Development of Operationally Relevant Suppressor Test Methods

Alan Kong
Test & Evaluation Lead
PM Individual Weapons

16 May 2012
Background

Current Suppressor Test Methods Have Limited Operational Relevance.

- Current TOPs (Mild-STD-1474D, TOP-1-2-608, TOP-3-2-045, TOP-4-2-016)
- Type of recording instrumentation, setting and calibration
- Light sensor, camera, microphone placement location
- Environmental Condition and interpolation method for repeatable results
- Second camera directly behind weapon for 3D envelop
- Duration and intensity components is subjectively quantified

The current Test Operations Procedure (TOP) for noise only addresses safety and hearing protection at the operator level.
Concerns

- **Flash Intensity and Duration is subjectively quantified**
  - Does the high-speed camera setting capturing the whole flash event? Or only part of it?
  - Capability of your recording instrumentation, basic requirements?

- **The current TOPs does not address human perception of noise and flash downrange.**
  - How is flash and muzzle blast perceived downrange under different environmental conditions?

  - Does the size/duration of the flash that was captured using the current TOP is “REALLY” what a human eyes can detect or see? Is it greater or less?

  - Those values need to be converted to “human relative intensity / db” so we can truly evaluate suppressor performance with human in the loop.

- **How much Flash and Noise is acceptable to the user?**
- **What is the Threshold of detection and localization downrange.**
Goals of this study

- Provide update and additional guideline to the current TOP to effectively evaluate suppressor systems in a controlled, repeatable manner.
  - For example: Optimal sensor placement, instrumentation requirements / setting...etc

- To establish and standardize improved test methods that will have operator relevance.

- Accomplish the above Goals in Parallel with generation of a new Small Arms Signature Reduction (SASR) Requirement Document.
Who is leading the effort of this study?

- PM Individual Weapons (PMIW) is leading this study.

Independent SMEs support:

- Aberdeen Test Center (ATC) is the technical lead for Muzzle Flash Measurement, Detection and Localization.
- ARDEC’s Acoustic Center of Excellence is the technical lead for Acoustic Suppression measurement.
- ARL/HRED will support the human validation model
- AETC will be engaged when the new test procedures/TOP are ready for validation and adoption.
Point of contacts

### Alan Kong
  T&E Lead, PM-Individual Weapons, bldg 151
  Picatinny Arsenal, NJ 07806-5000
  Phone: 973-724-6706
  Email: Alan.P.Kong@us.army.mil

### Tom Miskovich
  Chief, PM-Individual Weapons, bldg 151
  Picatinny Arsenal, NJ 07806-5000
  Phone: 973-724-2604
  Email: Thomas.Miskovich@us.army.mil
Questions??

- Next is John Hennage from ATC to present his study on muzzle flash measurement.