

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

May 2009

BUDGET ACTIVITY		PE NUMBER AND TITLE			
4 - Advanced Component Development and Prototypes		0603827A - Soldier Systems - Advanced Development			
COST (In Thousands)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	26181	41616	71832	Continuing	Continuing
S49 GROUND SOLDIER SYSTEM (GSS)		25420	56993	Continuing	Continuing
S51 AIRCREW INTEGRATED SYS AD	2577	1	138	Continuing	Continuing
S53 CLOTHING AND EQUIPMENT	13619	6549	7047	Continuing	Continuing
S54 SMALL ARMS IMPROVEMENT	3483	4266	5054	Continuing	Continuing
S55 Counter-Defilade Target Engagement	6502	5380	2600		14482

A. Mission Description and Budget Item Justification: This Program Element (PE) for Advanced Component Development and Prototypes manages the soldier as a system in order to increase combat effectiveness, test and deliver tangible products that save soldier's lives, and improve soldier's quality of life. It evaluates, develops, and tests emerging technologies and critical soldier support systems to reduce technology risk.

Project S49 funding (Ground Soldier System) integrates multiple components and leverages emerging technologies to provide overmatching operational capabilities to ground combat Soldiers.

Project S51 funding (Aircrew Integrated Systems) supports component development and prototyping of critical soldier support systems and other combat service support equipment that will improve unit sustainability and combat effectiveness.

Project S52 funding (Soldier Support Equipment) supports component development and prototyping of critical soldier support systems and other combat service support equipment that will improve unit sustainability and combat effectiveness.

Project S53 funding (Clothing and Equipment) supports development of state-of-the-art technology to improve tactical and non-tactical clothing and individual equipment to enhance the lethality, survivability, and mobility of the individual Soldier.

Project S54 funding (Small Arms Improvement) provides funds to develop, demonstrate and evaluate emerging technology for integration of systems, subcomponents and prototypes designed to enhance lethality, target acquisition, fire control, training effectiveness and reliability for current and future small arms weapon systems and ammunition.

Project S55 funding (Counter-Defilade Target Engagement) provides funds to develop, demonstrate and evaluate technology for integration of systems and subcomponents to enhance hit probability to defeat defilade and point area targets at the squad level.

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B. Program Change Summary

	FY 2008	FY 2009	FY 2010
Previous President's Budget (FY 2009)	20090	36558	32798
Current BES/President's Budget (FY 2010)	26181	41616	71832
Total Adjustments	6091	5058	39034
Congressional Program Reductions		-142	
Congressional Rescissions			
Congressional Increases		5200	
Reprogrammings	6643		
SBIR/STTR Transfer	-552		
Adjustments to Budget Years			39034

Change Summary Explanation:

FY 2008: Congressional add reprogrammed from OMA for proper execution, Advanced Combat Helmet, \$4 million; \$2.8 millions reprogrammed to support the Counter-Defilade Target Engagement program.

FY 2009: Congressional Adds: \$2.8 million for Acid Alkaline Direct Methanol Fuel Technology, \$1 million for Individual Airburst Weapon System, \$4.4 million for High Explosive Air Burst (HEAB) 25mm Ammunition (to be reprogrammed to PEO AMMO) and -\$3 million for Unjustified Program Growth

FY 2010: increase in support of the Ground Soldier System program.

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BUDGET ACTIVITY 4 - Advanced Component Development and Prototypes	PE NUMBER AND TITLE 0603827A - Soldier Systems - Advanced Development			PROJECT \$49	
COST (In Thousands)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	Cost to Complete	Total Cost
S49 GROUND SOLDIER SYSTEM (GSS)		25420	56993	Continuing	Continuing

A. Mission Description and Budget Item Justification: The Ground Soldier System (GSS) is an integrated dismounted Soldier situational awareness (SA) system for use during combat operations. The system provides unparalleled situational awareness and understanding to the dismounted Soldier allowing for faster and more accurate decisions in the tactical fight. This translates into Soldiers being at the right place, at the right time, with the right equipment making them more effective and more lethal in the execution of their combat mission. The Increment I of the GSS program will focus on the development of the SA system, improved navigation, and reduced fratricide through the visualization of friendly forces, with an integrated Ground Soldier Ensemble (GSE). Increment II will integrate Unified Battle Command and additional capabilities.

<u>Accomplishments/Planned Program:</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
FY09-FY10: Developmental engineering, competitive prototyping with three contractors, manufacturing, and systems engineering, assessment, competitive contractor testing (with three contractors) and program management support for Ground Soldier Ensemble (GSE)		23354	40765
FY09-FY11: Governmental Test and Evaluation Activities.		1442	16228
FY09: Small Business Innovative Research/Small Business Technology Transfer Program (SBIR/SBTR)		624	
Total		25420	56993

<u>B. Other Program Funding Summary</u>	FY 2008	FY 2009	FY 2010	To Compl	Total Cost
OPA 3, R8050000, Ground Soldier System			1809	Continuing	Continuing

Comment:

C. Acquisition Strategy The GSE acquisition concept, which supports Office of the Secretary of Defense (OSD) guidance on competition and prototyping, will take the GSE program from MS A through a Technology Development (TD) Phase to a MS C in a manner which will allow the maximum affordable competition. MS A Decision occurred February 19, 2009, enabling multiple contracts (up to three) to be awarded for the TD Phase. TD Phase will consist of two parts: Part 1 - prototyping, Part 2 - integration/refinement. During Part 1 of TD, three contractors will design, fabricate, integrate Government Furnished Property and test their systems during contractor and government testing to prove compliance with performance requirements. During Part 2 of TD, the contractors' systems will undergo formal ATEC Developmental Testing (DT) to demonstrate the ability to achieve technical requirements and a Limited User Test (LUT) to demonstrate the ability to achieve operational requirements. Technology maturity and programmatic risk will be assessed at the end of the TD phase. Depending on these results, GSE will proceed directly to MS C or to MS B if the technology/integration requires further maturation.

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PROJECT

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S49

ARMY RDT&E COST ANALYSIS (R3)

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BUDGET ACTIVITY			PE NUMBER AND TITLE							PROJECT		
4 - Advanced Component Development and Prototypes			0603827A - Soldier Systems - Advanced Development							S49		
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
Develop, Integrate and Prototype GSE	CPFF	General Dynamics C4 Systems, Inc, Scottsdale, AZ				5997	3Q	6379	1-4Q		12376	
Develop, Integrate and Prototype GSE	CPFF	Raytheon Company, McKinney, TX				6479	3Q	6772	1-4Q		13251	
Develop, Integrate and Prototype GSE	CPFF	Rockwell Collins, Inc, Cedar Rapids, IA				6345	3Q	6792	1-4Q		13137	
Subtotal:						18821		19943			38764	
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
PM Ground Soldier support	OGA, MIPR	Various				1746	3Q	10417	1-4Q		12163	
Subtotal:						1746		10417			12163	
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
Various Testing Organizations	OGA, MIPR	ATEC, TTC/YPG/DTC/EPT/A RL-SLAD, etc.				1442	1-4Q	16228	1-4Q		17670	
Subtotal:						1442		16228			17670	
IV. Management Services	Contract	Performing Activity &	Total	FY 2008	FY 2008	FY 2009	FY 2009	FY 2010	FY 2010	Cost To	Total	Target

ARMY RDT&E COST ANALYSIS (R3)

May 2009

BUDGET ACTIVITY			PE NUMBER AND TITLE							PROJECT		
4 - Advanced Component Development and Prototypes			0603827A - Soldier Systems - Advanced Development							S49		
	Method & Type	Location	PYs Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Complete	Cost	Value of Contract
PM Soldier Warrior oversight and integration of GSS program	In-House/Task Order	PM Soldier Warrior, Ft. Belvoir, VA				2787	1-4Q	10405	1-4Q		13192	
SBIR/SBTR						624	1Q				624	
Subtotal:						3411		10405			13816	
Project Total Cost:						25420		56993			82413	

Schedule Profile (R4 Exhibit)

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BUDGET ACTIVITY
4 - Advanced Component Development and Prototypes

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0603827A - Soldier Systems - Advanced Development

PROJECT
S49

Event Name	FY 08				FY 09				FY 10				FY 11				FY 12				FY 13				FY 14				FY 15			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(1) Milestone A Decision Increment I					▲ ₁ Milestone A Increment I																											
Prototyping/Refinement Increment I													Prototyping/Refinement Increment I																			
Developmental Test (DT) Increment I																	DT Increment I															
Limited User Test (LUT) Increment I																	LUT Increment I															
(2) Milestone C Decision Increment I																	▲ ₂ Milestone C Increment I															
Low Rate Initial Production (LRIP) Increment I													LRIP Increment I																			
Independent Operational Test and Evaluation (IOTE) Increment I																	IOTE Increment I															
(3) Full Rate Production (FRP) Increment I																	FRP Increment I				▲ ₃											
Development Increment II																					Development Increment II											

Schedule Detail (R4a Exhibit)

May 2009

BUDGET ACTIVITY		PE NUMBER AND TITLE						PROJECT	
4 - Advanced Component Development and Prototypes		0603827A - Soldier Systems - Advanced Development						S49	
<u>Schedule Detail</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	
Milestone A Decision Increment I		2Q							
Prototyping/Refinement Increment I		3Q - 4Q	1Q - 4Q						
Developmental Test (DT) Increment I			3Q						
Limited User Test (LUT) Increment I			4Q						
Milestone C Decision Increment I				2Q					
Low Rate Initial Production (LRIP) Increment I				2Q - 4Q	1Q - 2Q				
Independent Operational Test and Evaluation (IOTE) Increment I				4Q	1Q - 2Q				
Full Rate Production (FRP) Increment I					2Q				
Development Increment II					3Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q	

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BUDGET ACTIVITY 4 - Advanced Component Development and Prototypes	PE NUMBER AND TITLE 0603827A - Soldier Systems - Advanced Development			PROJECT S51	
COST (In Thousands)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	Cost to Complete	Total Cost
S51 AIRCREW INTEGRATED SYS AD	2577	1	138	Continuing	Continuing

A. Mission Description and Budget Item Justification: This project supports advanced component development and prototyping of critical soldier support systems with improved aviator safety, survivability, and human performance that amplify the warfighting effectiveness, and facilitates full-spectrum dominance of the Army aircraft including the AH-64 Apache/Longbow, CH-47 Chinook, UH/HH-60 Blackhawk, and Light Utility Helicopter. These programs include Air Soldier System and equipment which are unique and necessary for the sustainment, survivability, and performance of Army aircrews and troops on the future integrated battlefield. The Air Warrior and Air Soldier programs provide the aircrew with a system approach to noise protection, three-dimensional audio and external audio capability, crash and post-crash survivability, concealment and environmental protection, ballistic protection, night vision and heads-up display, directed energy eye protection and flame/heat protection. Improvements integrating new technologies into the Air Warrior system will continue to enhance and maximize aircrew mission performance, comfort, aircrew station interface, safety, and survivability. These funds also resource improved laser protection against emerging new threat systems and product improvement of existing helmets to improve performance and increased commonality. Maximum advantage will be taken of simulation to reduce program technical risk through early user evaluation and to reduce program design and test cost and schedules. Air Warrior and Air Soldier System Advanced Development were completed with FY 2008 RDTE Project S51 funding, except for a small amount of PM Administration costs resourced in RDTE Project S51 Advanced Development funding during FY 2009 through FY 2010 to enhance the transition of these programs from Advanced Development to Engineering Development.

<u>Accomplishments/Planned Program:</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
Concept exploration of pilot situational awareness and cognitive decision aiding tools completed during FY 2008.	884		
Explore technology to upgrade environmental control and waste management systems completed during FY 2008.	434		
Concept exploration of helmet technologies and helmet mounted devices completed during FY 2008.	1093		
Continue advanced component development of Air Warrior and Air Soldier technology improvements and advanced development effort transition to engineering development.	166	1	138
Total	2577	1	138

<u>B. Other Program Funding Summary</u>	FY 2008	FY 2009	FY 2010	To Compl	Total Cost
RDTE, A PE 0604601A PROJ S61-EMD	10422	14638	10513	Continuing	Continuing
Aircraft Procurement, Army SSN AZ3110 - ACIS	54222	48149	77525	Continuing	Continuing

Comment:

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PROJECT

S51

C. Acquisition Strategy Technologies developed under the Air Soldier System program integrate capabilities including a fully compliant Modular Integrated Helmet and Display System (MIHDS), Chemical, Biological (CB) waste disposal system and upgrades to Air Warrior block 2 components as emerging technologies become available. The MIHDS helmet will provide a day heads up display, nuclear flash protection, external audio, don in flight CB protection and Agile laser eye protection. This development effort was accomplished through a combination of contractor and governmental agencies managed within the Air Warrior Product Manager's Office and this Advanced Development effort was completed during FY 2008. Continued effort in FY 2009 and beyond provides for continued Air Warrior Product Manager's Office analysis and evaluation of emerging aircrew safety, survivability, and human performance improvement technologies for possible application to Army aviator requirements. These programs are planned to transition into Engineering Development as the Advanced Development effort is completed.

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BUDGET ACTIVITY 4 - Advanced Component Development and Prototypes	PE NUMBER AND TITLE 0603827A - Soldier Systems - Advanced Development			PROJECT S53	
COST (In Thousands)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	Cost to Complete	Total Cost
S53 CLOTHING AND EQUIPMENT	13619	6549	7047	Continuing	Continuing

A. Mission Description and Budget Item Justification: Funding supports the project development and state-of-the-art technology to improve tactical and non-tactical clothing and individual equipment to enhance the survivability, mobility, comfort, and sustainment of the individual Soldier. The current database position reflects a \$3 million Congressional reduction in this project. The reduction should have been taken in project S49.

<u>Accomplishments/Planned Program:</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
Individual Soldier Ballistic Protection: (FY08-09) Initiated efforts to integrate (mold) new fiber technologies into the Advanced Combat Helmet (ACH) to enhance protection against high speed ballistic blunt trauma and non-ballistic impact (crash) protection. Initiated efforts to leverage and incorporate laser eye protection technology advancements into ballistic goggles and spectacles and assessed capability improvements. Continued product improvement of Interceptor Body Armor (IBA) in support of fielding and executed incremental capability improvements related to technology maturity and operational feedback. Leverage advanced ballistic materials to increase Soldier survivability while decreasing weight, cube and cost. Integrate and enhance the capabilities of Soldier Personal Protective Equipment (PPE) capabilities (head, face, eyes, torso, extremity and feet) capabilities providing head-to-toe protection from current and emerging ballistic/blast threats. Conduct test and evaluation of prototype ballistic ensembles. Develop commonality at the component and subsystem levels to provide a modular layered/integrated ballistic protection system and conduct Soldier Protection Demonstration (VII) of plate carrier systems. (FY10-11) Test and evaluate modular, tailorable hard and soft armor solutions for Combat Vehicle Crewman (CVC). Develop Army standards for concealable body armor. Continue to evaluate and improve Soldier PPE including extremity protection from emerging ballistic/blast threats. Conduct extensive ballistic, compression, impact, accelerated aging, delamination, ceramic, backing composite, integrity and durability testing on next generation helmet systems. Establish testing protocol to build the correlation between testing and trauma on all protective items. Continue to assess helmet sensor accelerometer technologies to improve accuracy (transfer function) and reliability of data capture, storage and distribution.	8405	2857	3890
Soldier Uniforms and Clothing: (FY08-09) Conduct system integration and formal developmental Testing/Operational Testing (DT/OT) of preproduction and production representative systems leveraging advancements in materials, nanotechnology, fabrication techniques, moisture management, fire resistance, antimicrobial treatments, insect protection, extreme environmental protection and advancements in chemical/biological protection to increase the capabilities and durability of tactical and non-tactical clothing such as the Fire Resistant Environmental Ensemble (FREE) and Army Combat Shirt (ACS) and all Fire Resistant (FR) uniforms. Prove out commonality across as broad a spectrum of users as possible to provide a modular integrated uniform/clothing system from skin out and head-to-toe. (FY10-11) Investigate new technologies and fabrics relevant to FR, FREE improvements, Army Combat Pants, and FR Fuel Handlers Coveralls (FHC). Investigate new technologies to improve soldier survivability and mobility and dye and print technologies to improve uniform camouflage in visible to Short-Wave Infrared (SWIR) range. Research new material technologies and the combining of technologies for Generation (GEN) IV Extended Cold Weather Clothing System (ECWCS). Investigate a variety of combat boot improvements. Complete final mountain combat boot evaluation.	1160	1047	1978
Individual Equipment: (FY08-09) Conduct system integration and formal DT/OT of preproduction and production representative systems	3415	2180	979

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utilizing advancements in technology for load bearing equipment, hydration technologies including water filtration and NBC hydration, and other mission essential and/or mission specific equipment for Soldiers. Prove out as much commonality as feasible across a broad spectrum of user and mission scenarios. Purchase prototypes and conduct user assessment to advance the technology for navigational aid. (FY10-11) Army Test and Evaluation Command (ATEC) evaluation of water purification (Block III) - refill in a field environment. Conduct Limited User Evaluation (LUE) on improved Soldier Knee & Elbow Protection System (SKEPS). Investigate new technologies and concepts for improved Modular Sleep System (MSS).				
Soldier Cooling: (FY08-09) Evaluated advanced lightweight, low powered cooling systems for use with Nuclear, Biological, Chemical (NBC) and ballistic protection ensembles. Conduct trade-off analyses and system integration providing Soldiers enhanced ability to conduct missions for longer periods of time in extreme conditions/environments. (FY10-11) Continue to enhance systems by streamlining design for comfort, decreasing weight, and power management.				
Small Business Innovative Research/Small Business Technology Transfer Programs				
Total				
13619 6549 7047				

<u>B. Other Program Funding Summary</u>	FY 2008	FY 2009	FY 2010	To Compl	Total Cost
RDTE, 0604601A.S60, Clothing and Equipment	12463	13809	9753	Continuing	Continuing
OMA, 121017, Central Funding and Fielding	118231	95576	88872	Continuing	Continuing

Comment:

C. Acquisition Strategy Programs will pursue normal transition to Engineering and Manufacturing Development (EMD) and production. This Project will continue to exercise competitively awarded contracts using best value source selection procedures.

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4 - Advanced Component Development and Prototypes			0603827A - Soldier Systems - Advanced Development							S53		
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
Various	MIPRS	Natick Soldier Center, Natick, MA	5173	2203	1-2Q	1558	1-2Q	1518	1-2Q	Cont.	Cont.	
Various	Contracts	Various	7442	4190	1-3Q	2516	1-3Q	3029	1-3Q	Cont.	Cont.	
Subtotal:			12615	6393		4074		4547		Cont.	Cont.	
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
Misc Support Costs	MIPR	Various	2957	1341	1-2Q	750	1-2Q	750	1-3Q	Cont.	Cont.	
Subtotal:			2957	1341		750		750		Cont.	Cont.	
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
Various	MIPRS	Various	2090	1000	1-4Q	1025	1-4Q	1050	1-4Q	Cont.	Cont.	
Subtotal:			2090	1000		1025		1050		Cont.	Cont.	
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
In-House Support		PM Ft Belvoir, VA	2410	4885	1-4Q	700	1-4Q	700	1-4Q	Cont.	Cont.	
Subtotal:			2410	4885		700		700		Cont.	Cont.	

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Project Total Cost:

20072

13619

6549

7047

Cont.

Cont.

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Event Name	FY 08				FY 09				FY 10				FY 11				FY 12				FY 13				FY 14				FY 15			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
BALLISTIC																																
Integrate advanced materials & components - Spiral I into EMD	[Redacted]																															
(1) Transition Spiral I to EMD																																
Integrate advanced materials & components - Spiral II into EMD	[Redacted]																															
(2) Transition Spiral II to EMD																																
Integrate advanced materials & components - Spiral III into EMD	[Redacted]																															
Integrate hard and soft armor technology enhancements	[Redacted]																															
(3) Transition Spiral III to EMD																																
Evaluate non-ceramic systems	[Redacted]																															
Evaluate IOTV soft armor systems	[Redacted]																															
Advanced Eyewear Laser Protection	[Redacted]																															
(4) Transition Advanced Laser Protection to EMD																																
Develop/test 7.62 Helmet Prototype Dev Models	[Redacted]																															
Fabricate/test 7.62 Helmet Engineering Dev Models	[Redacted]																															

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Event Name	FY 08				FY 09				FY 10				FY 11				FY 12				FY 13				FY 14				FY 15							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
(5) Transition 7.62 to EMD									▲ 5																											
Evaluate/test enhanced non-ballistic impact protection																	■																			
(6) Transition improved non-ballistic impact protection to EMD																					▲ 6															
Dev Fully Integrated Head Protection Sys Mat & Components & Spiral I into EMD																					■															
(7) Transition Spiral I to EMD																													▲ 7							
Dev Fully Integrated Head Protection Sys Mat & Components & Spiral II into EMD																													■							
(8) Transition Spiral II to EMD																																	▲ 8			
Develop and Test NDTE Software Upgrades and Transition to EMD - Spiral I																	■																			
(9) Transition Spiral I to EMD																									▲ 9											
Develop and Test NDTE Software Upgrades and Transition to EMD - Spiral II																									■											
(10) Transition Spiral II to EMD																													▲ 10							
Develop and Test NDTE Software Upgrades and Transition to EMD - Spiral III																					■															
(11) Transition Spiral III to EMD																									▲ 11											

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Event Name	FY 08				FY 09				FY 10				FY 11				FY 12				FY 13				FY 14				FY 15			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Evaluate/test NDTE Prototype Dev Model	█																															
(12) Transitioned NDTE to EMD					▲ ₁₂																											
UNIFORM CLOTHING																																
Fire Resistant Environmental Ensemble (FREE) User Eval	█																															
Fire Resistant Clothing Upgrades					█				█				█				█				█											
Fire Resistant Cloth Upgrades - Next Generation																					█				█							
ICVC Fabric Upgrades									█				█				█				█											
JSLIST Upgrade																									█				█			
Army Combat Pants (ACP) Prototype Evaluation																																
Spiral I			█																													
Spiral II					█																											
Spiral III									█																							
Army Combat Pants Upgrade													█				█				█				█							
Pulse & Respiration Shirt Prototype																					█				█							
Army Combat Shirt Improvements Evaluation																																

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4 - Advanced Component Development and Prototypes	0603827A - Soldier Systems - Advanced Development																S53															
Event Name	FY 08				FY 09				FY 10				FY 11				FY 12				FY 13				FY 14				FY 15			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Spiral I																																
Spiral II																																
Army Mountaineering Boot User Evaluation																																
ACB Improvements																																
GEN IV ECWCS Material Concept																																
INDIVIDUAL EQUIPMENT																																
Soldier Knee & Elbow Protection System (SKEPS)																																
(13) Filtration trans to EMD																																
NBC Hydration Development and Testing																																
ATEC Evaluation - Block III Water Purification and Refill in Field																																
JC3/Chemical Gloves/Hydration Development																																
NAVIGATIONAL AID																																
Advanced Research for Nav Aid Development																																
SOLDIER COOLING																																
Soldier Cooling Evaluation																																

Develop/fabricate Prototype Development Models
0603827A (S53)
CLOTHING AND EQUIPMENT

Schedule Profile (R4 Exhibit)

May 2009

BUDGET ACTIVITY	PE NUMBER AND TITLE																PROJECT																																															
4 - Advanced Component Development and Prototypes	0603827A - Soldier Systems - Advanced Development																S53																																															
Event Name	FY 08				FY 09				FY 10				FY 11				FY 12				FY 13				FY 14				FY 15																																			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4																																
Test/Evaluate Prototype Development Models																																																																
(14) Transition Soldier Cooling to EMD																																																																
Integrate/spiral in New Soldier Cooling Technologies																																																																

Schedule Detail (R4a Exhibit)

May 2009

BUDGET ACTIVITY		PE NUMBER AND TITLE						PROJECT	
4 - Advanced Component Development and Prototypes		0603827A - Soldier Systems - Advanced Development						S53	
<u>Schedule Detail</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	
BALLISTIC									
Integrate advanced materials & components - Spiral I into EMD	1Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 2Q					
Transition Spiral I to EMD				2Q					
Integrate advanced materials & components - Spiral II into EMD				3Q - 4Q	1Q - 4Q	1Q - 2Q			
Transition Spiral II to EMD						2Q			
Integrate advanced materials & components - Spiral III into EMD						3Q - 4Q	1Q - 4Q	1Q - 2Q	
Integrate hard and soft armor technology enhancements									
Transition Spiral III to EMD								2Q	
Evaluate non-ceramic systems		1Q - 4Q	1Q - 4Q	1Q - 4Q					
Evaluate IOTV soft armor systems	1Q - 4Q	1Q - 2Q							
Advanced Eyewear Laser Protection	1Q - 4Q	1Q							
Transition Advanced Laser Protection to EMD		1Q							
Develop/test 7.62 Helmet Prototype Dev Models	1Q - 4Q								
Fabricate/test 7.62 Helmet Engineering Dev Models		1Q - 4Q							
Transition 7.62 to EMD			1Q						
Evaluate/test enhanced non-ballistic impact protection			1Q - 4Q	1Q					
Transition improved non-ballistic impact protection to EMD				1Q					
Dev Fully Integrated Head Protection Sys Mat & Components & Spiral I into EMD				1Q - 4Q	1Q - 4Q	1Q - 2Q			
Transition Spiral I to EMD						2Q			

Dev Fully Integrated Head Protection Sys Mat & Components & Spiral II into EMD						3Q - 4Q	1Q - 4Q	1Q - 2Q
Transition Spiral II to EMD								2Q
Develop and Test NDTE Software Upgrades and Transition to EMD - Spiral I				1Q - 4Q	1Q - 2Q			
Transition Spiral I to EMD					2Q			
Develop and Test NDTE Software Upgrades and Transition to EMD - Spiral II					3Q - 4Q	1Q - 4Q		
Transition Spiral II to EMD						4Q		
Develop and Test NDTE Software Upgrades and Transition to EMD - Spiral III							1Q - 4Q	1Q - 2Q
Transition Spiral III to EMD								2Q
Evaluate/test NDTE Prototype Dev Model	2Q - 4Q	1Q						
Transitioned NDTE to EMD		1Q						
UNIFORM CLOTHING	1Q - 4Q	1Q - 4Q						
Fire Resistant Environmental Ensemble (FREE) User Eval	1Q - 2Q							
Fire Resistant Clothing Upgrades		1Q - 4Q						
Fire Resistant Cloth Upgrades - Next Generation						2Q - 4Q	1Q - 4Q	
ICVC Fabric Upgrades		2Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q		
JSLIST Upgrade							1Q - 4Q	
Army Combat Pants (ACP) Prototype Evaluation								
Spiral I	2Q - 3Q							
Spiral II		1Q - 4Q						
Spiral III			1Q - 3Q					
Army Combat Pants Upgrade			2Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q		
Pulse & Respiration Shirt Prototype					3Q - 4Q	1Q - 4Q		
Army Combat Shirt Improvements Evaluation								
Spiral I	2Q - 4Q	1Q - 2Q						
Spiral II		1Q - 4Q	4Q					
Army Mountaineering Boot User Evaluation	2Q - 3Q							
ACB Improvements			2Q - 4Q	1Q - 3Q				

GEN IV ECWCS Material Concept			2Q - 4Q	1Q - 4Q				
INDIVIDUAL EQUIPMENT								
Soldier Knee & Elbow Protection System (SKEPS)			2Q - 4Q	1Q - 3Q				
Filtration trans to EMD	2Q							
NBC Hydration Development and Testing		1Q - 4Q	1Q - 2Q					
ATEC Evaluation - Block III Water Purification and Refill in Field			2Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q		
JC3/Chemical Gloves/Hydration Development						2Q - 4Q	1Q - 3Q	
NAVIGATIONAL AID								
Advanced Research for Nav Aid Development		1Q - 4Q						
SOLDIER COOLING								
Soldier Cooling Evaluation	1Q - 2Q							
Develop/fabricate Prototype Development Models		1Q - 3Q						
Test/Evaluate Prototype Development Models		3Q - 4Q						
Transition Soldier Cooling to EMD			1Q					
Integrate/spiral in New Soldier Cooling Technologies			2Q - 4Q	1Q - 4Q				

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

May 2009

BUDGET ACTIVITY 4 - Advanced Component Development and Prototypes		PE NUMBER AND TITLE 0603827A - Soldier Systems - Advanced Development			PROJECT S54	
COST (In Thousands)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	Cost to Complete	Total Cost	
S54 SMALL ARMS IMPROVEMENT	3483	4266	5054	Continuing	Continuing	

A. Mission Description and Budget Item Justification: The Small Arms Improvement program provides funds to study, develop, demonstrate and evaluate emerging technology for integration of systems, subcomponents and prototypes with weapons/ammunition. Small arms include weapons/ammunition ranging up to 40 millimeter. Current and future efforts focus on improvements designed to enhance lethality, target acquisition, fire control, training effectiveness and reliability of weapons/ammunition. Focus areas include studying, developing, demonstrating and evaluating light weight materials, obscurants, reconnaissance, observation, lethal and non-lethal ammunition, and electronics. Benefits include improvements to weapons, fire control equipment, optics, training devices, component mounts, weapon mounts, and ammunition.

<u>Accomplishments/Planned Program:</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
Ammunition			
- Design, Development and Engineering	737	350	303
- Prototype Fabrication	1271		600
Testing and Evaluation	570	341	1050
Demonstration			100
Fire Control			
Market Research		20	
- Design, Development	260	160	1475
- Prototype Fabrication	275	220	1166
- Testing and Evaluation	195	250	360
- Demonstration	175	94	
Congressional add for Acid Alkaline Direct Methanol Fuel technology incorrectly placed in project S54, will be moved to 0604827A/S65 for proper execution.			
Small Business Innovative Research/Small Business Technology Transfer Programs.		119	
Total	3483	4266	5054

<u>B. Other Program Funding Summary</u>	FY 2008	FY 2009	FY 2010	To Compl	Total Cost
RDTE S63, Program Element 0604601A - Infantry Support Weapons	6801	4830	24504	Continuing	Continuing

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

May 2009

BUDGET ACTIVITY

4 - Advanced Component Development and Prototypes

PE NUMBER AND TITLE

0603827A - Soldier Systems - Advanced Development

PROJECT

S54

Comment: Congressional increase of \$2.7 million incorrectly placed on S54.

C. Acquisition Strategy Primary strategy is to study, develop, demonstrate and evaluate emerging technologies that will ultimately lead to enhancing/improving the small arms inventory.

ARMY RDT&E COST ANALYSIS (R3)

May 2009

BUDGET ACTIVITY			PE NUMBER AND TITLE							PROJECT		
4 - Advanced Component Development and Prototypes			0603827A - Soldier Systems - Advanced Development							S54		
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
Hardware Development	TBD	Various	2379	1358		530		1633			5900	
Subtotal:			2379	1358		530		1633			5900	
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
Engineering	MIPR	Various	425	1299		3136		1656			6516	
Subtotal:			425	1299		3136		1656			6516	
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
Developmental Testing	MIPR	Various	1099	626		420		1365			3510	
Subtotal:			1099	626		420		1365			3510	
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
Program Management	In-house	PM SW	325	200		180		400			1105	
Subtotal:			325	200		180		400			1105	
Project Total Cost:			4228	3483		4266		5054			17031	

Schedule Profile (R4 Exhibit)

May 2009

BUDGET ACTIVITY										PE NUMBER AND TITLE										PROJECT												
4 - Advanced Component Development and Prototypes										0603827A - Soldier Systems - Advanced Development										S54												
Event Name	FY 08				FY 09				FY 10				FY 11				FY 12				FY 13				FY 14				FY 15			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
SMALL ARMS WEAPONS ENHANCEMENTS	SDD				SDD																											
Weapons Upgrades																													SDD			
AMMUNITION	SDD				SDD																											
Micro Mechanical Safe & Arm																									SDD				SDD			
Close in Improved Lethality Cartridge	SDD				SDD																											
Small Arms Deployable Sensors Network																									SDD				SDD			
Ammo Upgrades	SDD				SDD				SDD																							
COMBAT OPTICS																									SDD				SDD			
Optics Upgrades	SDD				SDD																											
FIRE CONTROL																									SDD				SDD			
Improved GLM Fire Control	SDD				SDD																											
Integrated Fire Control Small Arms																									SDD				SDD			
Fire Control Upgrades	SDD				SDD				SDD																							

Schedule Detail (R4a Exhibit)

May 2009

BUDGET ACTIVITY		PE NUMBER AND TITLE						PROJECT	
4 - Advanced Component Development and Prototypes		0603827A - Soldier Systems - Advanced Development						S54	
<u>Schedule Detail</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	
SMALL ARMS WEAPONS ENHANCEMENTS									
Weapons Upgrades					1Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q	
AMMUNITION	1Q - 4Q								
Micro Mechanical Safe & Arm	1Q - 4Q	1Q - 4Q							
Close in Improved Lethality Cartridge	1Q - 4Q	1Q - 4Q	1Q - 4Q						
Small Arms Deployable Sensors Network			1Q - 4Q						
Ammo Upgrades	1Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q	
COMBAT OPTICS									
Optics Upgrades					1Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q	
FIRE CONTROL									
Improved GLM Fire Control	1Q - 4Q	1Q - 4Q							
Integrated Fire Control Small Arms			1Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q			
Fire Control Upgrades	1Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

May 2009

BUDGET ACTIVITY 4 - Advanced Component Development and Prototypes	PE NUMBER AND TITLE 0603827A - Soldier Systems - Advanced Development			PROJECT S55	
COST (In Thousands)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	Cost to Complete	Total Cost
S55 Counter-Defilade Target Engagement	6502	5380	2600		14482

A. Mission Description and Budget Item Justification: The XM25, Individual Airburst Weapon System (IAWS) delivers a 25mm programmable high explosive airburst (HEAB) round to explode near or directly on target to significantly increase hit probability to defeat defilade and point area targets out to approximately 600 meters. The IAWS includes an integrated, multifunctional, all environment, full-solution target acquisition/fire control system. Independent analysis expects a 600% increase to down range effectiveness. The technology provides the Soldier a leap-ahead capability to defeat defilade targets while significantly reducing collateral damage without the use of a mortar, artillery, or air-to-surface weapon systems. The IAWS has been identified by the U.S. Army Infantry Center's (USAIC) Joint Capabilities Integration and Development System (JCIDS) analysis as the number one materiel approach to mitigate the Counter Defilade Target Engagement (CDTE) gap (accurate and lethal engagement of defilade at squad level).

<u>Accomplishments/Planned Program:</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
Design, Develop and Fabricate	5682	967	2000
Engineering Evaluation and Training Development	820		600
Congressional add for High Explosive Air Burst (HEAB) 25mm Ammunition incorrectly placed in Project S55		4263	
Small Business Innovative Research/Small Business Technology Transfer Programs		150	
Total	6502	5380	2600

<u>B. Other Program Funding Summary</u>	FY 2008	FY 2009	FY 2010	To Compl	Total Cost
RDTE: PE 0604601A, Project S62			21865		21865
RDTE: PE 0603607A, Project 627	6000				6000

Comment: Milestone A accomplished May 2008. Congressional increase of \$4.38 million incorrectly placed in PE 0603827A S55 FY2009 funding line difference came out and went into the Small Business Innovative Research/Small Business Technology Transfer Programs line.

C. Acquisition Strategy The XM25 IAWS will achieve Milestone B in 2Q FY2010, transitioning to Engineering and Manufacturing Development (EMD) phase. The EMD phase will complete development of the XM25 IAWS and verify training solution for the Milestone C approval in FY 2012. Research and Development acquisition strategy is to use sole source contracting with ATK, Plymouth, MN.

ARMY RDT&E COST ANALYSIS (R3)

May 2009

BUDGET ACTIVITY			PE NUMBER AND TITLE							PROJECT		
4 - Advanced Component Development and Prototypes			0603827A - Soldier Systems - Advanced Development							S55		
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
Design, Develop & Fabricate	Sole Source Cost Plus Fixed Fee	ATK, Minneapolis, MN		6502	2Q	5380	2Q	2600	2Q		14482	
Subtotal:				6502		5380		2600			14482	
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:				6502		5380		2600			14482	

Schedule Profile (R4 Exhibit)

May 2009

BUDGET ACTIVITY
4 - Advanced Component Development and Prototypes

PE NUMBER AND TITLE
0603827A - Soldier Systems - Advanced Development

PROJECT
S55

Event Name	FY 08				FY 09				FY 10				FY 11				FY 12				FY 13				FY 14				FY 15							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
(1) MS B																	▲ 1																			
Design Develop & Fabricate																																				
Development Tests & Evaluation																																				
(2) MS C/Type Classification- Low Rate Initial Production																									▲ 2											
Production Qualification Test (POT)																																				
Operational Test & Evaluation (OT&E)																																				
Low Rate Initial Production (LRIP)																																				
(3) Type Classification - Standard																																	▲ 3			

Schedule Detail (R4a Exhibit)

May 2009

BUDGET ACTIVITY		PE NUMBER AND TITLE						PROJECT	
4 - Advanced Component Development and Prototypes		0603827A - Soldier Systems - Advanced Development						S55	
<u>Schedule Detail</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	
MS B			2Q						
Design Develop & Fabricate			3Q - 4Q	1Q - 2Q					
Development Tests & Evaluation				3Q - 4Q	1Q - 2Q				
MS C/Type Classification- Low Rate Initial Production					3Q				
Production Qualification Test (PQT)					3Q - 4Q				
Operational Test & Evaluation (OT&E)					4Q	1Q - 2Q			
Low Rate Initial Production (LRIP)					3Q - 4Q	1Q - 4Q	1Q		
Type Classification - Standard							2Q		