



US DEPARTMENT OF DEFENSE

BLAST INJURY RESEARCH PROGRAM COORDINATING OFFICE

Vehicles

Product Manager Future Fighting Vehicles UBB Mitigation Programs

Product Manager Future Fighting Vehicle, part of the Program Executive Office Ground Combat Systems (PEO GCS) in Warren, Michigan, has challenged its contractors on a Science and Technology (S&T) contract to develop designs for mitigation of injuries resulting from increasingly larger blasts. Researchers have found that by implementing: 1) engineered joints that ensure one weld is in tension and one in compression during blast deformation; 2) automated welding such as friction-stir welding and High Energy Buried Arc welding; and 3) innovative joining techniques like explosively-bonding dissimilar metals; hull ruptures have been eliminated for the same size blasts that, just a few years ago, would have caused catastrophic failures and hull breaches resulting in Service Member injury and death. The utility of these improvements have been demonstrated by multiple tests conducted at Aberdeen Proving Ground (APG), Maryland, as well as contractor facilities. Further, third-party modeling and analyses have verified that these improvements can be successfully used in future combat vehicle designs. Tests conducted by Army Research Laboratories Weapons Materials Research Directorate at APG, Maryland, and partially funded by Future Fighting Vehicles, have demonstrated the successful integration of the TenCate Active Blast Defense System (ABDS) on a notional ballistic hull and turret. The ABDS automatically senses an under-body blast (UBB) and then applies a counter force to hold the vehicle down. In comparison tests conducted with and without the system, a 78 percent decrease in Service Member injuries due to slam down was observed by employing this active blast technology. Ultimately, incorporating advanced welding techniques and active blast technology into future combat vehicles will create safer vehicles, reducing injury and death of Service Members.

