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Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Army **DATE:** February 2011

APPROPRIATION/BUDGET ACTIVITY

2040: *Research, Development, Test & Evaluation, Army*
BA 5: *Development & Demonstration (SDD)*

R-1 ITEM NOMENCLATURE

PE 0605456A: *PAC-3/MSE MISSILE*

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	-	62.500	88.993	-	88.993	37.587	68.938	63.468	64.215	Continuing	Continuing
PA3: <i>PAC-3/MSE MISSILE</i>	-	62.500	88.993	-	88.993	37.587	68.938	63.468	64.215	Continuing	Continuing

Note

The funding increase of \$26.893 million dollars in FY2012 is for the MSE follow-on test, ground system integration and live fire test and evaluation.

A. Mission Description and Budget Item Justification

This system is an integral part of the overall Air and Missile Defense (AMD) architecture and will provide for an incrementally fielded Integrated Air and Missile Defense Fire Control System/capability for the composite Army Air and Missile Defense Brigades.

The PATRIOT Advanced Capability 3 (PAC-3) is the evolution of the phased material change improvement to PATRIOT. It is continuously being improved via hardware and software changes to provide enhanced performance across the spectrum for system and threat intercept performance. The latest missile improvement is the Missile Segment Enhancement (MSE) and has been accepted as the baseline missile for the Medium Extended Air Defense System (MEADS). It is being developed by the U.S. for PATRIOT to meet the U.S. operational requirements. The MSE will provide a more agile and lethal interceptor that increases the engagement envelope/ defended area of PATRIOT and the MEADS systems. The MSE improves upon the current PAC-3 missile capability with a higher performance solid rocket motor, modified lethality enhancer, more responsive control surfaces, upgraded software, and insensitive munitions improvements.

Near term efforts to include ground system software evolution to best utilize both the PAC-3 and MSE missile capabilities within the PATRIOT system are being implemented.

The Army is developing an MSE path forward which may impact the projected 4th Qtr FY14 First Unit Equipped (FUE) due to evolving funding limitations and flight test progress. If MSE is delayed, the Army would expect to continue to procure the PAC-3 Missile in FY13.

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APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 5: Development & Demonstration (SDD)		R-1 ITEM NOMENCLATURE PE 0605456A: PAC-3/MSE MISSILE			
B. Program Change Summary (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	-	62.500	62.100	-	62.100
Current President's Budget	-	62.500	88.993	-	88.993
Total Adjustments	-	-	26.893	-	26.893
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	26.893	-	26.893

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Exhibit R-2A, RDT&E Project Justification: PB 2012 Army								DATE: February 2011			
APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 5: <i>Development & Demonstration (SDD)</i>				R-1 ITEM NOMENCLATURE PE 0605456A: <i>PAC-3/MSE MISSILE</i>				PROJECT PA3: <i>PAC-3/MSE MISSILE</i>			
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
PA3: <i>PAC-3/MSE MISSILE</i>	-	62.500	88.993	-	88.993	37.587	68.938	63.468	64.215	Continuing	Continuing
Quantity of RDT&E Articles											

Note
From 2006 thru 2010, this system was funded under the PATRIOT/MEADS Combined Aggregate Program (CAP) program element: 0604869A.

A. Mission Description and Budget Item Justification
This system is an integral part of the overall Air and Missile Defense (AMD) architecture and will provide for an incrementally fielded Integrated Air and Missile Defense Fire Control System/capability for the composite Army Air and Missile Defense Brigades.

The PATRIOT Advanced Capability 3 (PAC-3) is the evolution of the phased material change improvement to PATRIOT. It is continuously being improved via hardware and software changes to provide enhanced performance across the spectrum for system and threat intercept performance. The latest missile improvement is the Missile Segment Enhancement (MSE) and has been accepted as the baseline missile for the Medium Extended Air Defense System (MEADS). It is being developed by the U.S. for PATRIOT to meet the U.S. operational requirements. The MSE will provide a more agile and lethal interceptor that increases the engagement envelope/ defended area of PATRIOT and the MEADS systems. The MSE improves upon the current PAC-3 missile capability with a higher performance solid rocket motor, modified lethality enhancer, more responsive control surfaces, upgraded software, and insensitive munitions improvements.

Near term efforts to include ground system software evolution to best utilize both PAC-3 and MSE missile capabilities within the PATRIOT system are being implemented.

The Army is developing an MSE path forward which may impact the projected 4th Qtr FY14 First Unit Equipped (FUE) due to evolving funding limitations and flight test progress. If MSE is delayed, the Army would expect to continue to procure the PAC-3 Missile in FY13.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: MSE upgrades <div style="text-align: right;">Articles:</div>	-	18.940 0	37.181
Description: Funding is provided for the following effort FY 2011 Plans:			

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APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 5: Development & Demonstration (SDD)	R-1 ITEM NOMENCLATURE PE 0605456A: PAC-3/MSE MISSILE	PROJECT PA3: PAC-3/MSE MISSILE		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2010	FY 2011	FY 2012
MSE specific qualification activities to include Solid Rocket Motor (SRM), Ignition Safety Device (ISD), canister, Functional Configuraton Audit (FCA). and completion of Guided Test Flight 2 (GTF-2), and MSE corrective action upgrade for future follow-on qualification activities. FY 2012 Plans: Continues MSE upgrade and qualification activities.				
Title: Program integration efforts Description: Funding is provided for the following effort FY 2011 Plans: Implementation of common redesign program integration efforts to support PAC-3/MSE missile improvements for initiation and completion of US operational needs. FY 2012 Plans: Integration of PAC-3 modernization hardware items in support of MSE follow-on flight tests (task 7.4 and 7.5) and MSE ground system integration.		Articles: -	31.960 0	38.490
Title: Range support for testing, targets, and modeling and simulation Description: Funding is provided for the following effort FY 2011 Plans: White Sands Missile Range (WSMR) Engineering support, MSE Live Fire Test and Evaluation (LFTE), hardware and set-up of test activities to prove out test readiness. FY 2012 Plans: Continues range support for LFTE, modeling and simulation, and MSE follow-on test.		Articles: -	11.600 0	13.322
Accomplishments/Planned Programs Subtotals		-	62.500	88.993

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APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 5: Development & Demonstration (SDD)				R-1 ITEM NOMENCLATURE PE 0605456A: PAC-3/MSE MISSILE				PROJECT PA3: PAC-3/MSE MISSILE			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	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
• PE 0604869A, Proj M06, PATRIOT/MEAD: PE 0604869A, Proj M06, PATRIOT/MEADS Combined Aggregate Program (CAP)	570.831	467.139	382.772		382.772					Continuing	Continuing
• SSN C53101, MSE Missile: SSN C53101, MSE Missile			74.953		74.953		532.540	487.049	560.099	Continuing	Continuing
• SSN C53201, PATRIOT/MEADS GSE: SSN C53201, PATRIOT/ MEADS GSE											
• PE 0102419A, Proj E55, JLENS: PE 0102419A, Proj E55, JLENS	317.132	372.493	344.655		344.655		58.124	19.717	19.726	Continuing	Continuing
• SSN BZ0525, JLENS Production: SSN BZ0525, JLENS Production							501.459	454.966	416.888	Continuing	Continuing
• PE 0604802A, Prpj S23, SLAMRAAM: PE 0604802A, Prpj S23, SLAMRAAM	56.441									Continuing	Continuing
• PE 0605455A, Proj S345 SLAMRAAM: PE 0605455A, Proj S345 SLAMRAAM		23.700	19.931		19.931					Continuing	Continuing
• SSN C81002, SLAMRAAM Launcher: SSN C81002, SLAMRAAM Launcher		116.732								Continuing	Continuing
• SSN C81004, SLAMRAAM Missile: SSN C81004, SLAMRAAM Missile											
• PE 0603305A, Proj TR7, Protection C: PE 0603305A, Proj TR7, Protection Capability II - Intercept		4.296	21.216		21.216		89.021	92.999	142.738	Continuing	Continuing
• SSN WK5053, FAAD GBS: SSN WK5053, FAAD GBS		91.467	7.958		7.958					Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2012 Army							DATE: February 2011				
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C. Other Program Funding Summary (\$ in Millions)

Line Item	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
• PE 0603327A, Proj S34, AMD System: <i>PE 0603327A, Proj S34, AMD System of System Engineering and Integration</i>	164.719									Continuing	Continuing
• PE 0605457A, Proj S40 Army Integrat: <i>PE 0605457A, Proj S40 Army Integrated Air and Missile Defense (AIAMD)</i>		251.124	254.745		254.745		346.341	298.869	275.651	Continuing	Continuing
• SSN BZ5075, Army IAMD Battle Comman: <i>SSN BZ5075, Army IAMD Battle Command System (IBCS)</i>							23.587	100.560	256.855	Continuing	Continuing
• PE 0208053m Proj 635, Joint Tact Gr: <i>PE 0208053m Proj 635, Joint Tact Grd Station-P3I (MIP)</i>	13.189	12.403	27.630		27.630		14.109	7.912	8.039	Continuing	Continuing
• SSN BZ8401, Joint Tactical Ground S: <i>SSN BZ8401, Joint Tactical Ground Station (JTAGS)</i>	6.682	9.279	1.199		1.199		9.740	4.432	4.496	Continuing	Continuing
• PE 0604820A, Proj E10, SENTINEL: <i>PE 0604820A, Proj E10, SENTINEL</i>			2.721		2.721		1.983	1.968	2.937	Continuing	Continuing

D. Acquisition Strategy

The design objective of the PATRIOT system is to provide an element of an integrated Ballistic Missile Defense system capable of being modified to cope with the evolving threat. This strategy minimizes technological risks and provides a means of enhancing system capability through planned upgrades of deployed systems. PAC-3 system development efforts further improve system capabilities against emerging and reactive threats. The PAC-3 Missile Program focuses on developing, fabricating and testing the high velocity, hit to kill, surface to air missile and associated ground support equipment to provide essential increases in battle space, accuracy, lethality and firepower to counter and destroy evolving air defense threats. The missile performance is demonstrated through a series of flight tests and modeling and simulation activities. The latest missile improvement is the PAC-3 MSE program which provides extended ranges, insensitive munitions enhancements, and greater logistical flexibility. The PAC-3 MSE will be fielded to PATRIOT units and is the baseline missile for MEADS.

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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 5: Development & Demonstration (SDD)					R-1 ITEM NOMENCLATURE PE 0605456A: PAC-3/MSE MISSILE				PROJECT PA3: PAC-3/MSE MISSILE					
Management Services (\$ in Millions)					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	
Government Program Management	Various	Various:Huntsville, AL	-	1.003		1.003		-		1.003	Continuing	Continuing	Continuing	
Subtotal			-	1.003		1.003		-		1.003				
Product Development (\$ in Millions)					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	
Missile Segment Enhancement (MSE) - Lockheed Martin Missiles and Fire Control (LMMFC)	C/CPIF	LMMFC:Dallas, TX	-	15.940		17.000		-		17.000	Continuing	Continuing	Continuing	
Program Integration	Various	Various:Huntsville, AL	-	19.832		22.454		-		22.454	Continuing	Continuing	Continuing	
MSE/PAC-3 Raytheon	Various	Raytheon:Waltham, Massachusetts	-	3.000		18.500		-		18.500	Continuing	Continuing	Continuing	
PAC-3 Product Office	Various	PO:Huntsville, Alabama	-	4.997		2.327		-		2.327	Continuing	Continuing	Continuing	
SETA Contracts	Various	Various:Huntsville, AL	-	2.380		3.609		-		3.609	Continuing	Continuing	Continuing	
U.S. Other Government Agencies (OGAs)	Various	Various:Huntsville, AL	-	3.748		6.200		-		6.200	Continuing	Continuing	Continuing	
Subtotal			-	49.897		70.090		-		70.090				
Test and Evaluation (\$ in Millions)					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	
Targets/Threat Simulators	Various	Various:Huntsville, AL	-	1.500		4.000		-		4.000	Continuing	Continuing	Continuing	
Modeling and Simulation	Various	Various:Huntsville, AL	-	1.900		1.700		-		1.700	Continuing	Continuing	Continuing	
Contractor T&E funding	Various	Various:Huntsville, AL	-	3.100		3.700		-		3.700	Continuing	Continuing	Continuing	
Other T&E Funding	Various	WSMR, White Sands, NM/Ft Wingate, White	-	5.100		8.500		-		8.500	Continuing	Continuing	Continuing	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Army										DATE: February 2011			
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Test and Evaluation (\$ in Millions)				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
		Sands, NM:White Sands, NM											
Subtotal			-	11.600		17.900		-		17.900			

	Total Prior Years Cost	FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	62.500		88.993		-		88.993			

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2012 Army			DATE: February 2011		
APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 5: <i>Development & Demonstration (SDD)</i>		R-1 ITEM NOMENCLATURE PE 0605456A: <i>PAC-3/MSE MISSILE</i>		PROJECT PA3: <i>PAC-3/MSE MISSILE</i>	

	FY 2010				FY 2011				FY 2012				FY 2013				FY 2014				FY 2015				FY 2016			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
PDB 7 Fielding - Modernized Adjunct Processor (MAP)																												
Missile Segment Enhancement (MSE) Development																												
MSE Production Decision																												
MSE Production Contract Award																												
PDB 8 Fielding - Radar Digital Processor (RDP)																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2012 Army			DATE: February 2011
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
PDB 7 Fielding - Modernized Adjunct Processor (MAP)	2	2012	2	2012
Missile Segment Enhancement (MSE) Development	4	2010	1	2013
MSE Production Decision	4	2012	4	2012
MSE Production Contract Award	4	2012	4	2012
PDB 8 Fielding - Radar Digital Processor (RDP)	3	2015	3	2015