120 mm Tank Ammunition
Advanced Case System (ACS)
Phase 2

Presented At
The National Defense Industrial Association’s
46th Annual Gun and Missile Systems
Conference and Exhibition

31 August 2011

Jeff Berg
Project Engineer
120mm Training Ammunition
ATK

Approved for public release 22 CFR 125.4(b)(13) applicable. PAO Log# 383-11
Agenda

120 mm Tank Ammunition Advanced Case System (ACS)

- Background and Program Summary
- M865 Qualification
- M865 Transition to Production
- M865 Refurbishment to ACS Design
- M1002 Qualification
- Technical Challenge – M1002 case-to-obturator joint
- M1002 Recovery Plan
- M1002 Transition to Production
- Summary - Current Program Status
- Questions
M1002/M865 Cartridge (current case design)

- Inert Case Adapter
- Case Base & Seal
- Combustible Cartridge Case
- Bond Joint
- Projectile

M1002

M865

Approved for public release 22 CFR 125.4(b)(13) applicable. PAO Log# 383-11
Background

Advanced Case System (ACS)

• Program:
  • Product Manager Large Caliber Ammunition: Program Management and Guidance
  • Joint Munitions Command (JMC): Executes and Manages the 120mm Multi-Year contracts

• Members: PM-MAS, PM-LC, JMC, ARDEC, ATK, GD-OTS, Esterline Defense Technologies (EDT), American Ordnance

• Objective: Redesign cartridge to eliminate a contributing cause of damaged rounds during training.
  • Relocate the cartridge bond joint
  • Qualify the modified cartridge design
  • Transition into production with qualified design
ACS Objective – Relocate Cartridge Joint

Live NC composition

Inert composition

Current cartridge case and case adapter

Transition (live & inert)

Aft Skive ACS cartridge case and base sleeve
M865 ACS Case and Base Sleeve

Inert composition

Transition (live & inert)

Live NC composition

Approved for public release 22 CFR 125.4(b)(13) applicable. PAO Log# 383-11
M865 Qualification

Qualification

- M865 ACS aft skive joint has passed qualification testing.
  - All results were as good or better than the current design.
Transition to Production

- Production of M865s for the next production year will be ACS
- Facilitization efforts are underway at both American Ordnance and Esterline Defense Technologies
  - ATK leading the AO Facilitization efforts
  - GD-OTS leading the EDT Facilitization efforts
- Tooling, gages, and facility requirements are on schedule
- Component and cartridge level First Articles are planned for summer and fall of 2011
- ACS design will replace current design in M865 production effective December, 2011
  - Production of M865 in the current configuration will end in September, 2011
M865 AO Facilitization

Adhesive Application

Cartridge Bonding

Approved for public release 22 CFR 125.4(b)(13) applicable. PAO Log# 383-11
M865 EDT Facilitization

Case Trimmer

Approved for public release 22 CFR 125.4(b)(13) applicable. PAO Log# 383-11
M865 Refurbishment

- Significant inventory of M865s with the current design
- Design allows for removal of current case / adapter and replacing with the ACS case / base sleeve.
- Process has been developed and proven.
- Refurbished M865s have been provided for evaluation in a gunnery exercise.
- Plan is to refurbish M865 existing inventory starting in calendar year 2013.
Qualification

- M1002 qualification testing has been suspended prior to completion.
- User handling tests resulted in failure of saw-tooth joint between ACS case and projectile obturator.
  - Inert material failed internally on the ACS cases.
  - Control M1002 cartridges (current design) had zero failures.
M1002 Sawtooth Joint:
  - ACS Case: Inert wood pulp material.
  - Obturator: Extruded Nylon

Failure Investigation:
  - Focused on mechanical properties of case.
  - Process adjustments and refinements.
  - Increased mechanical properties in inert material.
M1002 Recovery Plan:

- Demonstrate improved mechanical properties based on lab testing.
- Build test samples to validate results.
- Build cartridges – full scale simulated handling and comparative testing.
- Build qualification cartridges
  - Repeat qualification tests to complete qualification
Transition to Production – Current Plan

- Production of M1002 for next production year will be current design (Sep 2011 through Dec 2011)
- Comparable facilitization efforts required at both American Ordnance and Esterline Defense Technologies.
  - Anticipate ATK leading the AO Facilitization efforts.
  - Anticipate GD-OTS leading the EDT Facilitization efforts.
- Planning for component and cartridge level First Articles during spring of 2012.
- ACS design will replace current design in M1002 production effective in the fall 2012.
  - Production of M1002 in the current configuration will end in December, 2011.
M865 ACS:

- ACS Qualification complete.
- Last M865 with the current design: Sept 2011
- Facilitization and First Articles are on schedule
- First M865 with the ACS design: Dec 2011
- Refurbishment of inventory to ACS planned for 2013

M1002 ACS:

- ACS Qualification – interrupted to resolve joint strength.
- Complete recovery plan / re-qualification testing: Apr 2012
- Last M1002 with the current design: Dec 2011
- First M1002 with the ACS design: Fall 2012
QUESTIONS???

Jeff Berg  
Project Engineer – 120mm Tank Training Ammunition  
Alliant Techsystems – Advanced Weapons Division  
763-744-5523  
jeff.berg@atk.com