INSENSITIVE HIGH EXPLOSIVES FOR HIGH SPEED PENETRATORS

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Overview

- **Project Objectives**

- **Challenges**

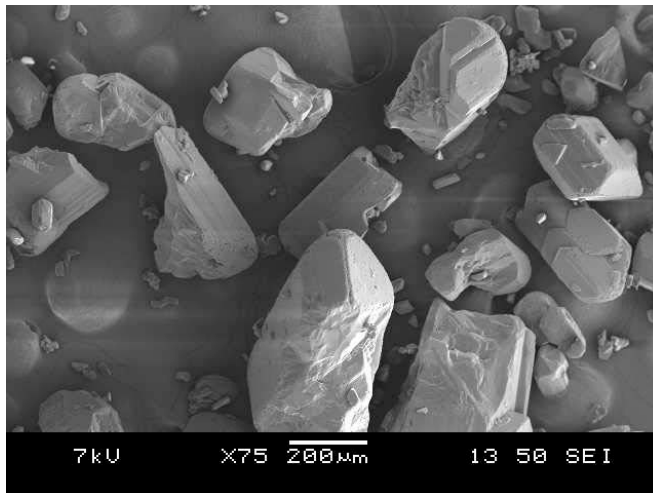- **Project Agreement (PA) Status**

- **Roadmap**

Project Objective

- **Understand the changes in high explosives (HE) due to loading during hard target impact**

- **Develop an experimental characterization protocol for understanding structural changes and senstivity correlations in HE**

- **Enhance the modeling and simulation capabilities to capture the damage-sensitivity correlations in HE**

Challenges

- **Develop a characterization protocol, including modeling and simulaton, for damaging and quantifying the effects of damage in HE**

- **Quantifying the microstructure associated with pristine and damaged HE**

- **Perform sub-scale tests on HE to validate protocol and models**
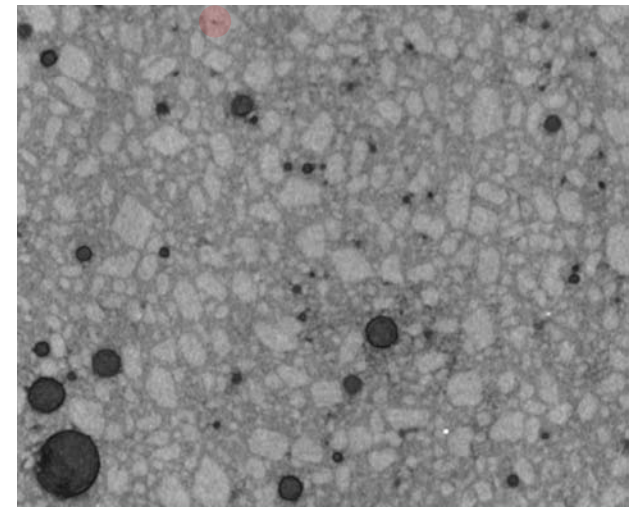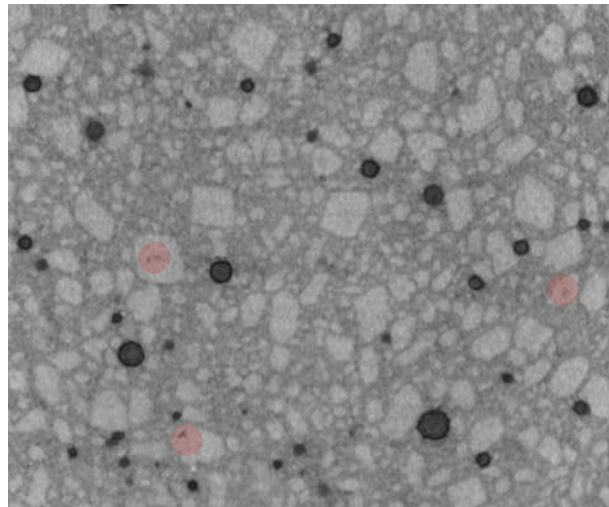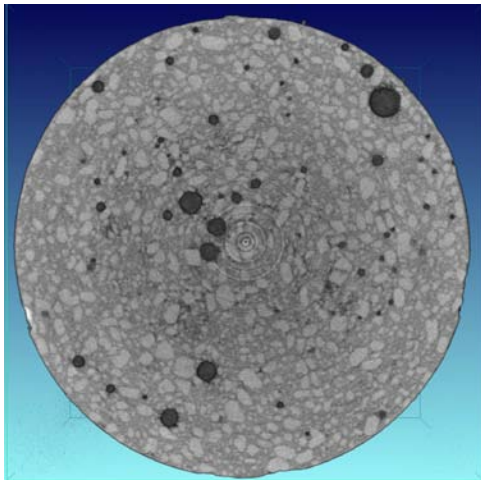
HE Crystals prior to Mixing
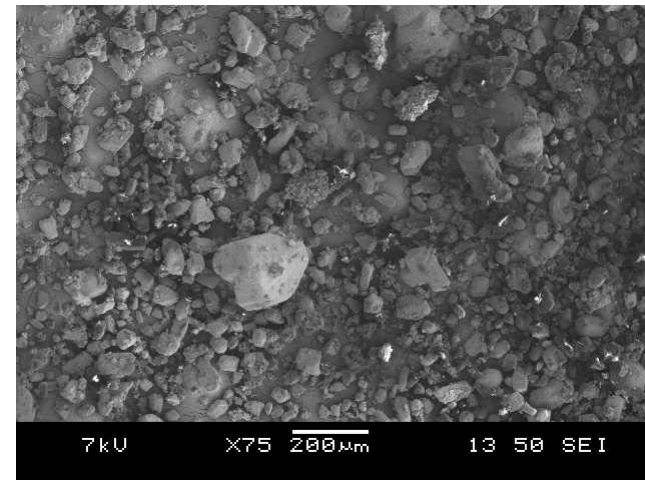
HE Crystals Post Mixing

Status of the Project Agreement

- **PA has been in progress for one year.**

- **Testing of representative HE materials is underway.**

- **Next interchange meeting is May 2011.**

Roadmap

- **Numerical analysis of loading conditions – complete**
- **Support of test design by numerical simulation – complete**
- **Selection of mechanical and thermal loading methods – complete**
- **Laboratory experiments with defined HE samples – underway**
- **Microstructural analysis and sensitivity tests – underway**
- **Numerical simulation of laboratory experiments – underway**
- **Numerical simulation of detonation process**
- **Correlation of thermo-mechanical loading with structural changes**
- **Correlation of micro-mechanical changes with changes in sensitivity**
- **Sub-scale impact tests**

Summary

- **Project Objectives / Challenges**

- **Project Agreement (PA) Status – PA underway**

- **Roadmap**

  – Technical progress being made on characterizing HE and supporting modeling and simulation