



US DEPARTMENT OF DEFENSE

BLAST INJURY RESEARCH PROGRAM COORDINATING OFFICE

Blast Exposure Analysis

Anthropomorphic Blast Test Device Validation and Transition

L-3 Applied Technologies, Inc. received funding from the Defense Medical Research and Development Program (DMRDP) managed by the Congressionally Directed Medical Research Program (CDMRP) for a project to validate the Anthropomorphic Blast Test Device (ABTD) for performing Blast Overpressure-Health Hazard Assessment (BOP-HHA) testing and analysis. Since this award in July 2016, the team has been working in close collaboration with the testing community represented by the US Army Public Health Command, Aberdeen Test Center (ATC), and Yuma Testing Center. As an integrated device, the ABTD enables the biofidelic collection of auditory and non-auditory data simultaneously from the same blast for the assessment of impulse noise and blast lung injury. A simulation study of potential differences in collected measurements between current Blast Test Devices (BTD) and ABTDs for the purpose of predicting lung injury and continuing to update software has been completed. Auditory data will be collected by mounting sound gauges on top of the ABTD at the ear location for impulse noise hazard assessment based on Military Standard (MIL-STD)-1474D “Department Of Defense Design Criteria Standard Noise Limits”,¹ and pressure sensors will be mounted at the chest elevation to collect thorax loading data for blast lung injury assessment using the normalized work algorithm that is incorporated in the BOP-HHA software. Using field test data and additional computational analysis supplied from Computational Fluid Dynamics (CFD) simulations and other existing data archives, the normalized work algorithm will be adjusted for the ABTD BOP-HHA software. The software will be re-written using a currently supported programming language to meet government informational assurance, and the package will be prepared for Army Test and Evaluation Command (ATEC) for verification, validation, and accreditation. The proposed system addresses an important area of research into the blast injuries of Service Members, and this device will assist in designing mitigation techniques for blast injury.

¹ Department of Defense Design Criteria Standard Noise Limits. MIL-STD-1474E. (2015) <https://www.arl.army.mil/www/pages/343/MIL-STD-1474E-Final-15Apr2015.pdf>

