

### 5.56MM REDUCED RICOCHET LIMITED PENETRATION (RRLP), MK 255 Mod 0

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Harnessing the Power of Technology for the Warfighter

Distribution Statement A: "Approved for public release; distribution unlimited"



- BACKGROUND/HISTORY
- CARTRIDGE DESCRIPTION
- CARTRIDGE SALIENT
   CHARACTERISTICS
- CURRENT STATUS





# **BACKGROUND/HISTORY**

- SPECWARCOM Finalized Joint Operational Requirements Document (JORD) for Frangible Ammunition (April 98)
  - Based on existing frangible technology and operational requirements
- JORD was reviewed by other USSOCOM activities
- USSOCOM Approved JORD (Aug 98)





# **BACKGROUND/HISTORY** (cont)

- One round, two missions
  - ➤ Training
  - Operational
- Be used for
  - Close Quarter Battle (CQB)
  - > Military operation in Urban Terrain (MOUT)
  - Visit Board Search and Seizure (VBSS)
  - Counter-Narcotics (CN) Operation





# **BACKGROUND/HISTORY** (cont)

- Initial Specification
  - > Minimal damage to training facility
  - Eliminate lead/toxic accumulation within the training facility
  - Eliminate lead/toxic emission from projectile and primer
  - > Reduce ricochet hazard/No reverse splatter
  - Must be lethal
  - > Be accurate (100Meters)
  - > Must be waterproofed
  - Ballistic match to the M855





# **BACKGROUND/HISTORY** (cont)

- NSWC, Crane evaluated production samples to determine if any commercially available cartridges could meet the JORD requirements
  - None of the cartridge types met all Operational Requirements
  - Acceptable function and reliability
  - Deficiencies:
    - Over penetration on hard target
    - Accuracy
    - Primer sensitivity
    - Waterproof
    - Lethality





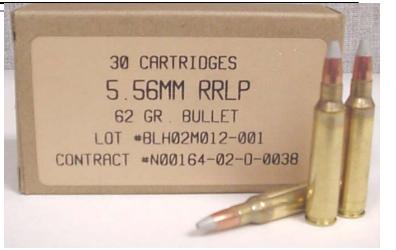
# **BACKGROUND/HISTORY** (cont)

- SPECWARCOM funded Crane Navy to develop cartridge
  - Changed nomenclature from "frangible" to "Reduced Ricochet Limited Penetration"
  - Modified Initial Specification
    - Emphasized waterproof, accuracy, lethality and no backstop penetration (3/8" AR500 steel plate)
    - Included 10 inch barreled M4A1 carbine requirement
    - Dropped lead-free primer requirement
  - Awarded 5 Year IDIQ Contract to Black Hills Ammunition



# CARTRIDGE DESCRIPTION

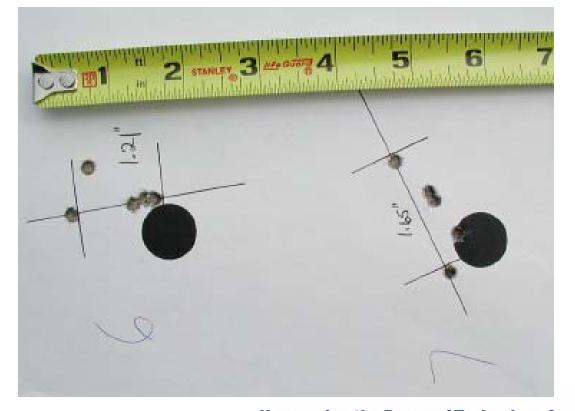
- 62 grain jacketed frangible projectile – Copper/polymer composite core
- Winchester cartridge case that meets M855 specification
- Standard military No. 41 primer
- Western C1700 propellant





#### **Cartridge Salient Characteristics**

- Chamber & Port pressures meet that of M855
- Accuracy less than 2 in. ES at 100 yards.







# **Cartridge Salient Characteristics**

- Waterproof
  - No water intrusion after the cartridge was subjected to 28-31 psig water pressure for 115-125 minutes.
- Ricochet Fragments
  - No fragments penetrated deeper than 2.5" into 10% (by weight) Ballistic Gelatin after 45° impact on AR500 steel plate located 15 ft. from the muzzle
- Reverse Splatter
  - No reverse splatter toward the shooter position from AR500 steel plate 15 ft. away from the muzzle





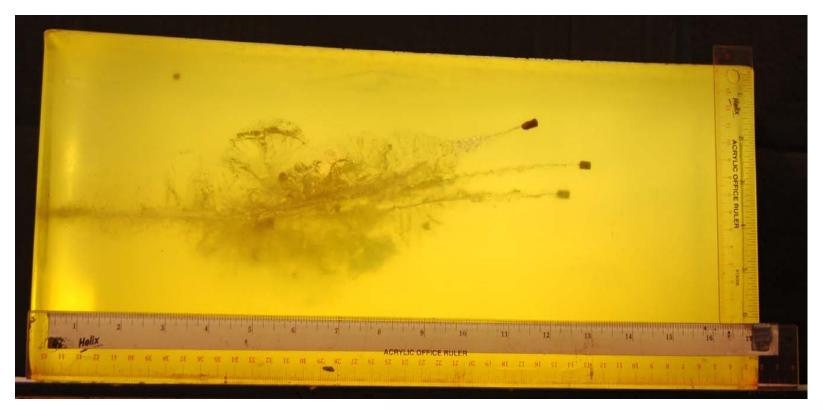
# **Cartridge Salient Characteristics (cont)**

- Lethality @ 15 ft.
  - > 10% Ordnance Ballistic Gelatin
  - Initial yaw; 2 in. max.
  - > Temporary cavity length; 6 in. min.
  - > Temporary cavity diameter; 3 in. min.
  - Temporary cavity diameter location; 3 to 6 in.
  - Number of fragments weighing 1 grain or more; 5 min.
  - > At least 50% of the fragments should be 7 in. or deeper
  - Maximum penetration depth should be 13 in. or deeper





# Cartridge Salient Characteristics (cont) 10% Ordnance Ballistic Gelatin Penetration





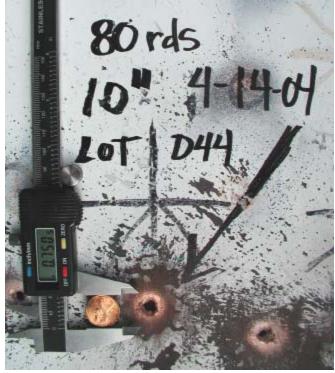
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#### **Cartridge Salient Characteristics (cont)**

- AR500 Steel Plate Penetration
  - Muzzle to impact was maintained at 3 feet
  - Multiple shots within a
     0.75 in. diameter area
  - No penetration occurred after 50 rounds using Mk 18 Mod 0
  - Penetration occurred from 25 rounds to 50+ rounds using M4A1 Carbine







# **CURRENT STATUS**

- JAG approved for training and operation, CONUS/OCONUS
- Completed WSESRB testing and requirement (2005)
- Received WSESRB IOC (Nov 2005)

