

# Program Overview



**Ammunition Summit 17-19 February 2004**

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**Project Manager for Combat Ammunition Systems**

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# PM CAS Organization



**PM Combat Ammunition Systems**  
 PM, COL Nathaniel Sledge, Jr. 973 724-2003      DPM, Mr. Rene Kiebler 973 724-2110

**Excalibur**  
 PM, LTC Jeff Wilson  
 DPM, Mr. Chris Grassano  
 973 724-3152

**Mortar Systems**  
 PM, LTC Andre Kirnes  
 DPM, Mr. David Super  
 973 724-4209

**Business Management**  
 Mr. Joseph Gormley  
 973 724-5891

**Precision Effects**  
 Mr. Peter Burke  
 973 724-5802

**Weapons and Fire Control**  
 Mr. Ed Lewis  
 973 724-4993



**Conventional Ammunition**  
 Mr. Armando Herrera  
 973 724-3636

**Advanced Systems**  
 Mr. Steven Hromnak  
 973 724-5476

**JMC Cell**  
 Mrs. Celia Hadden  
 DSN 793-6491

**Artillery**  
 Mr. Martin Moratz  
 973 724-5247

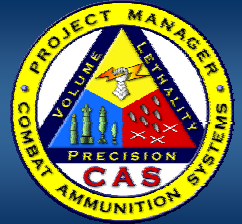
**Mortars**  
 Mr. John Slivovsky  
 973 724-3665

**Energetics**  
 Mr. Jim Rutkowski  
 973 724-2394

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# PM CAS Management Imperatives

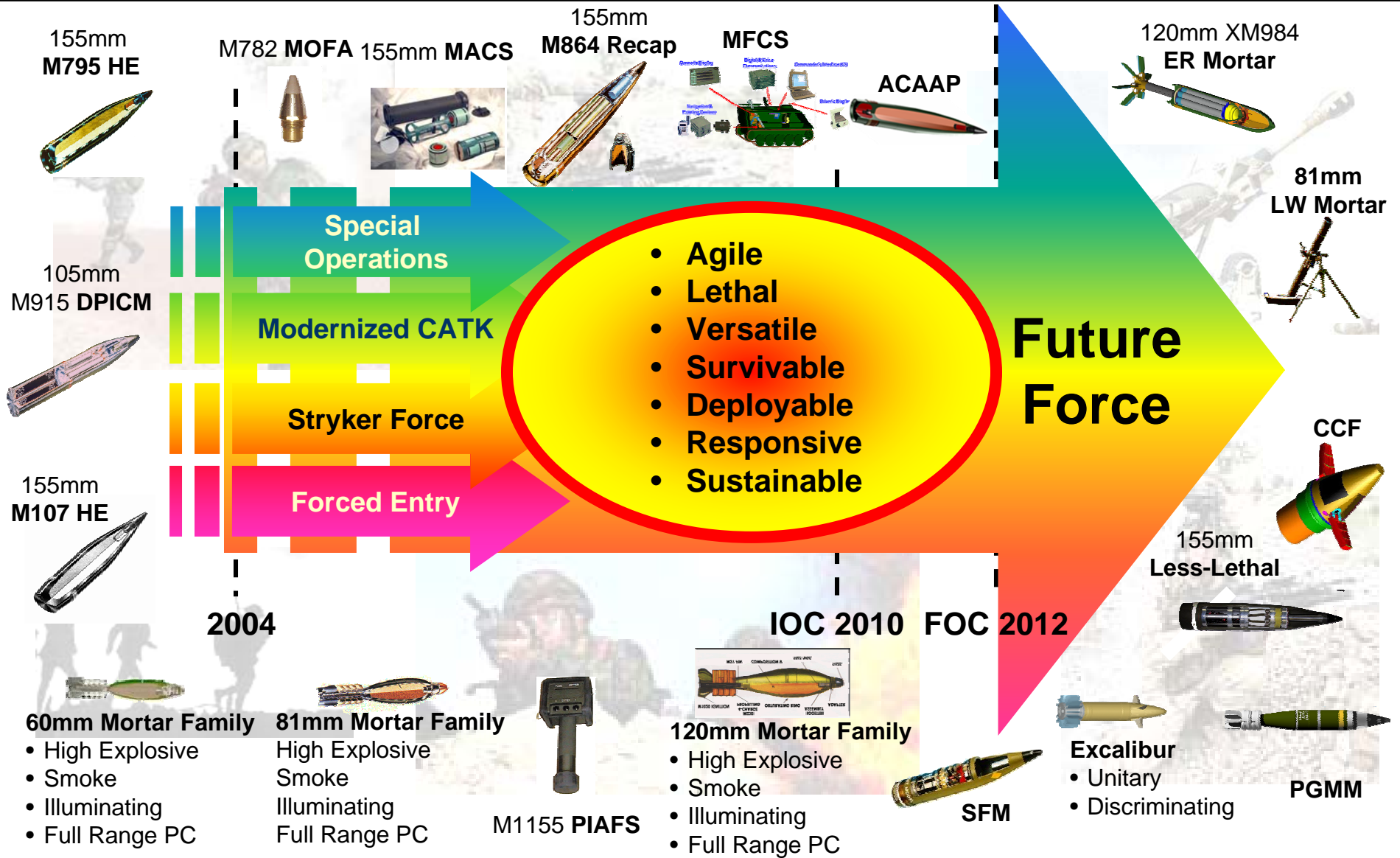
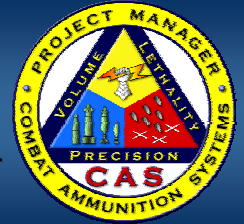


- Meet Requirements and Pursue Promising Technologies
- Promote Competition to achieve Best Value and Drive Down Costs
- Leverage Investments and Reinforce Successful Partnerships
- Endorse Teamwork and Employee Empowerment
- Promote and Employ Disciplined Processes
- Promote Lean Design and Production
- Promote Commonality and Interoperability
- Plan Aggressive and Non-Traditional T&E
- Take Calculated Risks, but Manage and Mitigate them
- Employ Spiral Development and Continuous Process Improvement
- Leverage Information Technology and Knowledge Management Systems
- “Trust, but Verify” – ‘Put Eyeballs On’ to Maximize Situational Awareness





# Army Transformation: How We Fit In





# Transforming Army Indirect Fires



Networked through Battle Command  
Fully Interoperable with Joint systems  
Mobile (Strategic and Tactical)  
Responsive & Integrated with Maneuver  
Lethal (through precision and volume)  
Precise Effects with Area Options  
Reduced Sustainment  
Ability to Mass Effects  
24/7, All-Weather, All-Terrain

## Challenges

Strategic Deployability  
Networked Capability (C4)  
Tactical Mobility  
Target Location (ISR)  
Accuracy / Rate of Fire  
Precision Munitions  
Discriminating Munitions

To achieve **Destructive, Suppressive and Protective** effects while **minimizing collateral damage** taking advantage of **emerging technology**



# Indirect Fires Investment Strategy (POM 06-11)



## Terms of Reference

- Improve precision and deployability
- Accelerate technology to Current Force
- Better balance investment between Current and Future Forces

# 75%

## Future Force



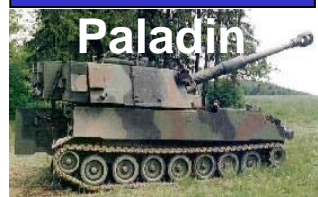
OBJECTIVE FORCE

Bridge to Future Force

# 25%

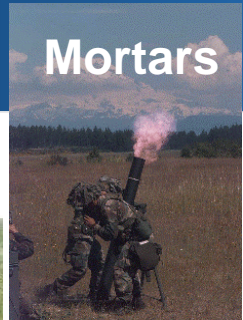
## Stryker Force

## Current Force



Paladin

## Mortars

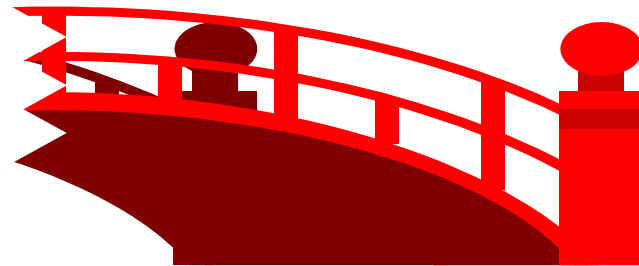
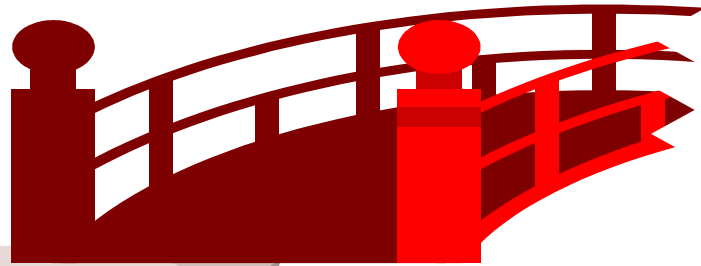


LW155

- |             |               |
|-------------|---------------|
| Networked   | Responsive    |
| Joint       | Continuous    |
| Mobile      | Survivable    |
| Lethal      | Precise       |
| Sustainable | Full Spectrum |



# Capability Gaps and Needs



## Current Force

- **Precision**
  - ✓ Collateral Damage
  - ✓ Urban Operations
- **Accuracy**
- **Range**
- **Sustainability**
- **Safety**
- **Readiness and Training**
- **Responsiveness**
- **Cost Effectiveness**

- **Lethality**
- **Operational Efficiency**
- **Robustness**
- **Special Purpose**
  - ✓ Weather
  - ✓ Complex Terrain
  - ✓ Scalable Effects
- **Mobility**
- **Automation**

## Future Force



# Fires Transformation: Precision - Accuracy - Range



## Ends

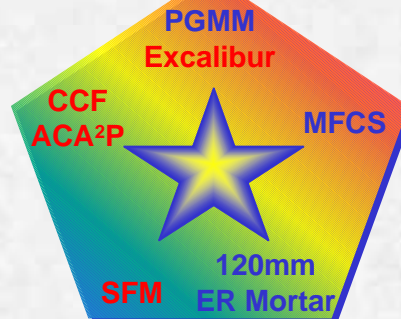
**Why? What?**

- Speed Defeat of Enemy Thru Quicker Engagements
- Achieve Capability Overmatch
- Set Conditions and Shape the Battle:
  - ✓ Strike Deeply with Precision
  - ✓ Extend Range of Conventional Artillery
  - ✓ Facilitate the Close Fight
  - ✓ Enhance Force Survivability
  - ✓ Destroy HPTs and MDTs
- Improve Mission Effectiveness
  - ✓ Enhance Unit Lethality
  - ✓ Kill More with Less
  - ✓ Improve Prob. (Kill / Acquisition)
- Complement Other Munitions to increase Flexibility and Scalability
- Increase Robustness
  - ✓ Flexibility
  - ✓ Scalability
  - ✓ Adaptability
  - ✓ Hard Targets
  - ✓ Moving Targets
  - ✓ Complementary Effects
  - ✓ Danger-Close Operations
  - ✓ Expand Mission set to MOUT
  - ✓ Operate in Varied and Complex Terrain
- Reduce Fratricide
- Address Trends in . . .
  - ✓ Technology
  - ✓ Doctrine and TTP
  - ✓ ROE – Collateral Damage
  - ✓ Threat – Entrenched and Interspersed in Structures
- Reduce Logistics Burden:
  - ✓ Improve Accuracy
  - ✓ Improve Efficiency
  - ✓ Free Up Lift Assets
  - ✓ Increase Stowed Kills
  - ✓ Reduce Number of Platforms
  - ✓ Reduce Frequency of Resupply

## Means

**MATERIEL**

**OPM  
CAS  
Products**



### Interoperability

- Fire Support Network
- Logistics System
- Joint Fires
- NLOS-M
- NLOS-C
- Paladin
- LW155
- UAVs
- PTS

### Other Systems

- NLOS-LS
- ATACMS
- HIMARS
- APKWS
- GMLRS
- MLRS
- BLOS
- JCM
- LAM
- PAM
- LOS
- FWA

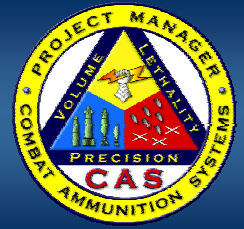
## Ways

**How?**

- Improve Precision
- Improve Accuracy
- Improve Range

- Improve Mobility for Hi OPTEMPO
- Increase and Improve Automation
- Improve Rates of Fire
- Improve Fire Control and SoLns
- Employ Automated Asset Tracking
- Employ Target Mensuration & Sheafing Techniques
- Deeply Integrate Guidance, Navigation and Control
- Develop New Seekers (LADAR)
- Address Target Location Error:
  - ✓ Improve Target Acquisition & Locating Devices
  - ✓ Increase Density of Target Location Devices
- Assess Complementary Nature of Weapons
- Emphasize 5 Predictive Elements of Accurate Fire
- Interoperate with Joint Platforms, Networks, and Sensors
- Acquire Extended Range Artillery
- Address DOTLM-PF
  - ✓ Joint Effects Integration
  - ✓ Universal Observer
  - ✓ RSTA & FIST - Equip & TTPs
- Develop NPMs – Accuracy, Range, and Efficiency
- Develop PGMs – Range and Precision
- Develop TGMs – Accuracy and Lethallity
- Acquire SFMs





# Bridging the Gaps

### Sustainability

- **Excalibur**
- **PGMM**
- **CCF**
- **MACS**
- **Lt. Wt. Mortar**

### Range

- **Excalibur**
- **ACAAP**
- **PGMM**
- **ER Mortar**
- **Arms Room Concept**

### Training/Readiness

- **CAP**
- **MACS**
- **81mm Insert**

### Precision

- **Excalibur**
- **PGMM**
- **CCF**
- **MFCS**
- **PTS**

### Safety

- **eSDF**
- **120mm Breech CAP**

### Special Purpose

- **Cargo**
- **HPM**
- **Less-Lethal**
- **Obscurants**
- **Illumination**
- **Thermobaric**

### Responsiveness

- **MFCS**
- **EPIAFS & MOFA**
- **NLOS-C & NLOS-M**
- **Fires Network**

### Mobility

- **Lt. Wt. Mortar**
- **NLOS-M**
- **NLOS-C**
- **Stowed Kills**

### Automation

- **Ammo Handling**
- **Fire Control**
- **Fuze Setters**
- **Modular Charges**
- **Inventory Management**
- **Dynamic Target Attack**
- **Target Deconfliction**
- **Target Acquisition**
- **Sensor Fusion**

### Robustness

- **Spectrum of Capabilities**
- **Complementary Munitions Mix**
- **24/7**
- **All Weather (Profiler)**
- **All Terrain (NLOS-M, NLOS-C)**

### Accuracy

- **MFCS**
- **PGMM**
- **ATR Excalibur**
- **NLOS-C with PTS**
- **Target Designation Initiatives**
- **Sheafing Techniques**
- **Sensor Fused Munitions**

### Cost Effectiveness

- **NPMs, PGMs, TGMs, & SFMs**
- **ACAAP and MFCS**
- **Lean Acquisition**
- **Spiral Development**
- **Modular Charges**

### Lethality

- **Increased Rates of Fire & MRSI**
- **Angle of Incidence (Excalibur)**
- **Novel Warheads (ACAAP, PGMM, & 60mm MAPAM)**
- **eSDF**
- **SFMs**
- **TGMs (PGMM, Copperhead)**
- **Arms Room Concept**



# Highest Priority Development Programs



**Precision  
Accuracy  
Range  
Lethality  
Robustness**

## System Description:

A NATO-size fuze that provides ballistic course correction for spin stabilized artillery projectiles

## Requirements:

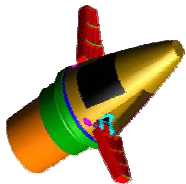
Low cost, fuze-sized module resulting in projectile CEP <50M at max range

**Goal:** Near Precision

**IC:** FY07 **IOC:** FY10

**Status:** Developing co-operative program with Navy

**POC:** Mr. Russ Hill



## Course Correcting Fuze

## Mortar Fire Control System

**System Description:** Links mortar fires with the digital battlefield

**Requirements:** Allow mortar crews to send and receive digital call for fire messages

**Goal:** Accuracy, Responsiveness

**IOC:** FY03

**Status:** Fielding

**POC:** MAJ James Winbush



**POC:** Mr. Bill Vogt

## Self-Destruct Fuzes

## System Description:

Precision Guided, Extended Range 155mm projectile

## Requirements:

Greatly increased precision and reduced collateral damage

**Goal:** Precision, Range **ACAT:** I

**IC:** FY06 (LW155) **IOC:** FY08

**Status:** SDD

**POC:** LTC Jeffrey Wilson

## Excalibur



## Precision Guided Mortar Munition

## System Description:

Precision strike round with extended range and enhanced lethal mechanism technology

## Requirements:

Capability to hit point targets

**Goal:** Range, Lethality, Accuracy

**ACAT:** II

**IOC:** FY10

**Status:** SDD contract award scheduled 3QFY04, following JROC approval.

**POC:** Mr. Pete Burke



## Advanced Cannon Artillery Ammunition Program

**System Description:** Extended range NDI projectiles

## Requirements:

Increased Lethality through Pff technology

**Goal:** Range, Ballistic Similitude

**IOC:** FY06

**Status:** Safety Testing

**POC:** Mr. John Irizarry

## System Description:

Autonomous, fire and forget, all weather 155mm SFM projectile

**Requirements:** Destroy or Immobilize stationary SPHs and other hard point targets

**Goal:** Lethality

**IOC:** N/A **Status:** Accessing foreign NDI projectile compliance with JBMOU

**POC:** Mr. Russ Hill

## Sensor Fuzed Munitions





# Other Developments



## 120mm ER Mortar

### System Description:

Inductively settable Multi-Option Fuze for Artillery

**Requirements:** Compatible with bursting projectiles



**Goal:** Reduced Logistic Burden & HOB accuracy

**IOC:** FY04 **Status:** In Production

**POC:** Mr. Tony Barreiro

## MOFA

## Arms Room Concept

**System Description:** Provide Light Forces maneuver commanders with 81mm and 120mm mortar support

**Requirements:** HQDA G3 approved BOIP change July 03

**Goal:** Lethality, Range, Flexibility

**IOC:** Fielding

**Status:** Seeking additional funding

**POC:** Mr. Ed Lewis

**Goal:** Parachute Delivery Dispense Less-Lethal Payloads

**IOC:** TBD **Status:** Concept Studies

**POC:** Mr. Steve Hromnak

## Less-Lethal Munitions

### System Description:

Designed for kinetic energy mitigation of mortar carrier to minimize collateral damage

**Requirements:** Lightweight with Parachute Delivery

**Goal:** Dispense Less-Lethal Payloads

Mortar An (MAPAM) cartridge fragments



## Lt. Wt. Mortar

**System Description:** STO to reduce the weight of the M252 81mm Mortar System

**Requirements:** 30 to 40% lighter weapon system

**Goal:** Mobility, Portability

**IOC:** TBD

**Status:** Trade Studies

**POC:** Mr. Ed Lewis



**System Description:** Modular propellant 155mm artillery ammunition

**Requirements:** Auto-Loading

**Goal:** Increased Range, Reduced Costs

**IOC:** M231 – FY03, M232 – FY04

**Status:** In Production, Fielding

**POC:** Mr. Jim Rutkowski



## MACS

## M864 Recap

**System Description:** "Like new" DPICM rounds with grenade Self Destruct Fuzes (SDFs) for the Stryker Brigade Combat Teams

**Requirements:** Submunition Self Destruct capability for 155mm artillery ammunition

**Goal:** Recapitalization, Safety (<1% UXO)

**IOC:** FY05

**Status:** Recap Feasibility Study Ongoing

**POC:** Mr. David Kondas

### System Description:

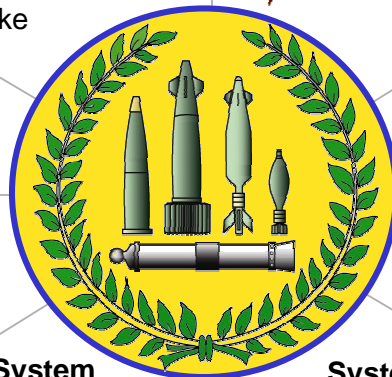
Anti-Materiel 60mm HE bearing

**Requirements:** Perform a side by side comparison of the MAPAM Cartridge, analyzing Lethality and Effectiveness

**Goal:** Lethality **IOC:** TBD **Status:** SDD

**POC:** Mr. John Slivovsky

## 60mm Modernization





# PM CAS Thrusts



## Get PGM's & Smart Weapons to Warfighters

- Executing **Excalibur PGM** Advanced Development
- Transitioning **PGMM** to Advanced Development
- Managing the **Course-Correcting Fuze (CCF)** Technology Demonstration
- Fielding **Mortar Fire Control System Heavy (MFCS-H)** and Developing **MFCS-Light**
- Executing **Sensor-Fuzed Munition (SFM)** Compatibility Assessments

## Satisfy Customers and Achieve Excellence

- Seeking funding for the **120mm Extended Range Mortar Program**
- Seeking funds for the **Mortar Arms Room Concept**
- Monitoring **Lightweight Mortar** and **Less-Lethal Munitions** Science & Technology Objectives
- Working to Ease Transition of STOs into Advanced Development
- Developing Strategic Plan and Business Practice Guidelines and Harmonizing Business Practices with the Joint Munitions Command
- Developing Value Engineering and Cost Reduction Plan

## Improve and Sustain Conventional Munitions

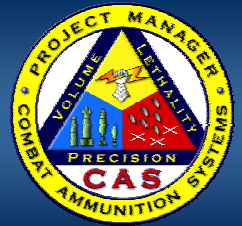
- To meet FCS Emerging Requirements for Munitions, Working with Proponents to Develop Capabilities such as the **NLOS-M**, the **Advanced Cannon Artillery Ammunition Program (ACA<sup>2</sup>P)** and **Course Correcting Fuzes**
- Fielding the **Modular Artillery Charge System (MACS)** to the active force
- Producing Bomblet **Self-Destruct Fuzes**
- Reengineering selected Munitions, such as the **60mm Mortar (HE)** and **155mm M864 (DPICM)**
- Reengineering Pyrotechnic, Explosives, and Propellants (PEP) for Improved Effectiveness, Safety, Insensitivity and Environmental Compliance

## Grow World-Class People and Teams

- Emphasizing Improved Communications
- Disseminating the PM CAS Management Philosophy and Disciplined Processes to Partners in Industry and Government
- Reshaping and Reorganizing the Workforce
- Developing Individual and Team Training Strategies
- Launching Leadership Competency Training Program
- Hiring, Recognizing, and Promoting the Meritorious



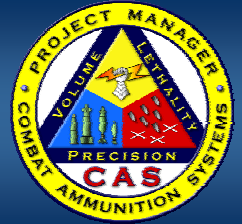
## Other Initiatives



- Fielding selected technologies in 24-36 months, to meet the CSA's guidance for accelerating capabilities
  - Participating in the PEO Ammunition Road Show in support of deploying combat units
  - Participating in the development of a comprehensive Fires and Effects Strategy
  - Determining optimum conditions for both Horizontal Contract Integration (breakouts) and Systems Contracting
  - Developing database interface program called the Combat Ammunition Plan (CAP)
  - Exploring value of supplementing disciplined processes with expert systems
-



# 2004 Goals and Objectives



- Conduct Successful Excalibur Guided-Gunfire-A Test Series
- Obtain JROC Approval for Excalibur's ORD and an APB
- Award and Kickoff the PGMM SDD contract
- Build at least 3 lots of the 105mm M915 DPICM projectile
- Establish cooperative CCF/GIF program with the Navy.  
Secure Additional Funding
- Secure additional funding for the ACA<sup>2</sup>P
- Conduct Successful MC-B IOTE (MFCS); continue fielding
- Secure S&T funding for the 120mm XM984 Extended-Range, Cargo-Carrying mortar
- Fund the Arms Room Concept
- Kickoff light-weight MFCS Program
- Field MACS to the Active Army



# Enabling Technologies

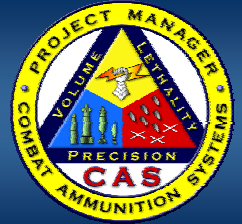


**SFM**  
**Automation**  
**Ammo Marking**  
**Inventory Control**  
**Ammo Condition Indicators**  
**ATR/ Discrimination Tech**

**IFF**  
**MEMS Fuzing**  
**Telemetry/Datalink**  
**Rocket Assist Tech**  
**Force-Level Models**  
**Fire Control Algorithms**  
**Decision Support Tools**



# Summary



- Promoting a **modern organization and philosophy**
  - **Transforming** cannon and mortar fire support munitions based on guidance, concepts, trends, and observations
  - Fire support materiel transformation is characterized by improvements in **precision, accuracy, range, lethality, robustness, responsiveness, and scalability**
  - Key products: **Excalibur, PGMM, CCF, MFCS, ACAAP, SFMs**
  - Managing **Key Thrusts** and **Other Initiatives**
  - Seeking improved **Enabling Technologies**
-