Protective Equipment

Advanced Honeycomb-core Helmet Pads for TBI Mitigation, Phase III

In FY14, TIAX, LLC, sponsored by the US Army Natick Soldier Research, Development, and Engineering Center (NSRDEC), advanced the development of an ACH pad system that uses thermoplastic elastomer materials formed into multi-layer honeycomb-like structures. This development of the improved ACH pad system was performed under a US Army Rapid Innovation Fund contract that followed up an earlier SBIR Phase II effort. The objective of the project was to reduce head injuries associated with tertiary blast by doubling the level of blunt impact protection provided by the current ACH pads. In this 18-month effort, a new helmet pad was designed, mechanically tested, and evaluated with users for acceptance. The design was optimized for a combination of comfort, weight, and blunt impact performance at 14 feet per second. The average and peak accelerations were significantly below those of the current-issue Team Wendy pad sets. However, as assessed by blunt impact tests, the system could not keep accelerations below 150 Gs for every impact location and every helmet size. Five hundred pad sets were fabricated for delivery to the Army for future evaluation. TIAX, LLC also explored large scale production processes for both low-rate and high-rate production, prepared a finalized cost evaluation and timeline for Army procurement, and identified a committed set of industrial manufacturing partners. Currently, TIAX, LLC has partnered with a prime vendor whose head-borne system is being tested and evaluated as a part of the SPS Program of Record managed by PEO Soldier. Should the prime vendor's design emerge as the winning solution, these improved helmet pads or an enhanced variant could be issued to Service Members as early as mid-FY16, increasing protection of Warfighters from blast-induced injury.