Exhibit R-2, RDT&E Budget Item Justification: PB 2013 Army										DATE: February 2012	
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*				R-1 ITEM NOMENCLATURE PE 0603004A: *Weapons and Munitions Advanced Technology*							
COST ($ in Millions)	**FY 2011**	**FY 2012**	**FY 2013 Base**	**FY 2013 OCO**	**FY 2013 Total**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**Cost To Complete**	**Total Cost**
Total Program Element	65.495	76.955	67.613	-	67.613	76.236	87.269	84.938	95.891	Continuing	Continuing
232: *ADVANCED LETHALITY & SURVIVABILITY DEMO*	45.373	54.124	50.578	-	50.578	58.985	63.898	61.023	67.960	Continuing	Continuing
L96: *HIGH ENERGY LASER TECHNOLOGY DEMO*	19.162	18.379	13.965	-	13.965	13.971	19.677	19.832	23.286	Continuing	Continuing
L97: *SMOKE AND OBSCURANTS ADVANCED TECHNOLOGY*	0.960	4.452	3.070	-	3.070	3.280	3.694	4.083	4.645	Continuing	Continuing

Note

FY 13 Reduced for higher priority efforts

A. Mission Description and Budget Item Justification

This program element (PE) matures weapons and munitions components/subsystems and demonstrates lethal and non-lethal weapons and munitions with potential to increase force application and force protection capabilities across the spectrum of operations. The weapons and munitions include artillery, mortars, medium caliber, tank fired, and shoulder fired. Project 232 focuses on affordable delivery of scalable (lethal to non-lethal) effects. Project L96 matures and integrates critical high energy laser subsystems into a mobile demonstrator to explore and validate system performance in relevant environments. Project L97demonstrates performance of advanced obscurants and delivery of mechanisms and conducts forensic analysis of explosives and hazardous materials to enable detection by Soldier and Small Units.

Work in this PE is related to, and fully coordinated with, PE 0602120A (Sensors and Electronic Survivability), PE 0602307A (Advanced Weapons Technology), PE 0602618A (Ballistics Technology), PE 0602622A (Chemical, Smoke, and Equipment Defeating Technology), PE 0602624A (Weapons and Munitions Technology), PE 0602772A (Advanced Tactical Computer Science and Sensor Technology), PE 0602782A (Command, Control, Communications Technology), PE 0603005A (Combat Vehicle and Automotive Advanced Technology), PE 0603008A (Electronic Warfare Advanced Technology), and PE 0603313A (Missile and Rocket Advanced Technology).

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering science and technology priority focus areas and the Army Modernization Strategy.

Work in this PE is performed by the Armament Research, Development, and Engineering Center (ARDEC), Picatinny Arsenal, NJ; Edgewood Chemical Biological Center (ECBC), Edgewood, MD; and the U.S. Army Space and Missile Defense Center (SMDC), Huntsville, AL.

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B. Program Change Summary ($ in Millions)	**FY 2011**	**FY 2012**	**FY 2013 Base**	**FY 2013 OCO**	**FY 2013 Total**
Previous President's Budget	64.438	77.077	82.110	-	82.110
Current President's Budget	65.495	76.955	67.613	-	67.613
Total Adjustments	1.057	-0.122	-14.497	-	-14.497
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	3.200	-			
• SBIR/STTR Transfer	-1.589	-			
• Adjustments to Budget Years	-	-	-14.497	-	-14.497
• Other Adjustments 1	-0.554	-0.122	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2013 Army			DATE: February 2012
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COST ($ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
232: *ADVANCED LETHALITY & SURVIVABILITY DEMO*	45.373	54.124	50.578	-	50.578	58.985	63.898	61.023	67.960	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project matures and demonstrates enabling technologies for affordable precision lethal and non-lethal weapons and munitions. Technologies include advanced energetic materials, insensitive munitions, novel fuze designs, penetrators, scalable effects and pulsed laser and millimeter wave sources for high power microwave (HPM) systems.

Work in this PE is related to, and fully coordinated with, PE 0602120A (Sensors and Electronic Survivability), PE 0602307A (Advanced Weapons Technology), PE 0602618A (Ballistics Technology), PE 0602622A (Chemical, Smoke, and Equipment Defeating Technology), PE 0602624A (Weapons and Munitions Technology), PE 0602772A (Advanced Tactical Computer Science and Sensor Technology), PE 0602782A (Command, Control, Communications Technology), PE 0603005A (Combat Vehicle and Automotive Advanced Technology), PE 0603008A (Electronic Warfare Advanced Technology), and PE 0603313A (Missile and Rocket Advanced Technology).

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Efforts in this project support the Ground domain portfolio.

Work in this project is performed by the Armament Research, Development, and Engineering Center (ARDEC), Picatinny Arsenal, NJ.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
Title: Ground Based Networked Munitions Technologies	3.101	3.151	-
Description: This effort provides follow-on technology advancement to ground based munitions systems currently being developed with improved capabilities. This includes an autonomous non-lethal response system.			
FY 2011 Accomplishments: Demonstrated a non-lethal layered response concept, focusing on ability to deploy munitions that can be fired in succession to intended ranges; continued to mature low-collateral self destruct concept by demonstrating a system with a representative explosively formed penetrator warhead.			
FY 2012 Plans: Integrate imagery and image processor, in a translucent protective container with Spider Munition Control Unit (MCU), for TRL 6 demonstration; incorporate the low collateral SD technology into a representative Scorpion System and conclude it with a final			

Exhibit R-2A, RDT&E Project Justification: PB 2013 Army		DATE: February 2012
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
TRL 6 test/demonstration; demonstrate the disposable radio repeater technology to maintain and regain signal from the Spider to the hand held device during the TRL 6 testing.			
Title: Scalable Effect Weapons and Munitions System ***Description:*** This effort matures scalable warhead technology and materials as well as demonstrates them in weapon and munition concepts that can be gun or missile launched to deliver a broad spectrum of effects. This ranges from non-lethal to lethal, against threat personnel and other targets. ***FY 2011 Accomplishments:*** Fabricated and integrated hardware as well as conducted fully integrated gun-launched firing demonstrations against varied targets and scenarios in a relevant environment to demonstrate scalable and adaptive effects with medium caliber cartridges, artillery shells, and unitary warheads for rocket applications; and verified system scalable lethality performance using technical data and modelind and simulation analysis.	11.363	-	-
Title: Operationally Adaptable Effects ***Description:*** Beginning in FY13, this effort utilizes the technologies demonstrated in Scalable Effect Weapons and Munitions System, which ended in FY11, to enable the defeat of a wide range of threats and provide scalable capabilities to engage ground targets and aerial threats, prevent fratricide and minimize collateral damage. ***FY 2013 Plans:*** Will design and fabricate variable yield unitary warhead that uses reactive materials, preformed fragmenting composite casing and dual purpose energetics to demonstrate improved scalable lethal and non-lethal effects.	-	-	2.904
Title: Soldier and Small Unit Lethality Integration ***Description:*** This effort leverages the soldier radio waveform (SRW) to enable network lethality at the small combat unit (SCU) level. ***FY 2011 Accomplishments:*** Refined and evaluated coordinated target hand-off, attack capability, as well as de-confliction with a small UGV/small UAV; and demonstrated network fire capabilities and fire control decision aides.	2.959	-	-
Title: Tunable Pyrotechnics ***Description:*** This effort demonstrates smoke and flare countermeasure for passive protection for ground and air combat platforms.	2.928	2.997	2.993

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
FY 2011 Accomplishments: Conducted a comprehensive evaluation on the performance of the compositions in a countermeasure mission using computer models of the decoy, evaluated effectiveness against simulation threat systems and captive IR seeker threat systems; and matured formulation characterization of IR and visible illumination compositions. ***FY 2012 Plans:*** Validate performance of advanced countermeasure flares through captive seeker flight testing and demonstrate performance of the pyrotechnic portion of the pocket hand-held signal with respect to the color given off and its illumination intensity. ***FY 2013 Plans:*** Will demonstrate and validate performance of ultraviolet, laser beam rider, and imaging seeker counter measures; subsequently validate performance using flares through flight testing; compare results to modeling and simulation studies and use derived information to advance computer modeling and simulation capabilities.			
Title: Extended Area Protection and Survivability (EAPS) ***Description:*** This effort demonstrates the use of command-guided medium caliber projectiles for the interception and destruction of incoming rockets, artillery, and mortar rounds (RAM). ***FY 2011 Accomplishments:*** Demonstrated with a fully loaded round with the capability to track, perform command maneuver and detonate warheads through an radio frequncy link. ***FY 2012 Plans:*** Integrate developed gun system with optimized ammunition to provide salvo firing capability; validate fire control software and integration into gun system; verify optimized warhead performance; assess software and firmware improvements to track, divert and initiate the warhead of multiple targets simultaneously. ***FY 2013 Plans:*** Will demonstrate the ability to track, command maneuver, and command detonate multiple in-flight projectiles against RAM targets and improve software based on flight results.	4.358	9.901	8.493
Title: Military Operations in Urban Terrain (MOUT)/Urban Lethal Technologies ***Description:*** This effort demonstrates the next generation of explosive wall breaching and shoulder launched weapon warhead technologies. ***FY 2011 Accomplishments:***	6.606	4.894	-

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
Matured fuzing technologies and build a lab demonstrator for shoulder launched weapons; matured standoff breaching warhead design and build a lab demonstrator; evaluated the enhanced shoulder launched weapon and breeching warhead in a militarily relevant environment. ***FY 2012 Plans:*** Integrate optimized flight projectile, fire from enclosure (from cover) propulsion and light weight composite launcher; optimize system against requirements; demonstrate integrated system capability; and validate system capability against target set.			
Title: Advanced Lethality Demonstration ***Description:*** This effort matures and demonstrates novel penetrator designs (without using depleted uranium), as well as, alternative lethal mechanisms to maintain or exceed tank main gun performance against multiple target types into the future. ***FY 2011 Accomplishments:*** Initiated performance assessment of three novel penetrator configurations at both ordnance and hypervelocity; conducted system trade studies; fabricated and bench test full scale surrogates to evaluate tactical deployment concepts; and revised baseline tank main gun kinetic energy (KE) cartridge system designs to incorporate these novel penetrator configurations. ***FY 2012 Plans:*** Optimize and validate tactical size KE penetrator against actual range targets; will provide lethality maps for modeling and simulation. ***FY 2013 Plans:*** Will fabricate several full-up KE rounds with selected novel penetrator and demonstrate lethality performance meets modeling and simulation predictions and range objectives in a instrumented range; design based on results, refine design and prepare additional testing on range and simulated operational environment, i.e., fired from a tank.	3.685	2.318	3.060
Title: Dual-Use Improved Conventional Munitions (DPICM) Replacement Acceleration ***Description:*** This effort matures and demonstrates ultra high reliability fuzing, advanced kill mechanisms, and alternative dispensing technologies to provide increased battlefield lethality with reduced unexploded ordnance (UXO) compliant with current DoD cluster munitions policy. ***FY 2011 Accomplishments:*** Matured and demonstrated enabling components as well as subsystems that provide: ultra high reliability through exploitation of novel power sources and redundant fuze architecture; enhanced lethal effects against armored targets via optimization of high	3.487	5.205	6.977

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
velocity penetrators and explosives; increased area coverage through demonstration of innovative munitions dispense systems; and provided UXO compliance via improved self-destruct/self-neutralization features. ***FY 2012 Plans:*** Demonstrate fuze reliability through static and ballistic testing; optimize warhead design based on feedback and will use input to validate systems effectiveness modeling. ***FY 2013 Plans:*** Will complete warhead insensitive munition tests, producibility studies and final static arena tests validating system lethality; conduct instrumented ballistic firings and dispersion verification tests of finalized dispense/stabilizer designs; build optimized fuze technology demonstrator and conduct evaluation testing; finalize submunition baseline, build demonstrator and conduct final 155mm integrated ballistic demonstration validating demonstrator.			
Title: Medium Caliber Weapon Systems ***Description:*** This effort matures and demonstrates advanced medium caliber rounds, weapon and ammunition handling systems optimized for remote operation. This effort addresses multiple warfighter capability gaps including super high elevation engagement, high performance stabilization, remote ammunition loading, weapon safety and reliability, improved lethality, accuracy, and the ability to fire a suite of ammunition from non-lethal to highly lethal, to provide escalation of force capability in one system. ***FY 2011 Accomplishments:*** Matured and demonstrated initial model designs and components for alternative lethality mechanisms; developed demonstration system mature controls and software; initiated system engineering analyses and testing; explored remote armament designs and built demonstrators. ***FY 2012 Plans:*** Build advanced prototypes using mature system dynamic models to optimize system precision, accuracy, reliability and lethality against new and existing target sets, with new munitions and weapon enhancements; mature remaining system dynamics models; utilize systems engineering to optimize components maturation efforts for maximum return on investments and performance; demonstrate scalable lethality effects leveraging non-lethal munition technologies; conduct live fire demonstrations in Mann barrels (test barrels designed to isolate munitions characteristics); and advanced medium and remote small caliber rounds, weapons, as well as ammunitions system prototypes. ***FY 2013 Plans:*** Will mature and demonstrate air burst munition and armament to validate accuracy; conduct analysis to model accuracy performance and optimize air burst munition; mature air burst munition; optimize performance of onboard fuze and fuze setter	6.886	10.932	12.408

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
for programmable airburst munition; provide interface control documents for weapon, ammunition handling system and air burst munition; optimize fire control software for scenario based touch screen user interface; mature fire control system with downrange wind sensor, dynamic meteorological, environmental, temperature (MET) sensor and improved laser ranging; continue with the maturation phase of remote weapon station to reach a higher level of ruggedness and reliability; optimize the control system; improve the operator control interface; conduct extended system level cycling tests; mature weapon and ammo handling/turret cycling tests to determine system reliability and effectiveness; demonstrate remote weapon station capabilities using both lethal and non lethal ammunition.			
Title: Advanced Power and Energy Management for Munitions ***Description:*** This effort demonstrates the technology options available to provide the next generation of gun fired smart munitions, with advanced fuzing and power components for improved performance. ***FY 2012 Plans:*** Demonstrated technologies for reserve batteries that use methods to integrate energy storage with new architectures that have superior characteristics for energy management; matured electrochemical architectures which were miniaturized for integration into semiconductor devices capable to scale up into standard reserve cell to power munitions systems; demonstrated novel methods and techniques designed to reduce the power consumption of advanced gun fired smart munitions, as well as advanced technology to develop future generation of energy harvesters. ***FY 2013 Plans:*** Will investigate fabricate technologies for gravity sensor, and perform small scale environmental testing; for proximity sensor, design necessary components and integrate into preliminary sensor, and conduct performance tests in lab environment; for multi-point initiation, create breadboard multi-point system based on artillery application, testing control circuitry and simultaneity; fabricate demonstration millimeters thin lithium- ion batteries and demonstrate environmental robustness; mature supercapacitor for munition application and fabricate for bench and environmental evaluation.	-	1.747	3.119
Title: Scale-up of Energetic Materials ***Description:*** This effort matures and demonstrates the performance and insensitivity of energetic materials in medium cal (direct fire) and large cal (indirect fire) weapons. ***FY 2012 Plans:*** Assess propulsion system as well as explosive warhead performance improvements against most critical current and projected threat targets; fabricate and bench test improved energetic materials in tactical quantities and configurations to evaluate performance improvements. ***FY 2013 Plans:***	-	2.500	2.948

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
Will investigate insensitive materials of interest for augmenting lethality ; scale up and formulate nano energetics for increased performance; scale up organic compounds based explosives to augment energy and lethality outcomes.			
Title: Counter Countermeasure (CCM) Technology Demonstrations ***Description:*** This effort demonstrates the continued effectiveness of US weapon systems and ammunition against current and projected enemy countermeasures, including conventional and classified threats and unexploded ordnance. ***FY 2012 Plans:*** Conduct performance assessment of counter countermeasure technologies for application to prioritize weapon systems with the most critical need; conduct system trade studies; fabricate surrogates to evaluate improvements; and assess technologies for application to Army unique needs for mitigation of unexploded ordnance. ***FY 2013 Plans:*** Will mature and demonstrate CCM technologies that optimize performance against threats, e.g. novel anti-armor weapon systems to defeat Active Protection Systems protected platforms; mature technology to reduce mounted soldier vulnerability by decreasing time on target.	-	1.345	0.737
Title: Lethality Efforts ***Description:*** This effort demonstrates several advanced lethality efforts, including weaponization of a robotic armed vehicle, air burst fuzing technology to enhance lethality against personnel in defilade, next generation kinetic energy penetrators, improved interception of Kinetic Energy Active Protection System projectiles, and increased lethality for medium caliber technologies. ***FY 2012 Plans:*** Mature and demonstrate enabling technologies, tactically relevant to the Kinetic Energy Active Protection System, and its subsystems to increase the battlefield lethality/survivability; demonstrate technologies for longer range artillery systems by optimizing alternative launch mechanisms for indirect fire extended range; demonstrate technologies for sensor-fused munitions for anti-armor and area defense capability; demonstrate technologies for improving precision that will extend beyond existing ranges. ***FY 2013 Plans:*** Will mature existing weapon platform and fire control software for integration and demonstration on a robotic platform; mature and demonstrate enabling integrated technologies tactically relevant to increasing battlefield lethality/survivability; continue to demonstrate technologies for improving precision that extends beyond existing ranges.	-	9.134	3.439
Title: Networked Effects Decision Suite	-	-	3.500

Exhibit R-2A, RDT&E Project Justification: PB 2013 Army		DATE: February 2012
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
Description: This effort provides sensor-to-shooter capabilities to deliver desired effects on target, specifically addressing accurate target location and target hand-off, improving accuracy and lethality at the small combat level. ***FY 2013 Plans:*** Will improve weapon target pairing (WTP) enhancement for non-lethal effects; improve fire support of unmanned aerial vehicle/ unmanned ground vehicle tactical behavior along with the remote weapon station collaborative effort; validate de-conflction of target data received; demonstrate improvements to validate the enhanced sensor-to-shooter WTP capabilities for lethal and non-lethal effects; validate the networked fire control perfomance utilizing existing hardware and software.			
Accomplishments/Planned Programs Subtotals	45.373	54.124	50.578

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

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COST ($ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
L96: *HIGH ENERGY LASER TECHNOLOGY DEMO*	19.162	18.379	13.965	-	13.965	13.971	19.677	19.832	23.286	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project matures and demonstrates advanced technologies for future High Energy Laser (HEL) weapons technology. The major effort under this project is the phased approach for mobile high power solid state laser (SSL) technology demonstrations that are traceable to the form, fit, and function requirements for a HEL weapon. At entry level weapon power of around 10 kW, SSL technology has the potential to engage and defeat small caliber mortars, unmanned aerial vehicles (UAVs), surface mines, sensors, and optics. At full weapon system power levels of around 100 kW, SSL technology has the potential to engage and defeat rockets, artillery and mortars (RAM), UAVs, and anti-tank guided missiles (ATGMs), as well as surface mines, sensors, and optics at tactically relevant ranges. HELs are expected to complement conventional offensive and defensive weapons at a lower cost-per-shot than current systems and without the need to strategically, operationally, or tactically stockpile ordnance. This effort utilizes a modular building block approach with open systems architecture to ensure growth, interoperability, and opportunity for technology insertions for maturation of laser, beam control, sensor/radar, integration of power and thermal management subsystems, as well as Battle Management Command, Control, and Computers (BMC3).

This project supports Army science and technology efforts in the Ground portfolio.

Work in this project is related to, and fully coordinated with, efforts in PE 0602307A (Advanced Weapons Technology), PE 0602890F (High Energy Laser Research), PE 0603924F (HEL Advanced Technology Program), PE 0603005A (Combat Vehicle and Automotive Advanced Technology), PE 0603924D8Z (High Energy Laser Advanced Technology Program), PE 0602120A (Sensors and Electronic Survivability), and PE 0605605A (DOD High Energy Laser Systems Test Facility).

The cited work is consistent with the Department of Defense Research and Engineering Strategic Plan and the Army Modernization Strategy.

Work is performed by the US Army Space and Missile Defense Command Technical Center, Huntsville, AL.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
Title: High Energy Laser Technology Demonstrator (HEL TD) Beam Control System (BCS)	19.162	18.379	-
Description: This effort matures and integrates a Beam Control System (BCS) into a mobile platform (Heavy Expanded Mobility Tactical Truck) and demonstrates BCS performance using low power SSLs. After the completion of the HEL TD BCS low power demonstrations in FY12, follow-on activities using the rugged, mobile BCS will be conducted under the High Energy Laser Mobile Demonstrations (HELMD) planned program. HELMD is the follow-on set of activities that utilize the mobile platform with rugged BCS to continue integration and demonstration of other subsystems required for a HEL weapon, such as power, thermal management, and a rugged laser.			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
FY 2011 Accomplishments: Completed the fabrication, assembly, and functional testing of the BCS; completed coating process for primary mirror; explored integration issues of subsystems onto a tactical vehicle platform; conducted low power HEL testing to demonstrate target acquisition, tracking, and aim point selection; evaluated performance from low power testing and began necessary changes; purchased test targets; and began design and fabrication of hardware and development of software interfaces to integrate the BCS and a 10kW Commercial-Off-The-Shelf (COTS) SSL for integration risk reduction and system high power testing. ***FY 2012 Plans:*** Conduct high power HEL demonstrations of target acquisition, tracking, aim point selection and lethality against rockets, mortar, and other selected targets. Pre-demonstration activities include BCS and 100 kW SSL hardware integration with check out activities. Integrate High Energy Laser Joint Technology Office (HEL JTO) provided Adaptive Optics (AO) technologies into the BCS and prepare for AO demonstrations at HELSTF.			
Title: Laser System Ruggedization ***Description:*** This effort ruggedizes laser systems for integration on tactical platforms. Ruggedization includes modifications of the laser system to withstand vibration, temperature, and contamination environments expected on the HELMD platform, and other selected tactical platforms, while ensuring platform volume, weight, and interface specifications are met. The laser system consists of laser devices, such as the laboratory laser devices developed under PE 0602307A, Project 042, and the prime power and thermal management subsystems required for the laser device operation. ***FY 2013 Plans:*** Will use the HEL technology selected under PE 0602307A, Project 042 to begin ruggedization of a 25-50kW class laser device for integration on the HELMD platform; validate vibration, temperature, and contamination environment specifications for the laser device and supporting equipment, as well as volume, weight, and interface specifications to ensure compatibility with the platform; begin ruggedization efforts for available programmable pulsed power technology to provide prime power for the 25-50 kW laser device; and ruggedize available thermal management technology that can cool the 25-50 kW laser device.	-	-	6.983
Title: High Energy Laser Mobile Demonstrations (HELMD) ***Description:*** This effort initially integrates a commercial-off-the-shelf (COTS) laser subsystem (then later a ruggedized higher power laser subsystem) into the existing mobile laser demonstrator platform along with the ruggedized BCS built under the HEL TD effort. The goal is to demonstrate and evaluate performance of a complete mobile high power laser weapon in a relevant environment. ***FY 2013 Plans:***	-	-	6.982

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
Will capitalize on the availability of COTS 10 kW class lasers and reduce risk for integration of higher power lasers on a mobile platform by integrating a COTS 10kW laser system on the HELMD platform to conduct demonstrations, including assessment of mobile SSL performance against mortars and other selected targets; demonstrate the HEL JTO provided AO technologies with the 10kW device to assess increases to effective range; and begin the integration of ruggedized components on the HELMD platform to support the next phase (25-50kW) of HEL mobile demonstrations.			
Accomplishments/Planned Programs Subtotals	19.162	18.379	13.965

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

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COST ($ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
L97: *SMOKE AND OBSCURANTS ADVANCED TECHNOLOGY*	0.960	4.452	3.070	-	3.070	3.280	3.694	4.083	4.645	Continuing	Continuing

A. Mission Description and Budget Item Justification

The project matures and demonstrates obscurant technologies with potential to enhance personnel/platform survivability by degrading threat force surveillance sensors and defeating the enemy's target acquisition devices, missile guidance, and directed energy weapons. Dissemination systems for new and improved obscurants are developed with the goal of providing efficient and safe screening of deployed forces. This project also matures and demonstrates improved detection of explosives and hazardous materials by Soldiers and Small Units.

This project sustains Army science and technology efforts supporting the Ground portfolio.

The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, and the Army Science and Technology Master Plan.

Work in this project is performed and managed by the Army Research, Development, and Engineering Command (RDECOM), Edgewood Chemical Biological Center (ECBC), Edgewood, MD.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
Title: Obscurant Enabling Technologies	0.960	1.011	0.650
Description: This effort demonstrates the dissemination of new and advanced obscurants. ***FY 2011 Accomplishments:*** Matured, fabricated, and tested grenade concept for bi-spectral obscuration and effective dissemination patterns. ***FY 2012 Plans:*** Optimize and demonstrate bispectral obscurant grenade; mature, fabricate and test grenade concepts for new low hazard visual obscurant/smoke. ***FY 2013 Plans:*** Will optimize new low hazard visual obscurant grenade.			
Title: Forensic Analysis of Explosives	-	1.444	0.906
Description: This effort demonstrates improved point and stand-off detection of explosives and home made explosive (HME) precursors.			

Exhibit R-2A, RDT&E Project Justification: PB 2013 Army		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603004A: *Weapons and Munitions Advanced Technology*	PROJECT L97: *SMOKE AND OBSCURANTS ADVANCED TECHNOLOGY*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
FY 2012 Plans: Mature and evaluate colorimetric homemade explosives kit and integrate improved signature information for explosives and precursor materials into chemical point and stand-off detection systems. ***FY 2013 Plans:*** Will optimize, mature and demonstrate a HME detection kit for the dismounted soldier.			
Title: Detection Mechanisms for Contaminants ***Description:*** This effort demonstrates improved point and standoff detection of a wide range of hazardous materials. ***FY 2012 Plans:*** Mature innovative technologies based on multiple spectroscopic sensing techniques for the detection and identification of hazardous material; integrate algorithms for improved probability of detection (Pd) and low false alarm rate (FAR) and based on the use of complementary spectroscopic techniques. ***FY 2013 Plans:*** Will optimize and demonstrate recommended spectroscopic approaches for standoff, proximity and point detection of explosives, homemade explosives, and/or homemade explosive precursors; and demonstrate integrated sensing of chemical agents and explosives in a common Ion Mobility Spectroscopy system (IMS) Joint Chemical Detector (JCD).	-	1.997	1.514
Accomplishments/Planned Programs Subtotals	0.960	4.452	3.070

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.