**Problem / Objective**

IMX-104 is a newly developed insensitive munitions (IM) explosive formulation. It will support the production of the 81mm High Explosive (HE) Mortar and is the leading candidate to replace Composition B and its equivalence, PAX-21 and PAX-41 as the HE fill in various munitions items. This IM explosive formulation provides a more IM compliant product to better safeguard warfighters from unplanned stimuli while maintaining the basic performance of Comp B. While IMX-104 has proven to possess good IM properties, how a large-scale manufacturing process will affect these desirable properties is not known. Without a proven process to efficiently manufacture the product, IMX-104 cannot be fielded due to cost and quality. The objective of this project was to maximize the manufacturing efficiency of IMX-104 to lower its unit cost while maintaining the desirable properties.

**Accomplishments / Payoff**

**Process Improvement:** The qualified, optimized manufacturing process demonstrated to shorten the cycle time and subsequently lower the unit cost of IMX-104 explosive formulation.

- Critical operating parameters, e.g., batch size, operation temperature, mixing time, etc. were identified and optimized using Design of Experiments (DOE)
- Additional unit to pre-melt DNAN proven to shorten the kettle turn over time by 2 hours
- Successfully produced 7,500 pounds of specification compliant IMX-104 to qualify the optimized production-scale manufacturing process
- Successfully developed and validated Brookfield viscosity test method for a more accurate measurement

**Expected Benefits and Warfighter Impact:**

1. Better understanding of operating conditions on the quality of final product
2. Ability to manufacture IMX-104 on a large-scale with consistent property and quality
3. IM compliant product to better safeguarding warfighters from unplanned stimuli while maintaining the basic performance of Comp B
4. Reduced cost from $30.51 per pound to less than $20.00 per pound, which was better than the program objective
5. $118M cost avoidance and a Return On Investment (ROI) of 52.6:1

**Time Line / Milestone**

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<tr>
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<td>January 2012</td>
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**Funding**

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**Participants**

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BAE SYSTEMS Ordnance System Inc., Holston Army Ammunition Plant, Kingsport, TN