



US DEPARTMENT OF DEFENSE

# BLAST INJURY RESEARCH PROGRAM COORDINATING OFFICE

## Protective Equipment

### Engineering Analysis of Ground Vehicle Systems

ARL supported the MRAP program on multiple fronts in FY15. Title X LFT&E engineering involved ARL co-authoring test plans with the Live Fire Integrated Product Team. ARL assessed vehicle failures and crew injuries that were incurred in underbody blast testing and made mitigation recommendations to the Army Program Office MRAP, and the USMC Program Manager MRAP. For FY15, the aforementioned pertains to Medium Mine Protected Vehicle Type I (RG-33L / Panther), Medium Mine Protected Vehicle Type II (RG-31), and the Navistar MaxxPro DASH Ambulance. ARL supported the USMC Cougar Seat Survivability Upgrade kit evaluation and procurement. ARL's engineering analyses and physiological evaluations of underbody blast tests validated the improvements made by the new energy attenuating crew seating design. Reductions in number and severity of lumbar injuries were recorded at "beyond objective level" threat sizes. ARL's damage assessment briefings, presented during Title X Live Fire Testing of the MRAP Cougar, serve as a foundation for the Cougar floor improvement/redesign. ARL's engineers and physiologists will assess the performance of the new floor designs when full-scale testing comes to fruition, providing data to the Program Manager for positive acquisition of a solution that meets their performance criteria. The new floor design is expected to raise the performance of the floor to that of the seat survivability upgrade so that the system performs acceptably, with reduced number and severity of lower leg and lumbar injuries, and beyond objective level threats as detailed in the design specification. The assessments will be used for future acquisition decisions and to support vehicle modifications to increase the survivability of the systems under test.