Empower, unburden and protect the Warfighter by providing superior armaments solutions that dominate the battlefield.

Innovative Armaments Solutions for Today and Tomorrow
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
ARDEC Core Competencies

**Weapon Systems & Technologies**
- Integrated Weapon Systems
- Gun / Cannon Tubes & Mounts
- Non-Lethal Weapons & Target Effects
- Remote Weapon Stations/Weapon Pods
- Ammo autoloaders and magazines

**Munition Systems & Technologies**
- Gun Launched Munition Systems
- Non-Lethal and Scalable Munitions
- Maneuver Support Munitions
- Grenades & Demolitions
- Countermeasure Flares / Decoys
- Smoke Munitions/ Grenades Signal Flares
- Guidance, Navigation, and Control
- Propulsion Systems

**Logistics**
- Ammunition Unique Packaging, Handling, Storage and Transportation
- Asset Visibility & Distribution Management
- Sets, Kits, Outfits & Tools
- Logistic Engineering & New Equipment Training

**Fire Control Systems**
- Embedded/Real-Time Software
- Fire / Weapon Control Hardware
- Fire / Weapon Control Hardware Integration
- Fire Control Components
- Ballistic Data & Products
- Prognostic / Diagnostics

**Enterprise Engineering & Business**
- Systems Engineering & Analysis
- Software Engineering
- Prototyping
- Quality, Reliability & System Safety Engineering
- Product and Technical Data Management
- Modeling & Simulation of Armaments
- Acquisition Support
- Industrial Base Analysis/Obsolescence Mgmt

**Energetics, Warheads & Materials**
- Propellants
- Explosives
- Pyrotechnics
- Advanced Materials / Nanotechnologies
- Environmental Technologies
- Stockpile Reliability
- Warheads / Lethal Mechanisms
- Anti-Tamper Devices
- Integrated Explosive Detection Systems
- Demil Technologies

**Fire Control Systems**
- TMDE & Automated Test Sets
- Networked Lethality Hardware
- Emergency Management & Anti-Terrorism Systems

**Logistics**
- Leverage 2%
- Enabler 26%
- World Class 49%
- Core 23%

Army Science Board July 2013 Lethality Analysis
Prevent, Shape, and Win in support of Combatant Commanders to defend the Nation and its interests at home and abroad, both today and against emerging threats.

**Strategic and Operational Initiatives in Context**

**Strategic Landpower**

*RISING VELOCITY OF HUMAN INTERACTION*

**Crisis**

**Force 2025**

**ARMY 2020**
A more globally responsive force, capable of decisive action across the ROMO

**Beyond 2025**
A fundamentally changed force, uniquely enabled and organized to conduct expeditionary maneuver

**Rapid Expeditionary Deployment Initiative**

**Force 2025**
A leaner, more lethal expeditionary, and agile force than today
Army Enduring Challenges

- Greater **force protection (Soldier, vehicle, base)** to ensure survivability across all operations (16.8% of ARDEC Portfolio)
- Ease **overburdened** Soldiers in Small Units (4.0%)
- Timely **mission command & tactical intelligence** to provide situation awareness and communications in **all** environments (0.5%)
- Reduce logistic burden of **storing, transporting, distributing** and **retrograde** of materials (2.4%)
- Create **operational overmatch** (enhanced lethality and accuracy) (69.6%)
- Achieve operational **maneuverability** in all environments and at **high operational tempo** (2.5%)
- Enable ability to **operate in CBNRE environment** (0.8%)
- Enable **early detection and improved outcomes for Traumatic Brain Injury (TBI) & Post Traumatic Stress Disorder (PTSD)** (0.0%)
- Improve **operational energy** (0.0%)
- Improve **individual & team training** (0.0%)
- **Reduce lifecycle cost** of future Army capabilities (A metric for all efforts!)

ARDEC Portfolio is Aligned to Army Enduring Challenges!
Enablers: Range Extension w/ Affordable Precision (1/2)

**ENERGETICS**

Develop and demonstrate novel artillery charge for enhanced range

**PAYOFF**
- Extended range with current weapon constraints
- Low residue propellant with improved energy efficiency
- Environmentally compliant gun propulsion
- More energy without exceeding peak pressure

**FUZING & POWER**

Demonstrate advanced fuzing solutions that enable enhanced lethality

**PAYOFF**
- Advanced proximity and media identification sensors enable interrogation of the target
- Multipoint initiation enabling enhanced lethality
- Novel high-g power sources w/ greater energy density

**WARHEADS**

Affordable warhead technologies against threat personnel, vehicles & material

**PAYOFF**
- Submunition warheads that provide enhanced lethality over large areas
- Warhead configured into the projectile body reduces cost per kill
Enablers: Range Extension w/ Affordable Precision (2/2)

**GUIDANCE, NAVIGATION & CONTROL**

Integrate affordable imaging and control systems into munition guidance, navigation and control in challenging environments

**PAYOFF**

- Extended Range given ability to glide
- Improved Circular Error Probable at an affordable cost

**FIRE CONTROL**

Provide advanced fire direction, position location, orientation and meteorological capabilities

**PAYOFF**

- Vehicle and training reduction
- Technology insertion reducing both weight and size by ~75%
- Enables mass fires in a GPS denied environment

**PAYOFF**

- Power, weight, time, and cost savings by elimination of cumbersome Personnel Computer technology
- Reduced logistical burden and life cycle cost

Low-power, low-cost, lightweight fire control system based on commercially available single board computer hardware
Weapons: Extended Range w/ Enhanced Lethality

**EXTENDED RANGE CANNON ARTILLERY (ERCA)**

Integrated extended range 52 caliber cannon/gun w/fully automatic ammunition handling system/loader

**PAYOFF**
- Extended Range, Increased rate of fire, Improved precision
- Common Fire Control System
- Technologies are transferrable to M777

**AUTOMATED DIRECT/INDIRECT FIRED MORTAR (ADIM)**

Remotely operable direct/indirect fire mortar system suitable for mounting on multiple platforms

**PAYOFF**
- Increased rate of fire enabling multi-target engagement
- Reduced emplacement times

**LAND BASED ELECTROMAGNETIC GUN**

Collaborating with Navy for development of land based EM Gun with common system components and projectile

**PAYOFF**
- Increased velocity and range
- Common system components
Family of lightweight weapons integrated with fire control systems, advanced munitions, integrated day/night sight, and magnified optics

PAYOFF
• Fire control system for increased accuracy/lethality
• 20% reduction in weight
• Integrated optics

Improved accuracy, lethality, ammunition handling and advanced sensor suite capable of using next gen munitions

PAYOFF
• Increased lethality
• Increase in precision and accuracy
• Integrated ammunition handling system
• Graphical user interface fire control system
ARDEC Strategy in Countering – UAS, CM & RAM Threats

Leveraging core technical competencies for cost effective solutions

Far-Term Effort
Address Long Range UAV Intercept in addition to current target set

Near-Term Effort
Multiple simultaneous engagements

Mid-Term Effort

Extended Range Technologies

Long Range Intercept (Extended Range)
Super FOB

EAPS - Extended Area Protection System
FOB - Bde

Fixed/Mobile Area Protection
COP – Co/Platoon

Squad Area Protection
PB/COP - Squad

M240 (7.62)
40mm
60mm
Teaming with ARDEC

- **Science & Technology**  
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- **CRADAs/Patent Licenses/Testing Services/Engineering Services**  
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... Continued dialog to leverage collaboration opportunities
Challenges Going Forward

- CSA Challenge 2025 and beyond
  - 3 Main Objectives
    - Reduction in manpower
    - Increase lethality
    - Reduction in logistic support trains
- Budget Realities
  - Acquisition funding reductions (Procurement and RDT&E)
  - Increasing user needs; must prioritize S&T investments at same funding level
  - Prototyping capability = ready off the shelf
- Pivot to Asia & Pacific and concerns over near-peer threats
  - Focus on longer range and increased precision in GPS-denied environment
  - Enhanced lethality as force structure is reduced
- How can you help?
  - Transitioning from Wartime Operations to Sustainment Operation: **NEW FOCUS**
  - Joint overarching Armament Strategy for the future
  - Reduction of funding; imperative WE WORK TOGETHER

What can we do collectively to overcome this new environment!
“Without **lethality** it’s just another parade”