

Introduction to Small Arms & Accessories Technology Area

Helping the Warfighter Maintain
Technological Superiority on the Battlefield

NDIA Armaments and Munitions Forum
12 Nov 2013



Agenda

- Background
- Small Arms & Accessories (SAA)
 - Organization
 - Vision and Mission
 - Current Activities
 - ROTI
 - Requirements Collaboration and Review Workshop
 - Takeaways



Background (How we arrived here)

A Premier Government, Industry & Academic Partnership

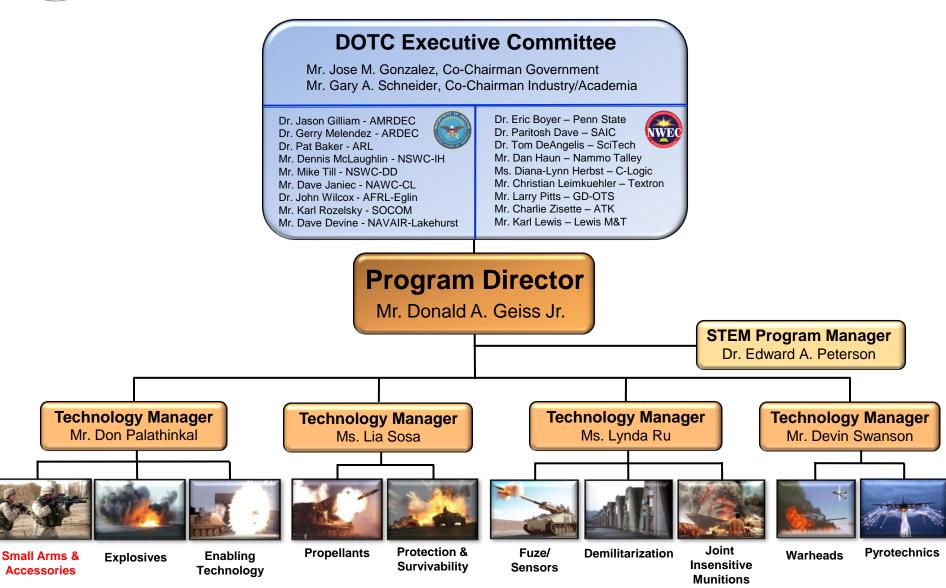
- Executive Board of the NSATC working closely with ARDEC senior management, Defense Ordnance Technology Consortium (DOTC) and the National Warheads and Energetics Consortium (NWEC) have agreed to move forward on the following initiatives:
 - Memorandum of Understanding (MOU) in place to integrate NSATC into DOTC-NWEC.
 - New technology area under DOTC <u>Small Arms & Accessories (SAA).</u>
 - Access to a world-class business development organization and structure to reach out and bring in new customers opportunities.
 - Economies of scale for customers in the following areas:
 - Reduced administrative expenses (versus a unique NSAC OTA)
 - Elimination of duplicative efforts (small arms initiatives existed in both NSAC and DOTC OTAs)

MOU Effective as of 24-JUL-13



SAA Organization

A Premier Government, Industry & Academic Partnership





SAA Vision and Mission

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Small Arms & Accessories

Vision: The continual development and demonstration of the technologies that will provide our Warfighters with enduring overmatch capabilities in all of our current and future small arms systems.

Mission: The projected funding available for technology sub-objectives in the Small Arms & Accessories Research Area is approximately \$XX.XXM for new initiatives. Research, development, and demonstration of technology for future lethal and non-lethal small arms weapon systems, accessories, and applications is the overall goal of this technology area. Initiatives in the small arms domain will consist of all individual and crewserved related weapons (whether mounted or dismounted), ammunition, target acquisition, fire control and ancillary devices ranging in calibers from 5.56mm to 25mm as well as 40mm grenade systems, both shoulder-fired and automatic grenade launchers. New technologies in this area will also include improved material applications, manufacturing techniques, and modeling and simulation methodologies relevant to the systems and sub-systems cited above as well as paradigm-shifting technologies supporting the close combat mission in traditional small arms applications.

Customer base:

JSSAP, ARDEC, CERDEC-NVL, PEO Ammo, PEO Soldier, PEO SOF Warrior, Joint Non-Lethal Weapons Directorate, MCCDC, Navy Crane, Office of Naval Research, Army Research Lab, DHS, and DoJ.

Agenda driven by Joint Service Small Arms Technology Plans and Service Lethality Roadmaps.



SAA Sub-Objective Areas

Sub-Objective Areas

- SAA-15-01 Fire Control, Optics, Electro-Optics, Enablers
- SAA-15-02 Modeling & Analysis, Studies
- SAA-15-03 Weapons Technologies
- SAA-15-04 Effects, Lethality, & Utility
- SAA-15-05 Materials & Processes
- SAA-15-06 Smart Munitions
- SAA-15-07 Warheads & Energetics
- SAA-15-08 New Concepts & Applications
- SAA-15-09 Non-Lethal
- SAA-15-10 Training & Simulations



SAA Current Activities

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Where are we Today!

- DOTC Request for Ordnance Technology Initiatives (ROTI) announcement
 - Opened: 16 SEP 2013
 - Closed: 5 NOV 2013
 - Technical Areas:
 - One-Way Luminescence (OWL)
 - Non-Lethal 1 Assessment: Variable-Velocity man-portable weapon systems
 - Non-Lethal 2 Assessment: High Power Microwave Sub-systems

SAA Requirements Collaboration and Review

- (3-4 DEC 2013), Fort Belvoir, VA, Bldg 20 (Officers' Club)
- Annual Tech Plan Kick-off Agenda
 - Customer Briefs
 - Futures Brief/Emerging Results
 - Sub-Objectives Development
 - Industry Briefs
 - Department of Energy Collaboration Briefs
 - DOTC Education

 How to navigate thru the DOTC process?
 - Customer, Industry one-on-one exchanges



SAA "Takeaways"

SAA Collaboraton Meeting: 3-4 Dec 2013, Fort Belvoir Officers' Club

Gov't/Industry Portal available at: http://www.nwec-dotc.org

Small Arms & Accessories (SAA Government POCs:)

- Mike Tauber, SAA Technology Area Lead, <u>michael.j.tauber.civ@mail.mil</u>, 973-724-7690
- Terence F. Rice, SAA Technology Area Co-Lead, <u>terence.f.rice.civ@mail.mil</u>, 973-724-9714
- Dr. Barton H. Halpern, SAA Technical Board Chair, <u>barton.h.halpern.civ@mail.mil</u>, 973-724-6009
- Dr. Stephen Small, SAA Science Technology Engineering Mathematics (STEM) Liaison, stephen.c.small.civ@mail.mil, 973-724-7043

DOTC Integration Benefits

- Economies of scale (based on contract volume, acquisition by large entity)
- Quicker contract award time after proposal(s) is/are selected (~ 45 days)
- SAA Tech Area would be the "point of entry" for Small Arms S&T



Back-up Slides



Proposed Small Arms & Accessories (SAA) Sub-Tech Objectives

Small Arms & Accessories Requirements Collaboration and Review, 3-4 Dec 2013 in

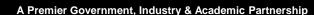
Support of the DOTC Annual Technology Plan for FY15



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- SAA-15-05 Materials & Processes
- SAA-15-06 Smart Munitions
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SAA Sub-Objectives

SAA-15-01 - Fire Control, Optics, Electro-Optics, Enablers

Technical

Accurate Range Finding Multi-function Laser

Multi Pulse Laser **Laser Steering**

Decision Aids Automated Target Acquisition

Off Weapon Aiming

Common Operational Picture

Image Stabilization/Registration/Recognition Hostile Fire Detection

Target Detection/Tracking/Recognition/ID

Tactical

Networked Target Information **Network Firing Solution**

 Sensor and Other Soldier Input Massed Fire

Collaborative Engagement Automated Re-supply

Target Hand-off Non-Line-of-Sight Engagement

Engagement from Defilade



SAA-15-02 – Modeling & Analysis

- Operation Modeling
- Operational Effectiveness
- What is good enough?
- What is really required?
- Which concepts offer best solutions?
- Determine Total Ownership Costs



SAA-15-03 – Weapons Mechanisms

- Recoil Reduction
- Muzzle Devices
- Magazine and ammo handling devices
- Power Generation
- Linkless Concepts
- Rate of Fire Control
- Lightweight
- Embedded maintenance
- Embedded prognostics and diagnostics



SAA-15-04 – Lethality & Utility

- KE Bullets
- Lightweight Ammunition
- Caseless Ammunition
- Tagging and Marking rounds
- Future Caliber Selections
- Rifle Launched Devices
- Frangible Carriers
- RF Marker
- IR Marker
- Davis Gun



SAA-15-05 – Materials & Processes

- Increased Life
- Reduced Wear
- Improved Reliability
- Ceramic Liners and Barrels
- Functionally Graded Materials
- Polygonal Bores
- Lubricious Coatings
- Electro Explosive Coatings
- Lightweight Materials



SAA-15-06 – Smart Munitions

- Assured Lethality
- Steerable Munitions
- Course Correcting Munitions
- Seeking Munitions
- Automated Engagement
- Instantaneous Engagement
- IR Sensors and Snapshot
- Electronically Morphed Control Surfaces



SAA-15-07 – Warheads & Energetics

- Airburst Technology to other calibers
- Proximity Rounds
- Airburst Smoke
- Multi-Effect Warheads
- Smart Warheads
- Tailorable Effects
- Multiple Shaped Charges
- Explosively Formed Penetrators
- Thermitic Cutters
- High Density Propellants
- Nano Propellants and Explosives
- Insensitive Explosives
- Fuze Design
- Explosive Train



SAA-15-08 – New Concepts & Applications

- Non-KE Lethality
- Tunable Effects Concepts
- Scalable Effects Munitions
- Exoskeleton Mounted Concepts
- Hot Trigger
- Remote Organic Weapons
- Recoil Reduction
- Power Generation



SAA-15-09 – Non-Lethal

- Variable velocity
- High voltage capacitors
- Thermobaric technology
- Airburst munitions
- Continuous wave lasers
- Pulsed lasers
- High power microwaves



SAA-15-10 – Training & Simulations

- Embedded Weapon and Enablers Training
- Training Aids, Devices
- Marksmanship/Operational Training
- Simulations and Simulators
- Immersive/Virtual Simulators
- Human Performance/Cognitive Abilities and Effects (reflexes, skills, reactions, learning, multi-tasking/input, etc)
- Instructional System Development (covers curriculum, tasks/conditions/standards goals, courses of fire, targets used, training/lesson plans, periods/rates/recurrence of training, instructor certifications and skills, environment, version or media used, etc)