

Project Manager Maneuver Ammunition Systems

“Enhancing Small Arms Effectiveness in
Current and Future Operations”



DISTRIBUTION STATEMENT A.

Approved for Public Release; distribution is unlimited.

Other requests shall be referred to the:
Office of the Project Manager for Maneuver
Ammunition Systems

ATTN: SFAE-AMO-MAS, Picatinny, NJ 07806-5000



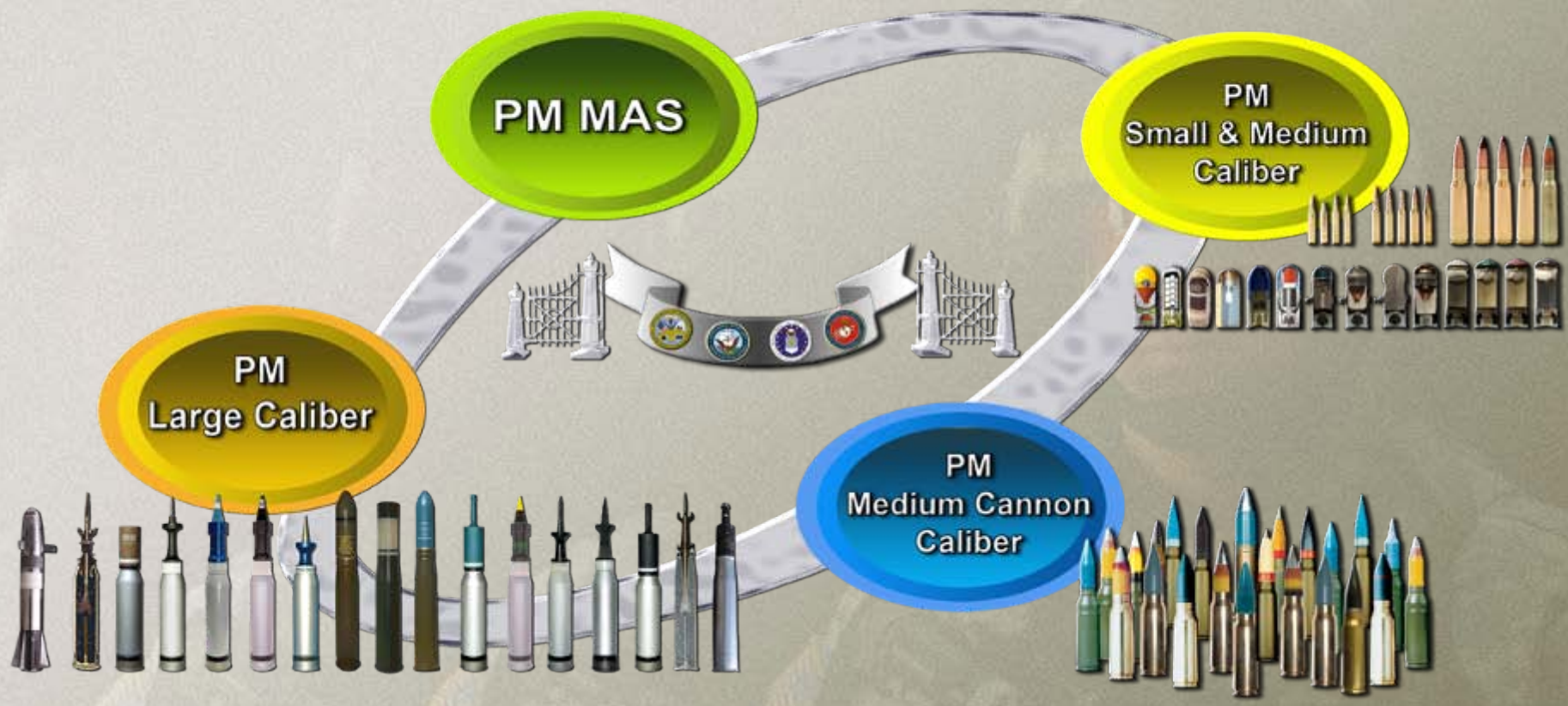
Chris Grassano
Project Manager

22 May 2009





Project Manager Maneuver Ammunition Systems (MAS)-Direct Fire



MISSION: Provide Lifecycle Management of Direct Fire Combat And Training Ammunition Capabilities To All Warfighters (Army, Navy, Air Force, Marines)

Ensure This Never Happens





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

Small and Medium Caliber

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



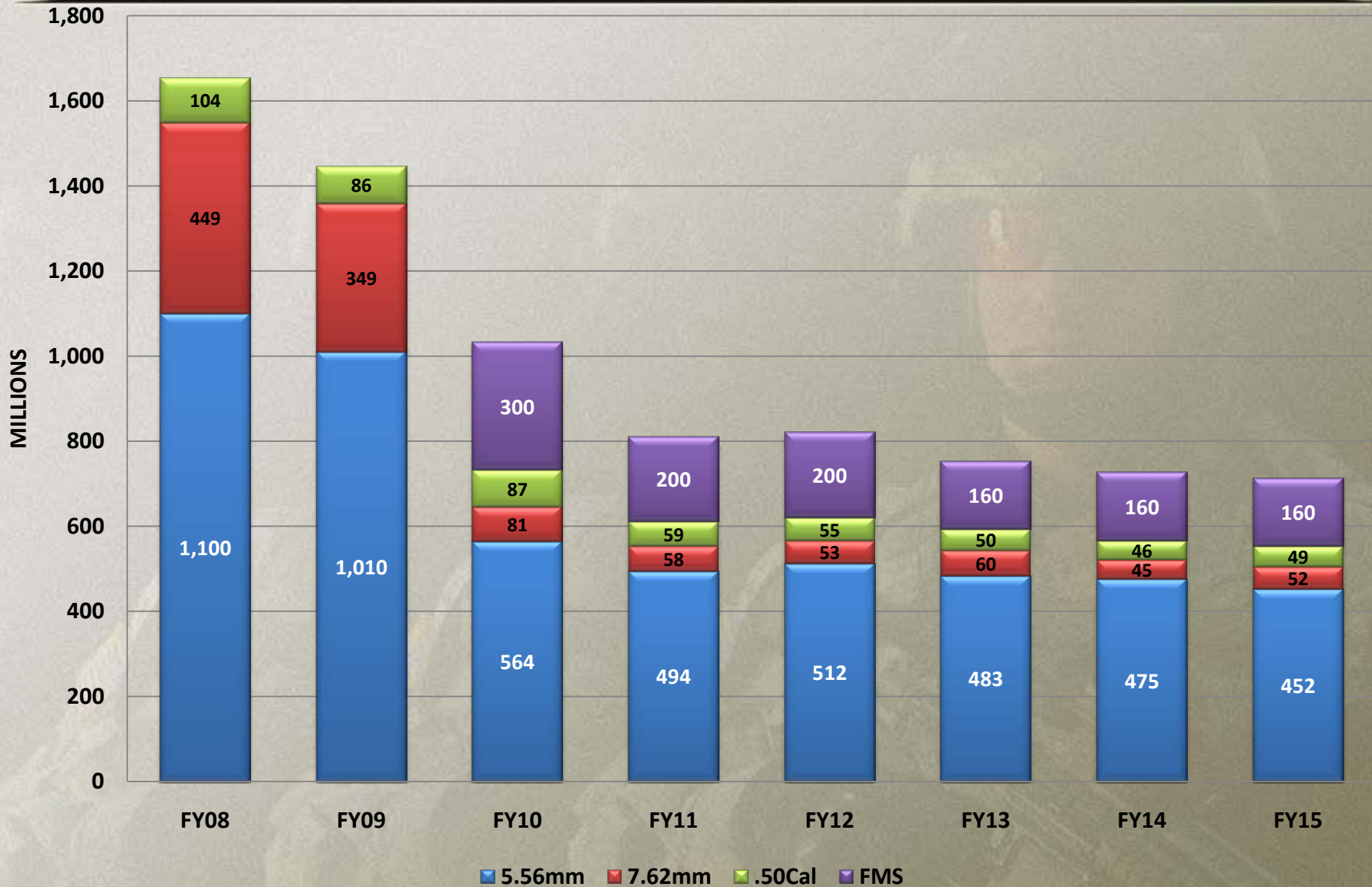
■ Strategic Situation

- **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

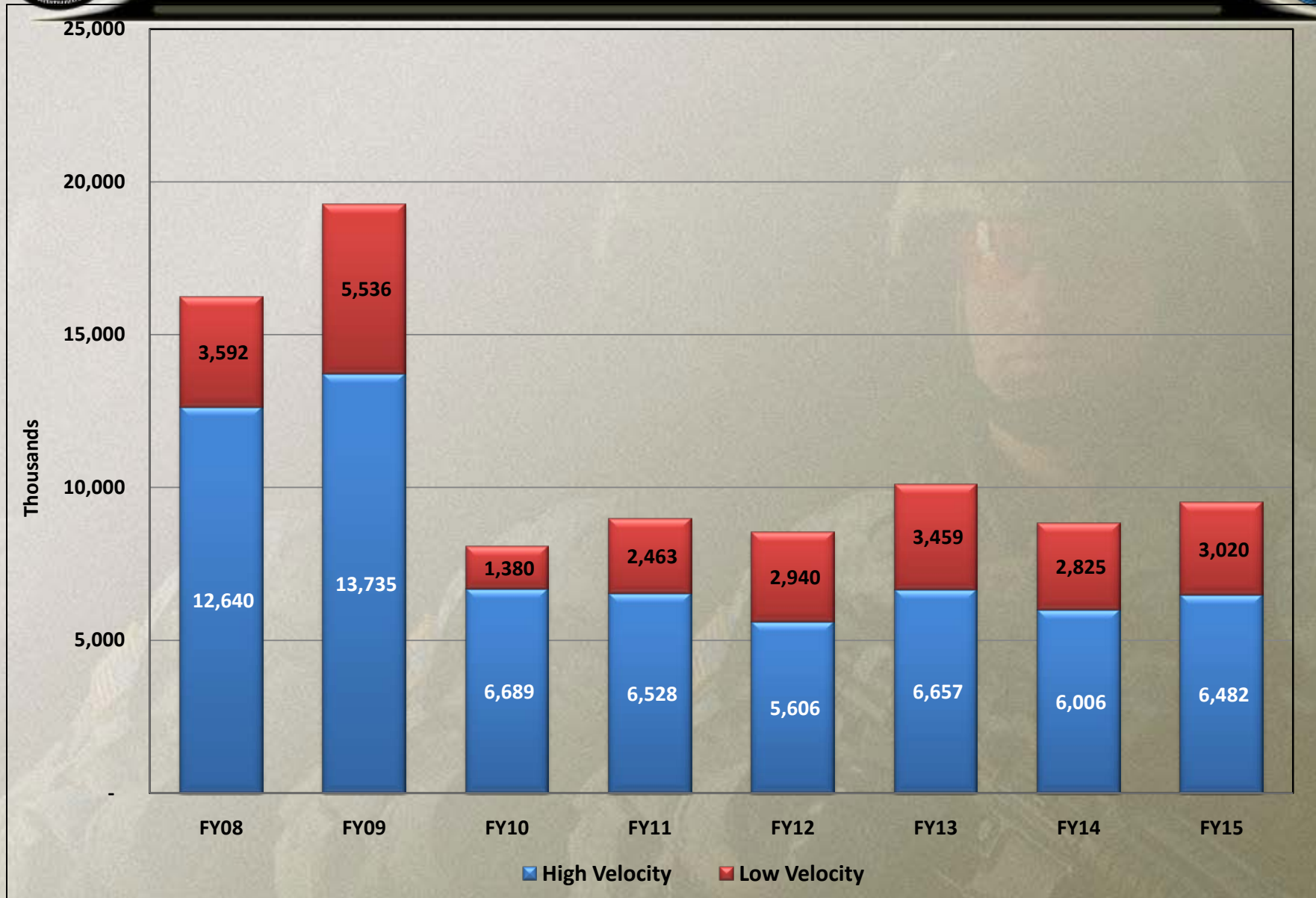


Small Caliber Buys





40mm Buys





Small Caliber Ammunition



LTC J. Woods
Product Manager
Small Caliber Ammunition

5.56mm, 7.62mm, 9mm, .50 Cal



M862 SRTA
M200
M193
M855 Ball
M856
M995
M855 LFS

5.56mm Family



M974
M993
M62
M80 Ball
M82
M80 Ball Lnkd
M276
M118 Ball

7.62mm Family



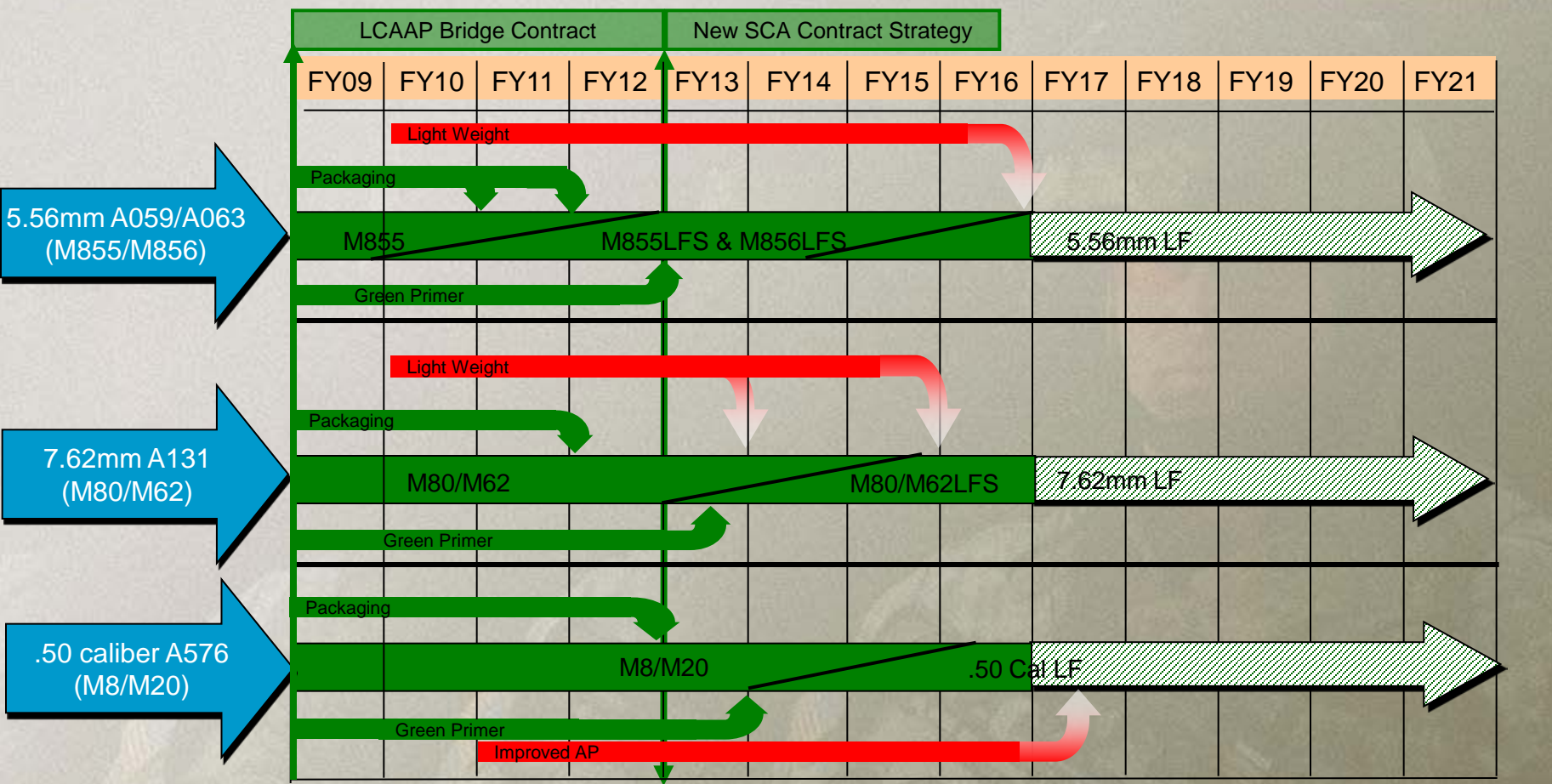
M1A1 Blank
M33 Ball
M17 Trace
M20
M8
M211
M962
M903
M860 Tracer
M858 Ball

.50 Cal
Family

ENHANCING SMALL CALIBER EFFECTIVENESS



Small Caliber Roadmap



2nd Source | New SCA Contract Strategy
 LCAAP Modernization | Follow On Modernization Efforts

Projected
 Funded
 Unfunded

- 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

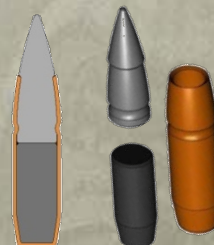


5.56mm Family



M855 LFS

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



M855 LFS Approach and Results

- 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



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



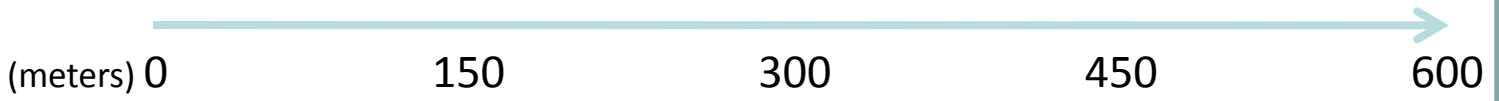
Hard Target Performance

Results are for M4

Battle Barrier
Surrogate (3/8" steel)



Concrete Masonry
Unit

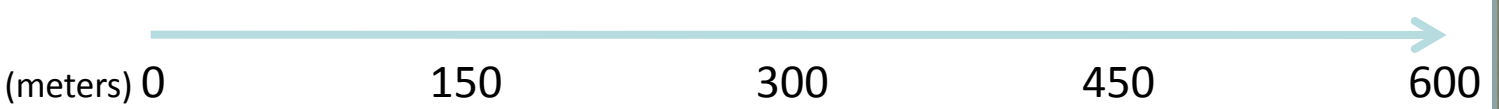


Results are for M16

Battle Barrier
Surrogate (3/8" steel)



Concrete Masonry
Unit

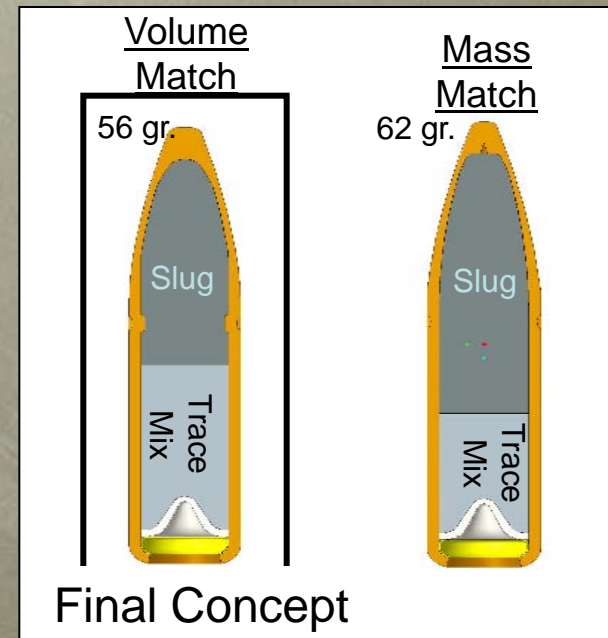




5.56mm Green Ammunition M856 Lead Free Slug (M856 LFS, Tracer)



- **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





Powder Improvements Flash Reduction /Temperature Stability/Velocity Improvements



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

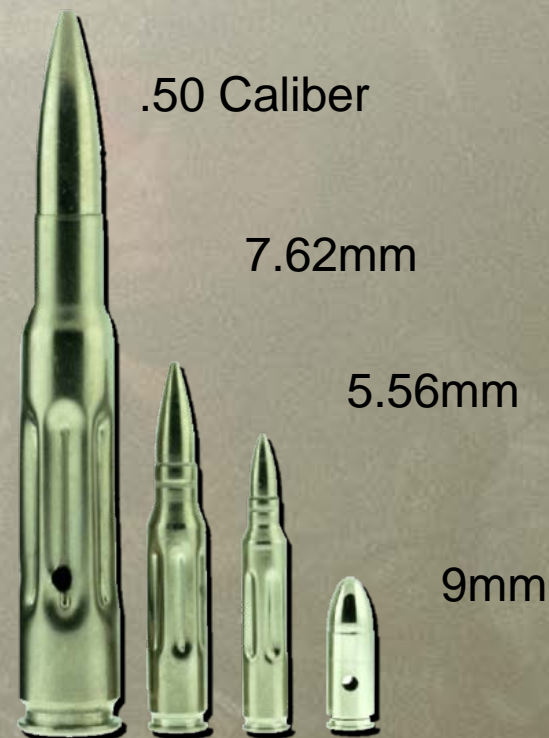


- **TRADOC Training Incidents (2) in Fall 07**
 - Live .50 Cal Ball Cartridge Mixed Into .50 Cal Inert Cartridge Linked Belt

- **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



Project Manager Maneuver Ammunition Systems

NDIA Small Arms Systems Symposium



DISTRIBUTION STATEMENT A.

Approved for Public Release; distribution is unlimited.

Other requests shall be referred to the:
Office of the Project Manager for Maneuver
Ammunition Systems

ATTN: SFAE-AMO-MAS, Picatinny, NJ 07806-5000



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

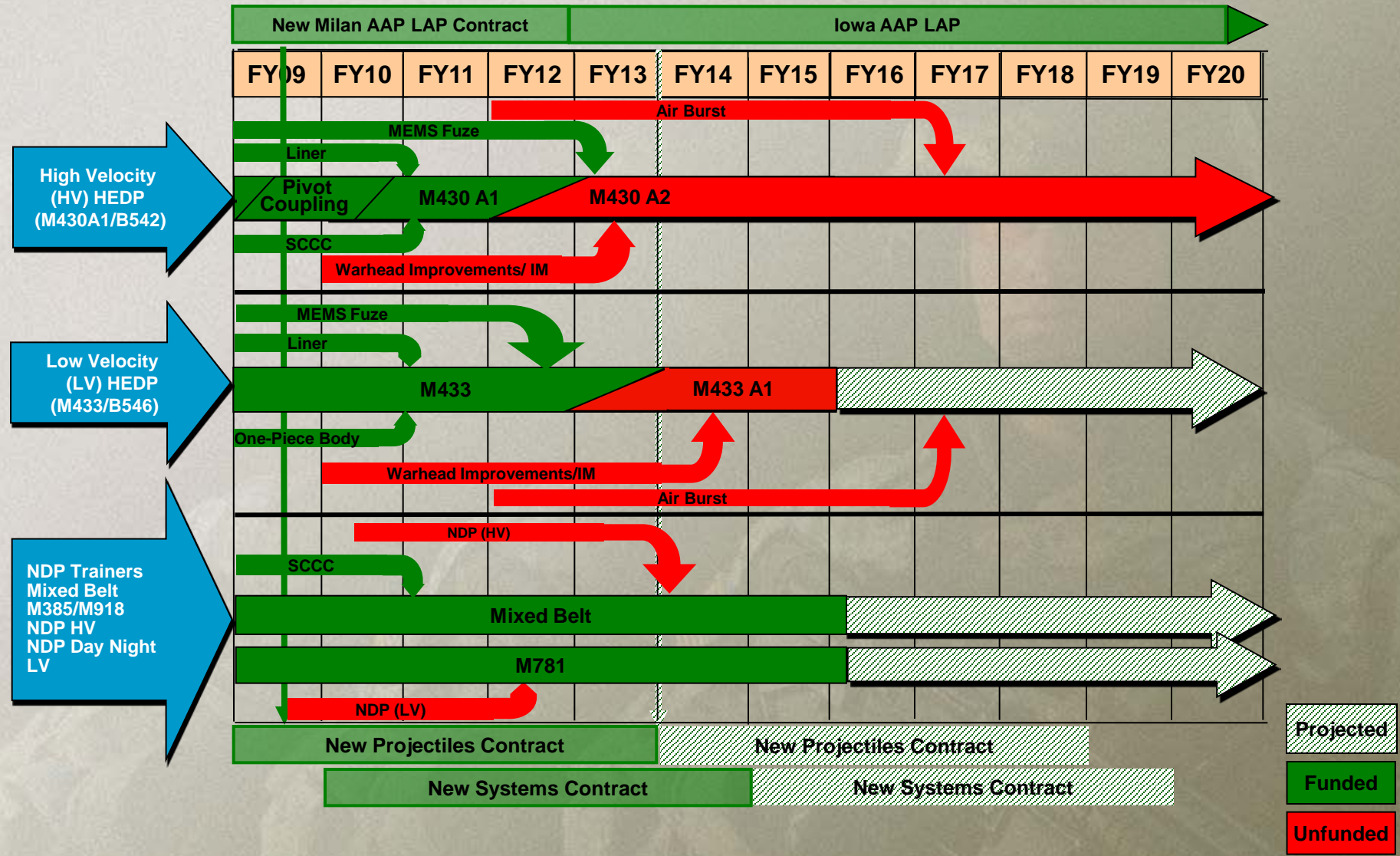
M661

M585

M583



40mm Grenades Roadmap





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



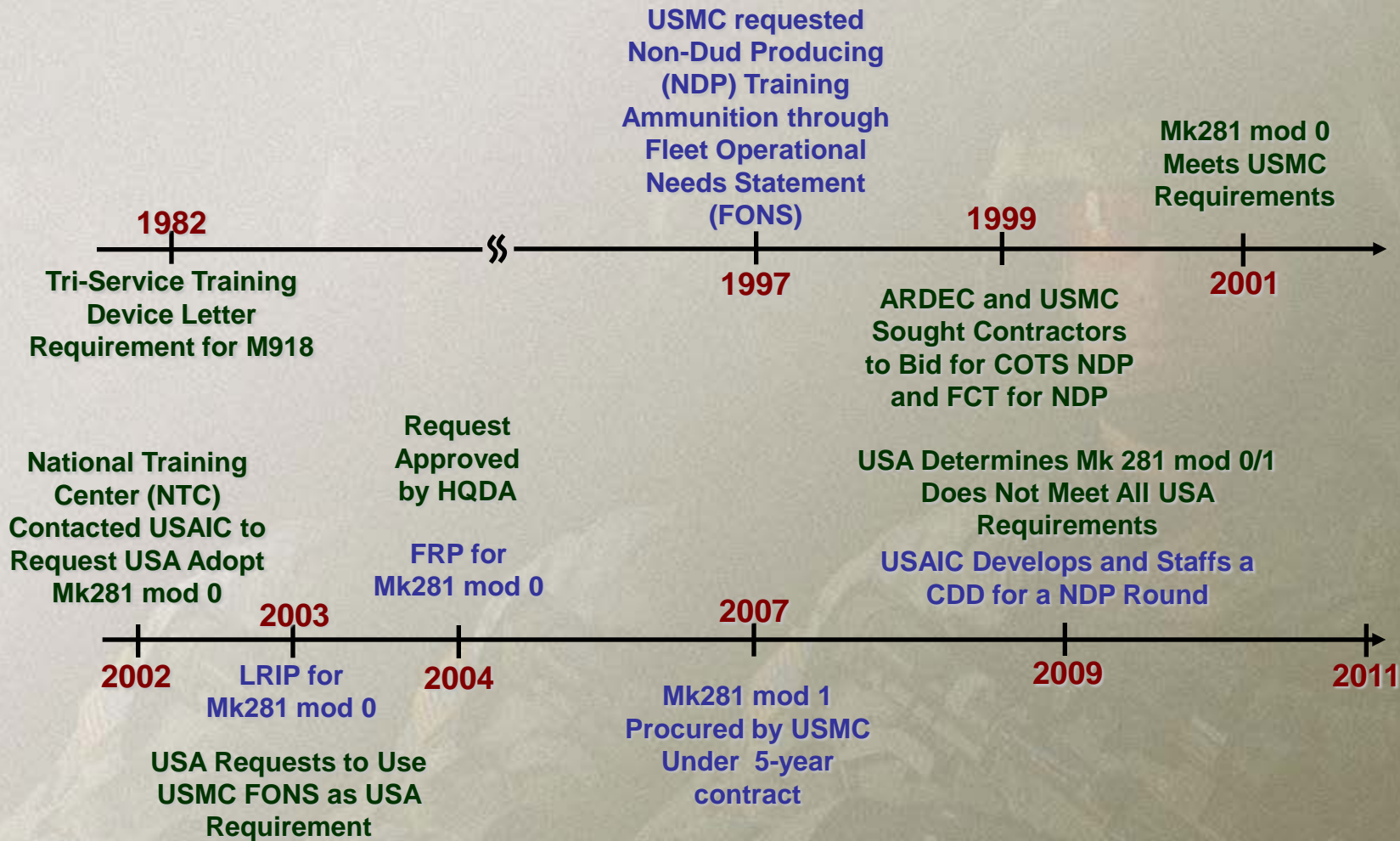
LV NDP Round Status



- **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)



HV NDP Round Requirements History





HV NDP Round Requirements & Current Status



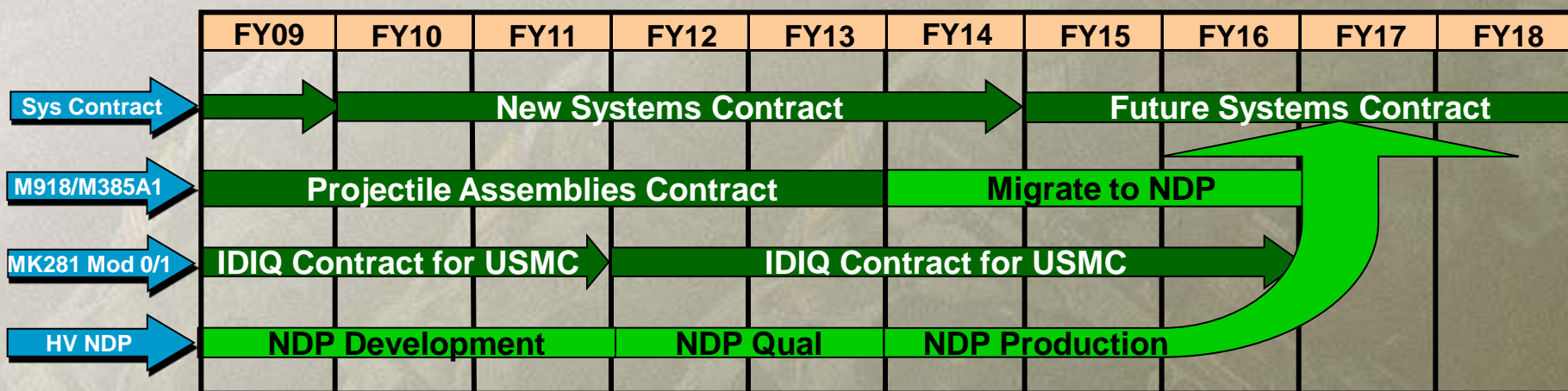
- **Requirements**
 - Ballistic match to M430
 - Visual signature upon impact day/night
 - Audible signature upon impact
 - Thermal signature upon impact with existing weapon sights
 - Minimum hazard to soldier (NDP)

- **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**