ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

May 2009

BUDGET ACTIVITY	PE NUMBER AND TITLE
7 - Operational system development	**0708045A - End Item Industrial Preparedness Activities**

COST (In Thousands)		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	Cost to Complete	Total Cost
	Total Program Element (PE) Cost	91305	90782	68466	Continuing	Continuing
E25	MFG SCIENCE & TECH	64690	68855	68466	Continuing	Continuing
EA2	MANTECH INITIATIVES (CA)	26615	21927			48542

A. Mission Description and Budget Item Justification: This program element (PE) demonstrates manufacturing processes that enable producibility and affordability of emerging and enabling technologies. Initiatives within the PE result in cost savings and reduced risk of transitioning military-unique manufacturing processes into production. This PE also fosters the transfer of new/improved manufacturing technologies to the industrial base, including manufacturing efforts that have potential for high payoff across the spectrum of Army systems and/or significant impact on national manufacturing issues (project E25). Major investment areas include Aviation Systems, Armor and Survivability, Sensors, Electronics and Power Systems, Precision Munitions and Armaments, and Flexible Displays. Project EA2 funds congressional special interest items.

Work in this PE is related to, and fully coordinated with, PE 0603710A (Night Vision Advanced Technology), PE 0602303A (Missile Technology), PE 0602105A (Materials Technology), PE 0602618A (Ballistics Technology), PE 0602601A (Combat Vehicle and Automotive Technology), and PE 0603005A (Combat Vehicle and Automotive Advanced Technology) and PE 0602705A (Electronics and Electronic Devices).

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

Work in this PE is performed by the Army Research, Development, and Engineering Command (RDECOM) and efforts are executed by the Army Research Laboratory (ARL) and appropriate Army Research, Development, and Engineering Centers (RDECs).

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B. Program Change Summary	FY 2008	FY 2009	FY 2010
Previous President's Budget (FY 2009)	87311	69084	69630
Current BES/President's Budget (FY 2010)	91305	90782	68466
Total Adjustments	3994	21698	-1164
Congressional Program Reductions		-302	
Congressional Rescissions			
Congressional Increases		22000	
Reprogrammings	6331		
SBIR/STTR Transfer	-2337		
Adjustments to Budget Years			-1164

FY09 increase is due to congressional adds.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

May 2009

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational system development	**0708045A - End Item Industrial Preparedness Activities**	**E25**

COST (In Thousands)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	Cost to Complete	Total Cost
E25 MFG SCIENCE & TECH	64690	68855	68466	Continuing	Continuing

A. Mission Description and Budget Item Justification: This project develops and demonstrates advanced manufacturing processes, equipment, and systems that enhance the quality and/or quantity of products, while achieving reductions in cost and/or transfer of improved manufacturing technologies to the industrial base. Efforts within this project have potential for high payoff across the spectrum of Army weapon systems, and significant positive impact on national manufacturing issues and the US industrial base. Current investment areas include: Aviation, Armor and Survivability, Sensors, Electronics and Power Systems, Precision Munitions and Armaments, and Display Technology.

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

Work in this project is performed by the Army Research, Development, and Engineering Command (RDECOM) and efforts are executed by the Army Research Laboratory (ARL) and appropriate Army Research, Development, and Engineering Centers (RDECs).

Accomplishments/Planned Program:	FY 2008	FY 2009	FY 2010
Aviation Systems - Embedded Sensor Processes for Aviation Component Structures (ESPACS): In FY09, produce prototype stabilizer, develop composite manufacturing processes for sensors with flexible substrate and adhesive binding techniques. In FY10 will demonstrate conductivity with airframes and insert into Apache Block III. Low Cost Cabin Floor Structures: In FY09, optimize the process used to manufacture survivable, affordable, repairable airframe components. In FY10, will combine materials, design, and process improvements for airframe components.		4000	3843
Base Structural Armor: In FY08, evaluated and qualified integrated subassembly processes for Future Combat Systems (FCS) armor structure and hybrid mine floor. In FY09, demonstrate process improvements and model-centric manufacturing for the fabrication of full-up upper and lower hulls for select protective armor structures in a production environment. In FY10 will demonstrate armor using hot pressing techniques that lower the cost of tiles for low rate production and combat vehicle production applications.	14712	14092	15767
Overlay Armor: In FY08, continued to address advanced armor solution affordability, and began the development of manufacturing technologies for producing novel armor materials critical to 3rd generation ballistic and underbelly armor. Delivered a multi-materials kit and supporting processes, to include prepreg, particulate metal-matrix composites, nano-bonds, and backing that enable affordable production of armor solutions. In FY09, integrate stiffening materials and demonstrate producible, affordable armor manufacturing processes that include hybridized fibrous metal matrix composites and 3-D composites backing. Develop low cost grinding methods for transparent armors. In FY10, will build to print armor and demonstrate 3-D hybrid composite armor for large transparent structures.	19249	14000	15767
Low Cost Manufacturing of Materials for Improved Warfighter Protection: In FY08, completed prototype fabrication process for next generation helmet shell development and manufacturing. In FY09, combine hydrostatic, multiple tow deposition, and multifunctional material technologies, and start full-scale implementation of these technologies into a variety of manufacturing lines. Transition manufacturing process for protective materials used on advanced combat helmets and soldier systems.	1320	2271	

Sensors Infrared PbSe Focal Plane Arrays: In FY09, develop production line and Indium-Tin-Oxide process for 8-in substrates. Develop high volume, high yield process and transition read out integration circuit for design and optimization. In FY10, will implement high yield processes for production of active protection systems.		4814	4927
Third Gen Infrared (IR) Dewar / Cooler Aperture: In FY08, developed variable aperture coating deposition processes, fabricated precision tooling, and tested smaller motors to verify improved manufacturability of the variable aperture mechanism, while maintaining performance and improving reliability and survivability in the Dewar vacuum environment. In FY09, integrate improved manufacturing components and processes for variable aperture and compact cold stage components to validate tooling documentation and perform manufacturing demonstration. In FY10, will increase yield, reduce weight, and increase reliability of cooled and uncooled systems and will increase reliability and capacity for guided devices.	2935	3500	2956
Software Defined Radio (SDR) Components: In FY08, demonstrated efficient manufacturability of the Silicon Germanium Radio Frequency (RF) Integrated Circuit, providing a 60 percent size, 75 percent weight, and 40 percent power reduction. In FY09, begin system integration of improved manufacturing technologies and processes for RF chipset, power amplifiers, and wideband tunable filter for low rate production. In FY10, will transition manufacturing technologies to Joint Tactical Radio System (JTRS), ManPack and Small Form Fit systems.	7500	6000	5913
Affordable Phase Shifters for Phased Arrays: In FY08, optimized manufacturing processes for ferroelectric and MEMS-based components enabling lower cost improved capability antennas for Warfighter Improved Network - Tactical (WIN-T) and Future Combat Systems.	2315		
Electronics/Power Systems - Silicon Carbide (SiC) Switches: In FY08, improved processes to reduce thickness of SiC material and improve uniformity. In FY09, improve manufacturing techniques to produce 4" substrates, and reduce the manufacturing cost of low voltage diodes and switches. In FY10, will develop manufacturing processes for SiC materials and energy storage devices for electronic systems.	6480	4270	3942
High Energy Density (HED) Capacitors: In FY08, demonstrated cost reduction from $100 to $60 for Army and Navy pulse power system demonstrators.	800		
Very High Power (VHP) Batteries: In FY08, reduced battery pack manufacturing time from 950 hours to 350 hours, and reduced cost from $115,000 to $58,000 per pack. In FY09, develop and demonstrate efficient manufacturing process that increases cell performance from 1 kilowatt to 3 kilowatts, while reducing cell capacity loss from 40 percent to 20 percent. In FY10 will complete battery certifications and transition production capabilities in support of combat vehicles and/or weapon systems.	4200	3772	2807
Low Cost Zinc Sulfide Missile Dome: In FY10, will develop flow model to increase product yield of dome; will develop extensive flow model and improve zinc sulfide (ZnS) chemical vapor deposition processes; will improve ZnS dome blank growth processes and improvements for demonstration and transition.			2956
Precision Munitions/Armaments, Scale up of (PAX-3): In FY08, conducted prototype scale production for PAX-3 insensitive munitions. In FY09, demonstrate efficent system process and manufacturing optimization of PAX-3 explosives suitable for dual purpose munitions. In FY10, will futher optimize production process and demonstate on large production scale for bunker defeat munitions.	230	3312	2690
Laser Ignition: In FY09, develop metal-to-ceramic brazing process and manufacturing methodology for Artillery Laser Ignition System (LIS) components. In FY10, will demonstrate prototype laser ignition diodes using new manufacturing processes.		2004	1971
Flexible Display Technology: In FY08, integrated reflective laminates and manufactured pilot line processes into 2nd generation (GEN	4949	5011	4927

II) production line. In FY09, demonstrate pilot production lines to manufacture GEN II reflective and emissive 7.5" displays. In FY10, will increase wafer yield, and demonstrate improved processing for 1280x1024 resolution micro displays and micro-displays transition to PEO Soldier systems.			
Small Business Innovative Research/Small Business Technology Transfer Programs		1809	
Total	64690	68855	68466

B. Other Program Funding Summary Not applicable for this item.

C. Acquisition Strategy Not applicable for this item.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

May 2009

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational system development	**0708045A - End Item Industrial Preparedness Activities**	**EA2**

COST (In Thousands)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	Cost to Complete	Total Cost
EA2 MANTECH INITIATIVES (CA)	26615	21927			48542

A. Mission Description and Budget Item Justification: Congressional Interest Item funding for Mantech Initiatives.

Accomplishments/Planned Program:	FY 2008	FY 2009	FY 2010
National Center for Defense Manufacturing and Machining	1544		
High Temperature Ceramic Manufacturing Technology for Helicopter Rotor Blade Erosian Protection	1930		
Laser Engineered Net Shaping (LENS) Qualification for Aging Weapon Systems	1546		
Electrodeposited Coatings Systems	1546		
Legacy Aerospace Gear Drive Re-Engineering Initiative	966	1938	
Smart Machine Platform Initiative	2898	3875	
Spring Suspended Airless Tires for Convoy Protection	4345	2712	
SuperPulse Laser System Development for Turbine Engine Applications	1546		
High Performance Alloy Materials, Steel Castings	1987		
Next Generation Combat Helmet	2318		
Advanced Materials Processing for Ultra-Efficient Power Systems	966		
Specialized Compact Automated Mechanical Clearance Platform (SCAMP)	386		
Aging Weapons Systems Structural Repair	1546		
Improved Manufacturing Process for SAPI	3091		
Manufacturing Metrology for Weapon System Production and Sustainment (M2WSPS)		1705	
Advanced Modeling Technology for Large Structure Titanium Machining Initiative		775	
Vehicle Common Armor Manufacturing Process (VCAMP)		1938	
Superior Weapons Systems Through Castings		1550	
Near-Net Shaped Direct-Sintered Silicon Carbide Torso Plates		1550	
Solid State Processing of Titanium Alloys for Defense Material Armaments		1395	
Network Centric Prototype Manufacturing		3875	
SBIR/STTR		614	

B. Other Program Funding Summary Not applicable for this item.

C. Acquisition Strategy Not applicable for this item.

ARMY RDT&E COST ANALYSIS (R3)

May 2009

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational system development	**0708045A - End Item Industrial Preparedness Activities**	**EA2**

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	FY 2010 Cost	FY 2010 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal:												

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	FY 2010 Cost	FY 2010 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal:												

III. Test And Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	FY 2010 Cost	FY 2010 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal:												

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	FY 2010 Cost	FY 2010 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal:												

Project Total Cost:												