

# ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

May 2009

BUDGET ACTIVITY	PE NUMBER AND TITLE		
<b>6 - Management support</b>	<b>0605805A - Munitions Standardization, Effectiveness and Safety</b>		
COST (In Thousands)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
Total Program Element (PE) Cost	39812	47898	45053
296 Close Combat Technology	1080	1137	7755
297 Mun Survivability & Log	4873	5838	8721
857 DOD EXPLOSIVES SAFETY STANDARDS	1535	1643	1664
858 ARMY EXPLOSIVES SAFETY MANAGEMENT PROGRAM	387	462	469
859 LIFE CYCLE PILOT PROCESS	22114	30843	4723
862 Indirect Fire and Fuze Technology	2067	2174	3096
F21 Direct Fire Technology and NATO Ammo Evaluation	972	1015	3042
F24 CONVENTIONAL MUNITIONS DEMIL	6784	4786	15583

**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 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.

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<u><b>B. Program Change Summary</b></u>	FY 2008	FY 2009	FY 2010
Previous President's Budget (FY 2009)	40947	20857	21146
Current BES/President's Budget (FY 2010)	39812	47898	45053
Total Adjustments	-1135	27041	23907
Congressional Program Reductions		-159	
Congressional Rescissions			
Congressional Increases		27200	
Reprogrammings	9		
SBIR/STTR Transfer	-1144		
Adjustments to Budget Years			23907

**Change Summary Explanation:**

FY 2009: Increase due to Congressional Adds of \$27.2M in Project 859 - Life Cycle Pilot Process.

FY 2010: Funds increased to support various technology investigations.

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<b>BUDGET ACTIVITY</b> <b>6 - Management support</b>	<b>PE NUMBER AND TITLE</b> <b>0605805A - Munitions Standardization, Effectiveness and Safety</b>		<b>PROJECT</b> <b>296</b>
COST (In Thousands)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
296 Close Combat Technology	1080	1137	7755

**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.

<u>Accomplishments/Planned Program:</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
Mitigation of Perchlorates	360		
Mitigation of Naphthalene			1000
Heavy Metal in Green Illuninants	295	175	255
Yellow Dye alternatives			500
Fragmentation Studies	155		
Nanoparticles for Pyro Items	270	380	750
Safer, More stable hand held signals and simulators		280	750
Multifunction Pyro Simulators		270	
M796 Impulse Cartridge variability and tolerance reduction			1000
M206 Infrared Countermeasure Flare trajectory improvement			1500
M211 Infrared Countermeasure Flare material dispersion improvement			1500
Aircraft Countermeasure Flare reliability modeling for Apache and Chinook			500
Small Business Innovative Research/Small Business Technology Transfer Programs		32	
<b>Total</b>	<b>1080</b>	<b>1137</b>	<b>7755</b>

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<b>BUDGET ACTIVITY</b> <b>6 - Management support</b>	<b>PE NUMBER AND TITLE</b> <b>0605805A - Munitions Standardization, Effectiveness and Safety</b>		<b>PROJECT</b> <b>297</b>
COST (In Thousands)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
297 Mun Survivability & Log	4873	5838	8721

**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, 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.

<u><b>Accomplishments/Planned Program:</b></u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
Demonstrate technology for munitions packaging that will create a venting system during propellant burning to reduce internal pressures and minimize explosive reactions.	98		200
Demonstrate new IM explosives formulated from new less sensitive basic explosive ingredients and binders to replace current non-IM explosives.	1334	1275	2136
Manage technology integration efforts to meet IM requirements, develop improved IM test capability, update and maintain IM compliance status and IM technology databases, and support the updating of the PEO Ammunition IM Strategic Plan. Conduct reviews of munitions in development and production to determine if they meet a DoD 5000.1 requirement to withstand unplanned stimuli.	715	366	600
Establish generic testing procedures to evaluate and down-select IM explosive candidates based on sensitivity to bullet and fragment impacts, sympathetic detonation, and high temperature. These procedures will provide a reliable and low cost method of determining IM reactions for new explosives used in a variety of munitions.	300		
Demonstrate a new generation of IM booster/supplementary materials to initiate new IM main charge explosives which cannot be initiated with a currently available booster.	570	493	
Demonstrate thermal protection material and warhead and cartridge case venting systems to mitigate ammunition cook-off failure when exposed to fire.			520
Evaluate, through modeling and simulation and testing, barrier technology that will mitigate bullet impact, fragment impact, and sympathetic detonation			200
Investigate alternatives to both natural and processed wood ammunition packaging pallets and boxes that provide a cost effective, environmentally and phyto-sanitary compliant packing and unitization option.	115		
Design and demonstrate a tank ammunition container sized to be compatible with the Joint Modular Intermodal Container (JMIC)	113		

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BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT	
<b>6 - Management support</b>	<b>0605805A - Munitions Standardization, Effectiveness and Safety</b>	<b>297</b>	
footprint in order to demonstrate rapid and seamless delivery of tank ammunition configured loads to the warfighter.			
Investigate and test alternative methods (blankets, coatings, dunnage) to achieve reductions in solar loading on ammunition packaging.			115
Investigate and evaluate commercially available and modified resealable barrier bags that will reduce life-cycle costs for many demolition items that undergo repacking multiple times during their expected shelf life.			100
Develop an alloy from commercially available metals that when applied to munitions containers utilizing techniques such as brazing/soldering/welding will maintain container structural integrity, but will also yield when exposed to a predetermined temperature thus allowing the container to vent when subjected to unplanned thermal stimuli.		271	285
Evaluate alternatives to Polyethylene-laminated (PolyLam) paper material which is used in the construction of fiber container inserts in ammunition packaging. Identification of alternative materials will help to reduce fiber insert costs and ensure availability of inserts for ammunition production.	105		
Develop an injection blow molded container for training ammunition that is less expensive and more weather resistant than current fiberboard packaging.	150		
Demonstrate next generation packaging with standardized characteristics that permit easy reconfiguration and that are reusable, nestable, unit friendly, and survivable.		200	1105
Develop technologies and algorithms that enable munitions to indicate their serviceability to the operator based upon aggregate environmental exposures, system cycling and munition degradation models.		149	1843
Demonstrate standard sized inter-modal shipping modules for ammunition. The modules will interlock with each other, top to bottom, and cargo platforms to form a stable, palletized, mixed-supply class configured load. They are automation friendly and rapidly re-configurable to meet changing user needs.	307	60	
Upgrade the ammunition Configured Load Building Tool and enable it to operate as a web based application. This would facilitate ease of use, reduce setup time for new users, and increase speed and efficiency in building configured ammunition loads for unit deployments.	310		300
Demonstrate temperature responsive materials that can be used to indicate highest and lowest temperature exposures and passive (battery free) visibly interpreted shock indicators that when applied to ammunition and/or packaging will provide end users and ammunition management personnel a low cost means of determining if ordnance has become unsafe or degraded due to environmental conditions or rough handling.		52	415
Develop Munitions Survivability Software (MSS) improvements to include incorporating a government off the shelf mapping capability that will facilitate field use of this explosives safety storage planning software tool.	546	669	125
Demonstrate a Forward Ammunition Resupply System, including robotic handling and/or soldier lifting enhancements and related ammunition tool kit upgrades, designed to improve soldier productivity and safety while unpacking and handling current ammunition.		1880	
Design and develop an International Standards Organization-container based capability to retrograde ammo returned from deployed combat units. The system will include the capability to inspect, reconfigure and recertify ammunition for Future Combat System in ready to fire configuration at the weapon systems.	210	189	537
Determine whether surface acoustic wave (SAW) enabled passive RFID tags mounted at the ammunition item or pallet level can be effectively utilized with ordnance for inventory, tracking, locating, or security purposes.		40	

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<b>6 - Management support</b>	<b>0605805A - Munitions Standardization, Effectiveness and Safety</b>		<b>297</b>
Demonstrate hazard classification certified packaging configurations for ammunition retrograde that use materials organic to the OCONUS facilities charged with the retrograde in order to provide a way to avoid the high costs for specialized transportation, detention and storage, or OCONUS demilitarization.		31	66
Using thermo-formable composites made from recycled plastics, demonstrate a low cost, disposable 463L pallet replacement that if substituted for the current aluminum 463L pallet would greatly reduce replacement costs and eliminate repair costs.			174
Small Business Innovative Research/Small Business Technology Transfer Programs		163	
<b>Total</b>		<b>4873</b>	<b>5838</b>

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<b>BUDGET ACTIVITY</b> <b>6 - Management support</b>	<b>PE NUMBER AND TITLE</b> <b>0605805A - Munitions Standardization, Effectiveness and Safety</b>		<b>PROJECT</b> <b>857</b>
COST (In Thousands)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
857 DOD EXPLOSIVES SAFETY STANDARDS	1535	1643	1664

**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.

<u><b>Accomplishments/Planned Program:</b></u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
Develop improved tri-service design procedures and improved computer codes for explosion-resistant structures. Initiate preparation of revised tri-service manual TM-51300.	279	305	306
Collect and analyze airblast/fragment/thermal data for revising DoD, NATO hazard classification.	245	238	243
Develop improved explosives and munitions tests and characterization data. Specifically, develop improved gap tests for rocket motors.	275	321	340
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.	252	215	230
Conduct other hazards analyses and expand/automate explosives safety databases. Develop improved Explosives Safety Mishap Analysis Module with links to accident reports.	275	253	269
Develop and improve risk based analysis tools for explosives safety. Develop sequence of operations prototype.	209	265	276
Small Business Innovative Research/Small Business Technology Transfer Programs		46	
<b>Total</b>	<b>1535</b>	<b>1643</b>	<b>1664</b>

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COST (In Thousands)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
858 ARMY EXPLOSIVES SAFETY MANAGEMENT PROGRAM	387	462	469

**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.

<u>Accomplishments/Planned Program:</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
Development of risk based explosives safety criteria that will aid commanders and safety personnel in the transition from regulation to risk management.	100	100	100
Develop enhanced protective structure designs that improve the survivability of Army personnel, facilities, and equipment.	150	160	180
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.	137	187	189
Small Business Innovative Research/Small Business Technology Transfer Programs		15	
<b>Total</b>	<b>387</b>	<b>462</b>	<b>469</b>

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COST (In Thousands)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
859 LIFE CYCLE PILOT PROCESS	22114	30843	4723

**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.

<u><b>Accomplishments/Planned Program:</b></u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
Continue ongoing technology investigations. Developed concept designs and plans to transfer life cycle pilot process technology into the supplier base.	1481	1414	1898
Performed numerous production base readiness assessments to analyze present capabilities and identify trends in munitions and industrial technology. Identified over 700 single points of failure in the supplier base and began assessment of mitigation plans.	727	762	960
Develop "pilot" prototype processes for critical ammunition end items and components necessary to establish quality, affordable, and environmentally safe production.	1374	1440	1865
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.	4826	3090	
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.	2317	2510	
Establish a focal point with the Defense Materials Technology Center to investigate innovative technology to support the needs of the munitions industrial base in metals manufacture.	1930	2896	
Establish a focal point for polymer technology to investigate innovative polymer based components and manufacturing processes related to polymer based components for munition applications.	965		
Completed initial facility design for production of atomized magnesium within the National Technology and Industrial Base (NTIB). Develop and prove-out the pilot scale process.	965	772	
Develop and transition flexible manufacturing and inspection processes for thermal batteries used in munition items.	2799		
Continued development of technology for the sensing of depleted uranium munitions residues and investigate technologies for their	4730	3862	

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<b>6 - Management support</b>	<b>0605805A - Munitions Standardization, Effectiveness and Safety</b>	<b>859</b>	
management and removal from soil and water. Efforts include full scale demonstration of technologies at relevant field site.			
Develop streamline business processes and foster integration across the Joint Munitions and Lethality Ammunition Enterprise to more efficiently and effectively support warfighter needs.		1545	
Establish capability to incorporate new technology solutions for rapid spiral development of select Joint Munitions and Lethality Program Management (PM) programs to support warfighter needs. Utilize strategy of leveraging program requirements and resources with non traditional supplier technologies. Provide small non-traditional businesses collaboration opportunities with the PM's on their technologies effectiveness and performance.		2317	
Develop and transition an information center for advanced manufacturing process knowledge and technology. It will support cost effective production of components at small to medium sized sub-tier suppliers.		965	
Develop, prove-out, and field new prototype protective armor solutions that utilize various lightweight ballistic materials. The configured hybrid solution is optimal for weight reduction, high performance and affordability.		3862	
Establish capability to produce nanodiamonds within National Technology and Industrial Base (NTIB). Assess the effectiveness of incorporating nanodiamonds in prototype parts.		1545	
Congressional Add in support of Titanium Extraction, Mining and Process Engineering Research (TEMPER) was put in this project erroneously. It will be reflected in Program Element 622624 in the next budget cycle.		3000	
Small Business Innovative Research / Small Business Technology Transfer Programs		863	
<b>Total</b>	<b>22114</b>	<b>30843</b>	<b>4723</b>

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<b>BUDGET ACTIVITY</b> <b>6 - Management support</b>	<b>PE NUMBER AND TITLE</b> <b>0605805A - Munitions Standardization, Effectiveness and Safety</b>		<b>PROJECT</b> <b>862</b>
COST (In Thousands)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
862 Indirect Fire and Fuze Technology	2067	2174	3096

**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 aging 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 30 mm 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.

The M483 Common Carrier program is a range matched family of 155mm ammunition with a maximum range of 22.5 kilometers that will result from a demilitarization cost avoidance utilizing a reutilization of M483 Dual Purpose Improved Conventional Munition (DPICM) projectile bodies. This effort includes the technical integration of a more producible White Phosphorous (WP) canister into the M483 carrier without the need of the M110's current burster tube resulting in savings per round. Also, more effective Infra Red (IR) and Visual Light (VL) Illumination payloads from the XM1066 and M485 will be integrated into the M483 Common Carrier with additional savings.

**Accomplishments/Planned Program:**

	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
Block Upgrades: Successfully completed the enhancement of the M762A1/M767 Application Specific Integrated Circuit (ASIC), and forwarded the design to PM CAS to incorporate into their Technical data package. Completed the Bunker defeat Munition (BDM) impact sensor upgrade. Provided data and design to PM CCS. Investigate drop in proximity upgrades for current airburst fuzing for mortar, artillery and other munitions. Evaluate proximity sensor upgrades for M734A1. Determining feasibility of a common training fuze for 60, 81, and 120mm mortar rounds. 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. Enhancing Turbine Alternator (T/A) on the M734A1/M783 mortar fuze to survive high g gun launch environments. Risk Mitigation: Evaluating improvements to stockpiled training and war reserve fuzes to enhance capabilities and/or address deficiencies. Evaluating second source for Digital Signal Processor for the M734A1 fuze, evaluate new battery and electronics sources for current inventory fuzes. Perform study to evaluate potential 2nd source for high -g survivable tuning fork crystals for electronic time fuzes for mortars and artillery. Evaluating storage reliability of current artillery batteries for the Multi Option Fuze for Artillery (MOFA) fuze/determine possible solutions to battery electrolyte storage instabilities.	2067	2112	2189
Indirect Fire: Finite element analyses, strength of design flat fire testing, static testing, engineering and proof of principal testing with the User will be performed. Ballistic testing including firing tables, safety, reliability and performance testing will be conducted. Demilitarization operations will be refined in order to provide for acceptable metal parts for use in the end item.			907

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BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT	
<b>6 - Management support</b>	<b>0605805A - Munitions Standardization, Effectiveness and Safety</b>	<b>862</b>	
Small Business Innovative Research/Small Business Technology Transfer Programs		62	
<b>Total</b>		2174	3096

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<b>BUDGET ACTIVITY</b> <b>6 - Management support</b>	<b>PE NUMBER AND TITLE</b> <b>0605805A - Munitions Standardization, Effectiveness and Safety</b>		<b>PROJECT</b> <b>F21</b>
COST (In Thousands)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
F21 Direct Fire Technology and NATO Ammo Evaluation	972	1015	3042

**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, maintenance 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 2010 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 rifle, 40mm grenade and medium caliber cannon ammunition effectiveness, accuracy and general improvements. Improvements in target practice technology such as spotter technology will be incorporated into training ammunition.

<u>Accomplishments/Planned Program:</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
40mm High/Low Velocity Standardization	45	50	
30mm Assessment Team	20	20	
Maintain standardization of qualified designs	100	100	
New Ammo design qualification & NATO Nominated Weapon Evaluation	125	121	
NARTC Equipment Purchases	80	95	
Staff, Equip, Maintain NARTC	130	140	150
Aeroballistic Study of M856	80	50	
Design & Refine Models	75	95	
Optimize Manufacturing Process	317	316	
Small Caliber Ammunition Standardization Efforts			622
40mm Non-dud Producing Training Cartridge			670
M433 Warhead Improvement			400
Target Practice Spotter Technology Insertion			500
Improved M789 Lethality			700
Small Business Innovative Research/Small Business Technology Transfer Programs		28	

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<b>6 - Management support</b>	<b>0605805A - Munitions Standardization, Effectiveness and Safety</b>	<b>F21</b>	
Total		972	1015

3042

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COST (In Thousands)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
F24 CONVENTIONAL MUNITIONS DEMIL	6784	4786	15583

**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 and demonstration of new, safe, and environmentally acceptable alternatives to open burning/open detonation (OB/OD), including recovery/recycle/recycling (R3) equipment, and processes to reduce the extremely large demil stockpile. Beginning in FY10, the Conventional Munitions Demil Project, F24 will incorporate 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. 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 (ESTCP), the Strategic Environmental Research and Development Program (SERDP) 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.

<u>Accomplishments/Planned Program:</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
Advanced Destruction: This effort focuses on destruction of munitions. In FY08 Plasma Ordnance Demilitarization System (PODS) Prove-out testing continued; additional items were selected for continued prove-out and demonstration/validation testing. Technical supervision and support of the (Mobile Plasma Treatment System) MPTS project was executed. Equipment fabrication/procurement for the Mobile Cryofracture Plasma Arc Treatment System (Cryo-Plasma) was conducted as well as sub-system testing on the feed interface. Prove-out testing of the upgraded Cryofracture process for ADAM anti-personnel land mines was conducted. Results indicated need for further minor process modifications and required changes were made. In FY09 PODS prove-out testing will be completed. MPTS technical support will continue. CryoPlasma equipment procurement will be completed, along with sub-system testing. System assembly and installation will begin. Cryofracture final prove-out and dem/val testing will be conducted. In FY10 PODS Dem/Val tests will be completed. MPTS technical supervision and support will be completed. CryoPlasma system assembly and installation will be completed. Cryofracture adaptation to Rock-eye sub-munitions will take place. Destruction of HC Smokes development of technology for demil will begin. Hydrolysis Prototype Processing Plant (HPPP) will initiate fabrication and transition of Acid Hydrolysis technology to CAD/PAD demil. White Phosphorous Felt Wedges will initiate fabrication of demil technology. Demil of Rockeye Munitions will initiate the concept design.	2490	2064	4438
Resource Recovery and Recycling (R3): This effort focuses on enhancing existing methods of munitions R3. In FY08 the Magnesium Recovery (Mg R3) equipment procurement and fabrication for the pilot process was completed. In FY09 Mg R3 equipment installation and prove-out testing will be conducted on the large-scale pilot plant. In FY10, Mg R3 demonstration and validation will be conducted as well as continuing plant fabrication. Munitions Residue Inspection System (MRIS) will transition machine vision for 105MM projectiles; will initiate the design and fabrication of machine vision for 750 lb. bombs. Initiate the design of a high pressure water washout system.	3943	1668	5162

# ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

May 2009

BUDGET ACTIVITY	PE NUMBER AND TITLE		PROJECT
<b>6 - Management support</b>	<b>0605805A - Munitions Standardization, Effectiveness and Safety</b>		<b>F24</b>
Advanced Munitions Disassembly: This effort focuses on the disassembly of conventional munitions. In FY10, will initiate the design of robotics 155mm rocket assisted projectile (RAP) disassembly technology. Will finalize and demonstrate the disassembly of M42, M46, and M77 grenades using Robotics Improved Conventional Munitions (ICM) Disassembly.			4009
Advanced Removal: This effort develops technology to remove propellant. In FY08 Ultrasonic Removal technology development continued at the pilot plant level of operations. In FY09 Ultrasonic Removal pilot plant operation will be completed and design of a prototype facility will be initiated. Development of IM Munitions technology. Autoclave process will be optimized via computer modeling and simulation. In FY10 Ultrasonic Removal Prototype facility equipment will be procured and fabricated. Will Continue with development of IM Munitions technology. Will demonstrate propellant removal technology on missiles utilizing auguring techniques. Initiate the development and fabrication of a technique for the milling of multiple missiles, Flexible Milling of Rocket Motors.	351	920	1974
Small Business Innovative Research / Small Business Technology Transfer Programs			134
<b>Total</b>	<b>6784</b>	<b>4786</b>	<b>15583</b>