ARDEC Science & Technology … Maintaining Balance between Government and Industrial Partners

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Army Materiel Command, AMC
Gen. Dennis L. Via

TACOM LCMC
MG Michael J. Terry

- Program Executive Office Combat Support and Combat Service Support
- Program Executive Office Ground Combat Systems
- Program Executive Office Soldier

assigned/Direct Support Coordination
Advanced Weapons:
Line of sight/beyond line of sight fire; non line of sight fire; scalable effects; non-lethal; directed energy; autonomous weapons

Ammunition:
Small, medium, large caliber; propellants; explosives; pyrotechnics; warheads; insensitive munitions; logistics; packaging; fuzes; environmental technologies and explosive ordnance disposal

Fire Control:
Battlefield digitization; embedded system software; aero ballistics and telemetry

ARDEC provides the technology for over 90% of the Army’s lethality and a significant amount of support for other services’ lethality
Enduring & Future Thrusts

- High g survivable power sources
- Advanced materials for warheads, lighter structural components
- Integration of additive manufacturing technologies to enhance performance and speed timeline from gap to operational use
- Extending range and affordable precision across all calibers
- Technologies that reduce Warfighter burden
- Affordable demilitarization technologies
- Technologies that reduce weapon tube erosion
Facilitate

>> Communication
>> Information
>> Planning
>> Priorities

Source Library – Army
Integrated Requirements Framework (IRF)
Identification/documentation of source needs and prioritization applicable to ARDEC S&T investments.

ARDEC S&T Needs/Opportunities
Identification, coordination, organization of individual “Source Documents” needs/gaps/priorities into one list.

ARDEC S&T Portfolio
Maintaining complete S&T Portfolio with project id, description, and attributes.

Source Library
- Army Enduring Challenges
- OSD Elegant 11
- PEO AMMO
- PEO Soldier
- PEO GCS
- TRADOC
  - Warfighter Outcomes (WFOs)
  - Capability Needs Analysis (CNAs)
  - MCoE
  - MSCoE
  - FCoE

ARDEC S&T Projects

DOORS Architecture/Modules
• 120mm Mortars extended range and increased precision.

• Extended range w/ conventional munitions and guided munitions

• Increased precision in GPS denied environments

• Munitions against advanced armors and hardened above/below ground targets

• Tailorable effects that match munitions to targets (to include scalable lethal to non-lethal)

• Cluster munitions replacement for area fires or imprecisely located targets

• Remote and autonomous delivery of fires for increased survivability

• CUAS at close range

• CRAM for base protection and armored vehicles on the move

• Detect and counter electromagnetic or directed energy attacks

• Explosive detection/neutralization above/below ground, at standoff distances, and convoy speeds

• Breach of entry points into urban infrastructure & disable assets from stand-off

• Efficient handling/throughput of cargo for faster/more effective deployment/sustainment

• Explosives safety techniques to improve storage site planning and minimize footprint at base camps.

• Real-time, automated, asset tracking and prognostics/diagnostics systems to manage/maintain ammunition.

• Automated rapid weapon system rearm and resupply to reduce manpower requirements and soldier exposure to risk.

• Lightweight renewable/recyclable/reusable packaging to reduce operational energy usage during distribution and retrograde.

• Direct fire counter-defilade target engagement capability

• Cooperative engagements (sensor to shooter, LOS, NLOS, kinetic, non-kinetic lethal capabilities) and near real-time networked fires

• Scalable (non-lethal and non-lethal to lethal) force to shape the fight, defeat insurgents, reduce casualties, minimize damage

• Multispectral obscurants and illumination to limit enemy freedom of action

• Imperceptible trace to prevent enemy detection of U.S. forces

• Large Cal direct fire to defeat ATGM

• Large Cal to defeat ATGM teams with precision airburst munitions

• Lethal overmatch and tactical standoff to extend the close-combat battle against tanks and armored vehicles

• Cooperative engagements (sensor to shooter, LOS, NLOS, kinetic, non-kinetic lethal capabilities) and near real-time networked fire

• Breach of entry points into urban infrastructure and disable assets from stand-off

• Remote and autonomous delivery of fires for increased survivability

• NL anti-material weapon effective at extended ranges

• 120mm Mortars extended range and increased precision.

• Extended range w/ conventional munitions and guided munitions

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UNCLASSIFIED

ARDEC S&T Portfolio
Dismounted Close Combat – Lethality

Improved Air Burst Accuracy
40mm LV Grenade (6.3)

Extended Range/Guided 40mm LV Grenade (6.2/6.3)

Integrated Decision Enhancing Capabilities for Fire Control (6.2/6.3)

OPPORTUNITIES

• Enhancing Squad effectiveness while reducing soldier load: precision, longer range, CUAS
• Technologies that enable affordable precision engagement in 40mm low and high velocity grenades: GNC, terminal guidance, GPS Denied environment, MEMS-based components, embedded on munition sensor/signal processing
• Multi-Purpose Technologies - enable a single munition to engage variable targets and target types
• Technologies that enable the next generation, Soldier-carried weapon system that will be lightweight, multi-functional, mission-configurable, and effective against exposed and defilade targets out to extended ranges

NEAR (FY13-16) MID (FY17-20) FAR (2021+)

Improved Air Burst Accuracy
40mm LV Grenade (6.3)

Extended Range/Guided 40mm LV Grenade (6.2/6.3)

Integrated Decision Enhancing Capabilities for Fire Control (6.2/6.3)
S&T (6.2, 6.3 & ManTech) Historical Trends

| Fiscal Year | In-house/OGA | Other Contracts | DOTC | Total
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<tr>
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<tbody>
<tr>
<td>FY11</td>
<td>67,336</td>
<td>27,535</td>
<td>18,441</td>
<td>113,3M</td>
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<tr>
<td>FY12</td>
<td>73,978</td>
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<td>113.7M</td>
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- DOTC total includes estimated Plan & Actuals
- In-house/OGA: 24.3%, 16.3%
- Other Contracts: 24.5%, 18.4%
- DOTC: 31.4%, 12.0%
Extended Range Cannon Artillery (ERCA): Systems Approach

Utilizing a systematic, system of systems, approach to provide range extension, weight reduction, accuracy improvement, and improved rates of fire for 155mm artillery.

Advanced Lightweight weapon system + Extended Range Projectile Family + Novel Propellant Charges

Self-propelled + Towed
Additive Manufacturing

Purpose:
Develop and optimize additive manufacturing systems and materials to enhance Warfighter capability while reducing logistics burden

Focus Areas:
- Nano Materials
- Energetic Materials
- Munitions Optimization
- Weapon System Components
- Real Time R&D Development

Payoff:
- Immediate response to Warfighter need
- Reduce development-to-field timeline
- Reduce logistics trail

Laying the ground work to allow our Warfighter to ‘print’ needed equipment and capability at the front line…
Teaming with ARDEC

- **Science & Technology and Manufacturing Technology**
  POC: Joseph Pelino, joseph.pelino.civ@mail.mil
  - **Small Business Innovation Research**
    POC: Carol L’Hommedieu, carol.j.lhommedieu.civ@mail.mil

- **CRADAs/Patent Licenses/Testing Services/Engineering Services**
  POC: Tim Ryan, timothy.s.ryan.civ@mail.mil

- **IR&D Technical Interchange**
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- **International Cooperation**
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- **DOTC**
  POC: Don Geiss, donald.a.geiss.civ@mail.mil
  - **Small Arms Consortium**
    POC: Mike Tauber, michael.j.tauber.civ@mail.mil
 Going Forward

• Budgets will remain constrained for the foreseeable future
• Senior Army leadership will continue to play a greater role in dictating RDT&E direction
  – AAE Roadmapping effort
  – Chief of Staff “Force 2025” effort
  – Sequestration & President’s Budget FY15
• Industry partners play a significant role in ARDEC’s S&T program
  – 41% of funding over last 3 years, DOTC efforts increasing
  – Working strategies to increase S&T transition in partnership with industry
• Emerging enabling technologies will play a significant role in how we produce and resource our Warfighter with capability
“Without **lethality** it’s just another parade”