XM395 Precision Guided Mortar Munition
(120mm PGMM)
Responsive, Standoff Precision Lethality
for Highly Deployable and Mobile Forces

"Translating Lessons Learned into Systems Requirements"
40th Annual Armament Systems: Guns-Ammunition-Rockets-Missiles
Conference & Exhibition
April 25-28, 2005

Presented By: James Terhune and Anthony Pezzano
OPEO Ammunition/OPM CAS/ OPM Mortars
Task

Present a Summary of the Product Manager’s Approach to PGMM Training

Purpose

Develop Systems Approach for PGMM Training Concept Utilizing Six Sigma Principles and Processes
PGMM Description

System Requirements (Key Performance Parameters):

Increment I

Lethality: Incapacitate protected personnel, in two rounds or less, within:
- Earth and timber bunkers
- Brick over block masonry structures
- Stationary lightly armored vehicles

Maximum Range:
- Current Force: 7.2km (Threshold), 10km (Objective)
- Future Combat System (FCS) Mortar: 8km (T), 10km (O)

Compatibility:
- 120mm Battalion Mortar System
- Stryker - Mortar Carrier
- FCS Non-Line of Sight (NLOS) Mortar
- Current / Future Laser Designators & Fire Control Systems
Precision Munitions Increase Warfighter Effectiveness

Leverages Existing Fire Support Systems Reduces Collateral Damage

Masonry Structures Earth and Timber Bunkers Light Armor Vehicles

Fire Direction Center (FDC)

Fire Support Element (FSE)

Simple Mission Setting

Ballistic Flight to Target Acquisition

Terminal Guidance • SAL Seeker • Thrusters

Forward Observer

Mortar Squad

RGR
Mortar Infrastructure In Place

- 120mm Mortars in current infrastructure
  - 120mm Mortar Platforms: M121 (carrier-mounted), M120 (towed), Stryker - Mortar Carrier
  - 120mm Mortar Munitions: HE, Smoke, Illumination (Visible & Infrared)
- Light-weight Laser Designator Range Finder (LLDR)
- Fire Control / Command & Control Links
  - Mortar Fire Control System (MFCS)
  - Advanced Field Artillery Tactical Data System (AFATDS)

PGMM
An Integral Part of Modern and Future Battalion Indirect Fire
Problem Statement

- Reduced Combat Effectiveness without Adequate Training Program
- No Affordable or Practical PGMM Training System is Available
  - Current Options
    - Firing Tactical Laser Guided PGMM (Hundreds of Rounds/Year x $10K/Round)
    - No Training (Not an Option)
    - Manual Process @ Training Center (not representative of Tactical)
Project Goals

- Develop an integrated plan for PGMM Training Concepts that can:
  - Effectively Train the Mortar Crew
    - Preparation, drop firing, and misfiring procedures
  - Training of Forward Observer to Adequately Designate Targets within the PGMM Firing Mission Timelines
  - Communication Links between FO, Battalion FSE, FDC and Mortar Crew
  - Achieve a 50% minimum overall Cost Avoidance through Reduced Tactical PGMM Firing
    - Cost effective training concept alternatives.

NOTES: FSE: Fire Support Element    FDC: Fire Direction Center    FO: Forward Observer
PGMM Training Q$SR

Project Summary:

Develop an integrated plan for PGMM Training Concepts that can:

- Effectively Train the Mortar Crew
  - Preparation, drop firing, and misfiring procedures
- Train Forward Observer to Adequately Designate Targets within the PGMM Firing Mission Timelines
- Identify Communication Links
- Achieve a 50% minimum overall Cost Avoidance through Reduced Tactical PGMM Firing.

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<thead>
<tr>
<th>Quality or Customer Satisfaction</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Provide the Warfighter with a viable low cost training solution to</td>
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<td>achieve indirect fire precision strike capability.</td>
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<td>Project Successfully laid out Approach, Methodology and Plan.</td>
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<td>(Follow-on Project recommended to Implement Training Concept into</td>
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<td>Program SDD)</td>
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<td>Potential savings $10.24M/year of Training (10 year product life</td>
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<td>cycle can save over $100M in training costs)</td>
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<td>FMEA evidenced medium risk areas.</td>
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<td>FO Trainer; Virtual Simulator QFD identified Training Concept</td>
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<td>leverage points to maintain affordable approach.</td>
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Schedule

Risk
PGMM Training Implementation
Implementing PGMM Training

• **New Equipment Training (NET)**
  - Update documents to include PGMM and operating Tactics, Techniques and Procedures.
  - Develop physical mock up of PGMM for handling, programming, and visual reference.
  - Text / Video Course instruction training material.

• **Institutional Training**
  - Develop classroom training.
  - Integrate CFFT / Mortars / MFCS / PGMM / Laser Designation for classroom training.

• **Virtual Training**
  - Understand / Develop Tactics, Techniques & Procedures (TTPs).
  - Integrate CFFT / Mortars / MFCS / PGMM / Laser Designation for virtual training.
  - Integrate PGMM Trainer with MFCS Gun & FDC training aids and devices.
  - Develop Models and Simulations as part of Virtual Training resources to support Live Training.
  - Virtually train Gunner, FDC, and Forward Observer in a closed loop system, for collective unit training.

• **Collective (Live and Combined Arms)**
  - Develop Embedded Training Instrumentation (MFCS).
  - Provide a PGMM training capability at the Combat Training Center (CTC).
Who We Will Be Training

- Fire Direction Specialist (MOS 13F)
- Indirect Fire Infantryman (MOS 11C)
- Ammunition Specialist (MOS 55B)
- Fire Direction Center (FDC) Personnel
- EOD

Mortar Mission Training Requirements

- Operate in Centralized or Decentralized C3 Modes
- Centralized: Through Battalion Fire Support Element
- Decentralized: Sensor to FDC and/or Gun
Summary

- US Army investing in Precision Munitions for Close Combat (Mortar Systems)
  - Requirements are Approved
  - Program is Fully Funded, PGMM SDD Awarded 01Dec04

- Result will be Leap Ahead Precision Effects Capabilities for the Maneuver Commander

- Training is key to PGMM Affordability and Performance

- Collective/Combined Arms Training Requirements are being defined

6th Annual Mortars Conference October 19-21, 2005
Headquarters Plaza Hotel, Morristown NJ

www.NDIA.org     w4.pica.army.mil/pmmortars