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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2013 Army	<b>DATE:</b> February 2012
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<b>APPROPRIATION/BUDGET ACTIVITY</b> 2040: <i>Research, Development, Test &amp; Evaluation, Army</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603639A: <i>Tank and Medium Caliber Ammunition</i>
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COST (\$ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
Total Program Element	35.849	40.314	30.560	-	30.560	19.812	7.083	-	-	Continuing	Continuing
652: <i>M829E4 120mm Cartridge</i>	35.849	40.314	30.560	-	30.560	19.812	7.083	-	-	Continuing	Continuing

**Note**

FY 2011: \$5.0 million Congressional decrement.

FY 2013: Funds were realigned to other higher priority requirements.

**A. Mission Description and Budget Item Justification**

The Direct Fire Advanced Technology (DFAT) Program Element (PE) encompasses a comprehensive program to develop, rapidly transition to production, and field advanced tank, medium and small caliber munitions. These programs will ensure continued battlefield overmatch and lethality of U.S. maneuver forces despite worldwide development and proliferation of enhanced armored vehicle protection technologies. To achieve this, DFAT will identify and develop promising technologies through competitive development and streamlined acquisition procedures. All ammunition development funds within this PE are managed to facilitate transitions between phases, avoid administrative delays, and focus resources on the most promising areas.

The M829E4 cartridge is an unguided, direct fire, platform-delivered Line of Sight (LOS) munition that will provide fast response lethality to rapidly destroy threat targets with Explosive Reactive Armor (ERA) and Active Protection Systems (APS) in the close fight from 0-2km (T) and to 0-4km (O). The M829E4 will be compatible with the 120mm Current Force Abrams Main Battle Tank. FY 2011 M829E4 AKE Cartridge funding supports the completion of Engineering and Manufacturing Development (EMD) Phase I and Phase II initiation of the M829E4. FY 2012 funding supports design finalization, design verification, testing and fabrication of Design, Test and Evaluation hardware and beginning of testing. FY 2013 will feature building of test hardware for final qualification testing.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2013 Army			DATE: February 2012		
APPROPRIATION/BUDGET ACTIVITY		R-1 ITEM NOMENCLATURE			
2040: Research, Development, Test & Evaluation, Army		PE 0603639A: Tank and Medium Caliber Ammunition			
BA 4: Advanced Component Development & Prototypes (ACD&P)					
B. Program Change Summary (\$ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total
Previous President's Budget	42.183	39.693	47.208	-	47.208
Current President's Budget	35.849	40.314	30.560	-	30.560
Total Adjustments	-6.334	0.621	-16.648	-	-16.648
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.106	-			
• Adjustments to Budget Years	-5.000	0.621	-16.648	-	-16.648
• Other Adjustments 1	-0.228	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2013 Army								DATE: February 2012			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 4: Advanced Component Development & Prototypes (ACD&P)				R-1 ITEM NOMENCLATURE PE 0603639A: Tank and Medium Caliber Ammunition				PROJECT 652: M829E4 120mm Cartridge			
COST (\$ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
652: M829E4 120mm Cartridge	35.849	40.314	30.560	-	30.560	19.812	7.083	-	-	Continuing	Continuing
Quantity of RDT&E Articles											
A. Mission Description and Budget Item Justification											
The M829E4 cartridge is a platform-delivered Line of Sight (LOS) munition that will provide capability for the current force Heavy Brigade Combat Team's (HBCT) commander to conduct decisive operations and destroy current and future enemy Main Battle Tanks (MBTs) equipped with Explosive Reactive Armor (ERA) and Active Protection Systems (APS) at ranges from 0-2km (T) and 0-4km (O). The M829E4 will provide the capability to destroy and or neutralize the adversary armor and capabilities. After a competitive shoot off in FY 2011 ATK was awarded the option to continue EMD Phase II until its conclusion in FY 2014. FY 2012 supports the continuation of Phase II of the M829E4 cartridge Engineering and Manufacturing Development (EMD). FY 2013 funding supports design finalization, design verification, fabrication and testing of Design, Test and Evaluation hardware. The full performance of the M829E4 is obtained with an Ammunition Data Link breach modification firing from the Abrams equipped tank.											
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2011	FY 2012	FY 2013	
Title: Phase I Engineering and Manufacturing Development (EMD)  Articles:  Description: Funding is provided for the following effort:  FY 2011 Accomplishments: Complete Phase I with shoot off and down select to one prime contractor.								3.661 0	-	-	
Title: Demonstration Test  Articles:  Description: Funding is provided for the following effort:  FY 2011 Accomplishments: The demonstration test is a competitive shoot-off between the two contractors. This test is conducted by the Government in which								6.188 0	-	-	
Title: Phase II EMD  Articles:  Description: Funding is provided for the following effort:  FY 2011 Accomplishments:								26.000 0	30.000 0	20.500	

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Exhibit R-2A, RDT&E Project Justification: PB 2013 Army		DATE: February 2012		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 ITEM NOMENCLATURE PE 0603639A: Tank and Medium Caliber Ammunition	PROJECT 652: M829E4 120mm Cartridge		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2011	FY 2012	FY 2013
Phase II of EMD which occurred after the down select, a single design was matured, analyzed, tested and evaluated to insure all requirements were met/ exceeded. Testing focused on the highest risks. Establishment and planning for qualification was included. Detailed safety and performance tests were conducted, and the subsystem designs were optimized for performance. <b>FY 2012 Plans:</b> Continuing Phase II of EMD in which the design will be optimized and a preliminary Technical Data Package (TDP) established. The design will be further tested, and refined. Process maps and TDP documentation will be prepared. Hardware for a Design Evaluation Test (DET) test will also be fabricated and DT&E test hardware/ components will be procured and initiate (Load Assembled Pack) LAP of DET cartridges. <b>FY 2013 Plans:</b> Continuing in Phase II of EMD, the design will be finalized, tested and evaluated to insure all requirements are met/ exceeded. Cartridges will be fabricated for DT&E testing, operational tests and live fire testing. A Technical Data Package (TDP) will be revised and a detailed specification shall be assembled. Production manufacturing fixtures and subsystem test equipment will be established and qualified.				
<b>Title:</b> Design Evaluation Testing  <b>Articles:</b>  <b>Description:</b> Funding is provided for the following effort:  <b>FY 2012 Plans:</b> Design Evaluation testing (DET) is an interim test of the finalized design prior to the build of the DT&E. This includes the test and analysis activities leading to DT&E. Analysis includes complete systems analysis with the use of modeling and simulation tools. DET is a risk reduction test to quantify performance of the design prior to the design freeze at a Critical Design review (CDR) at the end of FY 2012.		-	4.184 0	-
<b>Title:</b> Developmental Test & Evaluation (DT&E)  <b>Articles:</b>  <b>Description:</b> Funding is provided for the following effort:  <b>FY 2012 Plans:</b> The Development Test & Evaluation covers the build and test at the conclusion of EMD which is of a single design. The capability is demonstrated and performance against the performance specification quantified. The data and evaluation of this test support milestone C and Type Classified - Standard (TC-STD) decisions. Documentation for these milestones will be generated and compiled. Tests consist of a battery of safety, performance tests to assure army requirements are met/ exceeded. During FY		-	6.130 0	10.060

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Exhibit R-2A, RDT&E Project Justification: PB 2013 Army							DATE: February 2012				
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 4: Advanced Component Development & Prototypes (ACD&P)			R-1 ITEM NOMENCLATURE PE 0603639A: Tank and Medium Caliber Ammunition			PROJECT 652: M829E4 120mm Cartridge					
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)							FY 2011	FY 2012	FY 2013		
2012 the planning and manufacturing of special test fixtures & equipment will be fabricated/ procured for testing and subsequent qualification.											
FY 2013 Plans: The Development Test & Evaluation (DT&E) is the testing and analysis at the conclusion of EMD. A single design will undergo a battery of tests in which the capability is proven/ demonstrated, performance quantified. This covers the Test and Evaluation, the analysis of the results and the documentation that supports Milestone C and the TC-STD . Testing includes safety, survivability, armor testing, insensitive munitions, ballistic testing, noise, toxic fumes, and terminal impact dispersion/ accuracy tests. This effort also includes the live fire tests, user excursion tests and Stationary Ammunition accuracy testing.											
Accomplishments/Planned Programs Subtotals							35.849	40.314	30.560		
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
• Advanced Kinetic Energy: Advanced Kinetic Energy (AKE)							36.788			Continuing	Continuing
D. Acquisition Strategy											
The M829E4, Advanced Kinetic Energy cartridge is at Technology Readiness Level 6 (TRL6). The Milestone B Decision was obtained in 4Q FY 2009, and the program entered Engineering and Manufacturing Development (EMD) in FY 2010. EMD consists of two phases; the Phase I contract was awarded in 2Q FY 2010 and the Phase II contract was awarded in 3Q FY 2011. During Phase I (15 months), the Government awarded two separate Cost Plus Fixed Fee (CPFF) contracts culminating in a demonstration test and competitive source selection to down select to one contractor for the 31 month Cost Plus Incentive Fee (CPIF) Phase II. The down select was based on the demonstrated performance of the cartridge design, proposed systems engineering and management approach for Phase II, and the total program cost estimate for each contractor at the time of the demonstration test. ATK was awarded the option to continue EMD Phase II until its conclusion in FY 2014. Upon successful completion of Milestone C, a Low Rate Initial Production (LRIP) option will be awarded to ATK in 3Q FY 2014. The contract will also contain options for two additional production years. All production options are Firm Fixed Price (FFP).											
E. Performance Metrics											
Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2013 Army											DATE: February 2012			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 4: Advanced Component Development & Prototypes (ACD&P)				R-1 ITEM NOMENCLATURE PE 0603639A: Tank and Medium Caliber Ammunition				PROJECT 652: M829E4 120mm Cartridge						
Product Development (\$ in Millions)				FY 2012		FY 2013 Base		FY 2013 OCO		FY 2013 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
ATK Phase II	C/CPIF	ATK:Minnesota	102.500	30.000		20.500		-		20.500	Continuing	Continuing	Continuing	
PM-MAS	MIPR	PM-MAS Picatinny Arsenal:NJ	2.930	1.000		1.000		-		1.000	Continuing	Continuing	Continuing	
GD-OTS Phase 1	C/CPFF	GD-OTS:St.Petersburg, FL	2.068	-		-		-		-	0.000	2.068	0.000	
ATK Phase 1	C/CPFF	ATK:Minnesota	5.254	-		-		-		-	0.000	5.254	0.000	
Subtotal			112.752	31.000		21.500		-		21.500				
Support (\$ in Millions)				FY 2012		FY 2013 Base		FY 2013 OCO		FY 2013 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
ARDEC	MIPR	Picatinny:New Jersey	8.432	2.400		2.200		-		2.200	Continuing	Continuing	Continuing	
Subtotal			8.432	2.400		2.200		-		2.200				
Test and Evaluation (\$ in Millions)				FY 2012		FY 2013 Base		FY 2013 OCO		FY 2013 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Aberdeen Proving Ground	MIPR	APG:Aberdeen, MD	5.860	2.000		2.360		-		2.360	Continuing	Continuing	Continuing	
YPG	MIPR	YUMA:YUMA, AZ	6.321	1.930		2.000		-		2.000	Continuing	Continuing	Continuing	
ATEC	MIPR	ATEC:Aberdeen, MD	0.300	0.100		0.200		-		0.200	Continuing	Continuing	Continuing	
Watervliet	MIPR	Watervliet:Troy, NY	0.534	0.334		0.200		-		0.200	0.000	1.068	0.000	
JMC	MIPR	JMC:Rock Island, IL	1.350	0.750		0.600		-		0.600	Continuing	Continuing	Continuing	
Army Research Lab	MIPR	ARL:Aberdeen, Maryland	7.014	1.800		1.500		-		1.500	Continuing	Continuing	Continuing	
Subtotal			21.379	6.914		6.860		-		6.860				

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2013 Army								DATE: February 2012			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 4: Advanced Component Development & Prototypes (ACD&P)			R-1 ITEM NOMENCLATURE PE 0603639A: Tank and Medium Caliber Ammunition				PROJECT 652: M829E4 120mm Cartridge				
	Total Prior Years Cost	FY 2012		FY 2013 Base		FY 2013 OCO		FY 2013 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	142.563	40.314		30.560		-		30.560			

Remarks

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Exhibit R-4, RDT&amp;E Schedule Profile: PB 2013 Army

<b>DATE:</b> February 2012
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**APPROPRIATION/BUDGET ACTIVITY**

2040: Research, Development, Test & Evaluation, Army  
BA 4: Advanced Component Development & Prototypes (ACD&P)

### R-1 ITEM NOMENCLATURE

PE 0603639A: *Tank and Medium Caliber  
Ammunition*

PROJECT
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652: M829E4 120mm Cartridge

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2013 Army			<b>DATE:</b> February 2012
<b>APPROPRIATION/BUDGET ACTIVITY</b> 2040: <i>Research, Development, Test &amp; Evaluation, Army</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603639A: <i>Tank and Medium Caliber Ammunition</i>	<b>PROJECT</b> 652: <i>M829E4 120mm Cartridge</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Phase II Contract Award	3	2011	3	2011
Engineering and Manufacturing Development (EMD) Phase II	3	2011	1	2014
Integrated Baseline Review 2 (IBR)	4	2011	4	2011
Design Evaluation Testing (DET)	3	2012	1	2013
Developmental Test & Evaluation (DT&E)	4	2012	3	2014
Milestone C	3	2014	3	2014