

Advance Planning Briefing to Industry

Mr. John Hedderich III
(A) Director, ARDEC
20 November 2014



MISSION

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

VISION

Innovative Armaments Solutions for Today and Tomorrow



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RDECOM ORGANIZATION



GEN David G. Perkins
CG TRADOC



GEN Dennis L. Via
CG AMC



Ms. Heidi Shyu
ASA(ALT) & AAE



MG John F. Wharton
CG RDECOM



CSM Lebert O. Beharie
CSM RDECOM



Mr. Jyuji D. Hewitt
Executive Deputy to the CG RDECOM



BG William E. Cole
DCG RDECOM

- RFEC Atlantic
- RFEC Pacific
- RFEC Americas

AMRDEC
Aviation & Missile
Research, Development
& Engineering Center

ARDEC
Armaments Research,
Development &
Engineering Center

CERDEC
Communications-
Electronics Research,
Development &
Engineering Center

ECBC
Edgewood Chemical
Biological Center

NSRDEC
Natick Soldier Research,
Development &
Engineering Center

TARDEC
Tank Automotive
Research, Development
& Engineering Center

ARL
Army Research Laboratory



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ARDEC'S ROLE

Engineering Lifecycle



RESEARCH



DEVELOPMENT



PRODUCTION



FIELD SUPPORT



DEMILITARIZATION

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



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CHALLENGES GOING FORWARD

Army Operating Concept “Win in a Complex World” future operational environment

- Increased velocity and momentum of human interaction and events
- Potential for overmatch by our adversaries
- Proliferation of weapons of mass destruction
- Spread of advanced cyberspace and counter-space capabilities
- Demographics and operations among populations, in cities, and in complex terrain

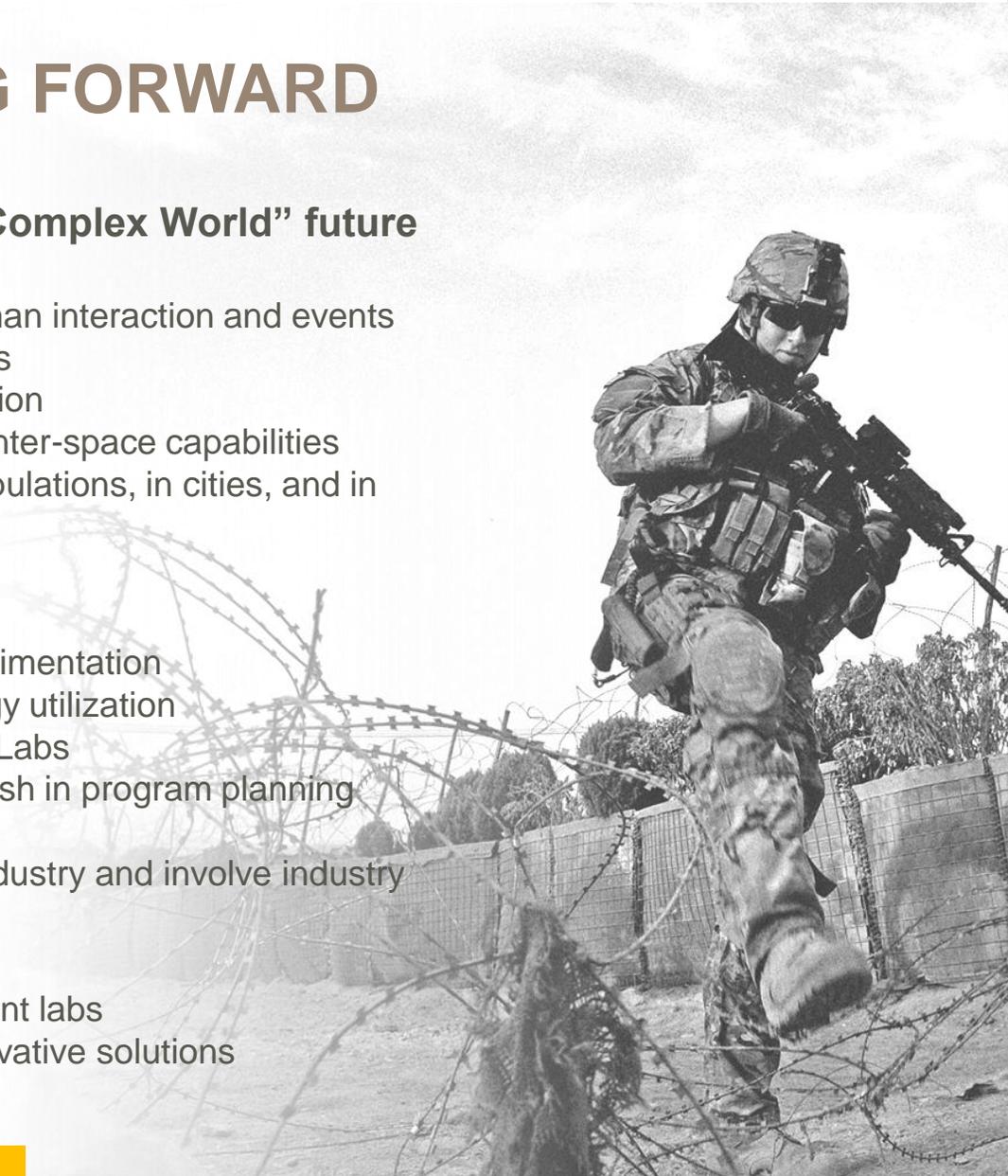
Better Buying Power 3.0

- Increase the use of prototyping and experimentation
- Remove barriers to commercial technology utilization
- Improve the return on investment in DoD Labs
- Emphasize technology insertion and refresh in program planning
- Increase the use of SBIR
- Provide draft technical requirements to industry and involve industry

How can you help?

- Enhance communications with Government labs
- Incorporate Government IP into your innovative solutions

What can we do collectively to overcome this new environment?



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ARDEC S&T USER GAPS

- 120mm Mortars **extended range** and **increased precision**.
- **Extended range artillery** 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

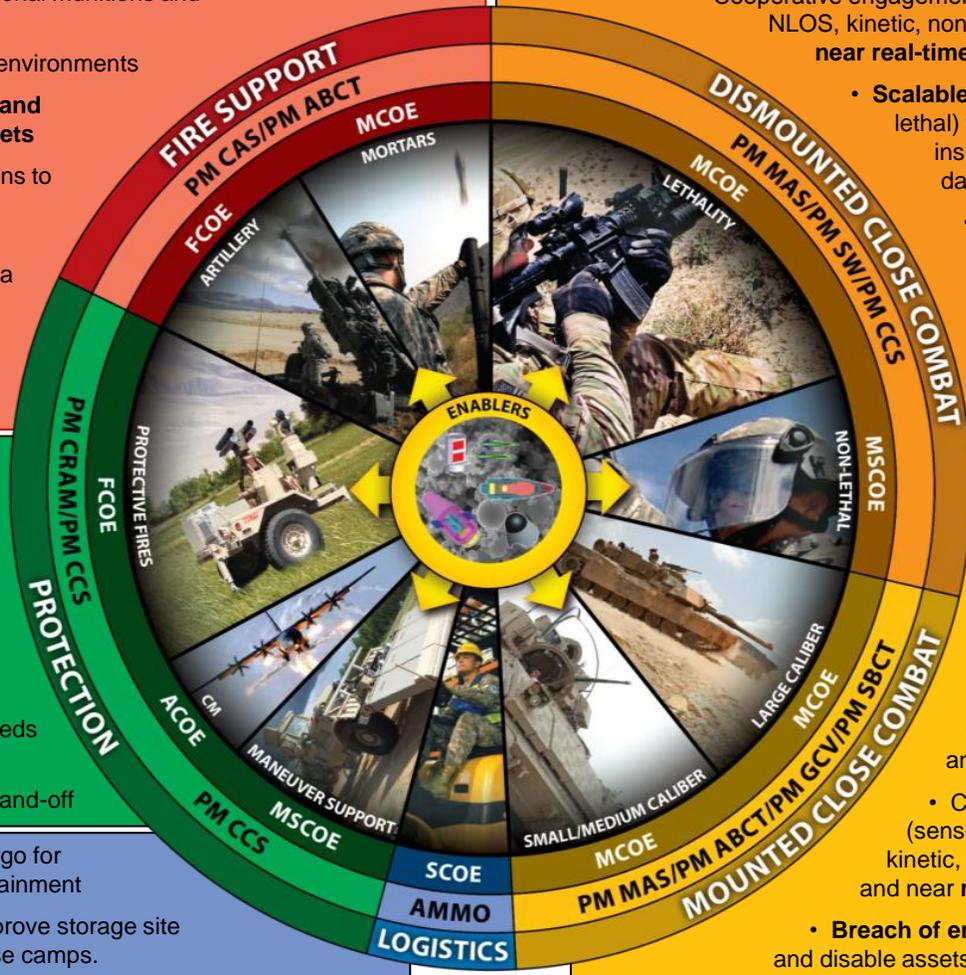
- **Counter Unmanned Air Systems** at close and extended ranges
- **Counter Rocket, Artillery and Mortar** for base protection and armored vehicles on the move
- Detect and **counter electromagnetic or directed energy** attacks
- **Explosive detection/neutralization** at standoff distances, and convoy 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
- Integrated approach to **reduce Warfighter load** – approach march load

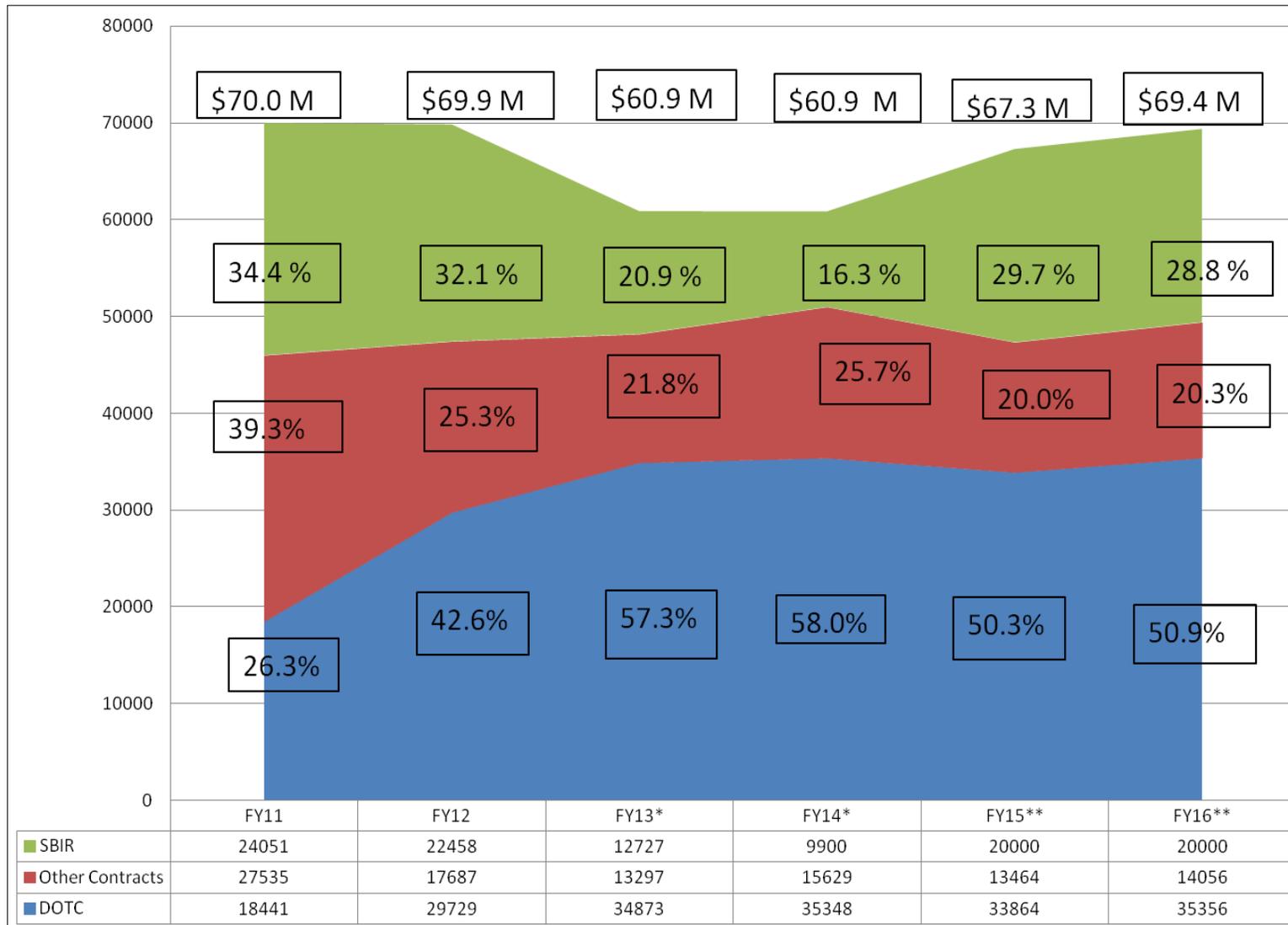
- Large Cal direct fire to defeat ATGM at short and extended ranges
- Large Cal to defeat ATGM teams with **precision airburst munitions**
- Lethal overmatch and **tactical standoff** to extend the close-combat battle against tanks and armored vehicles
- Cooperative engagements (sensor to shooter, LOS, 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 and anti-personnel weapon effective at range beyond current



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CORE S&T (6.2, 6.3, 6.7 & SBIR) CONTRACTS HISTORICAL TRENDS & FORECAST

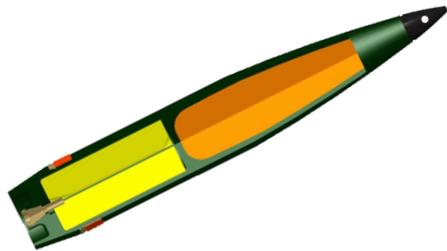


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ENABLERS: RANGE EXTENSION W/ AFFORDABLE PRECISION (1/2)

ENERGETICS



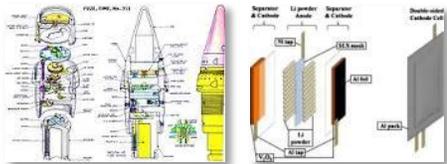
Develop and demonstrate novel artillery charge for enhanced range

PAYOFF

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

INDUSTRY OPPORTUNITY:
\$5-10M in Contracts in FY15-16

FUZING & POWER



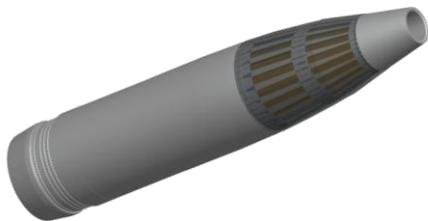
Demonstrate advanced fuzing solutions that enable enhanced lethality

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

INDUSTRY OPPORTUNITY:
\$1-2M in Contracts in FY15-16

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

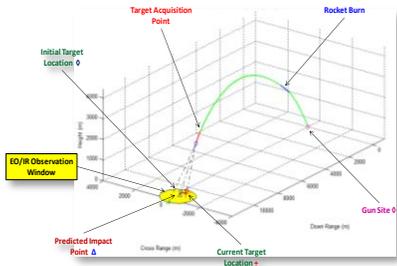
INDUSTRY OPPORTUNITY:
\$4-7M in Contracts in FY15-16



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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

FIRE CONTROL



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



Low-power, low-cost, light-weight fire control system based on commercially available single board computer hardware

PAYOFF

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

INDUSTRY OPPORTUNITY:
\$3-6M in Contracts in FY15-16

PAYOFF

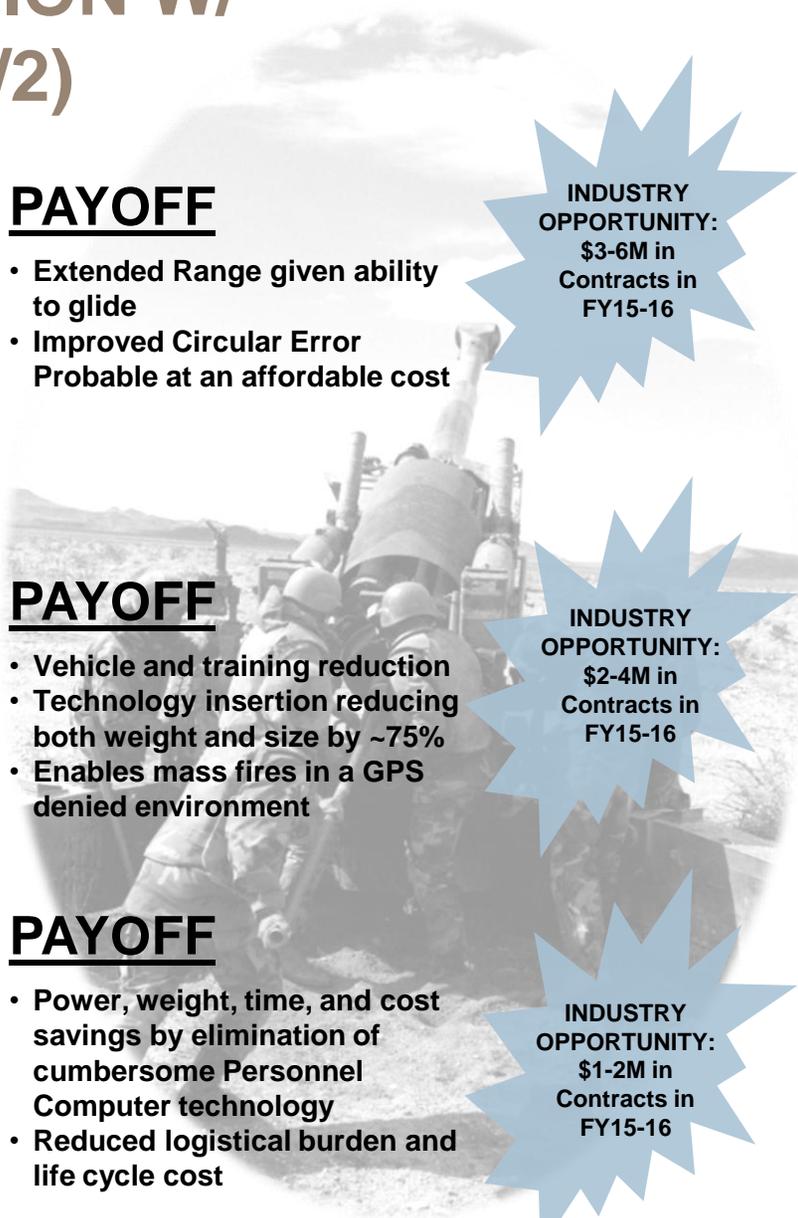
- Vehicle and training reduction
- Technology insertion reducing both weight and size by ~75%
- Enables mass fires in a GPS denied environment

INDUSTRY OPPORTUNITY:
\$2-4M in Contracts in FY15-16

PAYOFF

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

INDUSTRY OPPORTUNITY:
\$1-2M in Contracts in FY15-16



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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

INDUSTRY OPPORTUNITY:
\$2-4M in Contracts in FY15-16



ADVANCED LETHALITY & ACCURACY SYSTEMS – MEDIUM CALIBER (ALAS-MC)



50mm Enhanced Bushmaster III



XM813 30mm

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

INDUSTRY OPPORTUNITY:
\$6-8M in Contracts in FY15-16



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WEAPONS: EXTENDED RANGE W/ ENHANCED LETHALITY

SMALL ARMS TECHNOLOGIES



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

INDUSTRY OPPORTUNITY: \$3-5M in Contracts in FY15-16



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FY16 DOTC ANNUAL CYCLE

Annual Plan Development to Initiative Award...

OCT - JAN

Technology IPTs
Government Project
Officer/NAC
Planning



FEB - MAR

Annual Plan
Finalized Call for
Ordnance
Technology
Initiatives

-ExCom Meeting

- NAC Suggested Topics
- Draft Annual Plan
- Gov't S&T Guidance
- Collaboration Days



DOTC Acquisition
Activity

APR - JUN

White Papers
& Government
Feedback

-NAC General
Membership Mtg

JUL - SEP

Proposals
Submitted &
Evaluated

-ExCom Meeting

SEP - OCT

Selections &
Obligate
Funding



In Care of
Consortium
Management
Firm



Yes

Award
Initiatives

- INIT 001
- INIT 002
- INIT 003

No

Electronic
Basket

- Mostly RDT&E funding
- May sometimes accept Procurement funding
- Can not accept OMA funding

**Basket Proposals
Remain Valid
for 3 years from
Submission Date**



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FY16 SCHEDULE

| | |
|--|---------------------|
| Open BIDS for Suggested Topics | 07 OCT 14 |
| Close BIDS for Suggested Topics | 29 OCT 14 |
| Open BIDS for Annual Plan Requirements | 05 NOV 14 |
| Close BIDS for Annual Plan Requirements | 10 DEC 14 |
| Open BIDS for NAC Comments | 07 JAN 15 |
| Close BIDS for NAC Comments | 21 JAN 15 |
| Cut-off for Submissions to FY16 Annual Plan | 11 FEB 15 |
| Release of Final Annual Plan to NAC | 26 FEB 15 |
| NAC General Membership Meeting | 3-5 MAR 15 |
| Request for Ordnance Technology Initiatives | 18 MAR 15 |
| White Papers Due in BIDS | 22 APR 15 |
| White Paper Feedback to NAC Members | 19 MAY 15 |
| Proposals Received in BIDS | 14 JUL 15 |
| Proposal Evaluations due in BIDS | 17 AUG 15 |
| Technical Direction for Awards | OCT - NOV 15 |



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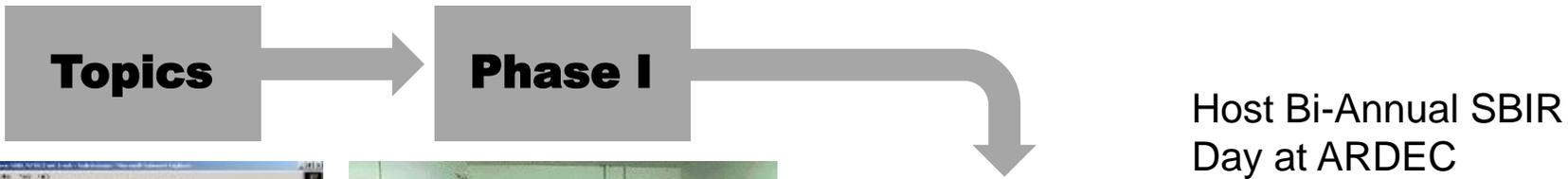
DOTC FY16 OBJECTIVE AREAS AND CATEGORIES

| | | | | |
|--|---|--|---|--|
| Ammunition (AMM) | Demilitarization (DEM) | Enabling Technologies (ENT) | Energetic Materials (ENR) | Fuzes & Sensors (FUZ) |
| <ul style="list-style-type: none"> • Small Caliber • Medium Caliber • Large Caliber • Non-Lethal Ammo • Mortars • Grenades • Area Denial • Demolitions • Logistics • Other | <ul style="list-style-type: none"> • Disassembly of Munitions • Munitions Recycle, Recovery, and Re-Use • Munitions Destruction and Final Disposition • Removal of Energetic Materials from Munitions • Waste Stream Treatment • Disposal Logistics • Other | <ul style="list-style-type: none"> • Precision Guidance • GPS Denied • Power Sources • Material and Processes • Manufacturing Technologies • Weaponization • Modeling and Simulation • Other | <ul style="list-style-type: none"> • Explosives • Propellants • Pyrotechnics • Ingredients • Additive Manufacturing for Energetic Materials • Other | <ul style="list-style-type: none"> • Hard Target Fuzing Technologies • Tailorable Effects Fuze Technologies • High Reliability Fuze Technologies • Enabling Fuze Technologies • Safe & Arm Fuzes • MEMS • Fuze Producibility • High G-Force • Sensor Development • Other |
| Joint Insensitive Munitions (JIM) | Protection & Survivability (PAS) | Rockets, Missiles and Bombs (RMB) | Warheads/Lethal Mechanisms (WLM) | Weapon Systems (WPN) |
| <ul style="list-style-type: none"> • High Performance Missile Propulsion • Minimum Signature Missile Propulsion • Blast Fragment Warheads • Anti-Armor Warheads • Gun Propulsion • System Level Demonstration • Explosive Ordnance Disposal (EOD) Insensitive Munition disposal tools/techniques • Other | <ul style="list-style-type: none"> • Threat Detection / Tracking • Countermeasures, Counter Countermeasures & Anti-Tamper • IED Detection & Destruction • EOD • Armament Survivability • Personnel & Equipment Survivability • Communications • Situational Awareness | <ul style="list-style-type: none"> • Air-to-Air • Air-to-Surface • Surface-to-Air • Surface-to-Surface • Shoulder Launched • Other | <ul style="list-style-type: none"> • Chemical Energy • Kinetic Energy • Multipurpose • Unitary • Directed Energy • Other | <ul style="list-style-type: none"> • Rifles • Hand Guns • Machine Guns • Grenade Launchers • Medium Caliber Cannons • Large Caliber Artillery • Non-lethal Weapons • Fire Control • Accessories • Enablers • Other |



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ARMY SBIR PROCESS



DoD Solicitation
Participation in all three solicitations

Feasibility Study
\$100K, 6 Months
• \$50K Option (Gap Funding)
• TRL 3 at completion

~10% of proposals submitted selected

Prototype Development
\$1M, 2 Years
• (\$50K Option Gap Funding)
• TRL 6 at completion
~50% invited proposals selected

Ph II Enhancement

Commercialization
Transition to Federal Govt or Private Program
No SBIR Funds

\$24M~ in FY14

Phase I - 24
Phase II - 12
6 FY15 SBIR Topics
1 FY15 STTR
10 ongoing phase II enhancements, 6 pending packets



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FY15 ARDEC SBIR TOPICS (PLANNED)

- Manned/Unmanned Multi-platform Target Effects Teaming and Collaboration
- Fast Charging Rate and High Energy Power Systems for High Shock Survivability
- Tungsten for Improved Ductility
- Counter UAS Technologies for Swarming UASs
- Low Cost, Low Temperature Processing, High Use Temperature Composite Material
- Advanced Materials for Enhanced Energetic Materials

| Army SBIR Program Phase I Milestones | | | |
|--------------------------------------|-------------------------------|-------------------------------|-------------------------------|
| | SBIR 20xx.1 (e.g., 2015.1) | SBIR 20xx.2 (e.g., 2015.2) | SBIR 20xx.3 (e.g., 2015.3) |
| Pre-solicitation | November | April | July |
| Opens | December | May | August |
| Closes | January | June | September |
| Phase I Selections Announced | March | August | November |
| Phase I Award Goal | May | October | January |

3 periods for topic entry in Phase I per year
(dates subject to change)



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TEAMING WITH ARDEC

- **Science & Technology**

POC: Joseph Pelino, joseph.pelino.civ@mail.mil

- **CRADAs/Patent Licenses/Testing Services/Engineering Services**

POC: Tim Ryan, timothy.s.ryan.civ@mail.mil

- **IR&D Technical Interchange**

POC: Sylvester Anyanwu, sylvester.o.anyanwu2.civ@mail.mil

- **Small Business Innovation Research**

POC: Benjamin Call, benjamin.d.call.civ@mail.mil

- **International Cooperation**

POC: Lu Ting, lu.ting.civ@mail.mil

- **DOTC**

POC: Don Geiss, donald.a.geiss.civ@mail.mil

.....Continued Dialogue to Leverage Collaboration Opportunities





“Without *lethality*
it’s just another parade”



U.S. ARMY
RDECOM

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