

## **Evaluation of the Transport Rotorcraft Airframe Crash Testbed (TRACT) Full Scale Crash Test**

by

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The Transport Rotorcraft Airframe Crash Testbed (TRACT) full-scale crash tests have been planned to address transport-category rotorcraft crash response under combined horizontal and vertical loading. Full-scale crash testing at NASA Langley Research Center's Landing and Impact Research Facility (LandIR) provides the capability to represent all the critical interactions between the airframe, seat, and occupant in a controlled environment. The TRACT is a CH-46E fuselage categorized as a medium-lift rotorcraft with fuselage dimensions comparable to a regional jet or business jet. The primary objectives for the first TRACT test, scheduled for August 2013, are to assess improvements to occupant loads and flail envelope with the use of crashworthy features such as pre-tensioning active restraints and energy absorbing seats, provide data for comparison to finite element analyses, and develop novel techniques for photogrammetric data acquisition to measure occupant and airframe kinematics. A combination of Hybrid II, Hybrid III, and ES-2 Anthropomorphic Test Devices (ATDs) will be placed in forward and side facing seats and occupant results will be compared against injury criteria. Results from the first TRACT test will be discussed. A second TRACT test is scheduled for Summer 2014. The second test will contain similar experiments, and one additional objective for the second TRACT test will be to retrofit the subfloor with different composite energy absorbing concepts. The cabin airframe, seat, and occupant responses will be directly compared to results from the first test to determine any improvements with the inclusion of the energy absorbing subfloor. Details of the second TRACT test development will be presented.