Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Army

DATE: February 2011

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)

•	•	• •	,										
COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost		
Total Program Element	33.202	42.183	39.693	-	39.693	47.208	58.882	68.743	64.109	Continuing	Continuing		
652: ADVANCED KINETIC ENERGY (AKE) 120MM CARTRIDGE	32.602	42.183	39.684	-	39.684	37.767	7.584	2.197	-	Continuing	Continuing		
656: FCS Mounted Combat System (MCS) Ammunition	-	-	0.009	-	0.009	9.441	51.298	66.546	64.109	Continuing	Continuing		
694: MEDIUM CALIBER AMMUNITION	0.600	-	-	-	-	-	-	-	-	0.000	0.600		

Note

FY 2012: Funds were realigned from the Advanced Multi-Purpose (AMP) cartridge program and the M829E4 program (\$78,855K) to 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 ammunitions. 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.

FY 2011 M829E4 AKE Cartridge funding supports the completion of Engineering and Manufacturing Development (EMD) Phase I and Phase II initiation of the M829E4. The M829E4 round 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 and 120mm platforms. FY 2012 funding supports design finalization, design verification, testing and fabrication of Design, Test and Evaluation hardware and beginning of testing. FY 13 will feature near completion of testing and preparation for Milestone C.

Funding in FY 2012 on Project 656 supports the Milestone B decision for the Advanced Multi-Purpose (AMP) cartridge program. The AMP is a platform delivered, multi-purpose cartridge that will provide the Abrams Tank and future 120mm platforms with the capability to defeat a multitude of targets throughout the joint battle space. AMP will be optimized for use in urban environments in direct support of infantry. It will provide a new wall-breaching capability and the ability to engage and defeat dismounted enemy forces such as Anti-Tank Guided Missile teams at ranges from 50m to 2000m (T) and 50m to 4500m (O). The AMP cartridge is a next generation multi-purpose round that will replace the M830 HEAT-MP-T, M830A1 HEAT MP-T, M1028 Canister, and M908 OR-T cartridges by consolidating the capabilities into a single round. FY13 funding for AMP will be utilized to conduct source selection efforts, make initial EMD contract award(s) and evaluate and demonstrate competing

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Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Army

DATE: February 2011

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)

EMD prototypes. The Abrams Main Battle Tank must be equipped with an Ammunition Data Link in order to realize the full performance benefits of our future munitions including M829E4 and AMP.

The Hell Hound project 694 was a 40mm Low Velocity door breeching cartridge for Infantry using the M203 grenade launcher which breeches doors from a distance. Funding analysis and testing concluded in FY10.

B. Program Change Summary (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	33.757	42.183	118.548	-	118.548
Current President's Budget	33.202	42.183	39.693	-	39.693
Total Adjustments	-0.555	-	-78.855	-	-78.855
 Congressional General Reductions 		-			
 Congressional Directed Reductions 		-			
 Congressional Rescissions 	-	-			
 Congressional Adds 		-			
 Congressional Directed Transfers 		-			
 Reprogrammings 	-	-			
SBIR/STTR Transfer	-	-			
 Adjustments to Budget Years 	-	-	-78.855	-	-78.855
Other Adjustments 1	-0.555	-	-	-	-

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Exhibit R-2A, RDT&E Project Just	ification: PB	3 2012 Army					DATE: February 2011				
APPROPRIATION/BUDGET ACTIV 2040: Research, Development, Test BA 4: Advanced Component Develo	R-1 ITEM N PE 0603639 Ammunition	PA: Tank and		aliber	PROJECT 652: ADVANCED KINETIC ENERGY (AKE) 120MM CARTRIDGE						
COST (\$ in Millions) FY 2010 FY 2011 Base				FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
652: ADVANCED KINETIC ENERGY (AKE) 120MM CARTRIDGE	32.602	42.183	39.684	-	39.684	37.767	7.584	2.197	-	Continuing	Continuing
Quantity of RDT&E Articles											

A. Mission Description and Budget Item Justification

The M829E4 round 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) 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. FY 2012 supports the continuation of Phase II of the M829E4 cartridge Engineering and Manufacturing Development (EMD). FY 2012 funding supports design finalization, design verification, testing and fabrication of Design, Test and Evaluation hardware and beginning of that testing. The Abrams Main Battle Tank must be equipped with an Ammunition Data Link in order to realize the full performance benefits of our future munitions including the M829E4 and AMP.

The M829E4 is the next generation premier Kinetic Energy (KE) round and will replace the current Abrams KE round (M829A3). The M829E4 will provide lethal overmatch against designated threats throughout all combat operations, to include Military Operation in Urban Terrain (MOUT), mountain, and non-traditional battlefields. The increased performance against standard armor, ERA, and APS will allow for the use of fewer rounds and will increase survivability of the platform with improved defeat capability at extended ranges beyond 2km.

M829E4 will be compatible with 120mm Current Force Abrams main battle tank and future 120mm platforms.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: Phase I Engineering and Manufacturing Development (EMD)	29.332	2.000	-
Articles:	0	0	
Description: Funding is provided for the following effort:			
FY 2010 Accomplishments: Phase I awarded two prime contracts for multiple competing prototypes.			
FY 2011 Plans: Complete Phase I with shoot off and down select to one prime contractor.			
Title: Intial Performance Test	3.270	-	-
Articles:	0		

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Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: Fe	bruary 2011	
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 4: Advanced Component Development & Prototypes (ACD&P)			ETIC ENERG	Y (AKE)	
B. Accomplishments/Planned Programs (\$ in Millions, Article Qu	antities in Each)		FY 2010	FY 2011	FY 2012
Description: Funding is provided for the following effort:					
FY 2010 Accomplishments: Initial Performance Testing					
Title: Demonstration Test		Articles:	-	3.250 0	-
Description: Funding is provided for the following effort:					
FY 2011 Plans: The demonstration test is a competitive shoot-off between the two con "the contractors designs will be assessed" for performance and mature		nt in which			
Title: Phase II EMD		Articles:	-	36.933 0	29.664
Description: Funding is provided for the following effort:					
FY 2011 Plans: Phase II of EMD which occurs after the down select, a single design verguirements are met /exceeded. Detailed safety and performance temperformance at the end of Phase II.		ed for			
FY 2012 Plans: Continuing Phase II of EMD in which the design will be finalized, teste exceeded. Hardware will be fabricated for FY12/13 DT&E testing.	ed and evaluated to insure all requirements are me	t /			
Title: Design Evaluation Testing			-	-	4.020
Description: Funding is provided for the following effort:					
FY 2012 Plans: Design Evaluation Test (DET) is a interim test of the finalized design production test to quantify performance of the design prior to design free					
Title: Developmental Test & Evaluation (DT&E)			-	-	6.000
Description: Funding is provided for the following effort:					

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Exhibit R-2A, RDT&E Project Justification: PB 2012 Army	DATE: February 2011		
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATURE	PROJECT	
2040: Research, Development, Test & Evaluation, Army	PE 0603639A: Tank and Medium Caliber	652: <i>ADVA</i>	NCED KINETIC ENERGY (AKE)
BA 4: Advanced Component Development & Prototypes (ACD&P)	Ammunition	120MM CA	RTRIDGE

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
FY 2012 Plans: The Developmental Test & Evaluation is the test at the conclusion of EMD which is of a single design, in which the capability is demonstrated and performance quantified. The data and evaluation of this test supports Milestone-C and TC-STD(Type Classified - Standard Decisions). This consists of a battery of safety and performance tests to assure ARMY requirements are met/exceeded. Testing will include survivability, Insensitive Munitions, armor, Ballistic and Safety test.			
Accomplishments/Planned Programs Subtotals	32.602	42.183	39.684

C. Other Program Funding Summary (\$ in Millions)

			FY 2012	FY 2012	FY 2012					Cost To	
<u>Line Item</u>	FY 2010	FY 2011	<u>Base</u>	<u>000</u>	<u>Total</u>	FY 2013	FY 2014	FY 2015	FY 2016	Complete	Total Cost
MCS: Advanced Kinetic Energy							30.182	36.788		Continuing	Continuing
(AKE)											

D. Acquisition Strategy

The M829E4, Advanced Kinetic Energy cartridge is at Technology Readiness Level 6 (TRL6). The Milestone B Decision was made in 4Q FY 2009, and the program entered Engineering and Manufacturing Development (EMD) in FY 2010. EMD consists of two phases; the Phase I contracts was awarded in 2Q FY 2010 and the Phase II contract will be 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 33 month Cost Plus Incentive Fee (CPIF) Phase II. The down-select will be 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. The selected contractor will be 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 the EMD Phase II contractor in 1Q 2014. The contract will also contain options for two additional production years. All production options will be 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 2012 Army

DATE: February 2011

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: ADVANCED KINETIC ENERGY (AKE)

120MM CARTRIDGE

Product Development	FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total						
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date Co	ost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
GD-OTS	Various	GD-OTS:St.Petersburg, FL	-	4.000		-		-		-	Continuing	Continuing	Continuing
ATK	Various	ATK:ATK Minnesota	-	4.000		-		-		-	Continuing	Continuing	Continuing
PM-MAS	MIPR	PM-MAS:Picatinny Arsenal, NJ	-	0.774		1.000		-		1.000	Continuing	Continuing	Continuing
TBS (Phase II)	Various	TBS:TBS	-	27.000	:	33.364		-		33.364	Continuing	Continuing	Continuing
		Subtotal	-	35.774		34.364		-		34.364			

Support (\$ in Millions)					011	FY 2012 Base		FY 2012 OCO		FY 2012 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	ARDEC:Picatinny, NJ	-	2.602		2.100		-		2.100	Continuing	Continuing	Continuing
Subtotal -			2.602		2.100		-		2.100				

Test and Evaluation (\$		FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 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
Yuma Proving Ground	MIPR	YPG:Yuma, AZ	-	1.200		1.400		-		1.400	Continuing	Continuing	Continuing
Aberdeen Proving Ground	MIPR	APG:Aberdeen, MD	-	0.750		0.800		-		0.800	Continuing	Continuing	Continuing
Battelle	MIPR	Battelle:Richland,WA	-	-		-		-		-	Continuing	Continuing	Continuing
ATEC	MIPR	ATEC:Aberdeen, MD	0.100	-		0.100		-		0.100	Continuing	Continuing	0.000
Watervliet	MIPR	Watervliet:Troy, NY	-	-		0.320		-		0.320	0.000	0.320	0.000
JMC	MIPR	JMC:Rock Island, IL	-	-		0.600		-		0.600	Continuing	Continuing	Continuing
Army Research Lab	MIPR	ARL:Aberdeen, Maryland	-	1.857		-		-		-	0.000	1.857	0.000
Subtotal 0.100				3.807		3.220		-		3.220			

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Army

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: ADVANCED KINETIC ENERGY (AKE)
120MM CARTRIDGE

Total F	Prior									Target
Yea	ırs			FY 2012	FY 2	2012	FY 2012	Cost To		Value of
Cos	st	FY 20 ⁻	11	Base	oco		Total	Complete	Total Cost	Contract
Project Cost Totals 0	0.100	42.183		39.684	-		39.684			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2012 Army **DATE:** February 2011 APPROPRIATION/BUDGET ACTIVITY **R-1 ITEM NOMENCLATURE PROJECT** 2040: Research, Development, Test & Evaluation, Army PE 0603639A: Tank and Medium Caliber 652: ADVANCED KINETIC ENERGY (AKE) BA 4: Advanced Component Development & Prototypes (ACD&P) 120MM CARTRIDGE Ammunition FY 2010 FY 2011 FY 2013 FY 2015 FY 2012 FY 2014 FY 2016 2 2 3 4 1 2 3 4 2 3 4 2 3 4 3 4 2 3 4 1 2 Phase I Contract Award Engineering and Manufacturing Development (EMD) Engineering and Manufacturing Development (EMD) Phase I Integrated Baseline Review (IBR) System Functional Review (SFR) Initial Performance Test Preliminary Design Review (PDR) **Demonstration Testing** Phase II Contract Award Engineering and Manufacturing Development (EMD) Phase II Integrated Baseline Review 2 (IBR) Design Evaluation Testing (DET) Developmental Test & Evaluation (DT&E) Milestone C

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Exhibit R-4A, RDT&E Schedule Details: PB 2012 Army

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: ADVANCED KINETIC ENERGY (AKE)

DATE: February 2011

120MM CARTRIDGE

Schedule Details

	Sta	End		
Events	Quarter	Year	Quarter	Year
Phase I Contract Award	1	2010	1	2010
Engineering and Manufacturing Development (EMD)	1	2010	1	2014
Engineering and Manufacturing Development (EMD) Phase I	1	2010	2	2011
Integrated Baseline Review (IBR)	2	2010	2	2010
System Functional Review (SFR)	2	2010	2	2010
Initial Performance Test	2	2010	3	2010
Preliminary Design Review (PDR)	4	2010	4	2010
Demonstration Testing	3	2010	1	2011
Phase II Contract Award	2	2011	2	2011
Engineering and Manufacturing Development (EMD) Phase II	2	2011	4	2013
Integrated Baseline Review 2 (IBR)	4	2012	4	2012
Design Evaluation Testing (DET)	1	2012	3	2012
Developmental Test & Evaluation (DT&E)	3	2012	4	2013
Milestone C	4	2013	4	2013

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Exhibit R-2A, RDT&E Project Justi	fication: PE	3 2012 Army	•						DATE : Febr	uary 2011	
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 656: FCS Mounted Combat System (MCS) Ammunition				
COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
656: FCS Mounted Combat System (MCS) Ammunition	-	-	0.009	-	0.009	9.441	51.298	66.546	64.109	Continuing	Continuing
Quantity of RDT&E Articles											

A. Mission Description and Budget Item Justification

The Advanced Multi Purpose (AMP) program is scheduled to enter Engineering and Manufacturing Development (EMD) in FY 2012. The AMP program is a direct fire line of sight 120mm large caliber munition to be developed for the Abrams Main Battle Tank, as well as other future 120mm direct fire platforms. It has three modes of operation including point detonate, delay, and airburst. AMP is the materiel solution for breaching reinforced concrete walls and defeating Anti Tank Guided Missile (ATGM) Teams from 50m to 2000m (T) and 50m to 4500m (O), a validated gap that cannot currently be met with existing stockpiled ammunition. Additional targets include bunkers, dismounted infantry, light armor and obstacle reduction. Added benefits of the AMP program come from the consolidation of capabilities currently provided by four stockpiled 120mm munitions including the M830 HEAT-MP-T, M830A1 HEAT-MP-T, M908 OR-T and the M1028 Canister. This consolidation addresses current 120mm aging stockpile issues, results in a reduced logistical burden, and provides the Warfighter with the operational benefit of being able to battle carry a single munition for various target engagement scenarios. AMP will increase platform survivability by providing a lethal overmatch throughout traditional and non-traditional combat operations including Military Operation in Urban Terrain (MOUT). The Abrams Main Battle Tank must be equipped with an Ammunition Data Link in order for the full performance benefit of AMP and other future munitions to be realized. FY13 funding will be utilized to evaluate and demonstrate competing EMD prototypes, conduct source selection efforts, make initial EMD contract award(s), and initiate contractor EMD efforts.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2010	FY 2011	FY 2012
Title: PM-MAS	-	-	0.009
Description: Funding is provided for the following effort			
FY 2012 Plans: FY12 funding will be utilized to support a MS B decision and prepare acquisition documents required to issue RFP and award EMD contracts.			
Accomplishments/Planned Programs Subtotals	-	-	0.009

C. Other Program Funding Summary (\$ in Millions)

N/A

D. Acquisition Strategy

FY12 funding will be utilized to support a MS B decision and prepare acquisition documents required to issue RFP and award EMD contracts.

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Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE : February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army 3A 4: Advanced Component Development & Prototypes (ACD&P)	R-1 ITEM NOMENCLATURE PE 0603639A: Tank and Medium Caliber Ammunition	PROJECT 656: FCS Mounted Combat System (MCS) Ammunition
E. Performance Metrics		
Performance metrics used in the preparation of this justification mat	erial may be found in the FY 2010 Army Perform	ance Budget Justification Book, dated May 2010
,	,	, ,

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Exhibit R-2A, RDT&E Project Just	tification: PE	3 2012 Army	,						DATE: Feb	ruary 2011	
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 4: Advanced Component Development & Prototypes (ACD&P)							PROJECT 694: MEDIUM CALIBER AMMUNITION				
COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
694: MEDIUM CALIBER AMMUNITION	0.600	-	-	-	-	-	-	-	-	0.000	0.600
Quantity of RDT&E Articles											

A. Mission Description and Budget Item Justification

Funding on Project 694 supports the purchase and test of the 40mm Hell Hound cartridge. The Hell Hound is a low velocity 40mm cartridge fired from the M203 and M320 grenade launchers. The purpose of the test is to determine whether the Hell Hound can breech doorways from a distance by infantry forces in a more efficient and safer manner than currently available with other methods.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: Hell Hound Evaluation	0.600	-	-
Articles:	0		
Description: Purchase and Test Hell Hound			
FY 2010 Accomplishments:			
Purchase and Test Hell Hound			
Accomplishments/Planned Programs Subtotals	0.600	-	-

C. Other Program Funding Summary (\$ in Millions)

N/A

D. Acquisition Strategy

There is no budget beyond FY 2008 Congressional funding.

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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