



FRANGIBLE AMMUNITION

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FRANGIBLE AMMUNITION

- OBJECTIVES
- WHO USES FRANGIBLE?
- REQUIREMENTS
- NSWC, CRANE FRANGIBLE PROGRAMS
- PROBLEMS AND CONCERNS



TRAINING OBJECTIVES

Frangible ammunition should:

- Cause Minimal damage to training facility
- Eliminate lead/toxic emission around shooter
- Eliminate lead/toxic accumulation down range
- Reduce ricochet hazard



OPERATIONAL OBJECTIVES

Frangible ammunition should:

- Be lethal
- Be accurate (100Meters)
- Reduce ricochet hazards
- Reduce hard target penetration
- Be used for
 - Close Quarter Battle (CQB)
 - Military operation in Urban Terrain (MOUT)
 - Visit Board Search and Seizure
 - Counter-Narcotics (CN) Operation



WHO USES IT?

Approved users are:

- Naval Special Warfare Command (SPECWARCOM)
- Chief of Naval Education and Training (CNET)
 - RTC Great Lakes
- U. S. Air Force
- U.S. Marine Corps



WEAPONS

➤ 5.56mm

- M16A2 Rifle
- M4A1 Carbine
- M247 SAW
- Mk 46 Light Machine Gun

➤ 9mm

- M9 Pistol
- M11 Pistol
- P226 Pistol
- MP5 Sub-Machine Guns

➤ 45 Cal

- M1911A Pistol
- Mk23 Offensive Handgun



U.S. MARINE Operational Requirements Document

➤ U.S. Marine issued ODR for Close Quarter Battle Weapon, NO. INS. 1.14 (August 94)

➤ The intent of the CQBW was to replace the MP5s Sub-machine Guns used by MEUSOC and MCSF with M4 Carbine

➤ The ORD identified two rounds, two missions

➤ Training

➤ Operational

➤ Revision 20 March 1998

➤ The Revision identified one round, two missions



SPECWARCOM

Join Operational Requirements Document

- SPECWARCOM Finalized Joint Operational Requirements Document (JORD) (April 98)
 - Based on frangible technology and operational requirements
 - JORD was reviewed by other USSOCOM activities
- USSOCOM Approved JORD (Aug 98)
 - 3 Calibers; 5.56MM, 9MM, and .45 Caliber
- One round two missions
 - Training
 - Operational



REQUAIED CAPABILITY

- Must be lead-free/non-toxic
- Must function weapon as reliably as current NATO Ball cartridges
- Must not penetrate background materials (**Shoot Houses**)
 - 3/8 in. AR500
- Must be waterproofed
- Must be no reverse splatter
- Must be no hazardous ricochet



REQUAURED CAPABILITY

- Must have primer sensitivity comparable to lead based primers
- 5.56mm and 9mm/.45 cal. must meet following requirements at 100M and 50M respectively:
 - Accuracy comparable to current NATO Ball cartridge
 - Adequate lethality
 - Ballistic match for current NATO cartridge



U.S. MARINE 5.56mm Safety Certification

- NSWC, Crane conducted Performance Evaluation to determine if any commercially available cartridges could meet the ORD requirements (June 98)
 - None of the cartridge designs met all Operational Requirements
 - Winchester Ranger was Selected by USMC



U.S. MARINE 5.56mm Safety Certification

- March 1999
 - USMC Task Crane to
 - Catalog
 - Conduct Safety Certification Testing
 - Obtain WSESRB Release
- Testing Completed January 2000
- May 2000 WSESRB issued Safety Approval for release (AA40)



SPECWARCOM

Solicitation of Cartridges

- WARCOM task Crane to procure and Safety Certify 5.56MM, 9MM and .45 Caliber Frangible Ammunition (Nov 98)
 - Specifications prepared based of JORD requirements
 - Solicitation issued February 1999 (5.56MM)
 - Five Vendors responded and provided bid samples



SPECWARCOM 5.56mm Safety Certification

- Evaluation of Bid Samples completed (July 99)
 - None of the samples met all the performance requirements
 - Acceptable function & casualty, lethality, accuracy, ballistic match
 - Deficiencies:
 - Over penetration on hard target
 - Primer sensitivity
 - Waterproof
- Specification modified



SPECWARCOM 5.56mm Safety Certification

- Reissued solicitation (Dec 99)
 - Dropped lead-free primer requirement
 - Emphasized accuracy, lethality and no backstop penetration (AR500 Steel Plate)
 - Two previous vendors responded w/bid samples



SPECWARCOM 5.56mm Safety Certification

- Conducted 2nd bid sample evaluations (Mar 00)
 - Neither vendor's samples met all performance requirements
 - Deficiencies:
 - Over penetration on hard target
 - Accuracy
 - Waterproof
 - Function and Casualty
- Based on test results WARCOM suspended action Pending development of R²LP cartridge (April 00)



SPECWARCOM

9mm and .45 Cal.
Solicitation

- Solicitation for 9mm and Caliber .45 issued (May 99)
 - Five Vendors responded for 9MM
 - Four Vendors responded for .45 Caliber



SPECWARCOM

9mm and .45 Cal.
Safety Certification

- Evaluation of Bid Samples completed (Jan 00)
 - None of vendors met all of the requirements
 - Deficiencies:
 - Function & Reliability
 - Over penetration on Drywall
 - Primer sensitivity
 - Waterproofing

- SPECWARCOM dropped requirement



CNET 9mm Safety Certification

- NSWC Crane tasked by Chief Naval Education & Training (CNET) to obtain WSESRB release for 9MM Frangible Ammunition (Mar 00)
 - Handgun Marksmanship Training @ RTC Great Lakes
- Cartridge Salient Characteristics
 - Lead Free/Non-Toxic
 - Function Beretta M9 Pistol
 - Reduced ricochet/Penetration
- It was determined that the CNET requirements were within the WARCOM JORD



CNET 9mm Safety Certification

- Minimal additional testing was required
 - Function and Casualty
 - AR500 Steel Plate Penetration
 - Ricochet
- SNC cartridge configuration best conformed to specification requirements
- Received JAG approval for training use by CNET (June 00)
- WSESRB issued safety approval (July 00)
 - AA16



USAF 9mm Safety Certification

- NSWC Crane tasked by USAF Security Force to Procure AA16, 9mm Frangible Ammunition (Jan 02)
 - Weapon qualification and proficiency Training
- Cartridge Salient Characteristics
 - Lead Free/Non-Toxic
 - Function Beretta M9 Pistol
 - Reduced ricochet/Penetration
- AA16, 9mm Frangible Ammunition is approved by Non-Nuclear Munitions Safety Board



SPECWARCOM

5.56mm Frangible Requirement

- WARCUM identified a requirement for 5.56MM Frangible ammunition for training (Mar 2001)
 - For CONUS and OCONUS use
 - This requirement to fill training requirements until the R²LP Cartridge is fully developed
- JAG approved 5.56mm frangible cartridge for training use only, CONUS/OCONUS (May 01)
- WSESRB issued safety approval for CQB and Indoor Training (Sept 01)
- WSESRB extended approval to use outdoors (Jan 02)



SPECWARCOM 9mm Frangible Requirement

- WARCOM identified a requirement for AA16, 9mm Frangible Ammunition for training
 - CONUS
 - OCONUS
 - For use in Sig Sauer P226, P228 and H&K MP5 Sub-Machineguns
- Received JAG approval for training use only by WARCOM units and CNET (Feb 02)
- Received WSESRB safety approval (Feb 02)



PROBLEMS & CONCERNS

- No-lead primer not meeting military operational requirements at extreme temperatures
- Need improved waterproofing
- Over-penetration on hard targets
- Over-penetration on soft targets (9mm)
- High Failure Rate of 9mm in MP5s



R²LP

➤ Reduced Ricochet, Limited Penetration (R²LP)
Cartridge is being developed to meet current frangible
ammunition requirements.