Video Landing Loads Facility

The Airborne Data Monitoring Research Program has established a number of activities to continuously validate and update the flight and landing loads airworthiness certification standards for transport aircraft. The video landing loads facility is part of this research program. This facility provides data that supplements the results of the landing parameter surveys conducted at commercial airports. The video landing loads facility uses the same video recording and analysis technology employed during surveys at commercial airports. The video system is based on a system originally developed by the U.S. Navy for recording carrier landings. The facility also permits the evaluation of new video survey technology.

The video landing loads facility consists of a trailer located on the side of runway 13-31 at the Atlantic City International Airport (ACY) with a series of four video cameras located along the edge of the runway. The cameras have a fixed overlapping field of view, and the recording system is switched between successive cameras as the aircraft passes through each camera's field of view. A laser disk recorder stores the collected video images. Fiber optic cables connect the cameras to the recording system. An image-processing software system is used to postprocess the video images and prepare the inputs for the landing parameter analysis software. Information derived from the video images includes aircraft closure speed, sink rate of all the landing gear wheels, and a sink rate estimate for the aircraft's center of gravity. Aircraft pitch and roll attitude at touchdown, off-center position from the runway centerline, and touch distance down the runway are also derived.

An additional camera and a microwave data transmission system are currently being evaluated to collect data on aircraft height over the runway threshold and as an additional check on aircraft closure speed. The facility has been used to perform special testing of the video system against a calibrated flight test aircraft to verify system performance. Industry questions concerning the video system's sink speed measurements were resolved when a series of blind tests were performed using a highly instrumented Boeing MD-95 flight test aircraft. Sink speeds reported by the video system matched the data that was collected on the instrumented aircraft.

The facility also provides information on the variation of aircraft landing performance caused by changes in wind and weather conditions. While the airport surveys done at other commercial airports only provide a

short-duration snap shot (about 2 weeks) of landing performance under a particular set of climatic conditions, the ACY facility collects data year round.

The facility routinely collects data on regularly scheduled flight operations at ACY. Along with its regularly scheduled operations, ACY routinely hosts military and commercial aircraft performing training landings. This has allowed the facility to collect landing data on a large number of KC-10 and KC-135 tanker aircraft, which are variations of the McDonnell Douglas DC-10 and the B707. During the introduction of a new wide-body aircraft to a U.S. operator, a series of training landings of that aircraft were recorded, and the data was provided to the airline and manufacturer. Additional opportunities to evaluate the landing performance of regional jet aircraft during pilot training are expected in the near future.

To find out more about the Airborne Data Monitoring Research Program, contact:

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