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

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604756N / <i>Ship Self Def (Engage: Hard Kill)</i>
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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	699.997	94.534	86.811	114.475	-	114.475	196.008	182.398	106.978	106.018	Continuing	Continuing
0167: <i>5in Rolling Airframe Missile</i>	206.119	12.304	14.275	18.100	-	18.100	19.346	7.461	3.513	0.459	Continuing	Continuing
0173: <i>NATO Sea Sparrow</i>	446.151	73.988	67.836	90.256	-	90.256	132.700	108.653	80.792	82.432	Continuing	Continuing
0243: <i>ALaMO</i>	0.000	0.000	0.000	5.759	-	5.759	25.984	24.982	0.000	0.000	0.000	56.725
3342: <i>Griffin Missile</i>	47.727	2.407	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	50.134
9081: <i>Phalanx CIWS SEARAM</i>	0.000	5.835	1.000	0.360	-	0.360	17.978	41.302	22.673	23.127	Continuing	Continuing
9999: <i>Congressional Adds</i>	0.000	0.000	3.700	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.700

A. Mission Description and Budget Item Justification

This program element provides funding for the development of systems that fulfill a portion of the third phase of the Ship Self Defense: Engage Hard Kill. Development in this line will focus on hard kill capabilities in which missiles are used to intercept incoming Anti-Ship Cruise Missiles (ASCM). Missile and system improvements necessary to meet their requirements are being addressed via NATO SEASPARROW Missile System (NSSMS) (0173), Rolling Airframe Missile (RAM) (0167), Advanced Low Cost Munition Ordnance (ALaMO), Phalanx Close-In Weapon System (CIWS) SeaRAM (9081), Griffin, Javelin and Spike Missile (3342). Missile improvements include improved kinematic performance plus advanced seeker and low elevation fusing/warhead capability improvements. CIWS System improvements include Technology Refresh for current fleet population and Next Generation CIWS for the future fleet. New system developments include integration of Griffin missile into Patrol Coastal (PC) and Littoral Combat Ship Missile Module, and development and/or qualification of shoulder launched missile system. ALaMo (0243) qualifies a guided 57mm projectile with an active seeker for United States Navy (USN) use. ALaMo provides enhanced lethality against Fast In-shore Attack Craft (FIAC) when compared to existing 57mm ammunition.

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B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	96.937	99.619	107.920	-	107.920
Current President's Budget	94.534	86.811	114.475	-	114.475
Total Adjustments	-2.403	-12.808	6.555	-	6.555
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-16.508			
• Congressional Rescissions	-	-			
• Congressional Adds	-	3.700			
• Congressional Directed Transfers	-	-			
• Reprogrammings	1.000	0.000			
• SBIR/STTR Transfer	-3.403	0.000			
• Program Adjustments	0.000	0.000	12.700	-	12.700
• Rate/Misc Adjustments	0.000	0.000	-6.145	-	-6.145

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 9999: *Congressional Adds*

 Congressional Add: *Shield Protection*

	FY 2015	FY 2016
	0.000	3.700
Congressional Add Subtotals for Project: 9999	0.000	3.700
Congressional Add Totals for all Projects	0.000	3.700

Change Summary Explanation

Decrease in Ship Self Defense (Engage: Hard Kill) by \$4.939M as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

FY15 funding decrease due to SBIR/STTR Transfer.

FY16-FY18 funding increase for RAM supports the implementation of RAM changes identified in the Integrated Combat System Failure Review Board (CSFRB) report known as the Fire Control Loop Improvement Project (FCLIP). These funds support RAM systems engineering, design analysis and testing of the combat system in support of the FCLIP process. Funding will deliver software baseline changes to the RAM Block 2 missiles, launcher software updates and updated interface to the combat system.

FY16-FY17 funding increase for NATO Sea Sparrow supports ramping up to full E&MD effort in preparation for ESSM Block 2 Testing and ESSM Block 2 Production in accordance with supporting the U.S. share of costs under the Block 2 E&MD MOU. Specific efforts include: Maturation of the ESSM Blk2 design during the EMD phase of the program focusing on Software and Hardware development as well as preparation for Milestone C.

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FY17-FY20 funding increase for RAM supports the implementation of RAM BLK 2+ with Ship Self Defense System (SSDS) combat system improvement efforts that are key to air defense survivability. This issue completes the Fire Control Loop Improvement (FCLIP) developmental efforts and installs FCLIP fixes onto the ships. Addresses current capability gaps to improve overall Probability of Raid Annihilation (PRA) as identified during Failure Review Board (FRB) following A5-1 test event. Funding closes these gaps by implementing FRB-identified fixes which improve PRA.

Changes to RAM Initial Operational Test and Evaluation (IOT&E) milestones which also impact the planned Full Rate Production (FRP) Decision have been driven by the following: All flight testing was disrupted a national moratorium on usage of BQM targets imposed after the 16 November 2013 testing incident where a BQM-74 drone impacted USS Chancellorsville (CG 62). RAM flight testing was reinstated in June 2014. In addition to the BQM flight test moratorium, a successful demonstration of Combat System (CS) enhancements, implemented as a result of the Fire Control Loop Improvement Project (FCLIP) was required to ensure proper RAM designation for stream raid engagement. IT-C2 is comprised of three test events: G,I and J. Test events G and I were completed in FY15 2nd Quarter. The final live-fire event, ET05J, a combined IWS Enterprise test event, has been moved to the right to align to another required element program's schedule. This delay has caused the final RAM IOT&E (OT-C5) LHA 6 PRA Testbed Event to slide to the right impacting RAM FRP decision.

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy										Date: February 2016		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604756N / <i>Ship Self Def (Engage: Hard Kill)</i>				Project (Number/Name) 0167 / <i>5in Rolling Airframe 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
0167: <i>5in Rolling Airframe Missile</i>	206.119	12.304	14.275	18.100	-	18.100	19.346	7.461	3.513	0.459	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The RAM program is an international cooperative program with the government of the Federal Republic of Germany. The purpose of this program is to develop, test, and field a surface-to-air self-defense system utilizing a dual mode, passive radio frequency/infrared RAM. The baseline system (Block 0) provides a self-defense system to counter ASCMs. RAM Block 0/1 provide defense capability against active and passive anti-ship missiles, very low altitude missiles, and maneuvering missiles through the utilization of passive radio frequency and infrared seekers and a maritime optimized fuse. The RAM Block 1A software update and the Mk 49 MOD 3 launcher upgrade program provide an additional asymmetric capability against helicopters, aircraft and surface craft. The RAM Block 2 upgrade program is a cooperative requirement of the U.S. and Federal Republic of Germany, as agreed to in an international Memorandum of Understanding (MOU), and allows RAM to counter emerging, highly maneuverable ASCM threats utilizing advanced seekers while maintaining all the proven capabilities of RAM Block 0/1/1A's accurate terminal guidance, proven lethality, and no shipboard post launch dependence. Funding supports formal Developmental and Operational Testing (DT/OT) scheduled through FY18, data analysis, operational/test driven studies, support of combat system performance analysis, identification of operationally relevant improvements.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Rolling Airframe Missile Block 2 Development and Test	12.237	14.211	18.039	0.000	18.039
Articles:	-	-	-	-	-
FY 2015 Accomplishments:					
Funded ongoing Integrated OT&E (Development and Operational) IT-C2 (Multi-target raids) testing, analysis, incorporation of any changes and associated efforts to achieve IOC and support a FRP decision. IOC was achieved May 2015. Funds also supported RAM Systems Engineering, design analysis and testing of the combat system changes in support of the Fire Control Loop Improvement Project (FCLIP) process. Funding delivered software baseline changes to the RAM Block 2 Missiles, launcher software updates and updated interface to the combat system.					
FY 2016 Plans:					
Funds completion of Integrated OT&E (Development and Operational) IT-C2 (Multi-target raids) testing, analysis, incorporation of any changes and associated efforts to support a FRP decision. Funds also support RAM systems engineering, design analysis and testing of the combat system changes in support of the FCLIP process. Funding will deliver software baseline changes to the RAM Block 2 Missiles, launcher software updates and updated interface to the combat system. Funds support additional engineering efforts to transition					

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy	Date: February 2016
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Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / <i>Ship Self Def (Engage: Hard Kill)</i>	Project (Number/Name) 0167 / <i>5in Rolling Airframe Missile</i>
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<p>from gap analysis/system requirements generation and simulation environment updates. FCLIP Block 2+ Phase I-Preliminary Design completes with the SSR/SRR and Preliminary Design Review (PDR) in FY16.</p> <p>FY 2017 Base Plans: Funds ongoing Integrated OT&E (Development and Operational) OT-C5 (Probability of Raid Annihilation, PRA, Testbed) testing, analysis, incorporation of any changes and associated efforts to support a FRP decision (2018). Funds also support RAM Systems Engineering, design analysis and testing of the combat system changes in support of the Fire Control Loop Improvement Project (FCLIP) process. In support of the FCLIP upgrade process, funding will deliver an updated RAM Block 2 software baseline changes to the Missile, Launcher, and Interface protocols to the combat system. With the completion of RAM system FCLIP Block 2+ Preliminary Design Review (PDR) in FY16, the project will transition into the detailed design, preliminary integration, and prototyping phase. Funds will support system engineering project efforts culminating in a Critical Design Review (CDR) in 1st quarter FY18.</p> <p>FY 2017 OCO Plans: N/A</p>					
<p>Title: Rolling Airframe Missile Block 2 Travel</p> <p align="right">Articles:</p> <p>FY 2015 Accomplishments: Funded program office travel to support program/testing as required by program schedule and in accordance with travel reduction mandate.</p> <p>FY 2016 Plans: Funds program office travel to support program/testing as required by program schedule and in accordance with travel reduction mandate.</p> <p>FY 2017 Base Plans: Funds program office travel to support program/testing as required by program schedule and in accordance with travel reduction mandate.</p> <p>FY 2017 OCO Plans: N/A</p>	0.067 -	0.064 -	0.061 -	0.000 -	0.061 -
Accomplishments/Planned Programs Subtotals	12.304	14.275	18.100	0.000	18.100

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / <i>Ship Self Def (Engage: Hard Kill)</i>	Project (Number/Name) 0167 / <i>5in Rolling Airframe Missile</i>

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

Line Item	FY 2015	FY 2016	FY 2017	FY 2017	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	Cost To	
			Base	OCO	Total					Complete	Total Cost
• WPN 2242: RAM	76.792	74.604	71.557	-	71.557	80.557	82.452	83.807	85.478	Continuing	Continuing
• OPN 5231: <i>Ship Missile Support Equipment</i>	4.373	9.779	8.175	-	8.175	7.783	6.376	3.019	2.988	Continuing	Continuing

Remarks

D. Acquisition Strategy

The RAM Program uses directed sole source contracts with Raytheon Missile Systems Company, Tucson, AZ.

E. Performance Metrics

Successfully complete DT/OT.
Achieved IOC decision and support a FRP decision.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy												Date: February 2016			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)					Project (Number/Name)						
1319 / 5				PE 0604756N / Ship Self Def (Engage: Hard Kill)					0167 / 5in Rolling Airframe Missile						
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Block 2 Upgrade	C/CPAF	Various : Various	154.650	0.000		0.000		0.000		-		0.000	0.000	154.650	-
Primary Hardware Dev/Blk 1	Various	Various : Various	10.081	0.000		0.000		0.000		-		0.000	0.000	10.081	-
FCLIP	WR	PHD : CA	0.000	0.125	Dec 2014	0.128	Nov 2015	0.318	Nov 2016	-		0.318	0.000	0.571	-
FCLIP	SS/CPFF	AECOM : VA	0.000	0.000		0.232	Dec 2015	0.284	Dec 2016	-		0.284	0.000	0.516	-
FCLIP	SS/CPFF	Raytheon : Tucson/Louisville	0.000	9.607	Jan 2015	11.742	Jan 2016	14.563	Nov 2016	-		14.563	0.000	35.912	-
FCLIP	WR	China Lake : CA	0.000	1.225	Oct 2014	0.867	Nov 2015	1.422	Nov 2016	-		1.422	0.000	3.514	-
FCLIP	SS/CPFF	JHU/APL : MD	0.000	0.118	Jul 2015	0.118	Dec 2015	0.311	Dec 2016	-		0.311	0.000	0.547	-
Subtotal			164.731	11.075		13.087		16.898		-		16.898	0.000	205.791	-
Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Studies and Analysis	Various	Various : Various	1.210	0.000		0.000		0.000		-		0.000	0.000	1.210	-
Subtotal			1.210	0.000		0.000		0.000		-		0.000	0.000	1.210	-
Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support	C/CPFF	Raytheon : Tucson	15.944	0.795	Mar 2015	0.426	Nov 2015	0.430	Nov 2016	-		0.430	0.000	17.595	-
Test Support	WR	China Lake/PHD : CA/CA	12.018	0.282	Dec 2014	0.433	Nov 2015	0.441	Nov 2016	-		0.441	Continuing	Continuing	Continuing
FOT&E	WR	China Lake : PHD, CA	4.701	0.000		0.000		0.000		-		0.000	0.000	4.701	-
Miscellaneous	Various	Various : Various	5.755	0.010	Feb 2015	0.000		0.000		-		0.000	0.000	5.765	-
Test Support	SS/CPFF	JHU/APL : MD	0.282	0.075	Jul 2015	0.265	Dec 2015	0.270	Dec 2016	-		0.270	0.000	0.892	-
Subtotal			38.700	1.162		1.124		1.141		-		1.141	-	-	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / <i>Ship Self Def (Engage: Hard Kill)</i>	Project (Number/Name) 0167 / <i>5in Rolling Airframe Missile</i>

	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	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
Proj 0167																												
RAM Block 2 Progam Milestones: IOC			■																									
RAM Block 2 Progam Milestones: FRP														■														
Test and Evaluation: IOT&E (IT-C2)			■	■	■	■	■																					
Test and Evaluation: IOT&E (OT-C5)									■	■	■	■																
ECPs/Improvement Studies: ECPs/ Improvement Studies														■	■	■	■	■	■	■								
FCLIP Phase 1: FCLIP Product Development	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
FCLIP Phase 1: FCLIP Test Events														■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
FCLIP Phase 2: FCLIP Product Development																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / <i>Ship Self Def (Engage: Hard Kill)</i>	Project (Number/Name) 0167 / <i>5in Rolling Airframe Missile</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Proj 0167</i>				
RAM Block 2 Progam Milestones: IOC	3	2015	3	2015
RAM Block 2 Progam Milestones: FRP	3	2018	3	2018
Test and Evaluation: IOT&E (IT-C2)	2	2015	3	2016
Test and Evaluation: IOT&E (OT-C5)	1	2017	1	2018
ECPs/Improvement Studies: ECPs/Improvement Studies	1	2018	4	2020
FCLIP Phase 1: FCLIP Product Development	1	2015	4	2017
FCLIP Phase 1: FCLIP Test Events	1	2018	4	2018
FCLIP Phase 2: FCLIP Product Development	1	2017	4	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy **Date:** February 2016

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / <i>Ship Self Def (Engage: Hard Kill)</i>	Project (Number/Name) 0173 / <i>NATO Sea Sparrow</i>
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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
0173: <i>NATO Sea Sparrow</i>	446.151	73.988	67.836	90.256	-	90.256	132.700	108.653	80.792	82.432	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project encompasses five (5) primary efforts to enhance ship self defense:

1. Evolved SEASPARROW Missile (ESSM) Testing: A cooperative effort among 10 NATO SEASPARROW Nations and the U.S., to improve the capability of the SEASPARROW Missile to counter the low altitude, highly maneuverable ASCM threat. The program consists of evolving the SEASPARROW Missile through the development of a new rocket motor with tail control; thrust vector control and ordnance (warhead) upgrade; modifications to the MK 41 Vertical Launch System (VLS) to fire from a single cell with 4 ESSM (QuadPack); and modifications to the NATO SEASPARROW Surface Missile System (NSSMS) to provide ESSM capability.
2. NATO SEASPARROW Objective Configuration (OC). The OC Program consists of segmenting and automating the existing MK 57 NSSMS radars (MK 9 Track Illuminator System) and launchers (MK 29 Guided Missile Launching System). The program eliminates all MK 57 watch stations, reduces the required system hardware.
3. NATO SEASPARROW Technical Direction Agent - MK 91 Rearchitecture: The MK 91 rearchitecture program integrates NSSMS into the SSDS architecture to provide ship missile defense utilizing an open architected system technical design agent.
4. ESSM Block 2 Risk Reduction/ESSM Block 2 Engineering and Manufacturing Development (EMD): ESSM Block 2 upgrade is a cooperative effort between U.S Navy and NATO SEASPARROW Consortium Nations. ESSM Block 2 upgrade replaces the largely obsolete guidance section with a dual mode Active/Semi-Active X-Band seeker capable of defeating future threat capabilities within the existing envelope, including; smaller signatures, increased raid sizes, and adverse environments including countermeasures. Threat types include; advanced ASCMs, Anti-Ship Ballistic Missiles (ASBMs), surface and asymmetrical. The U.S. RDT&E funding accounts for 40% of the overall ESSM Block 2 Development Program. Year-to-year fluctuations in funding levels are due to the variations in contributions provided by the other Nations.
5. Dual-Band Transceiver (DBT). The ESSM Block 2 missile will utilize a DBT for in-flight data communications. This two-way datalink enables control and management of the missile during flight. This DBT leverages the new DDG-1000/CVN-78 X-Band Transceiver (XBT) to incorporate the functions to support S-Band Aegis data link (i.e. a Dual Band Transceiver). This solves the S-band obsolescence issues and gives one common transceiver across the ESSM inventory.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Evolved SEASPARROW Missile (ESSM) testing	9.800	1.300	2.880	0.000	2.880
Articles:	-	-	-	-	-
FY 2015 Accomplishments:					

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Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / <i>Ship Self Def (Engage: Hard Kill)</i>	Project (Number/Name) 0173 / <i>NATO Sea Sparrow</i>				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Provide TDA expertise to review and where authorized by NSPO independently assess and analyze requirements, assess upgrade options, evaluate compliance, and derive delta qualification testing/analysis requirements.						
FY 2017 OCO Plans: N/A						
Title: Evolved SEASPARROW Blk 2 Risk Reduction/ESSM Blk 2 E&MD		60.556	63.897	86.012	0.000	86.012
Articles:		-	-	-	-	-
FY 2015 Accomplishments: Completed the risk reduction phase and entered into the Engineering & Manufacturing Development (EMD) phase of the program with a planned IOC of FY2020. Tasks included completing Milestone B; continuing critical experiments and analysis required to further mature the design to support Critical Design review (CDR) in FY16; continuing Hardware (H/W) and Software (S/W) development; procuring long lead material to support flight test; planning and initiating ground based test program.						
FY 2016 Plans: Continue maturing the ESSM Blk2 design during the EMD phase of the program focusing on S/W and H/D development. Tasks include completing CDR; initiating ground based testing to include Electromagnetic Environmental Effects (E3), Computer in the Loop (CiL), and Hardware in the Loop (HiL); execution of Captive Carry Flight testing; maturation of the Models & Simulations supporting performance predictions; and completing design modifications to the Mk 25 Canister.						
FY 2017 Base Plans: Continue maturing the ESSM Blk2 design during the EMD phase of the program focusing on S/W and H/D development. Continue maturing tactical flight code and Models & Simulations supporting performance predictions; execute Captive Carry Flight testing; continue ground based testing; execute two Control Test Vehicle (CTV) Flight tests; prepare H/W and S/W for Developmental Flight Testing; and prepare for Milestone C.						
FY 2017 OCO Plans: N/A						
Title: Dual Band Transceiver (DBT)		3.350	2.346	1.060	0.000	1.060
Articles:		-	-	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<p><i>FY 2015 Accomplishments:</i> Finalized critical item developmental and lower level specification. It included support to Safety reviews (Weapon System Explosive Safety Review Board (WSESRB) and Software System Safety Technical Review (SSSTRP)), initialization of DBT Transition to Production (TTP) activities (Mk698 upgrades, presidio development), Block 1 TSC updates and initial support to DBT Proof of Design (POD) development activities.</p> <p><i>FY 2016 Plans:</i> Complete POD development for both Block 1 and Block 2 integration activities. Task include: hold their Incremental Critical Design (ICDR) and support the ESSM Block 2 CDR, continue with Transition to Production (TTP) activities and start Block 1 and Block 2 integration activities (Hardware in Loop (HIL)) and Block 1 All Up Rounds (AUR) validation.</p> <p><i>FY 2017 Base Plans:</i> Development of Proof of Manufacturing (POM) to support both the Block 1 and Block 2 activities. Perform POM integration (HiL), qualification testing (E3, Electromagnetic Vulnerability (EMV)), DC Mag, environmental and hot battery testing), completion of Transition Section Computer (TSC) development , validation and Engineering Change Proposal (ECP) development/completion. It also includes completion of Mk698 development at Camden and of POM development (Andover and Tucson), as well as ECP completion. FY 2017 also includes support to S band and X band Waterfront Integration Test (WIT) and flight testing and support of Safety related reviews (WSESRB and SSSTRP) and Production Readiness Review (PRR).</p> <p><i>FY 2017 OCO Plans:</i> N/A</p>					
Accomplishments/Planned Programs Subtotals	73.988	67.836	90.256	0.000	90.256

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

Line Item	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
• WPN 2307: <i>ESSM</i>	116.934	37.671	107.397	-	107.397	61.138	107.693	100.151	102.218	Continuing	Continuing
• OPN 5231: <i>Ship Missile Defense</i>	23.520	41.850	42.180	-	42.180	44.851	39.780	30.958	31.578	Continuing	Continuing

Remarks

Starting in FY15, funding realigned from OPN 5237 to OPN 5231.

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / Ship Self Def (Engage: Hard Kill)	Project (Number/Name) 0173 / NATO Sea Sparrow

D. Acquisition Strategy

ESSM is a directed sole source contract to Raytheon Missile Systems Company. The MK 29 ESSM Launcher Upgrade and Rearchiture (REARC)/Ship Self Defense Syste (SSDS) Integration effort was a directed sole source contract to Raytheon Company Integrated Defense System.

E. Performance Metrics

Successfully complete Developmental Test/Operational testing.

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

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / Ship Self Def (Engage: Hard Kill)	Project (Number/Name) 0173 / NATO Sea Sparrow
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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			
ESSM Systems Engineering/Firing Spt	WR	Corona : CA	8.747	0.945	Oct 2014	0.000		0.705	Oct 2016	-		0.705	0.000	10.397	-
NATO OC System Engineering	C/FFPLOE	Raytheon : RI	1.955	0.000		0.000		0.000		-		0.000	0.000	1.955	-
NATO OC - Software	C/FFPLOE	Raytheon : RI	8.054	0.000		0.000		0.000		-		0.000	0.000	8.054	-
Stalker System Engineering	SS/CPAF	Ball : CO	4.782	0.000		0.000		0.000		-		0.000	0.000	4.782	-
Stalker Hardware Engineering	SS/CPAF	Ball : CO	14.350	0.000		0.000		0.000		-		0.000	0.000	14.350	-
Stalker Software Engineering	SS/CPAF	Ball : CO	2.725	0.000		0.000		0.000		-		0.000	0.000	2.725	-
ESSM Primary Hardware Development	C/CPAF	Raytheon : Tuscon	193.941	0.000		0.000		0.000		-		0.000	0.000	193.941	-
ESSM Ancillary Hardware	Various	Various : Various	71.324	0.000		0.000		0.000		-		0.000	0.000	71.324	-
ESSM Blk 2 EMD	C/CPAF	Raytheon : Tuscon	0.000	38.878	May 2015	51.889	Oct 2015	73.641	Oct 2016	-		73.641	0.000	164.408	-
ESSM Blk 2 Risk reduction	SS/FFPLOE	Raytheon : Tuscon	34.000	10.150	Nov 2014	0.000		0.000		-		0.000	0.000	44.150	-
NATO OC Systems Engineering SPT	WR	NSWC PHD : CA	0.700	0.000		0.000		0.000		-		0.000	0.000	0.700	-
Dual Band Tranceiver	SS/FFP	Raytheon : Tuscon	0.000	2.750	Feb 2015	1.746	Feb 2016	0.460	Dec 2016	-		0.460	0.000	4.956	-
Subtotal			340.578	52.723		53.635		74.806		-		74.806	0.000	521.742	-

Support (\$ 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			
NATO System TDA	SS/FP	APL : MD	1.910	0.282	Dec 2014	0.293	Dec 2015	0.304	Dec 2016	-		0.304	Continuing	Continuing	Continuing
NATO OC	SS/FFP	APL : MD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Stalker -ISEA/TDA/RM&A	SS/FFP	various : various	0.750	0.000		0.000		0.000		-		0.000	0.000	0.750	-
ILS/Engineering Support	Various	Various : Various	15.543	0.000		0.000		0.000		-		0.000	0.000	15.543	-

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

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / <i>Ship Self Def (Engage: Hard Kill)</i>	Project (Number/Name) 0173 / <i>NATO Sea Sparrow</i>
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Support (\$ 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			
ESSM Blk 2 EMD	WR	APL : MD	0.000	3.880	Nov 2014	3.976	Nov 2015	4.095	Nov 2016	-		4.095	0.000	11.951	-
ESSM Blk 2 EMD	WR	NSWC CL : CA	0.000	5.379	Nov 2014	5.574	Nov 2015	5.742	Nov 2016	-		5.742	0.000	16.695	-
ESSM Blk 2 EMD	Various	Various : Various	0.000	2.269	Jan 2015	2.458	Jan 2016	2.532	Jan 2017	-		2.532	0.000	7.259	-
NATO OC Support	WR	Dahlgren : VA	2.174	0.000		0.000		0.000		-		0.000	0.000	2.174	-
Dual Band Transceiver	WR	APL : MD	0.000	0.200	Jan 2015	0.200	Feb 2016	0.200	Dec 2016	-		0.200	0.000	0.600	-
Dual Band Tranceiver	WR	NSWC CL : CA	0.000	0.400	Feb 2015	0.400	Feb 2016	0.400	Dec 2016	-		0.400	0.000	1.200	-
Subtotal			20.377	12.410		12.901		13.273		-		13.273	-	-	-

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			
ESSM Developmental Test & Evaluation	WR	NSWC CL : CA	20.081	1.764	Nov 2014	0.000		0.204	Nov 2016	-		0.204	Continuing	Continuing	Continuing
ESSM OPEVAL/TECHEVAL/Test Firings	WR	Corona, IHD, Dahlgren, SNSWC, PHD) : various	15.633	2.485	Nov 2014	0.000		0.285	Nov 2016	-		0.285	0.000	18.403	-
ESSM Developmental Test & Evaluation	SS/FFP	APL : MD	4.937	0.845	Oct 2014	0.000		0.100	Oct 2016	-		0.100	Continuing	Continuing	Continuing
ESSM Test & Evaluation	C/CPAF	Raytheon : Tuscon	15.155	2.678	Nov 2014	1.084	Feb 2016	1.000	Nov 2016	-		1.000	Continuing	Continuing	Continuing
ESSM Test & Evaluation	WR	Dahlgren/PHD : VA/CA	1.695	0.647	Nov 2014	0.000		0.372	Nov 2016	-		0.372	0.000	2.714	-
Developmental Test & Evaluation	WR	Dahlgren : VA	0.418	0.000		0.000		0.000		-		0.000	0.000	0.418	-
Subtotal			57.919	8.419		1.084		1.961		-		1.961	-	-	-

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

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / Ship Self Def (Engage: Hard Kill)	Project (Number/Name) 0173 / NATO Sea Sparrow
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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			
ESSM-Support and Performing Activity	Allot	PHD/NAWC CL/ APL : CA/MD	14.427	0.336	Oct 2014	0.116	Oct 2015	0.116	Oct 2016	-		0.116	Continuing	Continuing	Continuing
ESSM-Travel	Allot	Program Office : VA	3.127	0.100	Oct 2014	0.100	Oct 2015	0.100	Oct 2016	-		0.100	Continuing	Continuing	Continuing
ESSM-Misc	Various	various : various	2.149	0.000		0.000		0.000		-		0.000	0.000	2.149	2.065
NATO Travel/Misc	Various	Program Office : various	2.111	0.000		0.000		0.000		-		0.000	0.000	2.111	-
Engineering Support	Various	Various : Various	5.458	0.000		0.000		0.000		-		0.000	0.000	5.458	-
Stalker Travel	Allot	Program Office : VA	0.005	0.000		0.000		0.000		-		0.000	0.000	0.005	-
Subtotal			27.277	0.436		0.216		0.216		-		0.216	-	-	-
Project Cost Totals			446.151	73.988		67.836		90.256		-		90.256	-	-	-

Remarks
Various used for multiple vendors and location under threshold.

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / <i>Ship Self Def (Engage: Hard Kill)</i>	Project (Number/Name) 0173 / <i>NATO Sea Sparrow</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 0173				
ESSM BLOCK 2: Engineering & Manufacturing Development MOU Signed	1	2015	1	2015
ESSM BLOCK 2: Risk Reduction Complete	2	2015	2	2015
ESSM BLOCK 2: MS B	1	2015	1	2015
ESSM BLOCK 2: Transition to Engineering & Manufacturing Development	1	2015	4	2015
ESSM BLOCK 2: Engineering & Manufacturing Development	2	2015	3	2019
ESSM BLOCK 2: Integration, Test & Evaluation Begins	2	2015	2	2015
ESSM BLOCK 2: Transition to Production	2	2018	2	2019
ESSM BLOCK 2: Production MOU Negotiation/Signature	1	2015	1	2017
ESSM BLOCK 2: Production Decision LRIP	2	2018	2	2018
ESSM BLOCK 2: Low-Rate Initial Production Contract Award 1	2	2018	2	2018
ESSM BLOCK 2: Low-Rate Initial Production Contract Award 2	2	2019	2	2019
OBJECTIVE CONFIGURATION: PDR	1	2015	1	2015
OBJECTIVE CONFIGURATION: CDR	4	2017	4	2017

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy **Date:** February 2016

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / <i>Ship Self Def (Engage: Hard Kill)</i>	Project (Number/Name) 0243 / <i>ALaMO</i>
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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
0243: <i>ALaMO</i>	0.000	0.000	0.000	5.759	-	5.759	25.984	24.982	0.000	0.000	0.000	56.725
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Advanced Low Cost Munition Ordnance (ALaMO) significantly increases 57mm MK 110 Gun Mount lethality and effectiveness against Fast Attack Craft and Fast In-Shore Attack Craft (FAC/FIAC). The 57mm ALaMO funding supports non-recurring engineering, design verification testing, environmental qualification, hazard classification, insensitive munitions and developmental testing. ALaMO will be qualified for USN use at the conclusion of the program.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Systems Engineering and Testing	0.000	0.000	5.759	0.000	5.759
Articles:	-	-	-	-	-
FY 2015 Accomplishments: None; program is FY17 new start.					
FY 2016 Plans: None; program is FY17 new start.					
FY 2017 Base Plans: Procure assets for design verification tests and prepare for DT events in FY18.					
FY 2017 OCO Plans: N/A.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	5.759	0.000	5.759

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

N/A

Remarks

D. Acquisition Strategy

ALaMO will be qualified for Navy use in FY2019, supporting Low Rate Initial Production in 2020.

E. Performance Metrics

Quarterly Program Reviews and semi-annual Product Certification Panel Reviews.

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy **Date:** February 2016

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / <i>Ship Self Def (Engage: Hard Kill)</i>	Project (Number/Name) 0243 / <i>ALaMO</i>
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FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
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

Proj 0243	
Build Design Verification Test Hardware	██████████
Conduct Design Verification Tests	██████████
Build DT Hardware	██████████
Conduct DT	██████████

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / <i>Ship Self Def (Engage: Hard Kill)</i>	Project (Number/Name) 0243 / <i>ALaMO</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Proj 0243</i>				
Build Design Verification Test Hardware	2	2017	1	2018
Conduct Design Verification Tests	1	2018	3	2018
Build DT Hardware	2	2018	2	2019
Conduct DT	2	2019	4	2019

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy **Date:** February 2016

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / Ship Self Def (Engage: Hard Kill)	Project (Number/Name) 3342 / Griffin Missile
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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
3342: <i>Griffin Missile</i>	47.727	2.407	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	50.134
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The purpose of this program is to develop and deliver Counter-Swarm Small Boat defense capabilities for the Surface Fleet. There are two (2) primary efforts supporting this mission area listed below:

1. Rapid Deployment Capabilities (RDCs)
 - Patrol Coastal(PC) with Griffin Missile System (GMS)
 - Littoral Combat Ship (LCS) Missile Module with GMS
2. Shoulder Launched Missile System

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Griffin Missile System (GMS) Rapid Deployment Capability (RDC)	2.407	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Completion of Live Fire Testing for Griffin Missile System, November, 2014 Completion of Griffin Missile Service Life Extension Analysis (SLEA)					
FY 2016 Plans: N/A					
FY 2017 Base Plans: N/A					
FY 2017 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	2.407	0.000	0.000	0.000	0.000

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

N/A

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / <i>Ship Self Def (Engage: Hard Kill)</i>	Project (Number/Name) 3342 / <i>Griffin Missile</i>

D. Acquisition Strategy

RDCs consist of GMS integrated on PC and LCS. The Program Office manages development and integration of the GMS on surface ships. GMS consists of Griffin B Block II Missile procured via Raytheon sole source contract with U.S. Army Joint Attack Munitions System (JAMS) program office and U.S. Special Operations Command (SOCOM); BriteStar EO/IR Laser Designator procured by Navy Surface Weapon Center (NSWC) Crane on a Firm Fixed Price (FFP) contract with Forward Looking Infra Red Systems. The Missile Launcher and Battle Management System are developed at NSWC Dahlgren and NSWC Corona.

Naval Air Warfare Center Weapons Division (NAWCWD) China Lake developed the China Lake Spike shoulder fired missile. Javelin missiles were procured through Marine Corps System Command (MARCORSYSCOM) and Armament Research Development and Engineering Center (ARDEC) program offices. Naval Surface Missions Program Office (PEO IWS3S) qualified the Javelin Missile for shipboard firing at Redstone Arsenal and NSWC Dahlgren.

E. Performance Metrics

Successful completion of Live Fire Testing for Griffin Missile System, November, 2014.

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

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / <i>Ship Self Def (Engage: Hard Kill)</i>	Project (Number/Name) 3342 / <i>Griffin Missile</i>
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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			
GMS - PC Integration	WR	Dahlgren : VA	14.635	0.401	Oct 2014	0.000		0.000		-		0.000	0.000	15.036	-
GMS - PC Integration	WR	PT Mugu : CA	2.184	1.067	Oct 2014	0.000		0.000		-		0.000	0.000	3.251	-
GMS - PC Integration	WR	China Lake : CA	6.500	0.594	Oct 2014	0.000		0.000		-		0.000	0.000	7.094	-
GMS - PC Integration	MIPR	Redstone : AL	5.698	0.098	Feb 2015	0.000		0.000		-		0.000	0.000	5.796	-
GMS - PC Integration	WR	PHD : CA	3.137	0.063	Oct 2014	0.000		0.000		-		0.000	0.000	3.200	-
GMS - PC Integration	WR	CORONA : CA	1.646	0.030	Oct 2014	0.000		0.000		-		0.000	0.000	1.676	-
GMS - PC Integration	WR	Various : Various	3.899	0.000		0.000		0.000		-		0.000	0.000	3.899	-
GMS - PC Integration	WR	Crane : IN	5.777	0.054	Oct 2014	0.000		0.000		-		0.000	0.000	5.831	-
GMS - PC Integration	WR	NAVAIR : MD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Shoulder Launch Missile Dev	WR	Dahlgren : VA	0.280	0.000		0.000		0.000		-		0.000	0.000	0.280	-
Shoulder Launch Missile Dev	MIPR	Redstone Arsenal : AL	0.150	0.000		0.000		0.000		-		0.000	0.000	0.150	-
Shoulder Launch Missile Dev	WR	Various : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Shoulder Launch Missile Dev	WR	China Lake : CA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Subtotal			43.906	2.307		0.000		0.000		-		0.000	0.000	46.213	-

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			
Program Management Support	Various	PEO IWS : Arlington, VA	3.821	0.100	Jul 2015	0.000		0.000		-		0.000	0.000	3.921	-
Subtotal			3.821	0.100		0.000		0.000		-		0.000	0.000	3.921	-

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		47.727	2.407	0.000	0.000	-	0.000	50.134	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy **Date:** February 2016

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / <i>Ship Self Def (Engage: Hard Kill)</i>	Project (Number/Name) 3342 / <i>Griffin Missile</i>
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FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
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

Proj 3342	
Test: Live Fire Test & Evaluation	██████████

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / <i>Ship Self Def (Engage: Hard Kill)</i>	Project (Number/Name) 3342 / <i>Griffin Missile</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3342				
Test: Live Fire Test & Evaluation	1	2015	1	2015

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy										Date: February 2016		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604756N / <i>Ship Self Def (Engage: Hard Kill)</i>				Project (Number/Name) 9081 / <i>Phalanx CIWS SEARAM</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
9081: <i>Phalanx CIWS SEARAM</i>	0.000	5.835	1.000	0.360	-	0.360	17.978	41.302	22.673	23.127	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Close in Weapon System (CIWS) Technology Refresh and Next Generation CIWS: CIWS fleet population exceeds 250 systems onboard nearly every USN surface combatant. In addition, CIWS continues to be installed on new construction surface ships with life expectancies of 25+ years. Basic system architecture is 20+ years old and is in need of Technology Refresh in order to avoid hardware obsolescence, maintain/improve reliability, and provide affordable spare parts to achieve acceptable Operational Availability for the next 20+ years. In conjunction with Technology Refresh, a Next Generation CIWS effort is planned (FY19) in order to define the follow-on CIWS system for future ships (and potentially backfit on newer fleet units) that can defeat the emerging anti-ship cruise missile threats at a lower overall life cycle cost. Given the sheer number of CIWS system deployed across the fleet and the amount of time it would take to upgrade existing installations to any Next Generation CIWS configuration, both Technology Refresh efforts (fielded to the fleet through overhauled CIWS Systems) and Next Generation CIWS efforts are required to be executed at same time in order to maintain existing CIWS capability while Next Generation CIWS is developed and begins fielding.

SeaRAM CIWS is to be deployed onboard DDG 64, 71, 75, and 78 in order to provide additional capability to meet emerging threats. Efforts include development, qualification, and testing of software and hardware modifications in order to support fielding on these AEGIS class ships.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Tech Refresh & Next Gen CIWS / SeaRAM on DDG Class	5.835	1.000	0.360	0.000	0.360
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Conducted trade studies and initial requirements definition for CIWS Technology Refresh (for fielding via retrofit kit and overhaul) and Next Generation CIWS with goal of improving system operational availability and performance.					
FY 2016 Plans: Non-recurring engineering efforts for integration/fielding of SeaRAM CIWS onboard DDG 64, 71, 75, and 78.					
FY 2017 Base Plans: Non-recurring engineering efforts for integration/fielding of SeaRAM CIWS onboard DDG 64, 71, 75, and 78.					
FY 2017 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	5.835	1.000	0.360	0.000	0.360

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / Ship Self Def (Engage: Hard Kill)	Project (Number/Name) 9081 / Phalanx CIWS SEARAM

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

N/A

Remarks

D. Acquisition Strategy

The MK 15 Close-In Weapons System (CIWS) is a fast reaction, rapid fire, computer controlled radar system utilizing either a 20mm gun (Phalanx) or a SeaRAM weapon system (SeaRAM) to meet its primary mission of providing Anti-Ship Missile (ASM) defense. Funding provides support for efforts related to Technology Refresh (for current fleet population) and Next Generation CIWS (for future and retrofit installations) as well as efforts related to the integration/installation of SeaRAM CIWS in DDG 64, 71, 75, and 78. This work will be completed via sole source contracts to the CIWS Design Agent (Raytheon Missile Systems).

E. Performance Metrics

Successfully complete trade studies and initial requirements definition for Technology Refresh/Next Generation CIWS and efforts related integration/installation of SeaRAM CIWS in DDG class ships.

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / <i>Ship Self Def (Engage: Hard Kill)</i>	Project (Number/Name) 9081 / <i>Phalanx CIWS SEARAM</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Proj 9081</i>				
Trade Studies & Initial Requirements Generation: Trade Studies and Initial Requirements Generation for Tech Refresh & Next Gen CIWS	2	2015	1	2016
SeaRAM CIWS on DDG Class: Integrate SeaRAM CIWS on DDG 64, 71, 75, and 78	1	2016	4	2017
Tech Refresh & Next Gen CIWS: Research, Development, and Test for Tech Refresh & Next Gen CIWS	1	2018	4	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy										Date: February 2016		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604756N / <i>Ship Self Def (Engage: Hard Kill)</i>				Project (Number/Name) 9999 / <i>Congressional Adds</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
9999: <i>Congressional Adds</i>	0.000	0.000	3.700	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.700
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Close in Weapon System (CIWS) Technology Refresh and Next Generation CIWS: CIWS fleet population exceeds 250 systems onboard nearly every USN surface combatant. In addition, CIWS continues to be installed on new construction surface ships with life expectancies of 25+ years. Basic system architecture is 20+ years old and is in need of Technology Refresh in order to avoid hardware obsolescence, maintain/improve reliability, and provide affordable spare parts to achieve acceptable Operational Availability for the next 20+ years. In conjunction with Technology Refresh, a Next Generation CIWS effort is planned (FY19) in order to define the follow-on CIWS system for future ships (and potentially backfit on newer fleet units) that can defeat the emerging anti-ship cruise missile threats at a lower overall life cycle cost. Given the sheer number of CIWS system deployed across the fleet and the amount of time it would take to upgrade existing installations to any Next Generation CIWS configuration, both Technology Refresh efforts (fielded to the fleet through overhauled CIWS Systems) and Next Generation CIWS efforts are required to be executed at same time in order to maintain existing CIWS capability while Next Generation CIWS is developed and begins fielding.

SeaRAM CIWS is to be deployed onboard DDG 64, 71, 75, and 78 in order to provide additional capability to meet emerging threats. Efforts include development, qualification, and testing of software and hardware modifications in order to support fielding on these AEGIS class ships.

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

	FY 2015	FY 2016
Congressional Add: Shield Protection	0.000	3.700
FY 2015 Accomplishments: N/A		
FY 2016 Plans: Provide engineering support for development of performance enhancements to MK 15 Mod 31 SeaRAM Weapon System.		
Congressional Adds Subtotals	0.000	3.700

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

N/A

Remarks

D. Acquisition Strategy

This work will be completed via sole source contracts to the CIWS Design Agent (Raytheon Missile Systems).

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / <i>Ship Self Def (Engage: Hard Kill)</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>

E. Performance Metrics

Successfully complete initial requirements definition for performance enhancements to the MK 15 Mod 31 SeaRAM Weapon System.

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / <i>Ship Self Def (Engage: Hard Kill)</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>

FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
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

Proj 9999	
Performance Enhancement to SeaRAM:	[REDACTED]

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / <i>Ship Self Def (Engage: Hard Kill)</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9999				
Performance Enhancement to SeaRAM:	2	2016	4	2017