



U.S. ARMY
RDECOM

Developing a Tool to Predict Ammunition
Compartment Survivability

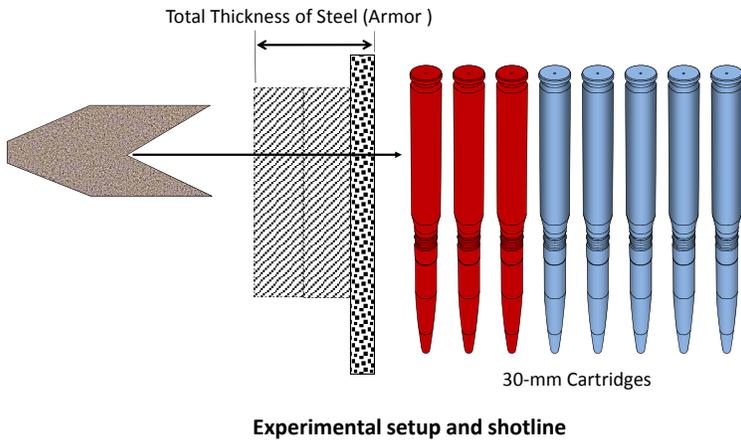


S&T Campaign: Assessment & Analysis
Statistical methods in ballistic modeling and simulation

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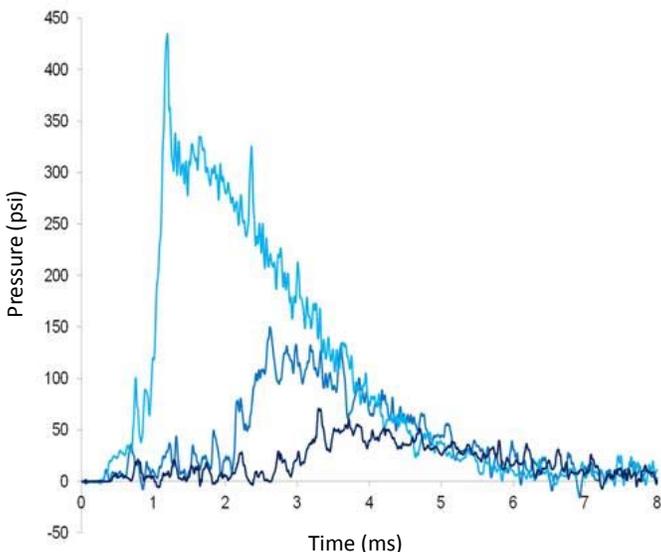
Research Objective

- To develop a model for predicting the energetic response of ammunition to ballistic impacts, which can be used to inform design and to support systems engineering, optimization, and live-fire evaluation.
- Extend model to predict the response of vehicle battery packs to ballistic impacts.



Challenges

- Isolating and identifying the parameters affecting the energetic response of propellant subject to ballistic impacts.
- It is difficult obtaining accurate data from instrumentation due to the violent reaction inside the ammunition compartment



ARL Facilities and Capabilities Available to Support Collaborative Research

- New photon Doppler velocimeter for use to measure velocity of the compartment lid during the experiment.
- Large body of expertise in the field of energetic reactions.
- Initial mathematical model for predicting pressure inside an ammunition compartment when impacted by a shaped charge jet attack.



Test chamber with compartment test rig

Lower Velocity Jet



Higher Velocity Jet



Varying levels of damage to rounds in test

Complementary Expertise/ Facilities/ Capabilities Sought in Collaboration

- Capability to develop novel instrumentation solutions to collect data in violent, extremely high pressure environments.
- Engineering model to determine the structural response of a compartment design using predicted pressure.