ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2005

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604□02A - Weapons and Munitions - Eng Dev

COST (In Thousands)		FY 2004 Actual	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost		149661	154356	87034	99760	68334	50797	25308	14919	Continuing	Continuing
134	OBJ IND CBT WPN ENG DE	0	15762	0	0	0	0	0	0	0	15762
613	MORTAR SYSTEMS	34984	30884	2115	4009	13452	11374	935	0	0	108022
705	ADV PRECISION KILL WEAPON SYSTEM (APKWS) - SD&ED	45224	15296	10779	8696	17483	15966	5803	0	0	140613
AS1	SMALL ARMS IMPROVEMENT	8089	10895	0	0	0	0	0	0	0	27373
AS5	ARTILLERY MUNITIONS ENGINEERING DEVELOPMENT	22396	15052	1501	0	0	0	6108	6093	0	57163
AS6	COMMON REMOTELY OPERATED WEAPONS STATION (CROWS)	2865	3356	0	0	0	0	0	0	0	8802
AS8	XM395 PRECISION GUIDED MORTAR MUNITION (PGMM)	0	0	28259	47745	26202	18368	10943	8826	Continuing	Continuing
S23	SURF LNCH ADV MED RNG AIR-TO-AIR MSL (SLAMRAAM)	36103	63111	36102	29200	0	0	0	0	0	166191
S36	COURSE CORRECTING FUZE (CCF)	0	0	8278	10110	11197	5089	1519	0	0	36193

A. Mission Description and Budget Item Justification: This program element funds multiple efforts for engineering development of weapons and munitions systems.

Starting in FY06, funds have been realigned from Project 134 (Objective Individual Combat Weapon (OICW)), Project AS1 (Small Arms Improvements), and Project AS6 (Common Remotely Operated Weapons Station (CROWS)) to PE 0604601 Infantry Support Weapons, Projects S62, S63, and S64 respectively, to streamline the management, development, and testing of infantry support weapons and associated equipment.

Project 134 (OICW) funds the spiral development of the XM-29 Integrated Air Burst Weapons System, and is comprised of two increments. Increment one is the XM-8 Modular Assault Weapon, and increment two is the XM-25 Air Burst Assault Weapon.

FY06 Mortar Systems (613) completes the RDTE effort for the Mortar Fire Control System (MFCS), a revolutionary improvement in mortar capability seamlessly linking mortar fires in the future digital battlefield.

Starting in FY07, funds provide for the System Development and Demonstration of the Lightweight Dismounted 81mm Mortar System (LDMS) enhancing the mobility of 81mm mortar users. LDMS will be compatible with all 81mm mortar rounds in production and development. Additionally, FY04/FY05 funds support Precision Guided Mortar Munition (PGMM) and FY 04 funds support the XM982 Short Range Practice Cartridge.

Project 705, the Advanced Precision Kill Weapon System (APKWS), is a highly accurate weapon that will complement the HELLFIRE missile in precision strikes against soft point targets and provide improved accuracy over the current 2.75-inch munition used on the AH-64 Apache, and OH-58 Kiowa Warrior.

Project AS1 (Small Arms Improvements) funds the development of technology to enhance lethality, target acquisition, fire control, training effectiveness, and reliability for current small arm weapons and ammunition systems. Funds for this project include several FY05 New Starts: Platform Integration of Crew Served Weapons; High Cap Feed Systems for the M240H Machine Gun (Aviation Variant); 5.56mm Light Weight Ammo; E50 Enhanced Cal. 50 Machine Gun Kit; and Enhance Optics for Rifles and Carbines.

FY06 Artillery Munitions Engineering Development (AS5) funds the Advanced Cannon Artillery Ammunition Program (ACA2P) Pre Production Engineering, a product improvement program for 105mm and 155mm families of extended range artillery munitions using common airframes for various payloads. FY05 funds ACA2P and Hybrid Propellant for the Future Combat System (FCS). ACA2P munitions have ballistic similitude intended to meet FCS and Force Entry range and ballistic requirements. Hybrid Propellant is a unique propellant under development for future application in small, medium and large caliber munitions. Hybrid propellant releases energy more efficiently than conventional propellants and provides future FCS munitions with: the highest possible muzzle velocity for extended ranges/lethality; the prospect of lighter barrels with less recoil, extended wear characteristics; and the ability to use heavier projectiles at standard muzzle velocities for greater lethality.

Project AS6 (CROWS) funds pre-production prototype remote mounting systems for heavy, medium, and light machine guns mounted on top of a variety of vehicles. These remote mounting systems reduce the Soldier's exposure to enemy fire by giving the Soldier the ability to acquire, track, and fire at targets from behind armor during day and night conditions. Funds for CROWS efforts include an FY05 New Start called CROWS Light, a smaller, lighter version of the current system.

In FY06, Project AS8 funds Increment 1 PGMM. The PGMM will be a precision strike round with advanced sensors, guidance systems and enhanced lethal mechanism technology. It will be capable of a first round defeat of high-value, hard-point targets such as bunkers, command and control centers and stationary lightly armored vehicles. The FY04/FY05 PGMM program was funded under Project 613 and is, therefore, not considered a new start.

Project S23, the Surface Launched Advanced Medium Range Air-To-Air Missile (SLAMRAAM), is the initial kinetic energy component of the Enhanced Area Air Defense System (EAADS), and AMD Objective Force system. SLAMRAAM's force protection mission is to engage the low-altitude aerial threats out to 18km.

In FY06, funds are provided in Course Correcting Fuze (CCF) (S36) for design, development, assembly and test.

CCF is a low-cost, fuze-sized module that is intended to replace a NATO standard fuze on legacy and future artillery projectiles. CCF will effectively reduce target delivery error of conventional artillery munitions and reduce the number of projectiles per fire mission. The FY04 CCF program was funded under Project AS5 and is, therefore, not considered a new start.

B. Program Change Summary	FY 2005	FY 2006	FY 2007
Previous President's Budget (FY 2005)	125885	94190	80507
Current Budget (FY 2006/2007 PB)	154356	87034	99760
Total Adjustments	28471	-7156	19253
Net of Program/Database Changes			
Congressional Program Reductions	-2308		
Congressional Rescissions			
Congressional Increases	35200		
Reprogrammings			
SBIR/STTR Transfer	-4451		
Adjustments to Budget Years		-7156	19253

FY 2005: Congressional increases (+35.2M). Project 613 (+$12.5M) for PGMM. Project AS5 (+$13.0M) for ACAAP. Project AS5 (+$2.7M) for Hybrid Propellant. Project 705 (+$3.5M) for APKWS. Project AS6 (+$3.5M) for CROWS.

FY 2006: Funds realigned (+$8.3M) for CCF - Project S36. Funds realigned (+$1.5M) for ACAAP - Project AS5. Funds increased (+$4.6M) for APKWS - Project 705. Funds realigned (-$6.3M) from Project AS1 to PE 0604601, S63, Small Arms Improvements. Funds realigned (-$14.5M) from Project 134 to PE 0604601 (S62), Objective Individual Combat Weapon (+$5.1M) and to other high priority DA requirements ($9.4M).

FY 2007: Funds realigned (+$10.1M) for CCF - Project S36. Funds increased (+$9.2M) for PGMM - Project AS8. Funds increased (+$3.5M) for APKWS - Project 705. Funds realigned (-$3.5M) to higher priority requirements.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2005

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - System Development and Demonstration	**0604□02A - Weapons and Munitions - Eng Dev**	**613**

COST (In Thousands)	FY 2004 Actual	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total Cost
613 MORTAR SYSTEMS	34984	30884	2115	4009	13452	11374	935	0	0	108022

A. Mission Description and Budget Item Justification: Mortar Fire Control System (MFCS) - This program provides funds to complete development and type classify items that will enhance the effectiveness, lethality, versatility, mobility, and accuracy of mortar systems. Current mortar systems include conventional ammunition with a variety of fuzing, weapons that range from man-portable 60mm to vehicle-mounted 120mm mortars, and related equipment such as fire control systems, mortar ballistic computers, training devices, and ammunition. Current funding for this project continues development of the M95/M96 digital Mortar Fire Control System-Heavy (MFCS-H) and the Lightweight Handheld Mortar Ballistic Computer (LHMBC). The MFCS is a revolutionary improvement in mortar capability, seamlessly linking mortar fires in the future digital battlefield. The MFCS (Heavy) provides an on-board fire control system that includes a fire control computer, position navigation system, and gun pointing system. The MFCS allows mortar crews to set-up and fire in one minute or less, down from the current eight minutes and accuracy is increased by a factor of four. Shorter exposure times increase crew survivability. The MFCS is fully compatible with the Advanced Field Artillery Tactical Data System (AFATDS), increasing situational awareness and reducing the probability of fratricide. The LHMBC will provide dismounted mortar users with a lightweight, handheld ruggedized mortar ballistic calculator that will be digitally linked to the fire control network. The LHMBC consists of the Army's Ruggedized Personal Digital Assistant loaded with Mortar Fire Control System Software that has been modified for use on that platform. The LHMBC is intended to replace the antiquated M23 MBC on dismounted mortars. The M23 is no longer logistically supportable.

Precision Guided Mortar Munition (PGMM) - This program provides funds to perform system and technical development that will enhance the effectiveness, lethality, versatility, mobility, and accuracy of mortar systems. FY 2004-FY 2008 funds provide for start and completion of System Development & Demonstration (SDD) of a Increment 1 PGMM. The PGMM will be a precision strike round using advanced sensors, guidance systems and enhanced lethal mechanism technology. It will be capable of a first round defeat of high-value, hard-point targets such as bunkers, command and control centers, and stationary lightly armored vehicles. The capability to hit point targets in built-up areas makes this especially valuable in Military Operations in Urban Terrain (MOUT) and Military Operations Other Than War/Stability and Support Operations (MOOTW/SASO) situations. First round hit capability reduces the overall logistical burden, a critical goal for early entry forces. Beginning in FY 2006 funding for PGMM will be reported under project AS8, XM395 Precision Guided Mortar Munition.

The 120mm XM932 Short Range Practice Cartridge (SRPC) will allow mortar crewmen to practice 120mm mortar firing techniques on ranges with limited impact areas.

Lightweight Dismounted 81mm Mortar System: This program provides funds for System Development and Demonstration of the Lightweight Dismounted 81mm Mortar System (LDMS). The LDMS will greatly enhance the mobility of 81mm mortar users. The LDMS is intended to weigh 40% (T) to 60% (O) less than the current M252 81mm Mortar system. The new system, which will be developed using requirements developed jointly by the Army and USMC, will be

compatible with all 81mm mortar rounds in production and in development. The new LDMS will greatly enhance the effectiveness and mobility of dismounted mortar users, a need demonstrated during OEF and OIF.

Mortar Anti-Personnel Anti-Material (MAPAM) - The XM1061 (M734A1 Multi-option Fuze), and the XM1046 (M783 Point Detonating Fuze) cartridges are for use with the 60mm M224 Lightweight Company Mortar System (LWCMS). This improved ammunition provides the soldier with as much as a 70% increase in lethality over conventional US ammunition due to a pre-fragmented Ball Bearing Matrix Body. The FY05 Congressional plus up will be utilized to type classify two 60mm MAPAM cartridges and begin evaluation of the 81mm MAPAM cartridge. There is interest in these cartridges from the Rangers at Ft.Benning and the USMC.

Accomplishments/Planned Program	FY 2004	FY 2005	FY 2006	FY 2007
MFCS: Hardware Development	1369	1595	1167	0
MFCS: Software Development	633	1973	540	0
MFCS: Test & Evaluation	1955	266	280	0
MFCS: Program Management	161	121	128	0
MFCS: Development Engineering	470	860	0	0
PGMM: SD&D Subsystem Test and System Integration	25000	15765	0	0
PGMM: System Engineering	2240	3140	0	0
PGMM: Program Management	1331	1711	0	0
PGMM: Development Test & Evaluation	659	1620	0	0
LDMS SDD Subsystem Test and Test Integration	0	0	0	2803
LDMS Systems Engineering	0	0	0	971
LDMS Program Management	0	0	0	235
120mm SRPC: Development	715	0	0	0
120mm SRPC: Test and Evaluation	400	0	0	0
120mm SRPC: Program Management	51	0	0	0
MAPAM: Systems Engineering & Development	0	3833	0	0
Totals	34984	30884	2115	4009

B. Other Program Funding Summary	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	To Compl	Total Cost
Other Procurement, Army-2-: K99300 (MFCS)	38029	14341	18877	38452	0	0	0	0	0	109699
0604802 AS8 Precision Guided Mortar Munition (PGMM)	0	0	28259	47745	26202	18368	10943	8826	184300	249250

C. Acquisition Strategy: The acquisition strategy for Mortar Fire Control System includes product development efforts performed by the government and industry. ARDEC, Picatinny, NJ will develop all versions of Mortar Fire Control software for all platforms, and will also provide post deployment software support. Most hardware and integration efforts will be performed by Honeywell Defense and Space Electronic Systems. However, hardware for the light weight handheld computer, as required by the MFCS Operational Requirements Document (ORD) for dismounted operations, will be procured through the PM Common Hardware/Software Task contract.

The Precision Guided Mortar Munition (PGMM) program had a successful Milestone B program review to begin the Systems Development and Demonstration (SDD) phase. Joint Requirements Oversight Council (JROC) approval of the Operational Requirements Document (ORD) occurred on 27 April 2004. The SDD contract was awarded 1 December 2004.

The 120mm XM932 Short Range Practice Cartridge is being developed by the government at ARDEC, Picatinny, NJ.

LDMS is being developed by the government and industry. Initial Scientific & Technical Objective (STO) work will be followed by further concept refinement and proveout. The program will move toward Milestone B and award an SDD contract in FY07 utilizing full and open competition to select a prime contractor.

The FY05 MAPAM Congressional plus up will be utilized to type classify two 60mm MAPAM cartridges and begin evaluation of the 81mm MAPAM cartridge.

ARMY RDT&E COST ANALYSIS(R3)

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BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604□02A - Weapons and Munitions - Eng Dev

PROJECT
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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . MFCS: Software Development Lightweight Handheld Mortar Ballistic Computer (LHMBC)	MIPR	ARDEC, Picatinny, NJ	4323	900	2Q	600	2Q	0		0	5823	0
b . MFCS: Hardware Development	C/FP	Honeywell Defense Electronics Systems, Albuquerque, NM	857	0		0		0		0	857	0
c . MFCS: Fire Direction Center Hardware Development	MIPR	ARDEC, Picatinny, NJ	800	0		0		0		0	800	0
d . LHMBC: Hardware Development	MIPR	ARDEC, Picatinny, NJ	473	0		0		0		0	473	0
e . LHMBC: Hardware	MIPR	Common Hardware Software,Ver 2 (CHS2) Fort Monmouth, NJ	400	26	2Q	0		0		0	426	0
f . MFCS Hardware Product Improvement	C/FP	Honeywell Defense Electronics Systems, Albuquerque,NM	0	859	3Q	615	2Q	0		0	1474	0
g . MFCS Software Development		MTA	0	500	2Q	0		0		0	500	0

ARMY RDT&E COST ANALYSIS(R3)

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BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
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I. Product Development (continued)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
h . MFCS Software Development	T&M	HTPI, Picatinny, NJ	0	573	3Q	0		0		0	573	0
i . PGMM: SD&D - Subsystem Test & System Integration	C/CPIF/AF	Alliant Techsystems, Plymouth, MN	25000	15765	1Q	0		0		0	40765	0
j . 120mm SRPC: Development	MIPR	ARDEC, Picatinny, NJ	335	0		0		0		0	335	0
k . 120mm SRPC: Development	SS/FP	Pocal Industries, Moscow, PA	380	0		0		0		0	380	0
l . LDMS: Subsystem Test & System Integration	C/CPIF	TBS	0	0		0		2803	1Q	0	2803	0
m . MAPAM: Developmental Engineering	FFP	RUAG Munitions, Switzerland	0	2189	2Q	0		0		0	2189	0
Subtotal:			32568	20812		1215		2803		0	57398	0

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BUDGET ACTIVITY
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II. Support Cost	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . MFCS: Development Engineering	MIPR	ARDEC, Picatinny, NJ	5145	0		300	2Q	0		0	5445	0
b . MFCS: Logistics Support	MIPR	TACOM-RI, Rock Island, Ill	676	252	2Q	0		0		0	928	0
c . MFCS: Development Support	T&M	TBS	0	0		200	2Q	0		0	200	0
d . MFCS: Development Support	T&M	CSC, El Segundo, CA	400	0		0		0		0	400	0
e . LHMBC: Development Engineering	MIPR	ARDEC, Picatinny, NJ	496	710	2Q	0		0		0	1206	0
f . LHMBC: Development Engineering	T&M	Robbins Gioia, Alexandria, VA	40	0		0		0		0	40	0
g . LHMBC: Development Engineering	FFP	Camber, Huntsville, AL	130	0		0		0		0	130	0
h . MFCS Camber Eng Spt	T&M	Camber, Huntsville, AL	0	320	2Q	0		0		0	320	0
i . MFCS EVM Task	T&M	MTS	0	38	2Q	0		0		0	38	0
j . MFCS ARDEC ILS	MIPR	ARDEC	0	250	2Q	0		0		0	250	0

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II. Support Cost (continued)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
k . PGMM: Systems Engineering	MIPR	ARDEC, Picatinny, NJ	2240	3140	2Q	0		0		0	5380	0
l . LDMS: Systems Engineering	MIPR	ARDEC, Picatinny, NJ	0	0		0		971	1Q	0	971	0
m . MAPAM: Engineering Support	MIPR	ARDEC, Picatinny, NJ	0	759	2Q	0		0		0	759	0
Subtotal:			9127	5469		500		971		0	16067	0

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . MFCS: Development Test & Evaluation	MIPR	ATEC, Alexandria, VA	3635	100	3Q	0		0		0	3735	0
b . LHMBC: Development Test & Evaluation	MIPR	ATEC, Alexandria, VA	1371	0		0		0		0	1371	0
c . MFCS: Information Assurance	MIPR	CECOM, Ft Monmouth, NJ	178	0		0		0		0	178	0

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III. Test and Evaluation (continued)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
d . LHMBC: Information Assurance	MIPR	CECOM, Ft Monmouth, NJ	150	126	3Q	100	2Q	0		0	376	0
e . MFCS: Development Test	MIPR	ARDEC, Picatinny, NJ	100	0		200	2Q	0		0	300	0
f . LHMBC: Development Test (PQT)	MIPR	ARDEC, Picatinny, NJ	434	40	3Q	0		0		0	474	0
g . PGMM: Development Test and Evaluation	MIPR	ATEC, Alexandria, VA	659	1620	2Q	0		0		0	2279	0
h . 120mm SRPC: Test and Evaluation	MIPR	Yuma Proving Ground, Yuma, AZ	400	0		0		0		0	400	0
i . MAPAM: Test and Evaluation	MIPR	Yuma Proving Ground, Yuma, AZ	0	684	2Q	0		0		0	684	0
Subtotal:			6927	2570		300		0		0	9797	0

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IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Mortar Fire Control System: Program Management	In-House	PM Mortars, Picatinny, NJ	2033	121	2Q	100	2Q	0		0	2254	0
b . PGMM: Program Management	In-House	PM Mortars, Picatinny, NJ	1331	1711	2Q	0		0		0	3042	0
c . 120mm SRPC	In-House	PM Mortars, Picatinny, NJ	50	0		0		0		0	50	0
d . LDMS: Program Management	In-House	PM Mortars, Picatinny, NJ	0	0		0		235	1Q	0	235	0
e . MAPAM: Program Management	In-House	PM Mortars, Picatinny, NJ	0	201	2Q	0		0		0	201	0
Subtotal:			3414	2033		100		235		0	5782	0
Project Total Cost:			52036	30884		2115		4009		0	89044	0

Schedule Profile (R4 Exhibit)

February 2005

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604□02A - Weapons and Munitions - Eng Dev

PROJECT
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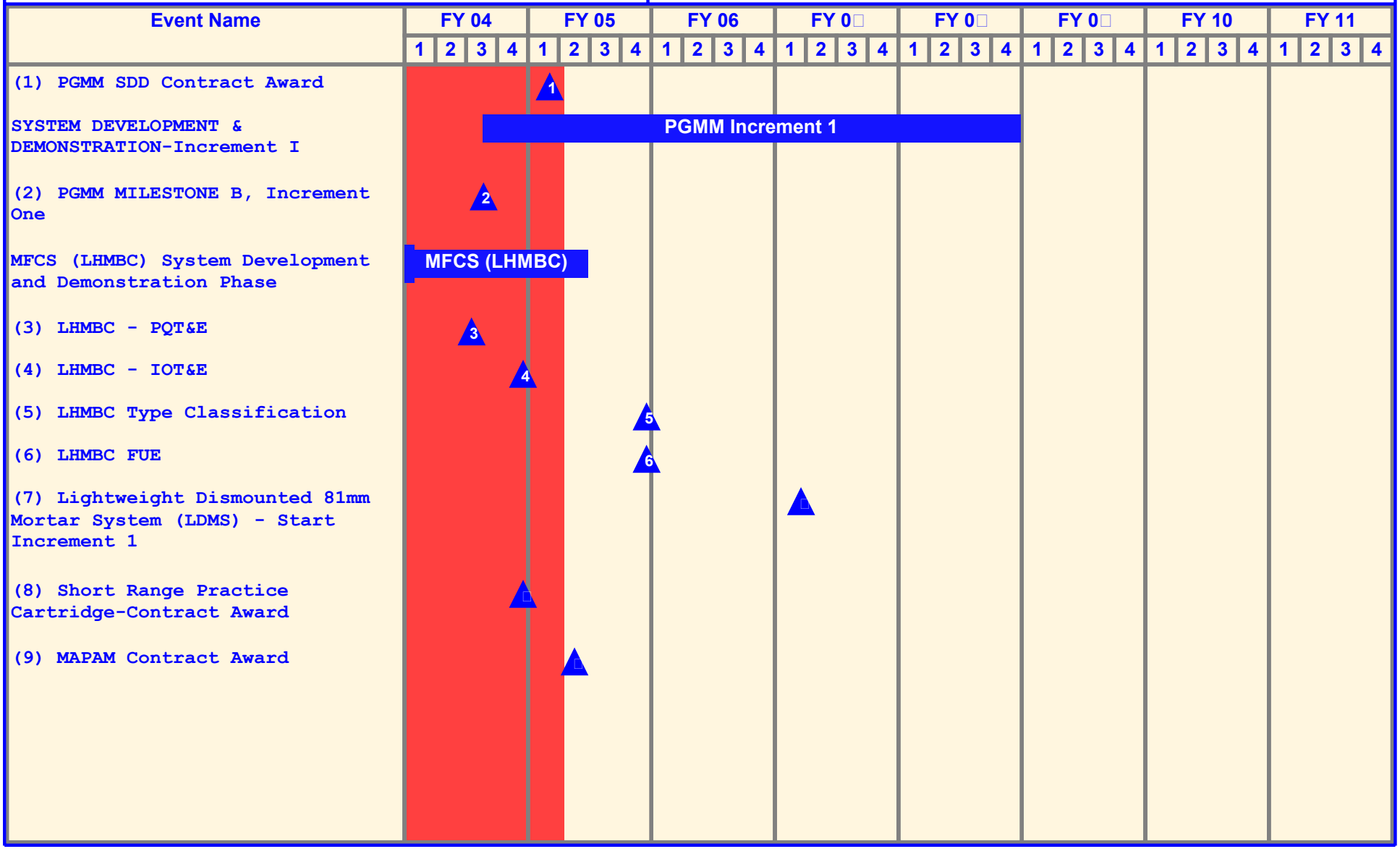

Schedule Detail (R4a Exhibit)

February 2005

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - System Development and Demonstration	**0604□02A - Weapons and Munitions - Eng Dev**	**613**

Schedule Detail	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
LHMBC Production Qualification Test	3Q							
LHMBC IOT&E	4Q							
LHMBC Type Classification		4Q						
LHMBC First Unit Equipped		4Q						
PGMM Milestone B/Start SDD, Increment 1	3Q							
LDMS Award SDD Contract				1Q				
LDMS Systems Integration					1Q			
SRPC Contract Award	4Q							
SRPC XM932 Cartridge Deliveries		4Q						
SRPC Perform Firing Tables Tests			1Q					
MAPAM Contract Award		2Q						
MAPAM Type Classification			4Q					

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

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BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - System Development and Demonstration	**0604□02A - Weapons and Munitions - Eng Dev**	**□05**

COST (In Thousands)		FY 2004 Actual	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total Cost
705	ADV PRECISION KILL WEAPON SYSTEM (APKWS) - SD&ED	45224	15296	10779	8696	17483	15966	5803	0	0	140613

A. Mission Description and Budget Item Justification: The Advanced Precision Kill Weapon System (APKWS) is a family of precision-guided rockets that combines a newly designed guidance section with existing 2.75-inch munition components and launch equipment. The APKWS is a highly accurate weapon that will complement the HELLFIRE missile in a precision strike against soft point targets. The APKWS will provide improved accuracy over the current 2.75-inch munition used on the AH-64 Apache, OH-58 Kiowa Warrior and armed reconnaissance helicopters. The APKWS Block 1 program will develop, test and qualify a laser guided 2.75-inch munition. FY06/07 funding supports development/qualification of an insensitive warhead and a more insensitive compliant rocket motor. The APKWS is expected to provide a substantial increase in the number of kills over the unguided Hydra 70 rocket and a reduction in collateral damage to minimize fratricide.

Accomplishments/Planned Program	FY 2004	FY 2005	FY 2006	FY 2007
Define and develop system requirements and preliminary design for precision guided rocket including hardware and software.	45224	10692	0	0
Develop test plans, test support equipment, and testing	0	2966	3291	2840
Perform government engineering support.	0	1638	1289	1152
Define and develop system requirements and design an insensitive warhead and rocket motor for APKWS	0	0	6199	4704
Totals	45224	15296	10779	8696

B. Other Program Funding Summary	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	To Compl	Total Cost
C70301 APKWS (Advanced Precision Kill Weapon System)	0	6852	27931	88362	98248	113065	105743	105580	1145300	1691081
0203802, project 786 (APKWS Simulator Upgrade)	0	4659	4879	5227	5462	5656	6049	4789	0	36721

C. Acquisition Strategy: Development of the APKWS will be sole source. The APKWS Block 1 development program is a 30-month effort. The Low Rate Initial Production (LRIP) and Full Rate Production will be sole source. The U.S. Army Aviation and Missile Command (AMCOM) will provide assistance and technical expertise during the development effort.

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BUDGET ACTIVITY
5 - System Development and Demonstration

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0604□02A - Weapons and Munitions - Eng Dev

PROJECT
□05

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Prime Contract	CPIF/AF	General Dynamics Armament and Technical Products, Inc.	62880	5443	2Q	4350	2Q	2614	2Q	20111	95398	0
b . Support Costs	Various	Various	391	792	1-4Q	789	1-4Q	908	1-4Q	4052	6932	0
c . Development Engineering	Various	Various	1197	957	1-4Q	1062	1-4Q	1185	1-4Q	3148	7549	0
d . Development Engineering -Distributed Aperture Semi-Active Laser Seeker (DASALS)		BAE	0	3500		0		0		0	3500	0
Subtotal:			64468	10692		6201		4707		27311	113379	0

ARMY RDT&E COST ANALYSIS(R3)

February 2005

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604□02A - Weapons and Munitions - Eng Dev

PROJECT
□05

II. Support Cost	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal:			0	0		0		0		0	0	0

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Test Support	Various	Various	1353	2966	1-4Q	3276	1-4Q	2887	1-4Q	7678	18160	0
Subtotal:			1353	2966		3276		2887		7678	18160	0

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . In-House Support	Various	Various	769	1638	1-4Q	1302	1-4Q	1102	1-4Q	4263	9074	0
Subtotal:			769	1638		1302		1102		4263	9074	0

Project Total Cost:			66590	15296		10779		8696		39252	140613	0

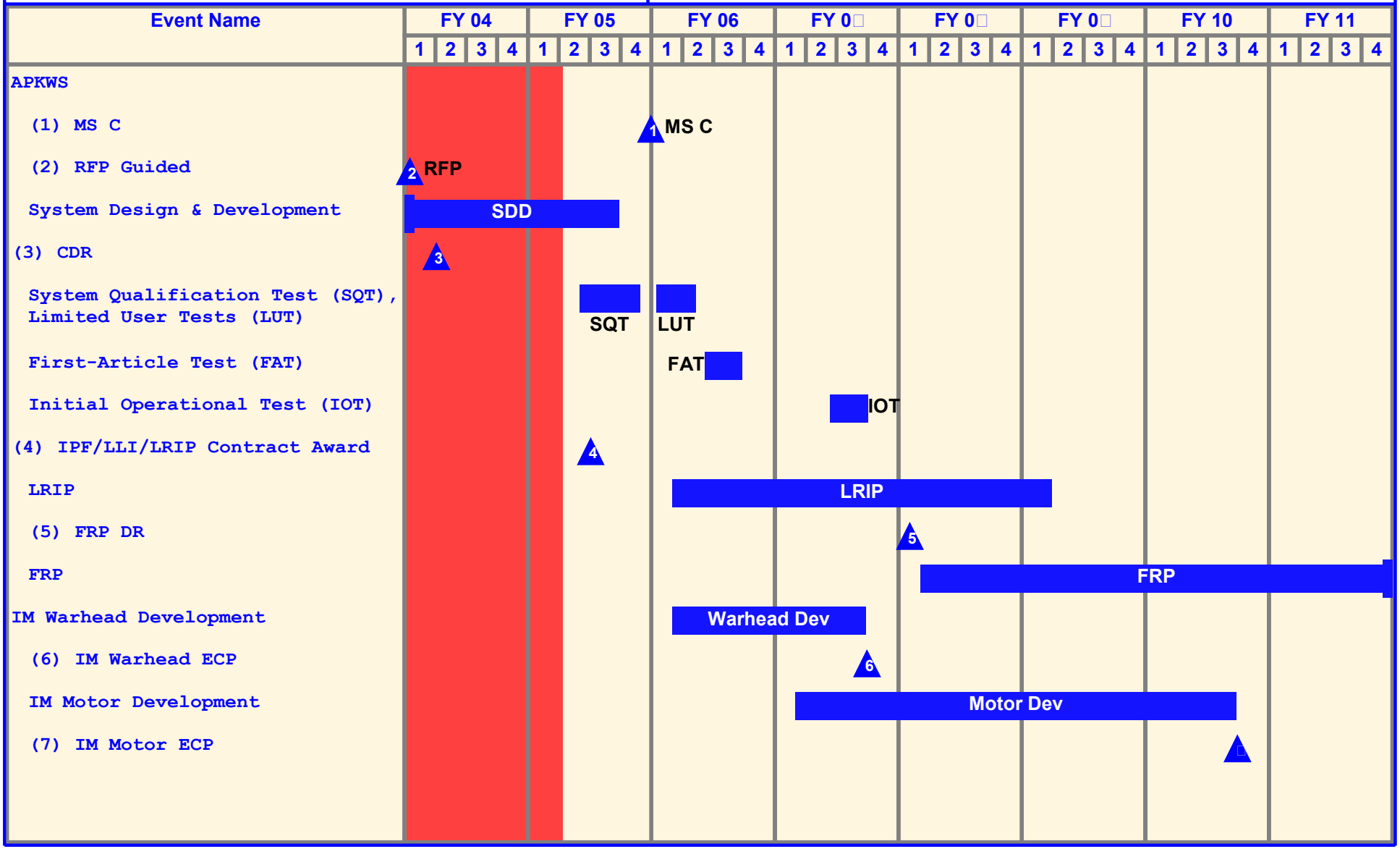
Schedule Profile (R4 Exhibit)

February 2005

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604□02A - Weapons and Munitions - Eng Dev

PROJECT
□05



Schedule Detail (R4a Exhibit)

February 2005

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604□02A - Weapons and Munitions - Eng Dev

PROJECT
□05

Schedule Detail	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
APKWS Critical Design Review (CDR)	2Q							
APKWS Testing (SQT,LUT, IOT)		1-3Q	1-2Q	3Q				
Milestone C		4Q						
IM Warhead Contract Award			1Q					
IM Warhead CDR			4Q					
IM Warhead Testing				1Q				
IM Warhead ECP				3Q				
IM Rocket Motor Contract Award				1Q				
IM Rocket Motor CDR					2Q			
IM Rocket Motor Testing					3Q			
IM Rocket Motor ECP						3Q		
IPF/LLI/LRIP Contract Award		3Q						
FRP Design Review/Contract Award					1Q			

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2005

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - System Development and Demonstration	**0604□02A - Weapons and Munitions - Eng Dev**	**AS5**

COST (In Thousands)		FY 2004 Actual	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total Cost
AS5	ARTILLERY MUNITIONS ENGINEERING DEVELOPMENT	22396	15052	1501	0	0	0	6108	6093	0	57163

A. Mission Description and Budget Item Justification: This project funds multiple efforts; the Course Correcting Fuze (CCF), the Advanced Cannon Artillery Ammunition Program (ACA2P), the Dual Purpose Integrated Conventional Munitions (DPICM) and the Hybrid Propellant.

The CCF is a low cost, fuze-sized module that is intended to replace a "NATO standard" fuze on existing stockpile and future conventional cannon artillery projectiles. The CCF corrects the ballistic trajectory of the projectile to reduce delivery errors and thus improves projectile accuracy. CCF will effectively reduce target delivery error of conventional artillery munitions and reduce the number of projectiles required to execute a fire mission. The CCF will benefit 155mm projectiles as well as the family of 105mm projectiles. The increase in effectiveness offered by the CCF gives commanders the operational capability to defeat more targets with the same basic load, while reducing the logistical burden associated with the current mission requirements.

ACA2P is a product improvement program for 105mm and 155mm families of extended range artillery munitions using common airframes for various payloads. The munitions have ballistic similitude intended to meet the Future Combat System (FCS) and Force Entry range and ballistic requirements. The common carrier designs have a re-configurable base, provide additional capability not in the current inventory, i.e. multi-spectral smoke, IR- Illumination and IR Obscurant Smoke, have increased lethality through Pre-formed Fragments (Pff) technology and are interoperable with multiple US howitzer platforms. The common carrier permits quickly field future cargo needs, i.e. Non-Lethal.

The DPICM program will develop an integrated package for Integrated Chip technology to enhance safety, performance, producibility of all electronic self-destruct fuzes for DPICM.

Hybrid Propellant is a unique propellant under development for future application in small, medium and large caliber munitions. it combines the advanced chemistry used in BALL POWDER Propellants with the optimum geometry of perforated propellants - resulting in the highest possible performance, which can be tailored to meet specific gun applications. Hybrid propellant releases energy more efficiently than conventional propellants and provides future FCS munitions with: the highest possible muzzle velocity for extended ranges/lethality; the prospect of lighter barrels with less recoil, extended wear characteristics; and the ability to use heavier projectiles at standard muzzle velocities for greater lethality. Hybrid propellant is also more environmentally friendly, and unlike conventional propellants, can be produced with 100% of the raw materials from the US. Hybrid propellant has the potential to drastically reduce gun barrel heat input thus increasing tube life and rates of fire for FCS applications. Under this effort, two deliverables (one 10,000 lb. lot and one 60,000 lb. lot of Hybrid propellant) will be manufactured and delivered for the 155mm Howitzer application. Both lots will be subjected to Ballistic Uniformity testing, Burning Embers/Residue testing, and Ballistic Temperature Sensitivity

Assessment. A sample of Hybrid propellant, on the order of a few hundred pounds, will also be manufactured, delivered, and ballistically tested for Proof of Principle on a 105mm Howitzer platform.

Accomplishments/Planned Program	FY 2004	FY 2005	FY 2006	FY 2007
CCF Design and develop inductive data link	500	0	0	0
CCF Design, develop and integrate gun-hardened system and components	11773	0	0	0
ACA2P Safety Assessment and Gun Qualification	8199	12468	0	0
ACA2P Pre Production Engineering	0	0	1501	0
Develop Integrated Chip Technology for DPICM electronic self-destruct fuzes	962	0	0	0
Hybrid Propellant initial ballistic temperature assessment	150	0	0	0
Fabricate and Characterize Hybrid Propellant	250	0	0	0
Hybrid Propellant heat input assessment	562	0	0	0
Hybrid Propellant: Manufacture and Test (Ballistic and Insensitive Munitions)	0	2584	0	0
Totals	22396	15052	1501	0

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2005

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - System Development and Demonstration	**0604□02A - Weapons and Munitions - Eng Dev**	**AS5**

B. Other Program Funding Summary	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	To Compl	Total Cost
0604802A - Weapons and Munition - Eng Dev	0	0	8278	10110	11197	5089	1519	0	0	36193
Project S36 Course Correcting Fuze (CCF)										

C. Acquisition Strategy: The Army plans to leverage the Navy Guidance Integrated Fuze (GIF) Technology Development (TD) program. The Army is cooperatively working with the Navy to include an Army System Development and Demonstration (SDD) option as part of the Navy TD contract. This option will be executed and transferred to the Army upon successful completion Army Milestone B in FY06. Milestone C is planned for FY08 allowing Low Rate Initial Production to continue for two years. Full Rate Production will begin in FY10.

The ACA2P acquisition fills artillery capability gaps (Bi-Spectral smoke and IR Illumination). Program objectives are to modernize the inventory through replenishment buys in order to meet FCS and Force Entry requirements for extended range, ballistic similitude, insensitive munitions and lethality. 155mm XM0121 IM HE, XM2002 Multi-Spectral Smoke and 105mm XM0125 IM HE Pff entered Safety Assessment in FY04.

The current DPICM SDF contract was modified.

Hybrid Propellant was added to the existing Defense Ordnance & Warheads Technology Consortium (DOTC) contract through a contract modification.

ARMY RDT&E COST ANALYSIS(R3)

February 2005

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604□02A - Weapons and Munitions - Eng Dev

PROJECT
AS5

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . CCF Contracts	Various	Various	8738	0		0		0		0	8738	0
b . ACA2P System Integrator	SS/FFP	GD-OTS, St Petersburg FL	9620	5200	2Q	0		0		0	14820	0
c . ACA2P Pre Production Engineering	SS/FFP	GD-OTS, St Petersburg FL	0	0		1501	2Q	0		0	1501	0
d . Hybrid Propellant Fabricate and Characterize	SS/CPAF	GD-OTS, St Marks Powder, St Marks FL	205	1150	2Q	0		0		0	1355	0
e . Hybrid Propellant: Combustable Cases	SS/CPAF	Armtec, Coachella, CA	0	100	2Q	0		0		0	100	0
f . Hybrid Propellant: Igniter Assemblies	SS/CPAF	GATP, Camden, AR	0	50	2Q	0		0		0	50	0
g . Hybrid Propellant Data Collection and Analysis	SS/CPAF	Veritay, East Amherst NY	200	0		0		0		0	200	0
h . DPICM Contract	SS/FFP	KDI, Cincinnati OH	822	0		0		0		0	822	0
i . Future Fuze Improvements			0	0		0		0		12201	12201	0
Subtotal:			19585	6500		1501		0		12201	39787	0

ARMY RDT&E COST ANALYSIS(R3)

February 2005

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604□02A - Weapons and Munitions - Eng Dev

PROJECT
AS5

II. Support Cost	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Government Support-CCF	In House/MIPR	PM CAS/ARDEC, Picatinny NJ	4345	0		0		0		0	4345	0
b . Product Manager's Office-ACA2P	In House	PM CAS, Picatinny NJ	500	868	1-4Q	0		0		0	1368	0
c . Government IPT Support-ACA2P	MIPR	ARDEC, Picatinny, NJ	1200	2000		0		0	1Q	0	3200	0
d . Government IPT Support-DPICM	MIPR	ARDEC, Picatinny NJ	140	0		0		0		0	140	0
e . Government IPT Support-Hybrid Propellant	MIPR	ARDEC, Picatinny NJ	307	384	2Q	0		0		0	691	0
f . Hybrid Propellant: 155mm gun tubes	MIPR	Watervliet Arsenal, Watervliet, NY	0	300	2Q	0		0		0	300	0
g . Hybrid Propellant: Government IPT Support-Projectiles	MIPR	Rock Island, IL	0	600	2Q	0		0		0	600	0
Subtotal:			6492	4152		0		0		0	10644	0

ARMY RDT&E COST ANALYSIS(R3)

February 2005

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604□02A - Weapons and Munitions - Eng Dev

PROJECT
AS5

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . CCF Testing	Various	Various	500	0		0		0		0	500	0
b . ACA2P Performance & Long Range Testing	MIPR	Yuma Proving Grounds, Yuma AZ	300	2400	3Q	0		0		0	2700	0
c . ACA2P Flight Simulation Testing	MIPR	Aberdeen Proving Ground, Aberdeen MD	300	500	3Q	0		0		0	800	0
d . ACA2P Smoke & Illumination Testing	MIPR	Dugway Proving Ground, Dugway UT	300	1000	3Q	0		0		0	1300	0
e . ACA2P Static Illumination Testing	MIPR	Crane Army Ammunition Activity, Crane IN	200	500	4Q	0		0		0	700	0
f . Hybrid Propellant Testing	MIPR	ARDEC, Picatinny, NJ	50	0		0		0		0	50	0
g . Hybrid Propellant Testing	MIPR	Yuma Proving Grounds, Yuma, AZ	200	0		0		0		0	200	0
Subtotal:			1850	4400		0		0		0	6250	0

ARMY RDT&E COST ANALYSIS(R3)

February 2005

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604□02A - Weapons and Munitions - Eng Dev

PROJECT
AS5

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal:			0	0		0		0		0	0	0
Project Total Cost:			27927	15052		1501		0		12201	56681	0

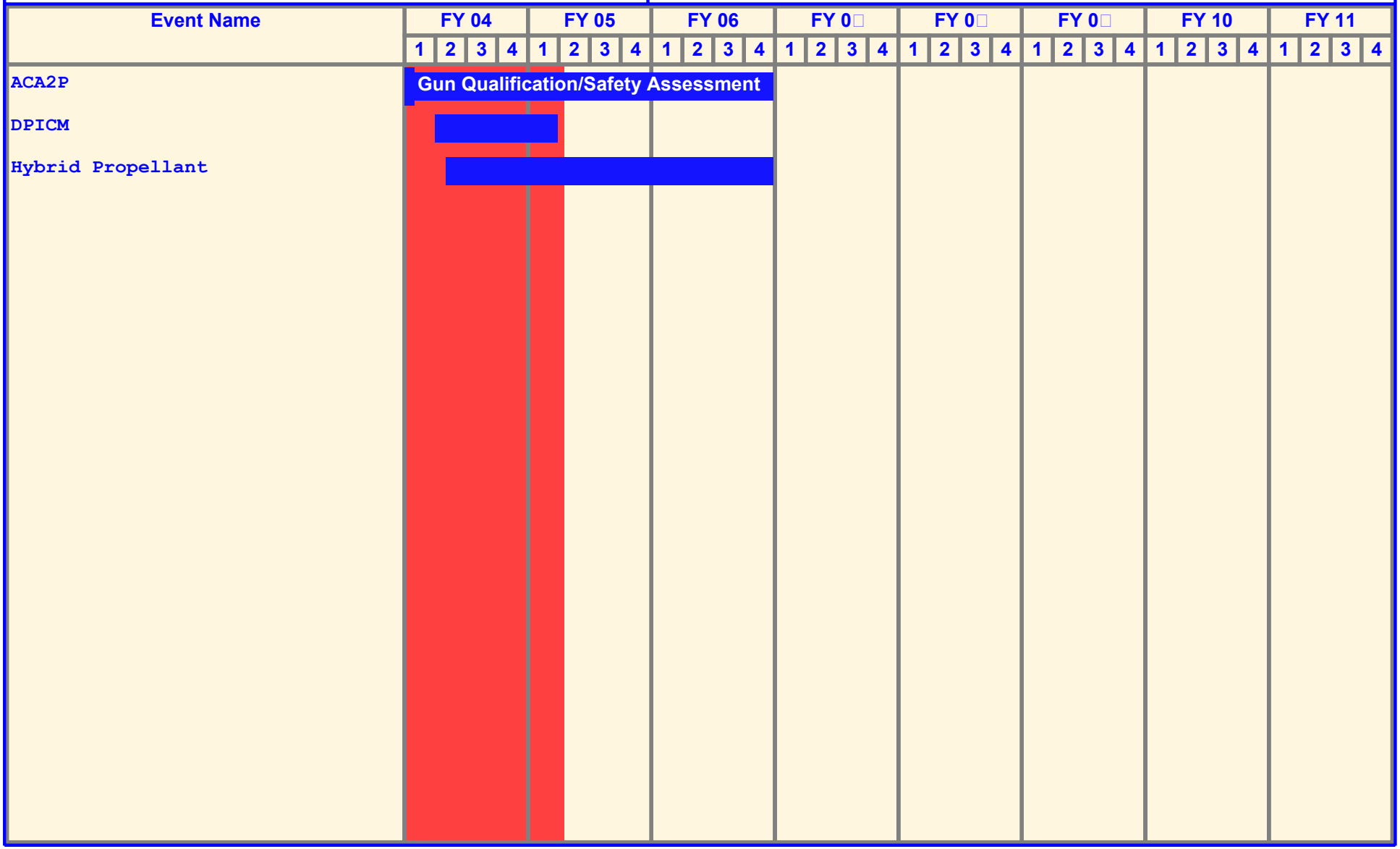
Schedule Profile (R4 Exhibit)

February 2005

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604□02A - Weapons and Munitions - Eng Dev

PROJECT
AS5



Schedule Detail (R4a Exhibit)

February 2005

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - System Development and Demonstration	**0604□02A - Weapons and Munitions - Eng Dev**	**AS5**

Schedule Detail	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
CCF Critical Design Review	3Q							
CCF Testing	4Q							
ACA2P Contract Award	4Q	2Q						
ACA2P Testing	3-4Q	3-4Q						
ACA2P Analysis		3Q						
ACA2P Pre Production Engineering			1-4Q					
DPICM Contract Award	2Q							
Hybrid Propellant Contract Awards	2Q	2Q						
Hybrid Propellant Testing	3-4Q							

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2005

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - System Development and Demonstration	**0604□02A - Weapons and Munitions - Eng Dev**	**AS□**

COST (In Thousands)		FY 2004 Actual	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total Cost
AS8	XM395 PRECISION GUIDED MORTAR MUNITION (PGMM)	0	0	28259	47745	26202	18368	10943	8826	Continuing	Continuing

A. Mission Description and Budget Item Justification: This program provides funds to perform system and technical development that will enhance the effectiveness, lethality, versatility, mobility, and accuracy of mortar systems. FY 2006-FY 2008 funds provide for the continuation and completion of System Development & Demonstration (SDD) of an Increment 1 PGMM. The PGMM will be a precision strike round with advanced sensors, guidance systems and enhanced lethal mechanism technology. It will be capable of a first round defeat of high-value, hard-point targets such as bunkers, command and control centers and stationary lightly armored vehicles. The capability to hit point targets in built-up areas makes this especially valuable in Military Operations in Urban Terrain (MOUT) and Military Operations Other Than War/Stability and Support Operations (MOOTW/SASO) situations. First round hit capability reduces the overall logistical burden, a critical goal for early entry forces. This program is initially funded in FY 2004 and FY 2005 under PE 654802A Project D613. Beginning in FY 2006 funding for PGMM has been transfered to project AS8. This project is therefore not considered a new start.

Accomplishments/Planned Program	FY 2004	FY 2005	FY 2006	FY 2007
PGMM: SD&D Subsystem Test and System Integration	0	0	20087	39277
PGMM: System Engineering	0	0	3553	3643
PGMM: Program Management	0	0	2429	2715
PGMM: Development Test & Evaluation	0	0	2190	2110
Totals	0	0	28259	47745

B. Other Program Funding Summary	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	To Compl	Total Cost
0604802A 613	37069	30884	0	0	0	0	0	0	0	67953
Procurement, Army Ammunition- E86200 (CTG, Mortar, 120mm, PGMM)	0	0	0	0	23028	19964	9734	12224	184300	249250

C. Acquisition Strategy: PGMM program Acquisition Decision Memorandum (ADM) and Acquisition Program Baseline (APB) were approved on 21 May 2004. The PGMM SDD contract was awarded 1 December 2004. The FY 2006 and FY 2007 funds are provided as a continuation of the SDD contract that was initated with FY 2004 Funds.

ARMY RDT&E COST ANALYSIS(R3)

February 2005

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604□02A - Weapons and Munitions - Eng Dev

PROJECT
AS□

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . SD&D- Subsystem Test & System Integration	CPIF/AF	Alliant Techsystems, Plymouth, MN	0	0		20087	1Q	39277	1Q	Continue	Continue	0
Subtotal:			0	0		20087		39277		Continue	Continue	0

II. Support Cost	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Systems Engineering	MIPR	ARDEC, Picatinny, NJ	0	0		3553	1Q	3643	1Q	Continue	Continue	0
Subtotal:			0	0		3553		3643		Continue	Continue	0

ARMY RDT&E COST ANALYSIS(R3)

February 2005

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604□02A - Weapons and Munitions - Eng Dev

PROJECT
AS□

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Design Verification Testing (DVT)	MIPR	Yuma Proving Grounds, Yuma. AZ	0	0		1000	3Q	1500	2Q	Continue	Continue	0
b . Training Simulator Testing	MIPR	PEO Simulation, Training, and Instrumentation, Orlando, FL	0	0		120	1Q	100	1Q	0	220	0
c . System Integration Testing	MIPR	Yuma Proving Grounds, Yuma, AZ	0	0		500	2Q	0		0	500	0
d . User Experiment Test	MIPR	Ft. Benning, GA	0	0		200	2Q	200	1Q	0	400	0
e . Misc Test Support	MIPR	Various	0	0		370	1Q	310	1Q	0	680	0
Subtotal:			0	0		2190		2110		Continue	Continue	0

ARMY RDT&E COST ANALYSIS(R3)

February 2005

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604□02A - Weapons and Munitions - Eng Dev

PROJECT
AS□

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Program Management	In-House	PM Mortars, Picatinny, NJ	0	0		1760	1Q	1826	1Q	Continue	Continue	0
b . Program Management Support	T&M	Various	0	0		669	1Q	889	2Q	0	1558	0
Subtotal:			0	0		2429		2715		Continue	Continue	0
Project Total Cost:			0	0		28259		47745		Continue	Continue	0

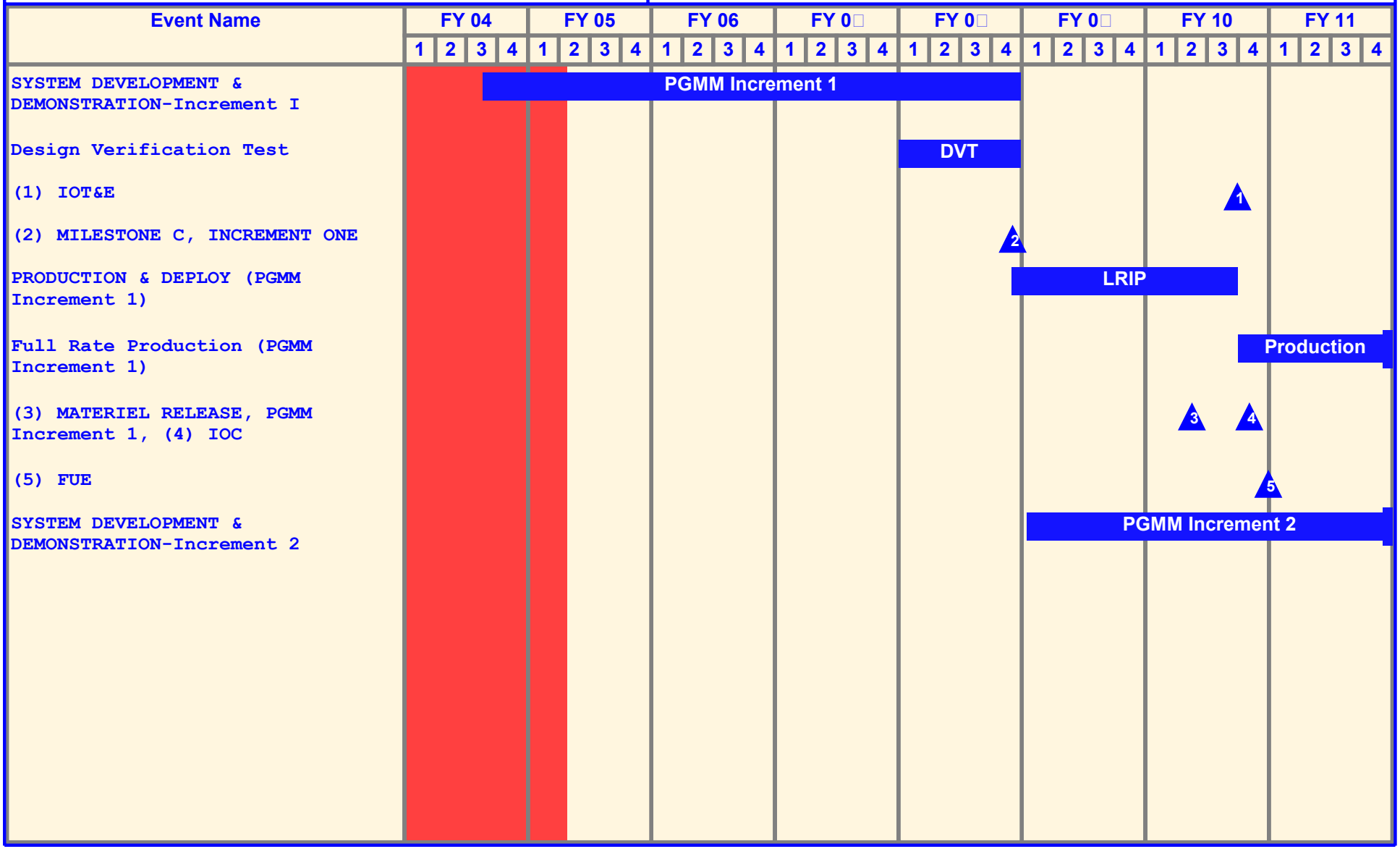
Schedule Profile (R4 Exhibit)

February 2005

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604□02A - Weapons and Munitions - Eng Dev

PROJECT
AS□



Schedule Detail (R4a Exhibit)

February 2005

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - System Development and Demonstration	**0604□02A - Weapons and Munitions - Eng Dev**	**AS□**

Schedule Detail	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Continue SD&D, Incr 1 (follow-on from Proj 613)			1Q					
Design Verification Test					1-4Q			
Limited User Test (LUT)					3Q			
LRIP					4Q			
Milestone C					4Q			
Start SDD, Increment 2						1Q		
IOTE							3Q	
FUE							4Q	
IOC							4Q	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2005

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - System Development and Demonstration	**0604□02A - Weapons and Munitions - Eng Dev**	**S23**

COST (In Thousands)		FY 2004 Actual	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total Cost
S23	SURF LNCH ADV MED RNG AIR-TO-AIR MSL (SLAMRAAM)	36103	63111	36102	29200	0	0	0	0	0	166191

A. Mission Description and Budget Item Justification: Surface Launched Advanced Medium Range Air-To-Air Missile (SLAMRAAM) is the initial kinetic energy component of Integrated Air & Missile Defense (IAMD), an Air and Missile Defense (AMD) Future Force system. The Short Range Air Defense (SHORAD) Project Office merged with Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS) Project office on Janurary 11, 2005 to become the Cruise Missile Defense Systems (CMDS) Project Office. On January 13, 2005 the Program Executive Office for Air, Space and Missile Defense and the Program Executive Office for Tactical Missiles merged to become the Program Executive Office for Missiles and Space (PEOMS). SLAMRAAM is a Missiles and Space System of Systems, consisting of a launcher platform, AIM-120 Advanced Medium Range Air-to-Air Missiles (AMRAAM), a common Army vehicle, launch rails, launcher electronics, on-board command, control, communications, computer (C4) components, Sentinel (Enhanced Target Range and Classification) Sensor, other external Sensors, and an Integrated Fire Control Station (IFCS). SLAMRAAM is a lightweight, day or night, adverse weather, non-line-of-sight (NLOS) fire unit for countering cruise missile (CM), low altitude rotary wing (RW), fixed wing (FW), unmanned aerial vehicle (UAV), and reconnaissance, surveillance, and target acquisition (RSTA) platforms. It supports clutter engagements in close combat areas where maneuvering forces and their supporting units operate. SLAMRAAM's force protection mission is to engage the low-altitude aerial threats out to 18km. SLAMRAAM IFCS is the initial incremental System of System (SoS) capability which delivers the command and control fire control and communication connectivity. This initial SLAMRAAM build is critical to SoS, since it supports smart evolution of the follow-on capabilities.

Accomplishments/Planned Program	FY 2004	FY 2005	FY 2006	FY 2007
Product Development	23146	47566	22110	9295
Support Cost	773	1004	372	350
Test and Evaluation	4795	9672	9950	15856
Management Services	7389	4869	3670	3699
Totals	36103	63111	36102	29200

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2005

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604□02A - Weapons and Munitions - Eng Dev

PROJECT
S23

B. Other Program Funding Summary	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	To Compl	Total Cost
PE 643869, MEADS	236823	251414	0	0	0	0	0	0	0	488237
PE 654869M06, PATRIOT/MEADS CAP	0	0	288785	326352	454511	510672	510389	490441	0	2581150
PE 273801, PATRIOT PIP	45587	32082	16188	10607	10884	11119	12029	12520	0	151016
PE 654865, PAC-3	151318	61482	0	0	0	0	0	0	0	212800
PE C49100, PATRIOT	616942	487364	489700	494754	466004	471770	0	0	0	3026534
PE C50001, PATRIOT/MEADS CAP	0	0	0	0	88425	64338	423209	663557	0	1239529
PE 172419, JLENS	57803	79316	106420	256893	471997	332428	0	0	0	1304857
PE BZ0525, JLENS Prod	0	0	0	0	0	29153	549707	397776	0	976636
PE 654802, SLAMRAAM	36103	63111	36102	29200	0	0	0	0	0	164516
PE C81001, SLAMRAAM Prod	7397	2440	19315	21970	59273	13124	0	0	0	123519
PE 654820, SENTINEL	0	5851	5080	2547	2647	0	0	0	0	16125
PE WK5057, SENTINEL Prod	20646	7337	8393	15373	25074	31572	34473	32552	0	175420
PE 643327, Integrated Fire Control AMD	40275	0	24961	42736	48894	50930	0	0	0	207796

This PE is an integral part of the Missile and Space System of Systems (SoS) including Integrated Fire Control, JLENS, Patriot/MEADS Combined Aggregate Program (CAP), SLAMRAAM, JTAGS, SENTINEL, and on-going initiatives to achieve Single Integrated Air Picture (SIAP).

C. Acquisition Strategy: System Development and Demonstration (SDD) contract award in 2nd Quarter FY04. SDD will be a 41 month effort, culminated by completion of IOT&E in 4th Qtr FY08. Initial Operational Capability (IOC) available in FY08.

ARMY RDT&E COST ANALYSIS(R3)

February 2005

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604□02A - Weapons and Munitions - Eng Dev

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S23

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Contractor Hardware/Software Development	CPIF	Raytheon, Tewksbury, MA	19778	47309	1Q	22110	1Q	9295	1-3Q	0	98492	98492
b . Government Prototype Manufacturing (GFE)	MIPR	SFAE-MSLS-CMDS	3368	257	1Q	0		0		0	3625	0
Subtotal:			23146	47566		22110		9295		0	102117	98492

II. Support Cost	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Contractor Support Costs	CPIF	Raytheon, Tewksbury, MA	773	1004	1Q	372		350		0	2499	2499
Subtotal:			773	1004		372		350		0	2499	2499

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BUDGET ACTIVITY
5 - System Development and Demonstration

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III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Contractor System Test & Evaluation	CPIF	Raytheon, Tewksbury, MA	488	2243	1Q	4428		5867		0	13026	13026
b . Government System Test & Evaluation	MIPR	CMDS (SFAE-MSLS-CMDS) Redstone Arsenal, AL	1257	3879	1Q	3618		7539		0	16293	0
c . Government Modeling & Simulation	MIPR	CMDS (SFAE-MSLS-CMDS) Redstone Arsenal, AL	3050	3550	1Q	1904		2450		0	10954	0
Subtotal:			4795	9672		9950		15856		0	40273	13026

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Contractor SE/PM	CPIF	Raytheon, Tewksbury, MA	4732	2681	1Q	2058	1Q	1524		0	10995	10995
b . Government SE/PM	MIPR	CMDS (SFAE-MSLS-CMDS) Redstone Arsenal, AL	4332	2188	1Q	1612	1Q	2175	1Q	0	10307	0
Subtotal:			9064	4869		3670		3699		0	21302	10995

Remarks: Government Modeling & Simulation included in Test & Evaluation.

Project Total Cost:			37778	63111		36102		29200		0	166191	125012

Schedule Profile (R4 Exhibit)

February 2005

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604□02A - Weapons and Munitions - Eng Dev

PROJECT
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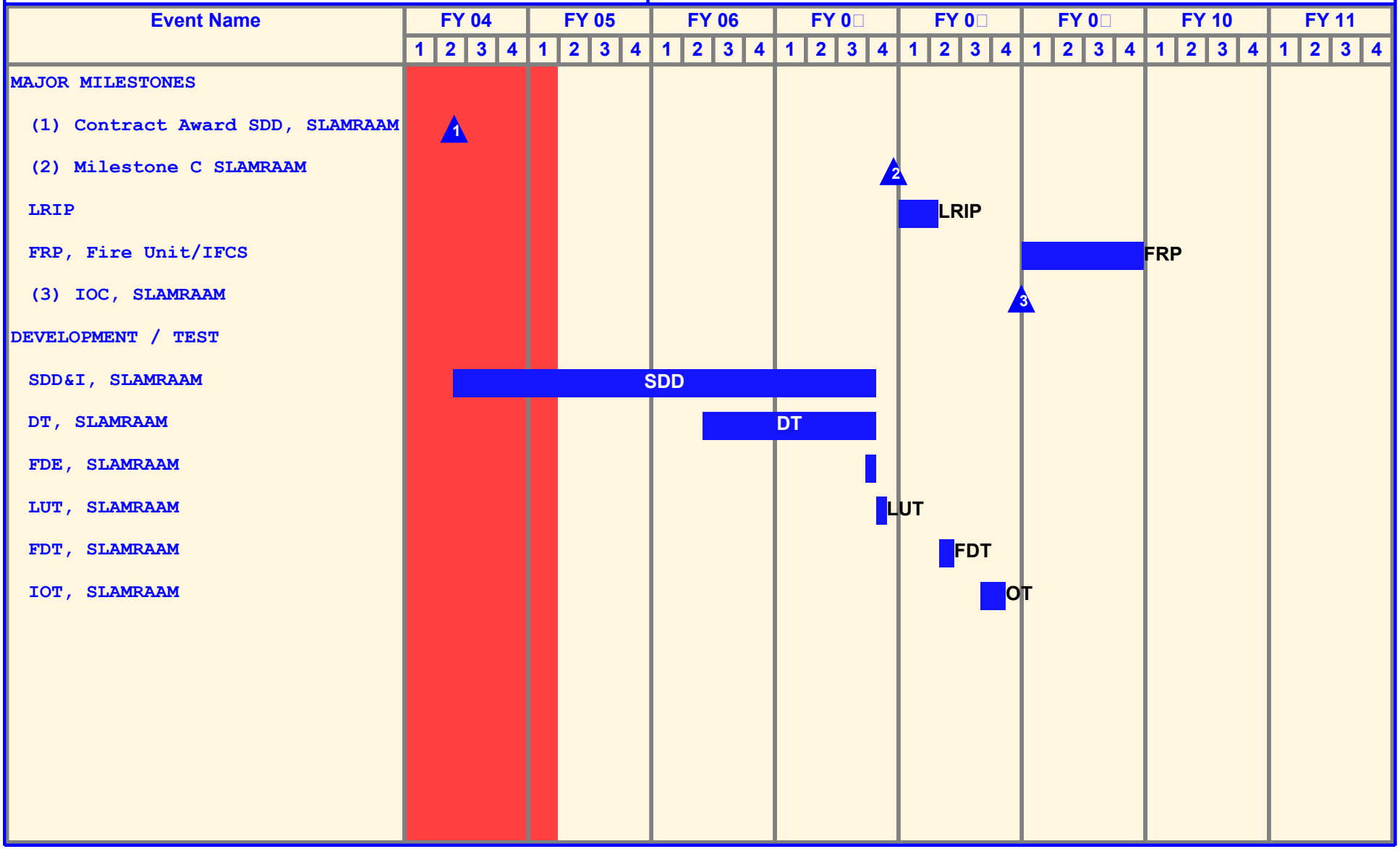

Schedule Detail (R4a Exhibit)

February 2005

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - System Development and Demonstration	**0604□02A - Weapons and Munitions - Eng Dev**	**S23**

Schedule Detail	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Milestone C				4Q				
LRIP					1-2Q			
Full Rate Production					4Q	1-4Q		
IOC					4Q			
SDD&I	2-4Q	1-4Q	1-4Q	1-4Q				
DT			2-4Q	1-3Q				
FDE				3-4Q				
LUT				4Q				
FDT					2Q			
IOT					3-4Q			

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2005

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - System Development and Demonstration	**0604□02A - Weapons and Munitions - Eng Dev**	**S36**

COST (In Thousands)		FY 2004 Actual	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total Cost
S36	COURSE CORRECTING FUZE (CCF)	0	0	8278	10110	11197	5089	1519	0	0	36193

A. Mission Description and Budget Item Justification: The Course Correcting Fuze (CCF) is currently being pursued as a solution to meet the Precision Guidance Kit Capability Development Document requirement. The CCF is adaptable to existing stockpile and future conventional cannon artillery projectiles. The CCF corrects the ballistic trajectory of the projectile to reduce delivery errors and thus improves projectile accuracy. The CCF will effectively reduce target delivery error of conventional artillery munitions and reduce the number of projectiles required to execute a fire mission. The CCF will benefit 155mm projectiles as well as the family of 105mm projectiles. The increase in effectiveness offered by the CCF gives commanders the operational capability to defeat more targets with the same basic load, while reducing the logistical burden associated with the current mission requirements.

Accomplishments/Planned Program	FY 2004	FY 2005	FY 2006	FY 2007
Supporting documentation and Milestone B execution	0	0	1174	0
Prepare RFP and conduct evaluation for SDD award	0	0	1600	0
Design and develop inductive data link	0	0	400	500
Design, develop, and integrate gun-hardened system and components	0	0	4904	7860
Testing	0	0	200	1750
Totals	0	0	8278	10110

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2005

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - System Development and Demonstration	**0604□02A - Weapons and Munitions - Eng Dev**	**S36**

B. Other Program Funding Summary	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	To Compl	Total Cost
0604802A Weapons and Munitions - Eng Dev Project AS5	12284	0	0	0	0	0	0	0	0	12284
E99250 Course Correcting Fuze (CCF)	0	0	0	0	11202	30661	35855	48083	0	125801

C. Acquisition Strategy: The Army plans to leverage the Navy Guidance Integrated Fuze (GIF) Technology Development (TD) program. The Army is cooperatively working with the Navy to include an Army System Development and Demonstration (SDD) option as part of the Navy TD contract. This option will be executed and transferred to the Army upon successful completion Army Milestone A/B in FY06. Milestone C is planned for FY08 allowing Low Rate Initial Production to continue for two years. Full Rate Production will begin in FY10.

ARMY RDT&E COST ANALYSIS(R3)

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BUDGET ACTIVITY
5 - System Development and Demonstration

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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . CCF Study Contract	FFP	Altarum, Ann Arbor MI	0	0		0		0		0	0	0
b . CCFStudy Contract	FFP	Ares, Arlington VA	0	0		150	2Q	150	2Q	0	300	0
c . CCF Analysis Contract	FFP	Alion, Rome NY	0	0		200	2Q	200	2Q	0	400	0
d . CCF Contract	CPAF	TBS	0	0		3704	2Q	6710		Continue	Continue	0
Subtotal:			0	0		4054		7060		Continue	Continue	0

II. Support Cost	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Product Manager's Office	In House	PM CAS, Picatinny NJ	0	0		3124	1-4Q	360	1-4Q	Continue	Continue	0
b . Government IPT Support	MIPR	ARDEC, Picatinny NJ	0	0		900	1-3Q	940	1-3Q	Continue	Continue	0
Subtotal:			0	0		4024		1300		Continue	Continue	0

ARMY RDT&E COST ANALYSIS(R3)

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BUDGET ACTIVITY
5 - System Development and Demonstration

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III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Safety and Performance Testing	MIPR	Yuma Proving Grounds, Yuma AZ	0	0		0		1450	2-4Q	Continue	Continue	0
b . Wind Tunnel Testing	MIPR	Redstone Arsenal, Redstone AL	0	0		100	3Q	150	2Q	0	250	0
c . Railgun Testing	MIPR	ARDEC, Picatinny NJ	0	0		100	1Q	150	1-2Q	0	250	0
Subtotal:			0	0		200		1750		Continue	Continue	0

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal:			0	0		0		0		0	0	0

Project Total Cost:			0	0		8278		10110		Continue	Continue	0

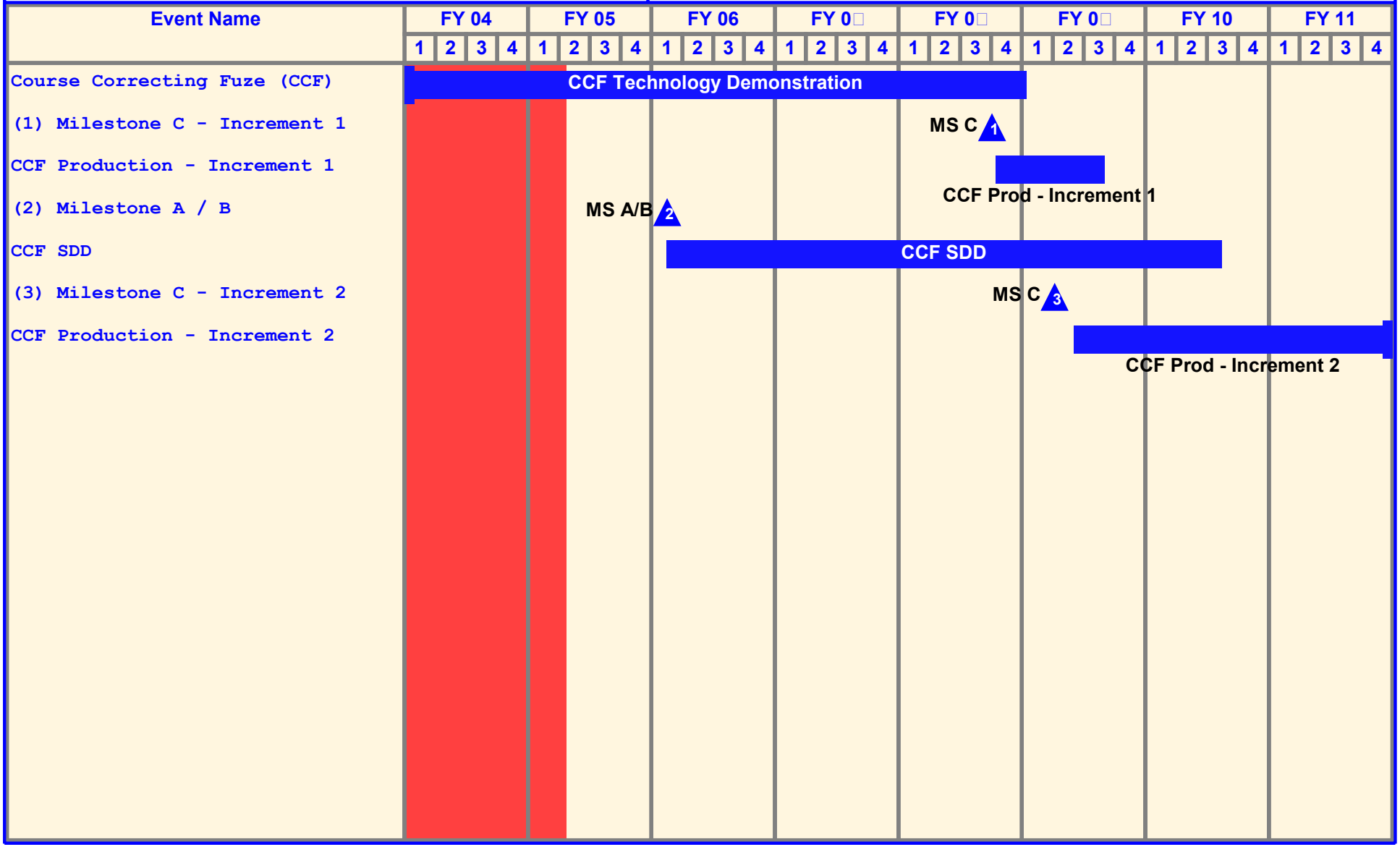
Schedule Profile (R4 Exhibit)

February 2005

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604□02A - Weapons and Munitions - Eng Dev

PROJECT
S36



Schedule Detail (R4a Exhibit)

February 2005

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - System Development and Demonstration	**0604□02A - Weapons and Munitions - Eng Dev**	**S36**

Schedule Detail	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Contract Award			1Q					
Milestone A/B			1Q					
Systems Requirement Review			3Q					
Prelinary Design Review				1Q				
Milestone C - Increment 1			2Q					
Critical Design Review					3Q			
Limited Users Test					3Q			
Milestone C - Increment 2						1Q		
Initial Capability - Increment 1						2Q		
Initial Operational Test and Evaluation							2-3Q	
Materiel Release							4Q	
Initial Operational Capability							4Q	