocity simulations at 1000 frames per second.

"High-performance MTS crash simulation solutions are designed to help aircraft and ground vehicle manufacturers adapt quickly to increasingly stringent occupant safety regulations and reduce the time required to gain valid, meaningful test data," said Joseph Mitchell, NIAR's director of Crash Dynamics. "They deliver a wider operating range of acceleration, frequency
response, and payload capabilities than any other crash simulation system on the market, giving test engineers the flexibility to replicate both high and low acceleration events with unmatched fidelity."

“We are proud of our role supporting research at such a prestigious institution as NIAR,” said Sidney W. Emery, Jr., MTS chairman and CEO. “The addition of this state-of-the-art crash simulator to the Institute’s already considerable array of MTS testing equipment is a testament to the strength of our product line and our success in satisfying customers’ needs.”

The new laboratory was demonstrated earlier this week during a dedication ceremony in which the Crash Dynamics dedication and Walter H. Beech Memorial Wind Tunnel rededication included a demonstration in each lab with a question-and-answer session with lab directors and an introduction to the new Advanced Joining Lab hosted by John Tomblin, executive director of NIAR.

“This ceremony kicks off the beginning of great things to come for NIAR,” Tomblin said. “These were the two most highly anticipated improvements NIAR has made since it was created – but there are many more to come.”