Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Army										DATE: February 2011	
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*				R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*							
COST ($ in Millions)	**FY 2010**	**FY 2011**	**FY 2012 Base**	**FY 2012 OCO**	**FY 2012 Total**	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**Cost To Complete**	**Total Cost**
Total Program Element	84.951	53.338	57.142	-	57.142	55.166	55.412	55.455	51.884	Continuing	Continuing
296: *Close Combat Technology*	7.451	7.330	2.824	-	2.824	3.241	2.707	2.388	2.461	Continuing	Continuing
297: *Mun Survivability & Log*	9.870	8.281	12.803	-	12.803	12.859	13.302	13.444	10.363	Continuing	Continuing
857: *DOD EXPLOSIVES SAFETY STANDARDS*	1.600	1.736	2.174	-	2.174	2.244	2.223	2.253	2.284	Continuing	Continuing
858: *ARMY EXPLOSIVES SAFETY MANAGEMENT PROGRAM*	0.450	0.619	0.702	-	0.702	0.590	0.680	0.671	0.680	Continuing	Continuing
859: *LIFE CYCLE PILOT PROCESS*	31.084	4.546	5.026	-	5.026	4.993	4.824	4.873	4.935	Continuing	Continuing
862: *Indirect Fire and Fuze Technology*	2.974	12.350	4.621	-	4.621	3.657	3.707	3.768	4.316	Continuing	Continuing
F21: *Direct Fire Technology and NATO Ammo Evaluation*	2.923	3.489	12.985	-	12.985	11.072	11.072	10.780	9.194	Continuing	Continuing
F24: *CONVENTIONAL MUNITIONS DEMIL*	28.599	14.987	16.007	-	16.007	16.510	16.897	17.278	17.651	Continuing	Continuing

Note

Change Summary Explanation:

FY 2012: Funds increased ($10.633 million) to support various technology investigations.

A. Mission Description and Budget Item Justification

This Program Element supports continuing technology investigations. It provides a coordinated tri-service mechanism for the collection and free exchange of technical data on the performance and effectiveness of all non-nuclear conventional munitions and weapons systems in a realistic operational environment. It provides for NATO interchangeability testing (F21); Joint munition effectiveness manuals used by all services; development of standardization agreements (STANAGS) and associated Manuals of Proof and Inspection (MOPI); operation of the North American Regional Test Center (NARTC); evaluation of demilitarization methods for existing conventional ammunition (F24); evaluation of useful shelf life, safety, reliability and producibility of pyrotechnic munitions; and improvement of explosives safety criteria for DOD munitions via the DOD Explosives Safety Board (857). Pyrotechnic Reliability and Safety (296) supports pyrotechnic research, development and testing to identify, characterize and resolve reliability, safety, storage and manufacturing issues that impact production availability and field use of pyrotechnics. Project 296 will result in the development and demonstration of new, safe, reliable and environmentally acceptable munitions. Munitions Survivability and Logistics (297) will make

Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Army	DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	**R-1 ITEM NOMENCLATURE** PE 0605805A: *Munitions Standardization, Effectiveness and Safety*

Army units more survivable by applying technologies to reduce the sensitivity of munitions to unplanned stimuli (e.g. bullet impacts, fragment impacts, fast cook off, slow cook off, sympathetic detonation, shaped charge jets) and by testing and demonstrating munitions logistics system solutions that prevent or minimize catastrophic explosive events and accelerate ammunition resupply. Project 297 also supports the Army Insensitive Munitions (IM) Board's reviews. The Army Explosives Safety Management Program (858) was established in FY01. The U.S. Army Technical Center for Explosives Safety uses the funds in this project to evaluate current explosives safety standards and develop new, scientific and risk-based standards to meet U. S. Army explosives requirements. The Life Cycle Pilot Program (LCPP) (859) will assess production base capabilities and needs over the acquisition life cycle of various munitions and will address the producibility of ammunition including the transition to type classification and production, and the ability of the production base to cost effectively produce quality products on schedule. The Fuze Technology Integration program (862) will improve performance and lower the costs of existing proximity fuzes and enable new applications in submunitions and medium caliber fuzes, addressing advanced proximity fuze sensor technology, Micro-electromechanical Systems (MEMS), Safety and Arming (S&A) technology, and Electronic S&A (ESA) technology for smart munitions.

B. Program Change Summary ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	72.851	53.338	46.509	-	46.509
Current President's Budget	84.951	53.338	57.142	-	57.142
Total Adjustments	12.100	-	10.633	-	10.633
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	10.633	-	10.633
• Other Adjustments 1	12.100	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT 296: *Close Combat Technology*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
296: *Close Combat Technology*	7.451	7.330	2.824	-	2.824	3.241	2.707	2.388	2.461	Continuing	Continuing
Quantity of RDT&E Articles											

A. Mission Description and Budget Item Justification

This project will support research, development and testing to identify, characterize and resolve reliability, safety, storage and manufacturing issues that impact production availability and field use of demolitions, grenades, shoulder launched munitions, mines and mine clearing charges, pyrotechnics, including training realism. Project will result in the development and demonstration of new, safe, reliable and environmentally acceptable munitions.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: Demolition Shape Charge Improvement	-	0.800	-
Articles:		0	
Description: Demolition Shaped Charges have been basically unchanged since WWII. Current configuration based on legacy technology is heavier and larger than necessary to complete the mission ***FY 2011 Plans:*** Redesign with advanced technology such as wave propagation shapers and Unitary Warhead.			
Title: Heavy Metal Mitigation in Illuminants	0.256	0.143	0.300
Articles:	0	0	
Description: Heavy metals (barium and/or perchlorate) have toxic effects on soldiers as well as workers in the manufacturing process. This project is to replace toxic oxidizers in green signals and reduce potential health hazards ***FY 2010 Accomplishments:*** .Design and sevelop alternate materials ***FY 2011 Plans:*** .Conduct component and system tests ***FY 2012 Plans:*** Complete tests and type classify			
Title: Nanoparticles for Pyro Items	0.666	0.500	-
Articles:	0	0	
Description: .			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT 296: *Close Combat Technology*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
FY 2010 Accomplishments: Develop the technology to produce pyrophoric nanopawders of Iron and demonstrate production of pyrophoric foils using current technologies. This effort is to develop government owned technology for the M211 Infrared Countermeasure flare. ***FY 2011 Plans:*** Develop the technology to produce pyrophoric nanopawders of Iron and demonstrate production of pyrophoric foils using current technologies. This effort is to develop government owned technology for the M211 Infrared Countermeasure flare.			
Title: Aircraft Countermeasure Improvements ***Articles:*** ***Description:*** This program covers the upgrade of Army aircraft countermeasures to maintain effectiveness against the ever evolving threat. It covers the M296, M211/M212 series of flares, the M839 chaff cartridge, and the M796/BBU-35 impulse cartridge. Goals are to increase overall decoy effectiveness, decrease observability, and optimize performance for the various rotory and fixed wing Army Aircraft ***FY 2010 Accomplishments:*** Begin variability and tollerance reduction on impulse cartridges, Begin IR flare trajectory and material dispersion improvement. Begin modeling and simulation of Apache and Chinook. ***FY 2011 Plans:*** Continue IR flare trajectory and material dispersion improvement. Begin chaff effectiveness improvements. Begin modeling and simulation for Army fixed wing aircraft.	2.693 0	3.137 0	-
Title: Demolition Initiator Packaging - Skin Pack ***Articles:*** ***Description:*** Current spool design is bulky, hard to conceal in urban environments and has potential for tangling. This project will develop a lighter, easily deployable and more reliable deployment method. It will have the added advantage of being compatable with Explosive Ordnance Disposal robotics. ***FY 2010 Accomplishments:*** MDI Skin Pack design ***FY 2011 Plans:*** Design and develop new packaging. ***FY 2012 Plans:***	0.820 0	0.875 0	0.900

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT 296: *Close Combat Technology*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Test and type classify new packaging.			
Title: M10 Universal Destructor Capability Enhancement ***Articles:*** ***Description:*** . ***FY 2011 Plans:*** Develop an infinitely variable adapter for the M10 -change explosive fill to an IM type composition (PAX-46 or similar) -examine alternative initiator adapter designs -develop lower cost packaging (replace custom fiber tube) -qualify any changes made through testing	-	0.900 0	-
Title: Advanced Incendary Grenade ***Articles:*** ***Description:*** . ***FY 2011 Plans:*** Develop improvements to the existing ANM14 incendary hand grenade to increase the penetration from 1/8 inch to 1inch of steel plate.	-	0.975 0	-
Title: Chaff Performance Improvements ***Articles:*** ***Description:*** Increase effectiveness against advanced missile threats. ***FY 2010 Accomplishments:*** Increase effectiveness against advanced missile threats ***FY 2012 Plans:*** Develop chaff cuts to improve effectiveness against current and new threats.	0.473 0	-	1.200
Title: Low Observable Ignition for CM Flares ***Articles:*** ***Description:*** Enhanced aircraft survivability ***FY 2010 Accomplishments:***	1.789 0	-	0.424

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT 296: *Close Combat Technology*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Develop low visibility ignition composition for M212 Countermeasure Flare ***FY 2012 Plans:*** Use low visibility ignition composition for M212 Countermeasure Flare.			
Title: Stun Hand Grenade Improvement ***Articles:*** ***Description:*** Reduce the use of perclorates to comply with environmental standards ***FY 2010 Accomplishments:*** Qualify government owned design to reduce hardware unit cost and provide an enviornmentally friendly and enhanced safefy design.	0.754 0	-	-
Accomplishments/Planned Programs Subtotals	7.451	7.330	2.824

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.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT 297: *Mun Survivability & Log*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
297: *Mun Survivability & Log*	9.870	8.281	12.803	-	12.803	12.859	13.302	13.444	10.363	Continuing	Continuing
Quantity of RDT&E Articles											

A. Mission Description and Budget Item Justification

This project supports the Army Transformation by making Army units more survivable through the investigation, testing and demonstration of munitions logistics system improvements that prevent or minimize catastrophic explosive events and accelerate ammunition resupply. Key thrusts are munitions storage area survivability, Insensitive Munitions (IM) technology integration and compliance, ammunition management and asset visibility, weapon system rearm, munitions configured load enablers and advanced packaging and distribution system enhancements. Within each thrust, a broad array of solutions will be identified, tested, and evaluated against developed system measures of effectiveness. Optimum, cost effective solutions that enable the rapid projection of lethal and survivable forces will be demonstrated. The early stages of force deployment are especially critical. Theater ammunition storage areas are vulnerable and present the enemy with lucrative targets. These areas and distribution nodes contain the only available munitions stocks in theater. Loss of these munitions could cripple the force, jeopardize the mission, and result in high loss of life. This project mitigates vulnerabilities and ensures a survivable fighting force.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: Munitions Predictive Life	2.796	1.476	1.837
Articles:	0	0	
Description: This program will demonstrate technologies and algorithms that can help assess munitions serviceability based upon aggregate environmental exposures, system cycling and munition degradation models. This program will provide life cycle management tools for risk mitigation strategies, while reducing testing, inspection & surveillance required and improving weapon system reliability & and warfighter effectiveness.			
FY 2010 Accomplishments: Conducted low cost environmental sensor accuracy and durability testing, completed design of canary indicator electronic boards that predict the reliability of electronic components in munitions in the stockpile without having to expend samples of the munitions via destructive test.			
FY 2011 Plans: Complete testing and analysis of canary indicator electronic boards for munitions, complete qualification of low cost environmental sensors for use with munitions.			
FY 2012 Plans: Complete algorithms used to determine remaining useful life of small caliber tracer and incendiary munitions resulting from exposure to heat and humidity, complete business case analysis for implementation of ammunition condition based management,			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT 297: *Mun Survivability & Log*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
complete and validate a model that will determine the correlation between simulated and actual temperatures experienced by ammunition assets while stored in open storage, in a 20 foot International Standards Organization container, and in an earth covered magazine in order to provide more accurate reliability forecasts. Demonstrate a sensor device powered by vibration induced energy that will provide a history of unusual vibrations, impacts, and shocks that munitions have experienced in order to better determine reliability.			
Title: Munitions Containerization Program ***Articles:*** ***Description:*** This program will demonstrate next generation packaging, with standardized dimensions/interfaces, that considers unit of issue, permits easy reconfiguration and that is reusable, nestable, automation friendly, and survivable. This new packaging (Ammoblocks) will permit the safe packing and shipping of more and different types of ammo together in user tailored loads; facilitate rapid, less labor intensive reconfiguration and resupply; and facilitate automation upgrades of load/assemble/pack and battlefield resupply operations. ***FY 2010 Accomplishments:*** Completed container size optimization, packaging/vehicle interface, and combat unit load quantity analyses. ***FY 2011 Plans:*** Complete design of container integrated locking mechanism that will permit the interlocking of individual containers to each other and a pallet base, complete analysis of improved container stacking mechanisms, complete analysis of automation friendly container closure mechanisms. ***FY 2012 Plans:*** Complete analysis of life cycle logistics system impact of Ammoblocks, complete designs of prototype Ammoblock interlocking cylindrical and rectangular munitions containers.	1.115 0	1.218 0	1.226
Title: Improved Munitions Packaging ***Articles:*** ***Description:*** This program will demonstrate upgrades to existing packaging components and materials to improve legacy ammunition survivability. These upgrades will enhance ammunition survivability and reliability, improve field ammunition operations, and improve packaging producibility. ***FY 2010 Accomplishments:***	0.518 0	0.539 0	0.500

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT 297: *Mun Survivability & Log*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Completed market survey of most promising inkjet vendors for ammunition packaging low cost inkjet printing feasibility analysis. Completed design concepts for a mechanism that will indicate whether a palletized closed ammunition container is empty, or not in order to facilitate more efficient use of ammunition and improve handling safety in ammunition logistics operations. ***FY 2011 Plans:*** Complete test and evaluation of inkjet materials and methods and make recommendations for implementing inkjet printing for ammunition packaging. Fabricate and test ammunition containers with prototype empty container identification mechanisms. Complete design and lab testing of low cost, lightweight High Density Polyethylene (HDPE) cylindrical ammunition containers. Complete design and preliminary testing of an improved security seal for rectangular ammunition containers. Complete a draft standard specification for pressure sensitive adhesive labels used on ammunition packaging. ***FY 2012 Plans:*** Complete prototype fabrication, testing, and user evaluation of HDPE cylindrical containers as replacements for current 120mm tank and 120mm/81mm mortar packaging. Complete prototype fabrication and verification testing of an improved security seal for rectangular ammunition containers and transition. Conduct test and evaluation of pressure sensitive adhesive label samples and finalize standard specification and Technical Data Package for use on ammunition packaging.			
Title: Insensitive Munitions (IM) Integration Program	3.880	3.162	7.450
Articles:	0	0	
Description: Develop multiple IM technologies and integrate into end item(s) to improve munitions survivability and warfighter safety. IM Technologies, using State-of-the-Art materials, will be developed in the areas of warhead, propulsion and propellants, explosives, packaging, and barriers. In addition, modeling and simulation will be used to reduce development and testing costs. Efforts will increase the number of IM compliant ammunition items fielded to mitigate munitions reaction to unplanned stimuli such as fire, fragments, cook-off, bullets, adjacent munitions reaction (sympathetic detonation), and shape charge jet attacks. ***FY 2010 Accomplishments:*** Down-selected and tested final IM Explosives formulations to replace Comp A-5 and H-6 in the 40mm Grenade and 25mm ammunition. Completed initial integration and testing of IM warhead, packaging, and cartridge case venting technologies for the 40mm Grenade. Performed multiple performance and IM tests to down-select a fuze-to-projectile plastic adapter for the 120mm HE Mortar. ***FY 2011 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT 297: *Mun Survivability & Log*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Complete integration and testing of IM Technologies (explosives, warhead, packaging, and cartridge case) into the 40mm HEDP, Hand Held Signals (Packaging & Propellant), 120mm Mortar (Warhead), 105mm Tank Round (Propulsion & Propellant, & Packaging), M67 Grenade (Warhead), and complementary packaging containers for selected munitions. ***FY 2012 Plans:*** Complete formulation and perform sub-scale safety and performance tests to prove-out integration of IM Igniter, low Nitro Glycerin Propellants with IM enhanced cartridge cases for medium caliber ammunition. Develop multiscale and environmentally friendly IM Explosives and conformal initiation systems for artillery, mortars, close combat ammunition, and demolition items. Perform modeling and simulation to identify multiple IM enhanced warhead concepts and build prototypes. Warhead technologies to consider for development are Multi-purpose liners, Surface ignition, and Reactive composite casings for artillery and tank ammunition. Incorporate state-of-the art materials in development efforts and use Modeling and Simulation to reduce testing and development costs. Conduct IM and performance testing of ionomer window vent, sealed seam, or metallic bonding IM packaging technologies in artillery and tank ammunition.			
Title: Ammo Provider	1.561	1.886	1.790
Articles:	0	0	
Description: This program demonstrates technologies that will assure a survivable munitions logistics system by increasing distribution velocity and protecting ammo storage areas. Technologies areas to be investigated include ammunition asset visibility (including environmental sensors, marking technologies, and supply chain modeling), ammunition management (including improvements in stockpile surveillance and condition based management), sustainment (including pre-configured loads (soldier to unit size), field ammo reconfiguration capability, robotic handling, and improved load building capability), and force protection (including site planning software and field storage protection) ***FY 2010 Accomplishments:*** Designed and fabricated a Joint Modular Intermodal Container (JMIC) that incorporates a forklift actuated interlocking mechanism that makes it possible to automatically lock JMICs together top to bottom and to a delivery platform equipped with a JMIC restraint system to permit rapid ammunition handling. Expanded software architecture of an ammunition igloo planning tool to perform storage space usage optimization across all igloos at a depot. ***FY 2011 Plans:*** Refine design and test JMIC with a forklift actuated interlocking mechanism. Incorporate optimal storage configuration, stock rewarehousing, and stock rotation planning functions into ammo igloo storage optimization software tool. Design fabricate and test an interface plate that will be attached to Container Roll-on roll-Off Platforms (CROP) and ISO Flat racks to allow the locking and restraint of JMICs without the use of tie down strapping. Complete design, modeling, and fabrication of a CROP with locking			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT 297: *Mun Survivability & Log*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
restraint mechanisms incorporated into its deck to secure JMICs without tie down strapping. Integrate base camp planning use cases into a Field Ammunition Storage Planner software tool. ***FY 2012 Plans:*** Complete integration and final testing of the ammunition igloo storage optimization software tool. Complete testing of the JMIC interface plate for CROP and the CROP with integrated JMIC restraint system. Complete integration of base camp planning software into the design of the Field Ammunition Storage Planner tool to provide capability for rapid planning of Forward Operating Bases (FOB).			
Accomplishments/Planned Programs Subtotals	9.870	8.281	12.803

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.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT 857: *DOD EXPLOSIVES SAFETY STANDARDS*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
857: *DOD EXPLOSIVES SAFETY STANDARDS*	1.600	1.736	2.174	-	2.174	2.244	2.223	2.253	2.284	Continuing	Continuing
Quantity of RDT&E Articles											

A. Mission Description and Budget Item Justification

This program supports the Research, Development, Test, and Evaluation efforts of the DoD Explosive Safety Standards Board. It supports explosive safety effects research and testing to quantify hazards and to develop techniques to mitigate those hazards in all DoD manufacturing, testing, transportation, maintenance, storage, disposal of ammunition and explosives operations, and also to develop risk based explosives safety standards. Results are essential to the development and improvement of quantity-distance standards, hazard classification procedures, cost effective explosion-resistant facility design procedures, and personnel hazard/ protection criteria.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: TM-51300	0.306	0.340	0.375
Articles:	0	0	
Description: Funding is provided for the following effort			
FY 2010 Accomplishments: Develop improved tri-service design procedures and improved computer codes for explosion-resistant structures. Initiate preparation of revised tri-service manual TM-51300.			
FY 2011 Plans: Develop improved tri-service design procedures and improved computer codes for explosion-resistant structures. Initiate preparation of revised tri-service manual TM-51300.			
FY 2012 Plans: Develop improved tri-service design procedures and improved computer codes for explosion-resistant structures. Initiate preparation of revised tri-service manual TM-51300.			
Title: Collect and analyze	0.240	0.266	0.275
Articles:	0	0	
Description: Funding is provided for the following effort			
FY 2010 Accomplishments:			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT 857: *DOD EXPLOSIVES SAFETY STANDARDS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Collect and analyze airblast/fragment/thermal data for revising DoD, NATO hazard classification. ***FY 2011 Plans:*** Collect and analyze airblast/fragment/thermal data for revising DoD, NATO hazard classification. ***FY 2012 Plans:*** Collect and analyze airblast/fragment/thermal data for revising DoD, NATO hazard classification.			
Title: Explosive and Munitions Tests ***Articles:*** ***Description:*** Funding is provided for the following effort ***FY 2010 Accomplishments:*** Develop improved explosives and munitions tests and characterization data. Specifically, develop improved gap tests for rocket motors. ***FY 2011 Plans:*** Develop improved explosives and munitions tests and characterization data. Specifically, develop improved gap tests for rocket motors. ***FY 2012 Plans:*** Develop improved explosives and munitions tests and characterization data. Specifically, develop improved gap tests for rocket motors.	0.322 0	0.344 0	0.485
Title: Safety Guidelines ***Articles:*** ***Description:*** Funding is provided for the following effort ***FY 2010 Accomplishments:*** Develop improved DoD and NATO explosives safety guidelines for munitions storage, explosives and field operation facilities. Prepared revised Dod 6055.9-STD and 4145.26M. ***FY 2011 Plans:*** Develop improved DoD and NATO explosives safety guidelines for munitions storage, explosives and field operation facilities. Prepared revised Dod 6055.9-STD and 4145.26M. ***FY 2012 Plans:***	0.218 0	0.230 0	0.275

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT 857: *DOD EXPLOSIVES SAFETY STANDARDS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Develop improved DoD and NATO explosives safety guidelines for munitions storage, explosives and field operation facilities. Prepared revised Dod 6055.9-STD and 4145.26M.			
Title: Explosive Safety Database	0.255	0.270	0.425
Articles:	0	0	
Description: Funding is provided for the following effort			
FY 2010 Accomplishments: Conduct other hazards analyses and expand/automate explosives safety databases. Develop improved Explosives Safety Mishap Analysis Module with links to accident reports.			
FY 2011 Plans: Conduct other hazards analyses and expand/automate explosives safety databases. Develop improved Explosives Safety Mishap Analysis Module with links to accident reports.			
FY 2012 Plans: Conduct other hazards analyses and expand/automate explosives safety databases. Develop improved Explosives Safety Mishap Analysis Module with links to accident reports.			
Title: Analysis Tools	0.259	0.286	0.339
Articles:	0	0	
Description: Funding is provided for the following effort			
FY 2010 Accomplishments: Develop and improve risk based analysis tools for explosives safety. Develop sequence of operations prototype.			
FY 2011 Plans: Develop and improve risk based analysis tools for explosives safety. Develop sequence of operations prototype.			
FY 2012 Plans: Develop and improve risk based analysis tools for explosives safety. Develop sequence of operations prototype.			
Accomplishments/Planned Programs Subtotals	1.600	1.736	2.174

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT 857: *DOD EXPLOSIVES SAFETY STANDARDS*

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.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT 858: *ARMY EXPLOSIVES SAFETY MANAGEMENT PROGRAM*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
858: *ARMY EXPLOSIVES SAFETY MANAGEMENT PROGRAM*	0.450	0.619	0.702	-	0.702	0.590	0.680	0.671	0.680	Continuing	Continuing
Quantity of RDT&E Articles											

A. Mission Description and Budget Item Justification

This projects purpose is to establish, validate or modify explosives safety requirements. This project promotes RDT&E of new and innovative explosives safety technologies that improve the survivability of Army personnel, facilities, and equipment as well as improve the health, safety, and welfare of the general public. It is an Army requirement as defined in AR 385-64.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: Risk based explosive safety criteria	0.123	0.143	0.164
Articles:	0	0	
Description: Development of risk based explosives safety criteria that will aid commanders and safety personnel in the transition from regulation to risk management.			
FY 2010 Accomplishments: Initiate research into historical relationship of ?intra-line distance? to the hazards and consequences to exposed personnel, facilities, and equipment.			
FY 2011 Plans: Continue support of hazard research and exposure consequences.			
FY 2012 Plans: Continue support of hazard research and exposure consequences.			
Title: Development of enhanced protective structure designs	0.151	0.223	0.264
Articles:	0	0	
Description: Develop enhanced protective structure designs that improve the survivability of Army personnel, facilities, and equipment.			
FY 2010 Accomplishments:			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT 858: *ARMY EXPLOSIVES SAFETY MANAGEMENT PROGRAM*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Initiate project to determine the effectiveness of sand filled and concrete barricades to stop inadvertently fire 2.75? rockets. ***FY 2011 Plans:*** Continue support of barricade development. ***FY 2012 Plans:*** Continue support of barricade development.			
Title: Development of explosive safety tools	0.176	0.253	0.274
Articles:	0	0	
Description: Develop explosive safety tools for use by Army personnel. Explosive safety tools allow commanders and safety personnel to make explosive safety decisions using risk management rather than regulations. ***FY 2010 Accomplishments:*** Develop new methods and algorithms for a risk based explosive safety tool that addresses potential probabilities and consequences of mishaps involving Army ammunition and explosives. ***FY 2011 Plans:*** Continue development of new methods for risk assesment. ***FY 2012 Plans:*** Continue development of new methods for risk assesment.			
Accomplishments/Planned Programs Subtotals	0.450	0.619	0.702

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.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT 859: *LIFE CYCLE PILOT PROCESS*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
859: *LIFE CYCLE PILOT PROCESS*	31.084	4.546	5.026	-	5.026	4.993	4.824	4.873	4.935	Continuing	Continuing
Quantity of RDT&E Articles											

A. Mission Description and Budget Item Justification

This project supports the implementation of the Single Manager for Conventional Ammunition (SMCA) Industrial Base Strategic Plan through technology investigations, model based process controls, pilot prototyping, and industrial assessments. It will assess life cycle production capabilities required for all ammunition families, address design for manufacturability to facilitate economical production, identify industrial and technology requirements, and address the ability of the production base to rapidly and cost effectively produce quality products. Cost Reduction is an important part of the Life Cycle Pilot Process (LCPP). LCPP provides the resources to prototype critical technologies and develop the knowledge base to establish cost effective, environmentally safe and modern production processes in support of the Munitions Industrial Base transformation.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: Product Costs Thrust Area	0.877	0.675	0.810
Articles:	0	0	
Description: This thrust area seeks out new opportunities to reduce overall manufacturing costs of ammunition and ammunition components. RDTE efforts will review and analyze legacy manufacturing processing for opportunities to integrate new technology and lean manufacturing processes to reduce cost. ***FY 2010 Accomplishments:*** Significant accomplishments include: initiated development of an improved process for cutting propellant. Initiated manufacturing process to integrate foamed beads into combustible structural components of munitions, reducing cost of grenade simulators for various medium and large caliber items. ***FY 2011 Plans:*** Planned programs include the following: initiate testing on prototype configuration of smoke mix with m-terphenyl. Complete chemical predictive model for propellant performance. ***FY 2012 Plans:*** Evaluate new technology for legacy processes to reduce overall production costs for the Army.			
Title: Single Point Failures	3.125	3.196	3.388
Articles:	0	0	

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT 859: *LIFE CYCLE PILOT PROCESS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Description: Project thrust area efforts will employ manufacturing technologies to address Single Point Failures (SPFs). These projects are part of the overall strategy to reduce the number of SPFs in the National Technology Industrial Base (NTIB). In addition, thrust area efforts address ammunition manufacturing capability shortfalls. This area leverages RDTE accomplishments and product knowledgement to satisfy manufacturing requirements. ***FY 2010 Accomplishments:*** Significant accomplishments include: initiated industrial survey on mitigation strategy for adhesive single point failures (SPF) group. Developed and manufactured a small lot of synthetic calcium silicide and conducted testing in primers. Efforts mitigated SPF in production of medium caliber and illumination munitions rounds. Completed an industrial base assessment on sources of densified magnesium carbonate. ***FY 2011 Plans:*** Planned programs include the following: evaluate manufacturing capabilities for potential SPF solutions. Initiate qualification test plans for mitigation of the adhesive SPF group. Evaluate potential environmentally-friendly replacement materials and processes for several energetic SPFs. Develop pilot scale manufacturing processes for SPFs. Test and characterize samples received from sources of densified magnesium carbonate. Continue RDTE efforts on transition of RD1333 lead azide process to private industry. Initiate lab scale process for development of spheroidal propellant. ***FY 2012 Plans:*** Continue development of manufacturing technology and processes for SPFs. Efforts will address source of supply problems within the NTIB.			
Title: Manufacturing Technology for Industrial Base Transformation	0.658	0.675	0.828
Articles:	0	0	
Description: Project thrust area identifies and develops technologies that can be utilized at multiple government and private ammunition manufacturing locations to transform the NTIB. ***FY 2010 Accomplishments:*** Significant accomplishments include: completed ultrasonic probe prototype for large caliber melt-pour applications. Initiated data assessments for modeling the nitration process of nitrocellulose (NC) to reduce variation in process parameters. ***FY 2011 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT 859: *LIFE CYCLE PILOT PROCESS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Planned programs include the following: develop mathematical model for nitration process of NC to reduce variation of the process parameters. Initiate transition of ultrasonic probe technology to industry. Initiate assessment of manufacturing technology for high precision components. ***FY 2012 Plans:*** Investigate potential technologies to transform key manufacturing processes in the NTIB. Continue investigations, develop and document manufacturing technology for transition to the NTIB.			
Title: Nano Advanced Cluster Energetics ***Articles:*** ***Description:*** Funding is provided for the following effort ***FY 2010 Accomplishments:*** Developed advanced coating technology and began transfer of process technology to the explosive manufacturing Industrial Base. Continue development of processes to eliminate safety concerns and achieve net-shape manufacturing of advanced cluster energetic materials by developing novel coating and handling processes to support Insensitive Munitions (IM) explosive fill and transfer those processes to the supplier base.	1.585 0	-	-
Title: Medium Caliber Metal Parts Upgrade ***Articles:*** ***Description:*** Funding is provided for the following effort ***FY 2010 Accomplishments:*** Established framework for integrated data environment for sharing of manufacturing science. Establish commercial partnership with ARDEC's Center for Manufacturing Science for the prototyping process and capturing of production knowledge in the arena of forged and drawn metal parts.	2.971 0	-	-
Title: Defense Metals Technology Center ***Articles:*** ***Description:*** Funding is provided for the following effort ***FY 2010 Accomplishments:*** Establish a focal point with the Defense Metals Technology Center to investigate innovative technology to support the needs of the munitions industrial base in metals manufacturing.	1.981 0	-	-
Title: Atomized Magnesium Domestic Production Design and Development	1.585	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT 859: *LIFE CYCLE PILOT PROCESS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Articles:	0		
Description: Funding is provided for the following effort ***FY 2010 Accomplishments:*** Completed facility design for production of atomized magnesium within the National Technology and Industrial Base (NTIB). Build a pilot scale reactor.			
Title: Army Range Technology Program (ARTP)	4.833	-	-
Articles:	0		
Description: Funding is provided for the following effort ***FY 2010 Accomplishments:*** Gathered imaging data of depleted uranium munitions from Army ranges. Tested initial hardware prototype designs. Developed initial software for data analysis. Refine hardware designs and integrate with software for the Army Range Technology Program.			
Title: Joint Munitions and Lethality Mission Integration	1.585	-	-
Articles:	0		
Description: Funding is provided for the following effort ***FY 2010 Accomplishments:*** Develop streamline business processes and foster integration across the Joint Munitions and Lethality Ammunition Enterprise to more efficiently and effectively support warfighter needs.			
Title: Protective Armor Systems	4.951	-	-
Articles:	0		
Description: Funding is provided for the following effort ***FY 2010 Accomplishments:*** Developed, proved-out, and fielded several new prototype protective armor solutions that utilize various lightweight ballistic materials. The configured hybrid solution is optimal for weight reduction, high performance and affordability. Continue to improve existing solutions and develop new armor solutions.			
Title: Domestic Production of Nanodiamond for Military Applications	1.585	-	-
Articles:	0		

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT 859: *LIFE CYCLE PILOT PROCESS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Description: Funding is provided for the following effort ***FY 2010 Accomplishments:*** Establish capability to produce nanodiamonds within National Technology and Industrial Base (NTIB). Assess the effectiveness of incorporating nanodiamonds in prototype parts.			
Title: Improved Thermal Batteries for Guided Munitions	2.377	-	-
Articles:	0		
Description: Funding is provided for the following effort ***FY 2010 Accomplishments:*** Investigate the feasibility of adapting conventional battery manufacturing processing and technology to thermal batteries used in guided munitions.			
Title: Nano Tech Enabled Self Healing ACCP	1.386	-	-
Articles:	0		
Description: Funding is provided for the following effort ***FY 2010 Accomplishments:*** Develop and evaluate novel self-healing pretreatments and polymer coatings to achieve enhanced corrosion resistance. Nanotechnology-enabled products adhesion to magnesium and titanium alloys will be researched.			
Title: 3D Woven Preform Technology for Army Munitions Applications	1.585	-	-
Articles:	0		
Description: Funding is provided for the following effort ***FY 2010 Accomplishments:*** 3-D woven technology for adaptation to improve the strength and reduce the weight of sabots. Manufacture prototype components for testing and to verify mechanical properties.			
Accomplishments/Planned Programs Subtotals	31.084	4.546	5.026

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT 859: *LIFE CYCLE PILOT PROCESS*

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.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT 862: *Indirect Fire and Fuze Technology*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
862: *Indirect Fire and Fuze Technology*	2.974	12.350	4.621	-	4.621	3.657	3.707	3.768	4.316	Continuing	Continuing
Quantity of RDT&E Articles											

A. Mission Description and Budget Item Justification

This program investigates maturing technologies and seeks potential candidates for integration on current fuzing and safe and arm devices. This program will implement these technologies into fuzing systems to preclude obsolescence and enhance performance of existing munitions. The program addresses two major areas: (1) risk mitigation and (2) block upgrades. Risk mitigation efforts will evaluate and demonstrate second sources for fuzing systems that may reduce cost by providing competition, and maintain production when sources or parts are no longer available. It will also allow for the performance enhancement of current ammunition items by conducting studies of major fuze components to detect and identify latent defects. The second major area is block upgrades, which will evaluate and perform studies on improvements to fuzes; increase commonality of fuze components and requirements across all hand grenade programs; determine feasibility of common training fuze for 60, 81, and 120mm mortar rounds; determine feasibility of common mortar safe and arm device components for M734A1, M783 Fuzes; improve M759 fuze sensitivity of 30mm munition. Block upgrades will enable the introduction of the latest technologies into fuzing, keep the fuzing design current to avoid obsolescence issues, and add capabilities.

Replacement of DPA Stabilizer in Ball Powder Propellants significantly reduces stabilizer depletion rate and increases propellant shelf-life with replacement of Diphenylamine (DPA) which is incompatible with Nitroglycerin (NG). Proposed replacement Akardite-2 is compatible with NG and is the least toxic of all stabilizers. IMX104 as Comp B explosive fill replacement for 81mm HE reduces risk of accidental/fratricidal incidents to the Warfighter in theater through incorporation of insensitive munitions. It also improves transport and stockpile survivability. The XM1128, 155mm extended range projectile addresses structural survivability and igniter reliability to achieve extended range on a modified profile projectile using the current weapon platform and existing propulsion systems.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: Indirect Fire & Fuze ARDEC Support.	2.017	2.083	1.159
Articles:	0	0	
Description: Risk Mitigation: Evaluating second source for Digital Signal Processor for the M734A1 fuze, evaluating new battery and electronics sources for current inventory fuzes. Evaluate Micro Electro-mechanical Systems (MEMS) component alternatives to increase sources of supply and lower cost; affects 40mm HEPD grenade munitions. Block Upgrades: Successfully demonstrated Zig-Zag safety design for Common Mortar training fuze for 60, 81, and 120mm mortars, and forwarded the design to Office of the Program Manager for Combat Ammunition Systems (PM CAS) to qualify the design. Determined that Proximity Sensor can fit analytically in existing 30mm HEDP M789 round and continuing to fabricate fuze components. Successfully demonstrated increased sensitivity of 30mm M759 fuze, and performing engineering test.			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT 862: *Indirect Fire and Fuze Technology*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Investigate drop in proximity upgrades for current airburst fuzing for mortar, artillery and other munitions. Evaluate proximity sensor upgrades for M734A1. Prototyping a mortar common Safe and Arm device for M734A1 and M783 rounds. Performing a study on commonality of fuze components and requirements across all hand grenades (M67, M84, and M18). Tested several iterations of the Turbine Alternator (T/A) on the M734A1/M783 mortar fuze to survive high G gun launch environments, and provided a final design to PM CAS for final qualification testing. ***FY 2010 Accomplishments:*** Indirect Fire & Fuze ARDEC Support. ***FY 2011 Plans:*** Indirect Fire & Fuze ARDEC Support. ***FY 2012 Plans:*** Indirect Fire & Fuze ARDEC Support.			
Title: Indirect fire & Fuze PM CAS Support ***Articles:*** ***Description:*** Indirect Fire: Initiate formulations design, propellants manufacturing, producibility assessments, propellants manufacturing and Stability Study. Develop prototype of parts/materials, load mortar and improve pilot controls, explosive train design and IM Testing. Finite element analyses, computational fluid dynamics modeling, strength of design testing. Conduct Ballistic testing including firing tables, safety, reliability and performance. ***FY 2010 Accomplishments:*** Indirect fire & Fuze PM CAS Support ***FY 2011 Plans:*** Indirect fire & Fuze PM CAS Support ***FY 2012 Plans:*** Indirect fire & Fuze PM CAS Support	0.957 0	0.971 0	1.006
Title: XM1128 development and testing ***Articles:*** ***Description:*** Indirect Fire: Develop the 155mm HE projectile, XM1128 with a base burner to reduce drag and provide capability of a fully zone-able projectile with a maximum range of 30km when fired from a 39 caliber cannon. Activities include the study and fabrication of a reliable igniter and base bleed grain, producibility study of metal parts and pre-production prototyping with	-	9.296 0	2.456

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT 862: *Indirect Fire and Fuze Technology*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
initial tooling. Initiate hazard classification and lethality analysis, verification of structural integrity of one piece body. Additional actions include the definition of projectile aerodynamics across entire launch Mach spectrum, characterization of the base burn performance, definition of muzzle velocity and range overlap at all MACS charges and complete qualification testing. ***FY 2011 Plans:*** XM1128 development and testing ***FY 2012 Plans:*** XM1128 development and testing			
Accomplishments/Planned Programs Subtotals	2.974	12.350	4.621

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.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT F21: *Direct Fire Technology and NATO Ammo Evaluation*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
F21: *Direct Fire Technology and NATO Ammo Evaluation*	2.923	3.489	12.985	-	12.985	11.072	11.072	10.780	9.194	Continuing	Continuing
Quantity of RDT&E Articles											

A. Mission Description and Budget Item Justification

This program assures complete interchangeability of small caliber and automated cannon-caliber ammunition and weapons among all NATO countries with all of the associated logistic, strategic and tactical advantages. Project involves development and testing compliance of NATO standardization agreements (STANAGS) and staffing of the NATO North American Regional Test Center (NARTC). The program also includes warhead improvements and capability insertions to enhance lethality and effectiveness of existing cartridges.

FY 2012 funds will continue to maintain the NARTC and support NATO standardization of small and medium caliber ammunition for battlefield interchangeability. Additionally, this funding will be used to support small caliber ammunitions, 40mm grenade and medium caliber cannon ammunition effectiveness, survivability, accuracy and general improvements. Improvements in target practice technology such as spotter technology will be incorporated into training ammunition. Funds increased in FY2012 $9,437 thousand to support Improved Small Caliber Armor Piercing Capabilities, Low Observable Traced Projectiles and Lightweight Ammunition.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: Improved Small Caliber Armor Piercing Capabilities	-	0.200	3.000
Articles:		0	
Description: Increase Armor Piercing capabilities against Advanced Body Armors. Potentially improve capability against soft targets which is a significant deficiency of current AP projectiles. ***FY 2011 Plans:*** Concept analysis. ***FY 2012 Plans:*** Investigate multiple designs, fabricate and test engineering prototypes.			
Title: Low Observable Traced Projectiles	-	0.300	2.500
Articles:		0	
Description: Tracers have a number of drawbacks, largely they give away the position of the shooter during firing. Advancement in technology has improved tracer technology which eliminates, mitigates short falls of current tracers and improves safety and soldier survivability.			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT F21: *Direct Fire Technology and NATO Ammo Evaluation*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
FY 2011 Plans: Baseline material testing and intial producability analysis. ***FY 2012 Plans:*** Initial Engineering prototype, development and testing.			
Title: Lightweight Ammunition ***Articles:*** ***Description:*** An alternate 7.62mm stainless steel (SS) cartridge case offering a 20% reduction in combat ammunition weight and cost effective manufacturing capabilities. ***FY 2011 Plans:*** Developing lightweight cartridge cases with cost effective manufacturing processes that support high volume production. ***FY 2012 Plans:*** Improve Producibility to manufacture lightweight cartridge cases..	-	0.489 0	1.500
Title: New Ammo Design Qualification & NATO Mission Support ***Articles:*** ***Description:*** This program assures complete interchangeability of small caliber and automated cannon-caliber ammunition and weapons among all NATO countries with all of the associated logistic, strategic and tactical advantages. ***FY 2010 Accomplishments:*** Support NARTC Test operations. ***FY 2011 Plans:*** Support NARTC Test operations. ***FY 2012 Plans:*** Support NARTC Test operations.	0.941 0	0.500 0	0.500
Title: M433 Warhead Improvement ***Articles:*** ***Description:*** 40mm: Improve lethality (fragmentation) of the M433 grenade. ***FY 2010 Accomplishments:***	0.612 0	0.750 0	1.750

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT F21: *Direct Fire Technology and NATO Ammo Evaluation*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Performed initial design studies, and long lead tooling for warhead loading. ***FY 2011 Plans:*** Fabricating warhead tooling, manufacturing warhead bodies and will conduct static lethality testing of new warhead design. ***FY 2012 Plans:*** Complete optimization and testing of integrated M433 with new warhead design. Increase manufacturing readiness.			
Title: Non-Dud 40mm Producing Training Cartridge ***Articles:*** ***Description:*** Goal to have training cartridge that will not leave unexploded ordnance on the range. May use similar technology to the 30mm TP spotter. ***FY 2010 Accomplishments:*** Performed intial feasibility design and testing.	0.870 0	-	-
Title: Target Practice Spotter Technology Insertion ***Articles:*** ***Description:*** Training cartridge similar in technology to the 40mm Non-Dud Producing Cartridge. Goal is to have better signature upon impact. ***FY 2010 Accomplishments:*** Performed Modeling and Simulation on design concepts, manufactured test assets and completed short range testing. ***FY 2011 Plans:*** Extended range testing and producibility assessments. Optimization of design and extended range testing of optimized design. ***FY 2012 Plans:*** Qualification Testing and approval for use.	0.500 0	0.500 0	1.500
Title: Improved M789 Effectiveness ***Articles:*** ***Description:*** Developed improved quickness of current fuze to improve effectiveness of M789 in soft media(mud,sand,etc) ***FY 2011 Plans:***	-	0.750 0	2.050

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT F21: *Direct Fire Technology and NATO Ammo Evaluation*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Design and evaluate alternative designs. ***FY 2012 Plans:*** Improve Fuzing and propulsion system improvements, reliability and implement green technologies.			
Title: .50 Cal DODIC Reduction ***Description:*** Improve .50 Cal ammunition cartridges to provide increased capabilities with fewer types of rounds and achieving logistics benefits. ***FY 2012 Plans:*** Feasibility analysis for reduced DODICS.	-	-	0.185
Accomplishments/Planned Programs Subtotals	2.923	3.489	12.985

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.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT F24: *CONVENTIONAL MUNITIONS DEMIL*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
F24: *CONVENTIONAL MUNITIONS DEMIL*	28.599	14.987	16.007	-	16.007	16.510	16.897	17.278	17.651	Continuing	Continuing
Quantity of RDT&E Articles											

A. Mission Description and Budget Item Justification

Under the leadership and oversight of the Product Manager for Demilitarization, this project supports a continuing technology evaluation of demilitarization methods for all types of conventional ammunition in development, production, and storage. Project F24 will complete the development, demonstration, and integration of new, safe, and environmentally acceptable alternatives to open burning/open detonation (OB/OD), including resource, recovery and recycling (R3) equipment, and processes to reduce the extremely large demil stockpile. In FY10, the Explosive Demilitarization Technology Program, a cooperative inter-service, interagency effort dedicated to the maturation of safe, efficient, and environmentally acceptable processes for the closed disposal of conventional munitions including explosives, missiles, missile components, and large rocket motors was moved into the Conventional Munitions Demil Project (F24). The effort employs the highly matured technology base in the DoD Service Laboratories and Technical Centers, the Department of Energy (DOE) national laboratories, industry, and academia. The program is integrated through the leadership of the Product Manager for Demilitarization and the Joint Ordnance Commanders Group Munitions Demilitarization/Disposal Subgroup leveraging support from the Department's Environmental Security Technology Certification Program, the Strategic Environmental Research and Development Program and the Joint DOD/DOE Munitions Technology Program. The program supports an annual global demilitarization symposium for technical review and data evaluation from ongoing projects and advanced demonstrations. The PM Demilitarization R&D Integrated Process Team utilizes a systematic approach for project prioritization.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: Advanced Destruction	17.199	6.989	6.559
Articles:	0	0	
Description: This effort focuses on destruction of munitions.			
FY 2010 Accomplishments: Plasma Ordnance Disposal System (PODS) Pollution Abatement System upgrade was designed. Mobile Plasma Treatment System (MPTS) installation, technical supervision, and support completed. Cryo Plasma Arc Demil System (CPDS) fabrication completed. Initiated fabrication of demil design for White Phosphorous Felt Wedges. Continued support of the Ammonium Pechlorate (AP) Destruction project's design phase. Completed Phase I and down selected technology for Letterkenny Munitions Center (LEMC) Motor Destruction. Began design and fabrication of components for White Phosphorous Felt Wedges. Initiated development of Contained Burn Facility for Multiple Launch Rocket System (MLRS) at Hawthorne Army Depot.			
FY 2011 Plans: Initiating assessment of Bull Pup Liquid Fuel Motors. Initiated the design of the Acid Hydrolysis Processing Plant. Beginning facility prove-out for Cryo Plasma Arc Demil System (CPDS). Initiating Mobile Plasma Treatment System (MPTS) prove-out			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT F24: *CONVENTIONAL MUNITIONS DEMIL*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
process. Plasma Ordnance Disposal System (PODS) system layaway will be initiated. Initiate Red Phosphorous Disposal study. Initiate process study on Family of Scatterable Mines (FASCAM) demil. Initiate study on Rotary Kiln Productivity Improvements. ***FY 2012 Plans:*** Initiate development of Red Phosphorous Disposal. Develop demil process for White Phosphorous Felt Wedges. Continue support of the AP Rocket Motor Destruction at LEMC. Test Transportable Cryo-Plasma Demil System. Develop process for Family of Scatterable Mines (FASCAM) Demil. Complete fabrication of equipment for Rotary Kiln Productivity Improvement.			
Title: Resource Recovery and Recycling (R3) ***Articles:*** ***Description:*** This effort focuses on enhancing existing methods of munitions R3. ***FY 2010 Accomplishments:*** Magnesium Recovery installation completed, prove-out is ongoing. Munitions Residue Inspection System (MRIS) prototype design initiated. Stinger Recycling program completed. The Nitro-Guanidine (NQ) recovery pilot process design was initiated and fabrication completed. Anniston Defense Munition Center (ADMC) efforts were suspended in FY 2010 awaiting the safety investigation results. Inititated research and design of recycling process for Cluster Bomb Units (CBUs) and Combined Effects Munitions (ECMs). Initiated demil process development for Navy Gun Ammunition. ***FY 2011 Plans:*** Nitro-Guanidine (NQ) installation and prove-out will be conducted. Magnesium Recovery demonstration and validation will be conducted. Evaluate results and initiate the design of a High Pressure Water Washout system. ***FY 2012 Plans:*** Proveout process for Nitro-Guanidine (NQ) Recovery and evaluate pilot scale. Initiate development of Projectile High-Pressure Water Washout process at Crane Army Ammunition Activity. Begin process development for Plasticized White Phosphorous Demil. Initiate a design for removal of Welded Rotating Bands.	7.545 0	4.100 0	4.160
Title: Advanced Removal ***Articles:*** ***Description:*** This effort develops technology to remove propellant and energetics. ***FY 2010 Accomplishments:***	1.929 0	1.001 0	4.082

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Completed the development of a technique for the milling of multiple missiles, flexible milling of rocket motors. Evaluated alternative technologies for Insensitive Munitions (IM). ***FY 2011 Plans:*** Continue development and fabrication of milling. Initiate design and down select technologies for Insensitive Munitions (IM). Initiate study into Autoclave improvements in removing Insensitive Munition Explosives (IMX). ***FY 2012 Plans:*** Develop process and establish pilot for Ultrasonic Fragmentation. Initiate lab study and pilot scale testing for Removal of Insensitive Munitions (IM) fills via Acid Digestion. Initiate pilot phase of Removal of Cast-Cures Insensitive Munition (IM) Explosives. Design and fabricate improvements for Autoclave Insensitive Munition Explosives (IMX).			
Title: Advanced Waste Stream Treatment	1.059	1.372	1.206
Articles:	0	0	
Description: This effort focuses on handling waste streams from munitions items. ***FY 2010 Accomplishments:*** Demonstrated thermal treatment oven liner technology. Initiated the feasibility of utilizing emissions monitoring technology during open detonation. ***FY 2011 Plans:*** Design prototype equipment for Asbestos effort. ***FY 2012 Plans:*** Facilitize Supercritical Water Oxidation (SCWO) for base hydrolysis.			
Title: Advanced Munitions Disassembly	0.867	1.525	-
Articles:	0	0	
Description: Funding is provided for the following efforts: ***FY 2010 Accomplishments:*** Cryofracture final prove-out and demonstration/validation testing was conducted. Initiated facility design for Acid Digestion. Complete D563 demonstration and validation as well as Low Rate Initial Production (LRIP). Rocket Motor Segmenting initiated fabrication. Completed installation for Demilitarization by Induction Heating Meltout System (DIHMES). ***FY 2011 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*	R-1 ITEM NOMENCLATURE PE 0605805A: *Munitions Standardization, Effectiveness and Safety*	PROJECT F24: *CONVENTIONAL MUNITIONS DEMIL*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Initiate the demil concept design of Cryofracture adaptation to Demil of Rockeye Munitions. Fabricate components for Acid Digestion. Complete Autoclave modeling and simulation. Conduct demonstration /validation for Rocket Motor Segmenting. Demilitarization by Induction Heating Meltout System (DIHMES) will complete demonstration /validation and begin Low Rate Initial Production (LRIP). Initiate the design of BLU Cryofracture. Proveout process for disassembly of M42/M46/M77 Insensitive Cluster Munitions (ICM) R3 and conduct downselect.			
Accomplishments/Planned Programs Subtotals	28.599	14.987	16.007

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.