“Enhancing Small Arms Effectiveness in Current and Future Operations”

Chris Grassano
Project Manager

22 May 2008
Top 10 Military Instructions

10 - "AIM TOWARDS THE ENEMY." -Instruction printed on US Rocket Launcher

9 - "WHEN THE PIN IS PULLED, MR. GRENADE IS NOT OUR FRIEND." -US Marine Corps

8 - "CLUSTER BOMBING FROM B-52s IS VERY, VERY ACCURATE. THE BOMBS ARE GUARANTEED TO ALWAYS HIT THE GROUND." -U.S.A.F. Ammo Troop.

7 - "IF THE ENEMY IS IN RANGE, SO ARE YOU." -Infantry Journal

6 - "A SLIPPING GEAR COULD LET YOUR M203 GRENADE LAUNCHER FIRE WHEN YOU LEAST EXPECT IT. THAT WOULD MAKE YOU QUITE UNPOPULAR IN WHAT'S LEFT OF YOUR UNIT." -Army's magazine of prevention maintenance

5 - "TRY TO LOOK UNIMPORTANT; THE ENEMY MAY BE LOW ON AMMO." -Infantry Journal

4 - "TRACERS WORK BOTH WAYS." -U.S. Army Ordnance

3 - "ANY SHIP CAN BE A MINESWEEPER....ONCE." -Anonymous

2 - "DON'T DRAW FIRE; IT IRRITATES THE PEOPLE AROUND YOU." -Infantry Journal

1 - "IF YOU SEE A BOMB TECHNICIAN RUNNING, TRY TO KEEP UP WITH HIM." -U.S.A.F. Ammo Troop
MISSION: PM MAS Provides Direct Fire Combat And Training Ammunition Capabilities To All Warfighters (Army, Navy, Air Force, Marines)
Ammunition Products

<table>
<thead>
<tr>
<th>Small Caliber</th>
<th>Medium Caliber</th>
<th>Large Caliber</th>
</tr>
</thead>
<tbody>
<tr>
<td>(5.56mm - .50 Cal)</td>
<td>(20mm – 40mm)</td>
<td>(105mm &amp; 120mm)</td>
</tr>
</tbody>
</table>

TOTAL 189
# PM MAS

## FY08 Procurement Quantities

(What we are Ordering)

<table>
<thead>
<tr>
<th>Small Caliber (1,708M)</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.56MM</td>
<td>1294.5M</td>
</tr>
<tr>
<td>7.62MM</td>
<td>240.3M</td>
</tr>
<tr>
<td>.50 Cal</td>
<td>94.7M</td>
</tr>
<tr>
<td>9MM</td>
<td>62.6M</td>
</tr>
<tr>
<td>Shot Shells, Calibers .45, .22, 30</td>
<td>16.2M</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Medium and Medium Cannon Caliber (27.5M)</th>
<th>2008</th>
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<tbody>
<tr>
<td>20MM</td>
<td>4.6M</td>
</tr>
<tr>
<td>25MM</td>
<td>2.2M</td>
</tr>
<tr>
<td>30MM</td>
<td>5.9M</td>
</tr>
<tr>
<td>40MM</td>
<td>14.8M</td>
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<table>
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<tr>
<th>Large Caliber (207K)</th>
<th>2008</th>
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<tbody>
<tr>
<td>105MM</td>
<td>.012M</td>
</tr>
<tr>
<td>120MM TRAINING</td>
<td>.178M</td>
</tr>
<tr>
<td>120MM TACTICAL</td>
<td>.017M</td>
</tr>
</tbody>
</table>

NOTE: All Services FY08 and Projected Supplemental

1.736B ctgs / $1.436B for FY08
PM-MAS 08 GOALS

- **Support Warfighters (GWOT)**
  - Production / Fielding
  - Logistics
  - Training

- **High Performing, Agile & Ethical Workforce**
  - Grow People & Teams
    - Training
    - Skills
  - Effective Management
    - System & Family Approach
    - Integrated Acquisition Lifecycle
    - War Reserve Management

- **Enhance Organic/Commercial Strategic Capabilities**
  - Shape Industrial Base Capacities to Meet Requirements
  - Modernize & Maintain Future Viability
  - Identify/Establish Alternate Sources

- **Develop & Field Capability Improvements**
  - Large Cal Strategy
  - Airburst fuzing
  - Small Cal RDT&E
  - FCS Support
  - Lethality

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**Small and Medium Caliber**

- **Support Warfighter**
  - Meet Scheduled Production Goals
  - Reduce Delivery Backlogs
  - 40mm Baselining

- **High Performing Workforce**
  - Developmental Assignments
  - Training / Certifications

- **Enhance Strategic Capabilities**
  - Lake City Modernization Program
  - Develop Future Small Caliber and 40mm Strategies

- **Field Capability Improvements**
  - Green Ammunition
  - 40mm Pivoting Coupling
  - Small Caliber Case Mouth Waterproofing
  - Downselect 40mm High Velocity Non-dud-producing Training Round Configuration
Recent Past

- In All Direct Fire Ammunition Families; Continuing to Deliver at Highest Levels Since Vietnam War

- Capacities and Sources Have Increased
  - LCAAP - 1.2B (FY05) to 1.6B (FY07)
  - Second Source Small Caliber - 300M
  - New 40mm LAP Contractors

- New Capabilities Have Been Fielded
  - GREM
  - 12 Gauge Breeching
  - 7.62mm SRTA
  - 5.56m / 9mm SESAMs part of CCMCK (pending)
  - 40mm M992 IR Illum (pending)

Much for Government and Industry to be Proud
Small Caliber Acquisition Strategy

1-2-3-4 Strategy

1. Lake City Capacity (1.2B) Ctgs.
2. Use Additional Capability (200M) Ctgs.
3. System Contractor (Commercial Capability)

Cartridges in Billions

- Lake City Capacity
  - Capacity Expansion (400M) Ctgs.
- Lake City (Organic Capability)
- System Contractor (Commercial Capability)

Strategy to Remain But Step Quantities to Change in FY09

DISTRIBUTION STATEMENT A:
Small Caliber Ammunition Deliveries

Deliveries Nearly Quadruple

Assumes No Major Crisis

(All Services)
- Sustains Training Ammo Support
- Meets Existing Tactical Requirements and Builds Tactical Stockpile
- Implements Green Program
Small Caliber NRE Efforts

- Lake City AAP Modernization – Positions This National Asset for Future Use
  – 7.62mm BAM Upgrade Depicted

- Case Mouth Waterproofing - Qualify Alternative Case Mouth Waterproofing Sealant Materials/Process to Increase Throughput by Reduction in “Leakers”
  – Reduce Failure Rate From 7% to 2%

- Packaging - Develop More Cost-Effective, High-performance Commercial Package for 5.56mm CONUS Range-fired Ammunition
  – Wirebound Elimination - $6M / yr savings
  – Simplified Bandoleer - $5M / yr Savings
Field an Environmentally Friendly 5.56mm Cartridge That Will Exhibit Comparable Performance to Current Leaded M855

- Operational in M4, M16 and M249 Weapon Systems
- Round Utilizes Latest Science and Technology to Improve Upon all Aspects of Round (Environmental Compliance, Accuracy)
- Ballistically Matched to Army's Current Ball Round so There will be Minimal Training Impact
- M855LFS will Begin Production Late FY08
40MM Grenade Family of Munitions

Current Acquisition Strategy
- Systems Contract Strategy
  - 2 Joint Venture Small Business Teams
- Government Focusing on Products/Industrial Base, Not Parts

Examples of High and Low Velocity 40MM Grenades
- M918: High
- M430A1: High
- M781: Low
- M433: Low

Future Challenges
- Iowa / Milan Competition (FY09)
- Follow-on Systems Contract (FY10)
40mm Deliveries

(All Services)

Deliveries Nearly Quadruple
40mm Roadmap

- High Velocity (HV) HEDP (M430A1/B542)
- Low Velocity (LV) HEDP (M433/B546)
- NDP Trainers Mixed Belt M385/M918
- NDP HV
- NDP Day Night LV

- Ammio Suite Satisfies ALL EXISTING 40mm Tactical Requirements
- HV and LV Trainers Will be Full NDP by FY12
Pivoting Couplings
- Combat Advantage: Link Next Belt of Ammo to One Currently Loaded in Mk19; No Need to Stop and Re-load
- Cost Savings: Add Single Round or Partial Belts to Existing Belt, so That Ammo is Not Wasted ($1M / yr)
- Scheduled for Implementation in 4QFY08

Single Chamber Cartridge Case
- Eliminate Gun Stoppage Due to Excessive Base Plug Movement
- Eliminate Bolt Face Erosion Due to the Leaking of Hot Propellant Gases Past Base Plug
- Reduce Cost by Eliminating Base Plug and Closing Cup ($0.30 / ctg), Easing Manufacturing Processes ($0.30 / ctg), and Reducing Critical/Major Defect Inspections

M433 Improvement
- Improve Robustness of Design and Create More Consistent Function by Reducing Number of Components and Defect Inspections
- Potential for Cost Savings Resulting from Less Complicated Design, Use of Production Methods Common with M430A1 HEDP, and Reduction of Touch Labor (Savings estimates not yet established)
Strategic Situation

- Production: At Capacity in Many Cases
- Requirements: Downturn on Horizon
  - Training - Replace Expenditures Only
  - Operational - Replace Expenditures & Build Stockpile
- Expenditures:
  - Training – recently at 40% requirement, historical at 70%
  - Operational – steady since FY06
- Stockpile: Increasing Daily…At or Nearing Objectives
- Requirements for Many Items
- FMS: On the Rise (223M Rounds So Far in FY08)

Challenges Ahead, But Opportunities Exist
## Future Years Outlook

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<td>5.56MM</td>
<td>Lower but Large FMS Orders Are Mitigating – Also Green Ammo</td>
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<td>25MM</td>
<td>Minimum Sustaining Buys</td>
</tr>
<tr>
<td>30MM</td>
<td>30mm x 113mm: Higher Reqts for M789 &amp; M788 Steady 30mm x 173mm: Slow Growth</td>
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<tr>
<td>40MM</td>
<td>Min HEDP Buys – Training Ammo Switch to Non Dud Producing – Overall Lower Buys</td>
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Industry Opportunities

Technologies the Army is Looking to Obtain

- **Improved Lethality**
  - 5.56mm thru 40mm

- **Cost Avoidance**
  - Packaging, Materials, Reduced Weight

- **Advanced Fuzing**
  - Self Destruct, Increased Reliability, Cheaper

- **Reduced Signature**
  - Reduced Flash, Smoke, Non-pyrotechnic Tracer

- **Improved Accuracy**

- **High Energy Propellants**
  - Higher Velocity, IM Attributes, Temperature Insensitive

Respond thru System Contractors, NASTC, Unsolicited Proposal, Web Page, NWEC
Questions?