“Enhancing Small Arms Effectiveness in Current and Future Operations”

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Project Manager

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MISSION: Provide Lifecycle Management of Direct Fire Combat And Training Ammunition Capabilities To All Warfighters (Army, Navy, Air Force, Marines)
Ensure This Never Happens

And I say they are out of Ammo!
**PM-MAS 09 Goals**

- **Support Warfighters**
  - 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**
  - 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
  - Case Mouth Waterproofing
  - Flash Suppression
  - Packaging Improvements
  - DDI Improvement Effort
  - 40mm Pivoting Coupling
  - Down-select 40mm High Velocity Non-dud-producing Training Round Configuration
Enterprise Management Philosophy

- Promote Best Value Acquisitions
- Utilize Disciplined Processes
- Deploy Six Sigma and Lean Design/Production
  - Using Six Sigma Principles in the Establishment of PEO Strategic Plans
    - Industrial Base
    - Demil
    -Insensitive Munitions
- Promote Continuous Process Improvement and Technology Insertion
- Promote Commonality and Interoperability
- Promote Spiral or Evolutionary System Development

*Put Eyeballs On – “Trust, but Verify”*
Future for Direct Fire Ammunition

- **Strategic Situation**
  - Production: At/Near Capacity in Many Cases
  - Requirements: Declining in FY10 and Flattening
    - Army and Marine Corps Size Increases Accelerated 2-3 yrs
  - Expenditures:
    - Training – approaching historical levels, 70%
    - Operational – steady since FY06, potential increases
  - Stockpile: Continuing to Grow…At or Nearing Objective Requirements for Many Items
  - FMS: Continuing to Grow Overall
    - 500% sales increase ($600M) FY04-08
    - 35% ammo hardware buys in FY08
    - 10% small cal buys in FY08

New Administration Plan Uncertain Beyond FY10
Small Caliber Buys

FY08 | FY09 | FY10 | FY11 | FY12 | FY13 | FY14 | FY15
---|---|---|---|---|---|---|---
1,100 | 1,010 | 564 | 494 | 512 | 483 | 475 | 452

5.56mm | 7.62mm | .50Cal | FMS

DISTRIBUTION STATEMENT A:
LTC J. Woods
Product Manager
Small Caliber Ammunition
5.56mm, 7.62mm, 9mm, .50 Cal

5.56mm Family

7.62mm Family

.50 Cal Family

ENHANCING SMALL CALIBER EFFECTIVENESS
Propellant / Tracer Efforts Ongoing
- Flash Reduction (end of FY09 Across Calibers)
- Velocity improvements, Temperature Sensitivity Reduction (FY10-12)
Green Ammunition

**M855 Lead Free Slug (LFS)**
- **M856 LFS**
- **M80 LFS**

- 5.56mm Family
- M855 LFS
- 7.62mm Family
Background
(What Started the Program)

- Original Lead Free Program: Replace Lead Slug Component
  - Used Tungsten/Nylon to Replace Lead
  - Program Stopped for Performance and Manufacturing Problems
  - Later Research Indicated Tungsten Possible Environmental Hazard

- Lethality Concerns:
  - Field Reports of Performance Issues With M855
  - Question: “Are There Commercial Off-the-Shelf (COTS) 5.56mm Bullets Available That are Better Than M855 in Close Quarter Battle (CQB)?”
  - Conclusions from Lethality Study in 2006
    - There is no Significant Difference Between M855 and Commercially Available 5.56mm Rounds
      - Shot Placement Far Outweighs Minor Differences Among Rounds
      - Good Shot With any Candidate Will Work; Bad Shot With any Candidate Won’t
    - Weapon-bullet Interaction Varies Greatly and Affects CQB Performance
      - Causes Variation in Soldier Experience
In 2007, applied a *Systems Approach* to Cartridge Improvements (M4 Optimized)
- Incorporated Lessons Learned from Lethality Study Conducted in 2006
- Working in close coordination with Weapon Engineers
- Addressing concerns from the field
- Significant Extension in Range of Hard Target Performance
- No Training Transfer Difference
- Leverage Existing Lake City Equipment and Modernization Efforts

**Environmental Impact**
- Eliminates ~2,000 Metric Tons/Year of Lead Currently Left in Theater and Training
- Removes Lead Hazard From Slug Manufacturing
- Enables Use On Currently Restricted Ranges

**Provides Consistent Performance on Shot By Shot Basis**

**Equal to or Better than M855 in Close Quarter Battle Performance**
M855 LFS Key Points

- M855 Round Performs Very Well in our Current Weapon Systems
  - New Round Is Better For The Environment Through Elimination Of Lead Slug
  - New Round Allows use in Lead Restricted Ranges and Eliminates 2000 Metric Tons of Hazardous Material From Soil and Ranges Per Year

- New Round Enhances Performance
  - Better Hard Target/Barrier Performance
  - Improved Propellant – Reduced Flash

- Shot Placement Still Matters The Most
  - Trajectory Match to M855
  - No Change to Current Training

- Optimized to Current Carbine and Concepts Applied From Lessons Learned
  - Maintains Consistent, Superior Performance Across Weapons and Shot To Shot
Hard Target Performance

Results are for M4

Battle Barrier Surrogate (3/8” steel)  M855 LFS
Concrete Masonry Unit  M855 LFS

(meters) 0 150 300 450 600

Results are for M16

Battle Barrier Surrogate (3/8” steel)  M855 LFS
Concrete Masonry Unit  M855 LFS

(meters) 0 150 300 450 600
5.56mm Green Ammunition
M856 Lead Free Slug (M856 LFS, Tracer)

- **Goal**
  - Implement green technology in M856 Tracer
  - Ballistic match to M855 LFS
  - Improve trace to range consistency compared to current M856 – 900 meters in M249 SAW
  - Reduction of lead at LCAAP

- **Approach**
  - Systems approach
  - Maintain performance, especially trace burn time/distance and trajectory match

- **Environmental impact**
  - Replacement of lead
  - Allows integration of M855 LFS for M249 and rifle systems to create complete “lead free bullets”
  - Eliminates ~ 500 metric tons of lead from the environment

- **Status**
  - Production qualification testing 3QFY10
  - Full rate production 2QFY11
7.62mm Green Ammunition
M80 Lead Free Slug (M80 LFS)

- **Goal**
  - Environmentally friendly cartridge with same or better performance than current M80 cartridge

- **Approach**
  - Systems approach
  - Eliminate lead from all 7.62mm bullet producing processes at LCAAP and at field ranges
  - Leverage 5.56mm design

- **Environmental impact**
  - Green M80 – 2nd highest consumer of lead at LCAAP
  - Eliminates ~ 1,500 metric tons of lead from environment

- **Status**
  - Production qualification testing 1QFY11
  - Full rate production 2QFY12
Flash Reduction
- 5.56mm – Currently being implemented with M855LFS, Will investigate potential for use with M856LFS
- 7.62mm – Near term - ECP being staffed to implement in M80 DODICs
- Mid Term – M80LFS and M62LFS will contain flash suppressed technology
- .50 Cal – Already contains some level of flash suppressed technology, future efforts will examine potential for additional improvement

Temperature Stability
- 7.62mm – Alternate M118LR propellant design being identified and will provide both flash suppression and temp stability
- All Calibers – All future investigations into alternate propellants will add flash suppression and temperature stability as a requirement

Velocity Improvements
- 5.56mm – increased velocity incorporated into current M855LFS design (required modification of current propellant and an increase in chamber pressure)
- All Calibers – All future investigations into alternate propellants will investigate potential for increased velocity
Dummy, Drilled, & Inert (DDI) Cartridge Overview

- .50 Caliber
- 7.62mm
- 5.56mm
- 9mm
Background

- TRADOC Training Incidents (2) in Fall 07
  - Live .50 Cal Ball Cartridge Mixed Into .50 Cal Inert Cartridge Linked Belt

- Gen Wallace Letter (15 Feb 08) to PEO Ammunition
  - Standardize Appearance of Dummy / Inert Ammunition
  - Revise Guidance for Accountability, Storage, Use and Requisition of DDI Ammunition
  - Review and Revise Appropriate Publications to Reflect New Standards
Summary of DDI Effort

- **Standard Color / Configuration for Small Caliber DDI Selected**

- **Publications / Standards Updated**
  - Definitions for Dummy, Drill, Inert Ammunition Revised
  - Mil-Std-709C (Ammunition Color Coding) Updated
  - Weapon Technical Manuals Updated to Improve Information on Ammunition Color Coding
  - Training Support Packages Updated to Include Ammunition Identification Information

- **Guidance For Storage, Accountability, And Use Revised**
  - Graphic Training Aid (GTA) Card Included
  - Ammunition Information Notice (AIN) on DDI to be Published
Questions / Discussions
NDIA Small Arms Systems Symposium

LTC Chris Seacord
Product Manager
Medium Caliber Ammunition

19 May 2009
Agenda

- 40mm Family
- 40mm Grenades Roadmap
- 40mm Acquisition Strategy
- Low-Velocity (LV) & High Velocity (HV) Non-Dud Producing (NDP) Rounds
40mm Family

M433  M781  M385A1  M430  M1001  M918  M992  M662  M661  M585  M583
40mm Grenades 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

**New Milan AAP LAP Contract**
- FY09: MEMS Fuze
- FY10: Liner, Pivot Coupling
- FY11: M430 A1
- FY12: M430 A2
- FY13: SCCC
- FY14: Warhead Improvements/IM
- FY15: Air Burst
- FY16: NDP (HV)
- FY17: NDP Trainers
- FY18: New Projectiles Contract
- FY19: New Systems Contract
- FY20: Iowa AAP LAP

**NDP (LV)**
- Mixed Belt
- M781
- NDP (LV)

**Projected**
- Funded
- Unfunded
40mm Acquisition Strategy

- **Main Components**
  - Small Business (SB) Set Aside
  - 8A contracts for projectiles
  - Directed LAP for HV rounds at Milan

- **Relevant Facts**
  - 40mm contract is largest SB set-aside in the Army
  - Main components are parameters we work within
  - SB must manufacture 51% of products
  - Maintain capability in NTIB
  - New Systems Contract Award planned in 2QFY10
LV NDP Round Status

- **PM-SW program for SOCOM Requirement**
  - Estimate FRP Sep 09 with deliveries in Jan 10
  - R&D / Production contract in place
  - XM1110 (Rheinmetall) was selected through FCT

- **PM-SW / PM-MAS working w/ USAIC on CPD**
  - CPD being staffed internally
  - Future capabilities are being discussed
  - Possible COTS solution (XM 1110)
USMC requested Non-Dud Producing (NDP) Training Ammunition through Fleet Operational Needs Statement (FONS) Request Approved by HQDA

1997

ARDEC and USMC Sought Contractors to Bid for COTS NDP and FCT for NDP

1999

USA Determines Mk 281 mod 0/1 Does Not Meet All USA Requirements

USAIC Develops and Staffs a CDD for a NDP Round

2001

Mk281 mod 0 Meets USMC Requirements

1982

Tri-Service Training Device Letter Requirement for M918

National Training Center (NTC) Contacted USAIC to Request USA Adopt Mk281 mod 0

2002

LRIP for Mk281 mod 0

USA Requests to Use USMC FONS as USA Requirement

2003

2004

Request Approved by HQDA

FRP for Mk281 mod 0

2007

Mk281 mod 1 Procured by USMC Under 5-year contract

2009

2011
HV NDP Round
Requirements & Current Status

- **Requirements**
  - Ballistic match to M430
  - Visual signature upon impact day/night
  - Audible signature upon impact
  - Thermal signature upon impact with existing weapon sights
  - Minimum hazard to soldier (NDP)

- **Current Status**
  - PM-MAS working w/USAIC on CDD
  - Draft CDD nearly complete (fine tuning wording on KPPs)
  - Expecting CDD approval by 2010
HV NDP Round Road Ahead

- Staff CDD
- Submit CDD through JCIDS process
- Conduct Market Survey
- Draft Acquisition Strategy
- Develop Detailed Schedule
- Continue to procure Mk281 Mod 0 for Army as needed on USMC IDIQ Contract
Summary

- NRE efforts will increase reliability, producability and effectiveness of the 40mm Family
- 40mm will remain a SB set-aside for the foreseeable future
- LV & HV NDP requirements are on-going and we expect to have approved requirements in 2010
- PM-MAS is committed to providing the Warfighter with the most reliable and lethal grenades available