Presented to the: Armaments Division Forum

Presented by: Mr. James Shields, PEO Ammunition

2 May 2017
PEO Ammo Place Within the DoD

President of the United States

Secretary of Defense

Secretary of the Army

Assistant Secretary of the Army
(Acquisition, Logistics & Technology)

Program Executive Office Ammunition
Ammunition Enterprise

**LEADERSHIP**

**Director, Armament Research, Development & Engineering Center**
Mr. John Hedderich
Picatinny (Army Materiel Command)

**Program Executive Officer**
Mr. James Shields
Picatinny (Assistant Secretary of the Army for Acquisition, Logistics & Technology)

**Joint Munitions Commander**
BG Richard Dix
Rock Island (Army Materiel Command)

**MISSION**

Lead Research, Development and Engineering of Systems Solutions to arm those who defend the Nation against all current and future threats, at home and abroad

**RESEARCH & DEVELOPMENT:**
- Life-cycle engineering support lead
- Manage/execute Tech Base (BA6.1-6.3)
- Rapid Prototyping & Manufacturing Process Development
- System Engineering & Integration
- R&D Evaluation & Experimentation
- Ammunition Packaging, Handling, Storage, and Transportation R&D
- Quality Engineering/System Safety (Products)
- Matrix Support to PMs

**ACQUISITION:**
- Single Manager for Conventional Ammo
- Systems Development
- Acquisition Strategy
- Hardware Production
- Components for Renovation
- Ammunition Peculiar Equipment (Maintenance Support)
- Research Development Test & Evaluation
- Industrial Base
- Demilitarization/Disposal

**LOGISTICS/SUSTAINMENT**
- Receipt / Issue
- Storage / Distribution Mgmt.
- Inventory / Accountability
- Safety / Security
- Quality Assurance (Ammunition Stockpile Reliability Program/Surveillance)
- Maintenance
- Transportation
- Operations & Maintenance Army Program/Budget / Receive
- Funding

**LEADERSHIP FEEDBACK**

Develop, equip, and sustain lethal armament and protective systems enabling joint warfighter dominance.

Provide America's Joint Forces with ready, reliable and lethal munitions at the right place and time in a cost effective manner to enable successful military operations.
POTUS and SECDEF are committed to Strengthening our U.S. Armed Forces*

- The “ultimate objective is to build a larger, more capable, and more lethal joint force”

- Strengthen the Armed Forces by:
  1. Improve warfighting readiness with FY17 Budget Amendment
     - “Address urgent warfighting readiness shortfalls”
     - “Increase force structure in critical areas” to have an “immediate readiness impact”
  2. Achieve program balance by addressing pressing shortfalls in the FY18 Pres Budget Request
     - “Focus on balancing the program, addressing programmatic shortfall, ... continuing to rebuild readiness”
     - Examples include “building more critical munitions”
  3. Build a larger, more capable, and more lethal joint force in the FY19-23 Defense Program
     - Determine the approach to “enhancing the lethality of the joint force against high-end competitors and the effectiveness of our military against a broad spectrum of potential threats”
     - “Improve how the Department does business” ... and include “horizontal integration across DoD components to improve efficiency and take advantage of economies of scale”

* Excerpts from SECDEF Memo dated 31Jan17
* This memo is Distribution A, available and download-able off of the Internet

Improved Efficiency and More Lethal Joint Force
Army Issues

• While the US focused on the Counter-Insurgency Fight its Peers and Near-Peers focused on the US
  – 4+1 (Russia, China, Iran, North Korea [4] + ISIS and other terrorist organizations [1])

• Capability Gaps
  – “We are not maintaining our combat-overmatch for the next ten-years”
  – “We need Long-Range-Precision-Fires, Air & Missile Defense, Cyber, ...”
  – Current size of the Army is not adequate for potential global issues

• Chief of Staff is not happy with the speed of acquisition
  – The Army needs to find ways to decrease the complexity of fielding munitions and systems
  – “Empower the PEOs”
  – Leave Project Managers in place longer so they own success or failure for a program
  – CSA sees SOCOM as one example of an acquisition process that works well

• Full-year 2017 CR would create a $4B delta in Readiness while also collapsing RDA
PEO Ammunition FY17 Budget

- **PAA $1,681.1M**
- **WTCV $60.8M**
- **Other Services $1,037.7M**

- **OPA $97.6M**
- **RDTE $267.4M**
- **OMA $9.8M**

Source: FY17PB-R
### PEO Ammunition Items and the FY17 Amended Budget

<table>
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<tr>
<th>Appropriation</th>
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<th>$ in Amended Budget Submission</th>
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<td>CTG, 30mm, All Types</td>
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<td><strong>PEO AMMO Total</strong></td>
<td><strong>$566,420</strong></td>
<td><strong>$566,420</strong></td>
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Flares & Signals
Near-term:
• Defeating increased threats to aircraft
• Lighter and more tunable countermeasures (multi-purpose)
Mid-term:
• Defeating advanced aircraft threats
Long-term:
• Fully tunable effects (user selectable)

Tank Ammo
Near-term:
• Advanced KE and AMP
Mid-term:
• DU alternates
Long-term:
• Guided extended range for advanced targets

Small Cal
Near-term:
• OWL; Training Flexibility
• RRA; Mobility
• Lightweight Sm. Cal Ammo (LSCA)
Mid-term:
• Precision
Long-term:
• Extended range guided with user tunable effects
• “Trace” capability in smart sight on the weapon vs. on the round
• “Ammo on demand” - user has the capability to “produce” the ammo as needed.

Artillery & Mortars
Near Term:
• Fielding light-weight wpns / Precision ammo
• Producing High Explosive rounds with insensitive munition fills
• C-DAEM Bridging Strategy
• Compatibility with M-Code GPS
• High Explosive Guided Mortar (HEGM)
• Lightweight digital fire control
• Improved HOB (IMOFA/IMOFM)
Mid-term:
• Longer range through ammo improvements
• Increased lethality for 155mm (cluster munition replacement)
Long-term:
• Longer range through weapon upgrades
• Extended Range Autonomous Weapons

Demolitions:
Near-term
• Improving producibility of Modernized Demolition Initiators components (i.e., blasting cap)
Mid-term
• Reducing collateral damage
• Developing more IMX compliant items
Long-term
• Non-kinetic neutralization of explosives from standoff

Bomb Production:
Near-term:
• Address increases in Bomb requirements
PEO Ammo Focus Areas (cont.)

Medium Caliber
Near-term:
- Increased lethality through warhead and round design
- Door Breach
Mid-term:
- Extended range and guidance
Long-term:
- Collaborative/swarming effects
  - “Ammo on Demand”

Non-Lethal
Near-term:
- Improvements to the 40mm and 12 ga ammunition
Mid-term:
- More covert and passive marking of targets
Long-term:
- Integrated lethal and non-lethal effects and non-kinetic engagement

Shoulder Launched
Near-term:
- FMR of Multi-role Anti-armor Anti-personnel Weapon System (MAAWS)
Mid-term:
- Development of IAM
Long-term:
- Fielding of IAM
  - Longer range defeat of advanced targets

Area Denial
Near-term:
- Spider (all increments)
- Remote/autonomous emplacement and scalable effects - Gator Landmine Replacement Program (GLRP)
Mid-term:
  - Close-Terrain Shaping
Long-term:
  - Mid-Terrain Shaping Obstacles

Counter Explosive Hazard (CEH)
Near-term:
- Development of autonomous operations
Mid-term:
- Greater speed and standoff for detection marking and lower cost technologies
Long-term:
- Detection and non-kinetic neutralization of explosives from standoff

Grenades
Near-term:
- Benign smoke & fuze/primer upgrades
Mid to long term:
- Dual use grenades
Long-term:
- Non-kinetic effects and lighter weight
FY19-23 Army Requirements

The munitions trend is an increase in both war reserve and training requirements

• Emerging factor that could further affect future requirements:
  – Potential increase in force structure
  – War reserve requirements increased due to changes to the war fight scenarios, number and type of BCTs in the campaigns, and changes to BCT structure
    » Aviation Restructure Initiative
    » 30mm on Stryker
    » Mobilization training
  – Training requirements increased due to use of the current 1,015K personnel in force structure vice the 980K used in previous training requirements analysis
    » Priority is maintaining funding to replenish training expenditures to support the DA G3 ability to authorize 100% of the annual Training Requirements
    » The Army is expending more ammunition in training than it is acquiring
    » ARSTAFF is assessing the funding needs to mitigate projected funding shortfalls as part of the POM 19-23 process

Assess the impact of increased requirements on the Organic and Key Commercial Ammo Production Capabilities
Trends in Army Ammunition Requirements (FY18-22 vs FY19-23)

- **Minimal Increase**
  - Small Caliber
  - Medium Caliber
  - Mortar
  - Signals
  - Grenades

- **Moderate Increase**
  - Demolition
  - Tank
  - Aircraft Flares

- **Significant Increase**
  - Shoulder Launched
  - Artillery Fuze and Primer
  - 155mm Artillery
  - Modular Artillery Charge (MACS)
  - 30mm Stryker
  - 20mm C-RAM
**Capability Gaps & Operational Risk**

- **Oslo Accord:** Full implementation of the DoD cluster munitions policy is scheduled for 1 Jan 2019 and will prevent US Armed Forces from using existing cluster munitions (DPCIM, APAM).
  - By end of 2018, no longer use cluster munitions that result in more than 1% UXO in intended operational environments
    - No waivers
    - Self-Deactivation can reduce hazards to civilians, but still considered UXO
  - Can use cluster munitions that exceed 1% UXO until the end of 2018, but use must be approved by COCOM
  - **Replacement Program:** Cannon-Delivered Area Effects Munition (C-DAEM)

- **National Landmine Policy:** Prohibits the Use, Stockpiling, Production and transfer of Anti-Personnel Mines. There are no current policy compliant systems capable of replacing the Anti-Personnel Mines role of conducting Deep Terrain Shaping (17km and beyond)
  - **Replacement Program:** Gator Landmine Replacement (GLMR)

- **Unmanned Aerial Systems (UAS):** A decade ago unmanned aerial systems were used only by a handful of industrialized countries armed forces. Now with a rapidly growing commercial industry UAS’ are cheap, readily available and being used by ISIS, Hezbollah and other terrorists groups for both surveillance and to carry and release munitions
  - **Defense:** Counter-Unmanned Aerial Systems (C-UAS)
DoD Policy on Cluster Munitions (19 June 2008):
- Implemented to minimize unintended harm to civilians from Unexploded Ordnance (UXO)
- Loss of cluster munitions creates a capability gap starting in Jan. 2019
- Policy eliminates use of 155mm Dual-Purpose Improved Conventional Munition (D-PICM)

Solution: Cannon-Delivered Area Effects Munition (C-DAEM) Program
- Develop & deliver a **FULL Area Effect** capability to mitigate or eliminate gaps for engagement of area targets, poorly located targets, moving targets, counter-fire, and suppression of enemy air-defense (SEAD).
- Provides fires/counter fires overmatch (range and lethality).
- Delivers efficient effects against personnel and light to heavy mechanized vehicles in poorly located & GPS Degraded/Denied environments

### C-DAEM Program Baseline

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<td>JAS</td>
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<td>AMJ</td>
<td>JAS</td>
<td>ONL</td>
<td>JFM</td>
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</table>

- **Material Solution Analysis**
- **Technology Maturation and Risk Reduction**
- **Engineering & Manufacturing Development**
- **Production and Deployment**

- AoA-Analysis of Alternatives
- CDD-Capabilities Development Document
- CPD-Capabilities Production Document
- FRP-Full Rate Production
- LRIP-Low Rate Initial Production
- MS-A-Milestone A
- MS-B-Milestone B
- MS-C-Milestone C
- IOC-Initial Operational Capability
Cannon-Delivered Area Effects Munition (C-DAEM) Bridging Strategy

- C-DAEM Bridge for loss of DPICM 1 January 2019
  - C-DAEM Bridge will deliver 155mm Sensor Fuzed Munition capability for Area Effects against Armor, goal of first deliveries Fall of 2018
  - C-DAEM Bridge accelerates development of 155mm XM1128 with enhanced lethality features.
  - C-DAEM Bridge will Test & Evaluate 155mm Improved Conventional Munition (ICM) projectile’s compliance with DoD Cluster Munition Policy (achieve less than 1% unexploded ordnance)
Gator Landmine Replacement Program (GLRP)

What is GLRP

• Technologies and systems to employ deep, mid and close range obstacles to:
  – Deny enemy access to terrain
  – Deny enemy freedom of action
  – Allow friendly forces to maneuver freely within the same battlespace

• The deployed components will likely be delivered by fixed-wing aircraft to the pre-planned locations

• GLRP will enable early situational awareness without exposing friendly forces while shaping the battlespace at deep operational ranges

• Will be compliant with current policy and will incorporate Man in the Loop controlled effects.

Innovative Acquisition Approach

• PM Close Combat Systems awarded DOTC contracts to 4 contractors to develop and demonstrate capabilities to meet the Program of Record requirements

• In parallel PM CCS is implementing a bridging strategy of rebuilding legacy Gator without Anti-Personnel mines which will be policy compliant

• The bridging strategy would be an interim solution that would provide the same legacy operational effect within 5 years to support Warfighter needs
Counter Unmanned Aerial Systems (C-UAS)

- Production of commercial UAS’ is a rapidly growing industry
- UAS’ are cheap and readily available
- UAS’ are being used by ISIS and other terrorists groups for surveillance and to carry out terrorist acts against military and civilian targets

- ARDEC and PEO Ammo are working on a number of possible solutions to counter the UAS threat
- Potential candidates include the Ballistic Low Altitude Drone Engagement (BLADE) and the 40mm C-UAS Net Warhead Technology

Small Cal Solution - Ballistic Low Altitude Drone Engagement (BLADE)
- C-UAS Interceptor using .50 cal. Munition
- Payoff: Detects, tracks and defeats enemy UAS using an organic, low cost, low collateral damage solution

Medium Cal Solution - 40mm C-UAS Net Warhead Technology
- Non-lethal CUAS launched from a man-portable grenade launcher or Stryker LEDS Launcher
- Payoff: Uses existing systems to launch a non-destructive method to incapacitate and recover the enemy UAS

- Precision Fire Control Radar (PFCR)
- Common Remotely Operated Weapon Station (CROWS)
- Small Caliber (0.50 cal) C-UAS munition
Need for Speed

PEO Ammunition initiatives to increase the speed of acquisition

- Bridging Strategies (ex. C-DAEM, GLMR, IAM)
- DD250 versus Technical Proposals
- Other Transaction Authority (OTA)
- Longer Contract/Higher Values
- Bundling Family of Items
- Cleansheeting
- Ceiling Values
- Cross Leveling
- Special Defense Acquisition Fund (SDAF)

PEO Ammo’s Use of DOTC (FY11-16)

(Through 30 SEP 2016)
Cleansheets help you change the conversation from “does cost” to “should cost”

- Understand Supplier costs
- Increase Cost Transparency
- Improve Negotiation Power
- Find Mutually Beneficial Solutions

PEO Ammo Programs
- Precision Guidance Kit (PGK)
- PSS-14C
- M829A4
- M141 Bunker Defeat Munition (BDM)
- Bombs
- Lake City

Invoice cost

Does cost

Should cost

$A

Is the vendor charging a fair margin?

$B

Is the service provided in the best way?

$C

Does cost

Should cost
PEO Ammunition
Better Buying Power

220 Initiatives Across All BBP Focus Areas

- Achieve Affordable Programs
- Achieve Dominant Capabilities while Controlling Lifecycle Costs
- Incentivize Productivity in Industry and Government
- Incentivize Innovation in Industry and Government
- Eliminate Unproductive Processes and Bureaucracy
- Promote Effective Competition
- Improve Tradecraft in Acquisition of Services
- Improve the Professionalism of the Total Acquisition Workforce

$6.01B Savings & Avoidance

- All Services
- All Years

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<th>Projected</th>
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Savings & Avoidance By Year

- FY11
- FY12
- FY13
- FY14
- FY15
- FY16
- FY17
- FY18
- FY19
- FY20
- Later

- Army Savings
- Army Avoidance
- Other Service (Avoidance)
# Single Manager for Conventional Ammunition (SMCA) Customer Satisfaction Survey

## FY15 SMCA Customer Survey Results

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<tr>
<th>Category</th>
<th>Individual Metric</th>
<th>USMC</th>
<th>NAVY</th>
<th>PMO-201</th>
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## FY16 SMCA Customer Survey Results

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<tr>
<th>Category</th>
<th>Individual Metric</th>
<th>USMC</th>
<th>NAVY</th>
<th>PMO-201</th>
<th>PMO-202</th>
<th>USGCOM</th>
<th>FY16 Average Score</th>
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<tr>
<td>Participation</td>
<td>SMCA transition</td>
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<td>Management of the transition</td>
<td>process</td>
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<td>Identification &amp; incorporation of</td>
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<td>Coordination on significant</td>
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<td>Wholesaler and distributor (WMD)</td>
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<td>Transportation and handling</td>
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</tbody>
</table>

### 2016 FINDINGS:

- No “Areas of Concern”
- 22 out 23 questions are “Positive Indicators” (96%)
- 134 of 138 responses are “Satisfactory or Better” (97%)
GOCO Army Ammunition Plant (AAP) Modernization Strategy

Key Objectives:
- Increase manufacturing readiness to meet current & future requirements
- Reduce AAP operating costs and footprint
- Improve safety and environmental compliance
- Improve quality and efficiency
- Improve Quality of Work Environment (QWE)

Approach:
- Identify, consolidate and prioritize production deficiencies, aligning with Joint Warfighter needs
- 1-N Priority List Scoring Criteria
  - (1) Operational Continuity (30%), (2) Environmental (20%), (3) Safety (15%), (4) Cost (20%), (5) Return on Investment (15%)
- Characterize “Critical” requirements
- Target organic capabilities & capacities not found in the Commercial Sector

Requirements:
- Critical: Investment necessary to avoid significant supply disruptions or to provide an immediate improvement to operating efficiencies. Also includes efforts requiring action in order to meet specific environmental compliance regulations or safety standards.

Validation:
- Process establish w/ HQDA G8/G3/G4; AMC, ABO, ASA(ALT); USD(AT&L)
  - Determination & Findings (D&F) used to validate requirement
  - <$10M PEO Ammo approves
  - >$10M USD (AT&L) approves

SMCA DODI 5160.68
“Manage and Invest….. To Ensure Adequate Production Base that Supports SMCA Assigned Products”

44 Families
All Green or Amber

Annual long range planning report to Congress

Quality of Work Environment ~15% of Overall Annual Modernization Budget
Cross-leveling Program

• **History**
  – Implemented in FY1997
  – Office of the Executive Director for Conventional Ammunition facilitates the Military Munitions Cross-leveling program

• **Purpose**
  – Provides formal process for transfer of conventional military munitions (to include missiles) deemed in long supply between Military Departments to fulfill munition requirements
  – Military Services assess munitions inventory annually for potential long-supply stocks that may satisfy requirements of another Military Service

• **Benefits**
  – Validates/Justifies military munition inventories
  – Minimizes potential excess
  – Avoids unnecessary procurement
  – Avoids unnecessary demil

FY16 Military Munition Cross-Leveling By Family

- Medium Caliber $55.1M (62%)
- Small Cal $17.8M (20%)
- Pyrotechnics $7.5M (8%)
- Artillery $6M (7%)
- Demolitions $1.1M (1%)
- Grenades $0.5M (1%)
- Other $0.8M (1%)

$88M in Cost Avoidance for FY2016
Ammunition Demilitarization

The Single Manager for Conventional Ammunition (SMCA) is responsible for demilitarization and disposal of excess, obsolete and unserviceable ammunition for all military services.

PATH TO DEMILITARIZATION

STEP 1: Ammunition deemed excess, obsolete, unserviceable

STEP 2: Ammunition offered to other military services (cross leveling)

STEP 3: Ammunition offered to other Federal Agencies (FBI, ATF, etc)

STEP 4: Ammunition offered to state government agencies

STEP 5: Ammunition offered to foreign governments

STEP 6: Ammunition sent to demil

Field Service Ammunition
Re-use of Demil Stocks

PM CAS M483 Re-use

Downloaded M483A1 Projectile Metal Parts are used to create five new projectiles

- M1122 HE
- M1123 IR
- M1124 VL
- M110A3 Smoke
- XM1125 Smoke

Provides extended range at lower cost than existing projectiles!

PM Precision Fires MLRS Re-use

PODS for GMLRS

Rocket Motors – Low Cost rocket Trainer

PM MAS Tank Ammo Re-use

Steel Cartridge Cases

- Propellants – M30, JA-2

Other Services Re-use

- US Navy Torpedoes – Otto Fuel, batteries
- USAF Cluster Bombs – FZU-39 Altimeter fuzes, CB411 containers

New production cost avoidance in hundreds of millions $$, also demil cost avoidance
Global Ammunition Power Projection

Global Presence
- Leveraging Ammunition Positioning for the Joint Warfighter and our Allies
- Building Coalition Capacity

Joint Warfighter Support

Foreign Military Sales

- 67 Countries
- 331 Open Foreign Military Sales Cases
- $5.5B Total Value

- Non Standard Ammo 24.6%
- Mortars 13.7%
- Small Caliber 12.6%
- Artillery 11.9%
- Med Caliber 11.7%
- Other 25.5%

NORTHCOM Value: $48M
SOUTHCOM Value: $17M
AFRICOM Value: $41M
EUROPEAN COMMAND (EUCOM) Value: $291M
PACIFIC COMMAND (PACOM) Value: $469M
CENTRAL COMMAND (CENTCOM) Value: $4.7B

Value: $48M
Value: $291M
Value: $469M
Value: $4.7B
NSA Supplier Base

- Non Standard Ammunition (NSA) is ammunition that has not been Type Classified by Department of Defense, is not in U.S. inventory, and is designed for Former Soviet Union (FSU) weapons platforms
- Supplier base is comprised of manufacturers in Eastern European countries, FSU
- Current FSU supplier base has been producing NSA for decades
- Supplier base manufacturers are subcontracted by U.S. Prime contractors who are contracted by U.S. Government

- 300 Products Managed
- Over 942M Rounds Delivered
- Over $1.34B Procured

- 7.62mm x 54R
- 23mm
- 40mm
- 60/82/120mm Mortar Ammo and Systems
- 40mm RPG
- 73mm HE Recoilless
- 57mm Rocket
- 80mm Rocket
- 120mm Artillery
- 90mm Tank

- 300 Products
- Over 942M Rounds
- Over $1.34B

[Map of countries]
Summary

• Dangerous place
• Munitions are critical
• Reform & accelerate everything we do
• Continue to grow technologies
Meeting Joint Warfighter’s Needs!

Over 20B Rounds Delivered FY02-16
THE HIGHEST CALIBER