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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>					PE 0605456A / <i>PAC-3/MSE Missile</i>							
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	33.709	2.272	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	35.981
PA3: <i>PAC-3/MSE Missile</i>	-	33.709	2.272	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	35.981

Note

Realigned requirements not unique to MSE to PE 0205456A EF9 in FY15.

A. Mission Description and Budget Item Justification

This system is an integral part of the overall Air and Missile Defense (AMD) architecture and enables the incremental fielding of the Integrated Air and Missile Defense Fire Control System/capability for the composite Army Air and Missile Defense Battalions.

The PAC-3 Missile Segment Enhancement (MSE) is the latest version of the PAC-3 Missile. It provides a more agile and lethal interceptor that increases the engagement envelope/defended area of the PATRIOT System. Both Live Fire Test and Evaluation (LFT&E) and Initial Operational Test & Evaluation (IOT&E) activities are required to be executed during Low Rate Initial Production (LRIP) in support of the planned Full Rate Production (FRP) decision. As software and hardware improvements are developed there is a continuing need for system level modeling, simulations, and tests. Modeling and Simulation allow for performance assessment against all threats that would not be possible in flight tests due to cost, target, and range constraints. Flight testing is periodically required for validation of the Modeling and Simulation as well as satisfying Army Test & Evaluation Command/Director, Operational Test & Evaluation (ATEC/DOTE) requirements.

B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	34.991	2.272	0.000	-	0.000
Current President's Budget	33.709	2.272	0.000	-	0.000
Total Adjustments	-1.282	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.282	-			

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army										Date: February 2016		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605456A / PAC-3/MSE Missile				Project (Number/Name) PA3 / PAC-3/MSE Missile			
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
PA3: PAC-3/MSE Missile	-	33.709	2.272	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	35.981
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Missile Segment Enhancement (MSE) is the latest version of the PAC-3 Missile. It provides a more agile and lethal interceptor that increases the engagement envelope/defended area of the PATRIOT System. Both LFT&E and IOT&E activities are required to be executed during Low Rate Initial Production (LRIP) in support of the planned Full Rate Production (FRP) decision. As software and hardware improvements are developed there is a continuing need for system level modeling, simulations, and tests. Modeling and Simulation allow for performance assessment against all threats that would not be possible in flight tests due to cost, target and range constraints. Flight testing is periodically required for validation of Modeling and Simulation as well as satisfying ATEC/DOTE requirements.

PATRIOT is an integral part of the overall Air and Missile Defense (AMD) Architecture and enables the incremental fielding of the system capability for Army Air and Missile Defense Battalions.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2015	FY 2016	FY 2017
Title: MSE PAC-3	11.851	-	-
Description: Funding is provided for the following efforts			
FY 2015 Accomplishments: Provided Missile Segment Enhancement / PAC-3 technical support for initial PDB-8.			
Title: Testing, Targets, and Modeling and Simulation	21.858	2.272	-
Description: Funding is provided for the following efforts			
FY 2015 Accomplishments: Integration of missile and ground system hardware and software. Test activities to support Test and Evaluation Master Plan (TEMP) for initial IOT&E activities.			
FY 2016 Plans: Continues test activities to support the Test and Evaluation Master Plan (TEMP) for IOT&E activities.			
Accomplishments/Planned Programs Subtotals	33.709	2.272	-

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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605456A / PAC-3/MSE Missile	Project (Number/Name) PA3 / PAC-3/MSE Missile
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u> <u>Base</u>	<u>FY 2017</u> <u>OCO</u>	<u>FY 2017</u> <u>Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• SSN C53101: SSN C53101, MSE Missile	532.605	414.946	423.201	-	423.201	459.040	497.009	529.839	520.513	Continuing	Continuing
• SSN C50016: SSN C50016, Lower-Tier Air and Missile Defense (AMD)	110.300	115.075	126.470	-	126.470	112.888	122.768	150.444	120.542	Continuing	Continuing
• PE 0205456: PE 0205456, Proj EF9, System Integration and Test	78.720	64.159	70.547	-	70.547	79.750	81.138	96.209	113.810	Continuing	Continuing
• PE 0604319A: PE 0604319A, Proj DU3, IFPC2, (FY12 PE 0603305A IFPC II - Intercept)	96.131	155.361	-	-	-	-	-	-	-	0	251.492
• SSN C62002: SSN C62002, IFPC Inc 2-I Block 1 Missile	-	-	-	-	-	73.552	123.106	186.840	146.300	Continuing	Continuing
• SSN C62001: SSN C62001, IFPC Inc 2-I Block 1 System	-	-	19.319	-	19.319	47.289	138.547	174.760	287.325	Continuing	Continuing
• PE 0604820A: PE 0604820A, Proj E10, SENTINEL	5.221	12.309	17.152	-	17.152	21.035	20.792	30.277	41.577	Continuing	Continuing
• PE 0605457A: PE 0605457A, Proj S40 Army Integrated Air and Missile Defense (AIAMD)	152.516	214.099	225.769	-	225.769	169.241	153.097	33.058	34.581	Continuing	Continuing
• SSN BZ5075: SSN BZ5075, IAMD Battle Command System (IBCS)	-	20.917	204.513	-	204.513	296.361	375.763	443.637	-	Continuing	Continuing
• PE 0604741A: PE 0604741A, Proj 126,146,149, Air Defense C2I Eng Dev	15.898	24.569	27.131	-	27.131	20.524	20.018	18.082	-	Continuing	Continuing
• SSN AD50700: SSN AD50700; Air & Missile Defense Planning & Control Sys	27.374	28.176	25.443	-	25.443	25.690	26.032	6.366	7.000	Continuing	Continuing
• PE 0202429A: PE 0202429A Proj EP8 JLENS COCOM EXERCISE	43.248	40.565	46.371	-	46.371	6.746	-	-	-	0	136.930

Remarks

This program is an integral part of the Army Integrated Air and Missile Defense (IAMD) architecture.

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605456A / PAC-3/MSE Missile	Project (Number/Name) PA3 / PAC-3/MSE Missile

D. Acquisition Strategy

The design objective of the PATRIOT system is to provide an element of an Integrated Air and 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 PAC-3 / MSE program evolves the PAC-3 system providing extended ranges, insensitive munitions enhancements, and greater logistical flexibility. The PAC-3 MSE will be fielded to U.S. PATRIOT units.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605456A / PAC-3/MSE Missile	Project (Number/Name) PA3 / PAC-3/MSE Missile
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Management Services (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Government Program Management	Various	Various : Huntsville, AL	4.109	-		-		-		-		-	0	4.109	4.109
PAC-3 Product Office	Various	Various : Huntsville, AL	12.028	1.000	Dec 2014	-		-		-		-	0	13.028	0
Subtotal			16.137	1.000		-		-		-		-	0.000	17.137	4.109

Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Integration	Various	Various : Huntsville, AL	49.581	-		-		-		-		-	0	49.581	49.573
MSE/PAC-3 Raytheon	Various	Raytheon : Waltham, Massachusetts	52.809	-		-		-		-		-	0	52.809	52.809
SETA Contracts	Various	Various : Huntsville, AL	12.648	-		-		-		-		-	0	12.648	12.640
Subtotal			115.038	-		-		-		-		-	0.000	115.038	115.022

Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Targets/Threat Simulators	Various	Various : Huntsville, AL	32.251	-		-		-		-		-	0	32.251	32.251
Modeling and Simulation	Various	Various : Huntsville, AL	7.904	-		-		-		-		-	0	7.904	7.904
Contractor T&E funding	Various	Various : Huntsville, AL / Dallas, TX	11.476	5.114	Dec 2014	-		-		-		-	0	16.590	24.185
Other T&E Funding	MIPR	Various : Holloman AFB, NM	27.067	6.295	Dec 2014	2.272	Dec 2015	-		-		-	0	35.634	36.338
Mobile Flight Mission Simulator	TBD	Raytheon : Massachusetts	21.500	-		-		-		-		-	0	21.500	21.500

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605456A / PAC-3/MSE Missile	Project (Number/Name) PA3 / PAC-3/MSE Missile
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MSE System Test and Evaluation	1	2014	2	2017
DTE	4	2015	3	2016
IOT&E	3	2016	4	2017