

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
---	----------------------------

APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE							
1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>				PE 0604756N: <i>Ship Self Def (Engage: Hard Kill)</i>							
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
Total Program Element	55.323	46.044	5.860	0.000	5.860	6.209	6.365	6.512	6.648	Continuing	Continuing
0167: <i>5in Rolling Airframe Missile</i>	35.288	26.953	1.547	0.000	1.547	1.530	1.567	1.605	1.636	Continuing	Continuing
0173: <i>NATO Sea Sparrow</i>	9.364	7.141	4.313	0.000	4.313	4.679	4.798	4.907	5.012	Continuing	Continuing
9999: <i>Congressional Adds</i>	10.671	11.950	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	37.855

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). ENGAGEMENT: Missile and system improvements necessary to meet their requirements are being addressed via NATO SEASPARROW Missile System (NSSMS) (0173), 5" Rolling Airframe Missile (RAM) (0167), and Phalanx CIWS SeaRAM (9853A). Missile improvements include improved kinematic performance plus advanced seeker and low elevation fusing/warhead capability improvements. System improvements include incorporation of Phalanx detection capability into RAM system (SeaRAM), future concepts studies and self-destructing ammunition, and Future Phalanx Next Generation Improvements. FY09 Congressional Add provides funding for Future Phalanx Next Generation improvements. FY10 Congressional Add provides funding for Next Generation Phalanx with Laser Demo

B. Program Change Summary (\$ in Millions)

	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011 Base</u>	<u>FY 2011 OCO</u>	<u>FY 2011 Total</u>
Previous President's Budget	46.715	34.236	0.000	0.000	0.000
Current President's Budget	55.323	46.044	5.860	0.000	5.860
Total Adjustments	8.608	11.808	5.860	0.000	5.860
• Congressional General Reductions		-0.192			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		12.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	9.624	0.000			
• SBIR/STTR Transfer	-1.017	0.000			
• Program Adjustments	0.000	0.000	5.860	0.000	5.860
• Rate/Misc Adjustments	0.001	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #121

Page 1 of 21

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy		DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>		R-1 ITEM NOMENCLATURE PE 0604756N: <i>Ship Self Def (Engage: Hard Kill)</i>	
<u>Congressional Add Details (\$ in Millions, and Includes General Reductions)</u>		FY 2009	FY 2010
Project: 9999: <i>Congressional Adds</i>			
Congressional Add: <i>PHALANX CIWS FUTURE CONCEPTS/NEXT GEN</i>		10.671	11.950
Congressional Add Subtotals for Project: 9999		10.671	11.950
Congressional Add Totals for all Projects		10.671	11.950
<u>Change Summary Explanation</u>			
Added FY09 funding for Navy Directed RAM lethality study and system concept demonstration to counter emergent threats.			
FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.			

UNCLASSIFIED

R-1 Line Item #121

Page 2 of 21

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy								DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>				R-1 ITEM NOMENCLATURE PE 0604756N: <i>Ship Self Def (Engage: Hard Kill)</i>				PROJECT 0167: <i>5in Rolling Airframe Missile</i>			
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0167: <i>5in Rolling Airframe Missile</i>	35.288	26.953	1.547	0.000	1.547	1.530	1.567	1.605	1.636	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		
A. Mission Description and Budget Item Justification The purpose of this program is to develop a surface-to-air self-defense system utilizing a dual mode, passive Radio Frequency/Infrared 5" Rolling Airframe Missile. The baseline system (Block 0) provides a self-defense capability against active radar-guided anti-ship missiles and was developed on an equal cost share basis with the Government of the Federal Republic of Germany. The RAM Block 1 provides a capability against passive anti-ship missiles, very low altitude missiles, and maneuvering missiles through the incorporation of an infrared all-the-way mode seeker and improved fuse. The RAM Block 1 MOD 3 upgrade program, which provides an additional capability against helicopters, aircraft and surface craft, is a joint requirement of the U.S. and Federal Republic of Germany agreed to in a Memorandum of Agreement (MOA) signed by both parties. FY09-15 funding continues development and testing of a Block 2 upgrade to the RAM. This upgrade will allow RAM to regain battlespace lost to emerging, more maneuverable ASCM threats. This system is designed to counter anti-ship cruise missile raids and other threats to provide for ship survivability with accurate terminal guidance, proven lethality, and no shipboard post launch dependence.											
B. Accomplishments/Planned Program (\$ in Millions)											
						FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	
5in Rolling Airframe Missile Block 2 Development and Test						35.028	26.836	1.540	0.000	1.540	
<i>FY 2009 Accomplishments:</i> FY09 funds development and testing of RAM Block 2 upgrade and RAM lethality study											
<i>FY 2010 Plans:</i> FY10 funds continued development and support of RAM Block 2 upgrade.											
<i>FY 2011 Base Plans:</i> FY11 funds continued development and support of RAM Block 2 upgrade.											
5in Rolling Airframe Missile Block 2 Travel						0.113	0.117	0.007	0.000	0.007	

UNCLASSIFIED

R-1 Line Item #121

Page 3 of 21

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy				DATE: February 2010							
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>		R-1 ITEM NOMENCLATURE PE 0604756N: <i>Ship Self Def (Engage: Hard Kill)</i>		PROJECT 0167: <i>5in Rolling Airframe Missile</i>							
B. Accomplishments/Planned Program (\$ in Millions)											
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total					
<i>FY 2009 Accomplishments:</i> FY09 funds travel.											
<i>FY 2010 Plans:</i> FY10 funds travel.											
<i>FY 2011 Base Plans:</i> FY11 funds travel.											
Defense Acquisition Workforce Fund <i>FY 2009 Accomplishments:</i> Funded Defense Acquisition Workforce Fund		0.147	0.000	0.000	0.000	0.000					
Accomplishments/Planned Programs Subtotals		35.288	26.953	1.547	0.000	1.547					
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• OPN 5238: RAM	16.949	8.735	11.805	0.000	11.805	5.065	1.164	0.033	0.036	0.000	673.395
• WPN 2242: RAM	70.778	69.728	74.976	0.000	74.976	68.740	71.460	80.567	83.214	647.226	1,714.036
D. Acquisition Strategy											
The RAM Program uses directed sole source contracts with Raytheon Systems Company, Tucson, AZ.											
E. Performance Metrics											
Successfully achieve Milestone C. Successfully achieve Development/Operational Milestones											

UNCLASSIFIED

R-1 Line Item #121

Page 4 of 21

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy											DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 5: Development & Demonstration (SDD)					R-1 ITEM NOMENCLATURE PE 0604756N: Ship Self Def (Engage: Hard Kill)					PROJECT 0167: 5in Rolling Airframe Missile				
Product Development (\$ in Millions)														
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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	
Primary Hardware Development	SS/CPFF	Raytheon Tucson/Louisville	7.434	0.000		0.000		0.000		0.000	0.000	7.434	Continuing	
Primary Hardware Dev Support	WR	China Lake CA	1.266	0.000		0.000		0.000		0.000	0.000	1.266	Continuing	
Block 1 Eng/Interface Support	SS/CPFF	Raytheon Tucson/Louisville	0.400	0.000		0.000		0.000		0.000	0.000	0.400	Continuing	
Block 1 MOD 3 Interface Support	C/CPFF	JHU/APL MD	0.981	0.000		0.000		0.000		0.000	0.000	0.981	Continuing	
Block 2 Upgrade	SS/CPAF	Raytheon Tucson/Louisville	102.737	25.474	Nov 2009	0.000		0.000		0.000	Continuing	Continuing	Continuing	
Block 2 Upgrade	WR	China Lake/ NRL/ Dahlgren CA/VA	14.531	0.626	Jan 2010	0.726	Nov 2010	0.000		0.726	Continuing	Continuing	Continuing	
Block 2 Upgrade	C/CPFF	JHU/APL md	1.300	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing	
Block 2 Product Support	Various/ Various	various various	2.823	0.736	Jan 2010	0.814	Nov 2010	0.000		0.814	Continuing	Continuing	Continuing	
Subtotal			131.472	26.836		1.540		0.000		1.540				
Remarks														

UNCLASSIFIED

R-1 Line Item #121

Page 5 of 21

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy											DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>				R-1 ITEM NOMENCLATURE PE 0604756N: <i>Ship Self Def (Engage: Hard Kill)</i>				PROJECT 0167: <i>5in Rolling Airframe Missile</i>					
Support (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Studies and Analyses	Various/ Various	various various	1.210	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
Subtotal			1.210	0.000		0.000		0.000		0.000			
Remarks													
Test and Evaluation (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
DT&E/OT&E/FOT&E/	SS/CPAF	Raytheon Tucson/Louisville	13.787	0.000		0.000		0.000		0.000	0.000	13.787	Continuing
FOT&E	WR	China Lake/PHD CA/CA	4.674	0.000		0.000		0.000		0.000	0.000	4.674	Continuing
Test Support	WR	China Lake/PHD CA/CA	11.061	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
Miscellaneous	Various/ Various	various various	5.733	0.000		0.000		0.000		0.000	0.000	5.733	Continuing
Subtotal			35.255	0.000		0.000		0.000		0.000			
Remarks													

UNCLASSIFIED

R-1 Line Item #121

Page 6 of 21

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy											DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>				R-1 ITEM NOMENCLATURE PE 0604756N: <i>Ship Self Def (Engage: Hard Kill)</i>				PROJECT 0167: <i>5in Rolling Airframe Missile</i>					
Management Services (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Travel	Various/ Various	various various	0.766	0.117	Nov 2009	0.007	Nov 2010	0.000		0.007	Continuing	Continuing	Continuing
Defense Acquisition Workforce Development Fund	Various/ Various	various various	0.147	0.000		0.000		0.000		0.000	0.000	0.147	Continuing
Subtotal			0.913	0.117		0.007		0.000		0.007			
Remarks													
			Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			168.850	26.953		1.547		0.000		1.547			
Remarks													

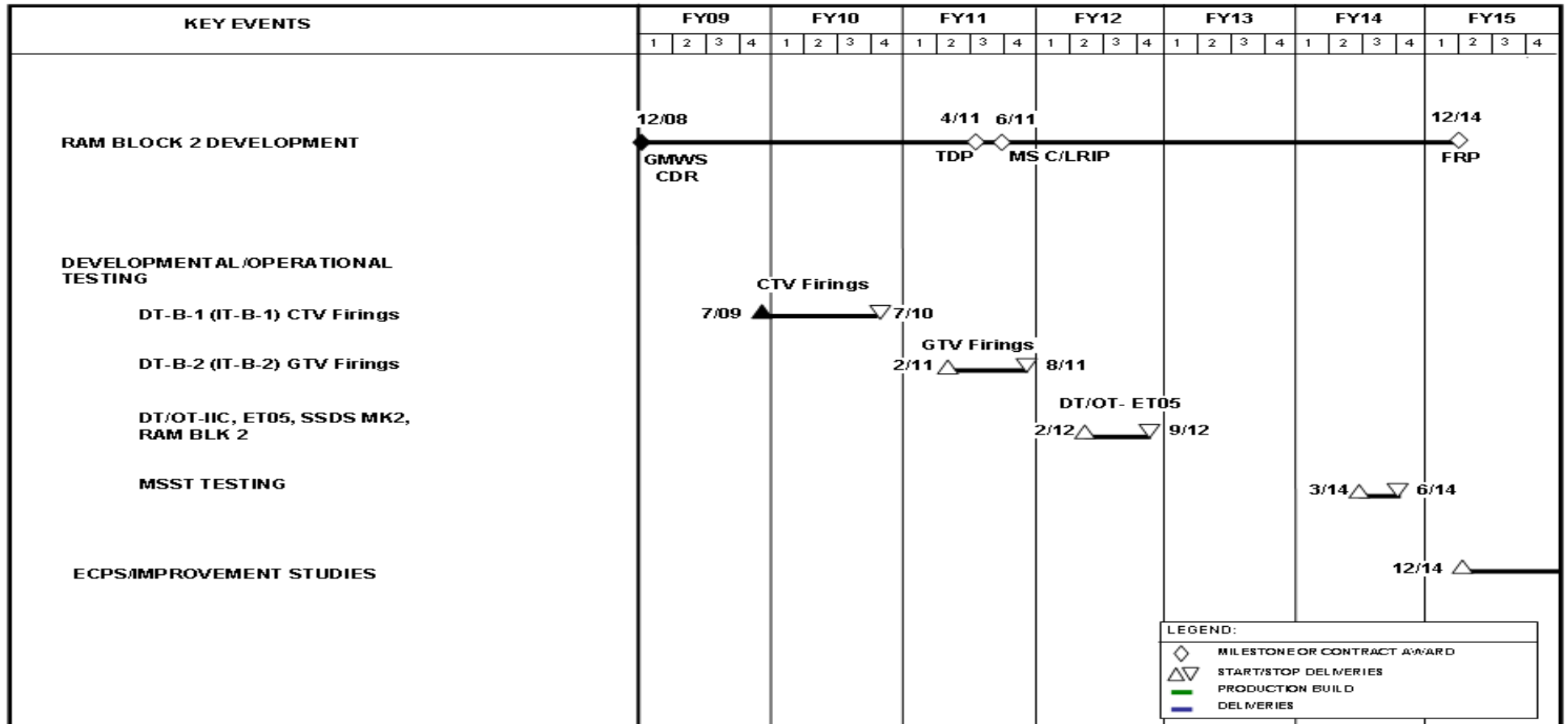
UNCLASSIFIED

R-1 Line Item #121

Page 7 of 21

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy			DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>		R-1 ITEM NOMENCLATURE PE 0604756N: <i>Ship Self Def (Engage: Hard Kill)</i>		PROJECT 0167: <i>5in Rolling Airframe Missile</i>	



UNCLASSIFIED

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604756N: <i>Ship Self Def (Engage: Hard Kill)</i>	PROJECT 0167: <i>5in Rolling Airframe Missile</i>	

Schedule Details

Event	Start		End	
	Quarter	Year	Quarter	Year
BLOCK 2 DEVELOPMENT	1	2009	1	2015
DT- B-1 CTV Firings	4	2009	4	2010
DT-B-2 GTV Firings	2	2011	4	2011
DT/OT-IIC	2	2012	4	2012
MSST Testing	2	2014	3	2014
ECPs/Improvement Studies	1	2015	4	2015

UNCLASSIFIED

R-1 Line Item #121

Page 9 of 21

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy								DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>				R-1 ITEM NOMENCLATURE PE 0604756N: <i>Ship Self Def (Engage: Hard Kill)</i>				PROJECT 0173: <i>NATO Sea Sparrow</i>			
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0173: <i>NATO Sea Sparrow</i>	9.364	7.141	4.313	0.000	4.313	4.679	4.798	4.907	5.012	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		
A. Mission Description and Budget Item Justification A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project encompasses three (3) primary efforts to enhance ship self defense: <ol style="list-style-type: none"> 1. EVOLVED SEASPARROW MISSILE (ESSM): 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 Anti-Ship Cruise Missile 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 VLS to fire from a single cell with 4 ESSM (QuadPack); and modifications to the NATO SEASPARROW Missile System (NSSMS) to provide ESSM capability. 2. NATO SEASPARROW - MK 91 Rearchitecture/SDSMS: The MK 91 Rearchitecture Program integrates NSSMS into the Ship Self Defense System (SSDS) Architecture to provide ship missile defense utilizing an open architected system. This effort consists of combining the Firing Officer Console and Radar Set Console functionality into a single Advanced Display System Console (AN/UYQ-70); modifying the Signal Data Processor and eliminating the MK 157 Computer Signal Data Converter and System Evaluation and Trainer, and redistributing this functionality within SSDS compatible microprocessors. This approach will eliminate the analog, point-to-point architecture, limited input-output channel and computer processing reserve deficiencies resident in the existing MK 57 NSSMS, and is required for ESSM. This modification also allows for full exploitation of the capabilities of the future ESSM and provides significant reductions (over 50%) in NSSMS cost of ownership and manning requirements. 3. Amphibious Self-Defense AAW Probability of Raid Annihilation (PRA) Improvement- The Amphibious Self-Defense AAW PRA Improvement program provides the L-Class Amphibious ships (LHA, LHD, LSD) with an improved PRA through full integration of the weapons and sensors of the combat system. This improvement introduces the Multi-Sensor Integration (MSI) unit that receives fire control and sensor data from ship radars, fuses them into an integrated radar picture and provides composite track reports to the combat system. MK 15 CIWS is upgraded to a Block 2 configuration with a much improved search and track radar. No longer stand-alone, CIWS will be integrated into the sensor suite and provide fire control quality search and track data to the combat system via the MSI unit. As a fallback measure, CIWS Blk 2 can also report directly to the MK 23 Target Acquisition Radar Threat Evaluation Weapons Assignment (TEWA) providing fire control quality track data at a very fast update rate for targets to the horizon. Target Acquisition System (TAS) itself will receive an upgrade of its OSM unit to accommodate direct inputs from both the MSI and CIWS units. This improvement program provides full integration of the combat system and will meet or exceed threat detection and designation 											

UNCLASSIFIED

R-1 Line Item #121

Page 10 of 21

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 5: Development & Demonstration (SDD)		R-1 ITEM NOMENCLATURE PE 0604756N: Ship Self Def (Engage: Hard Kill)		PROJECT 0173: NATO Sea Sparrow	
requirements through 2020. Use of the MSI will provide stable track data through a composite track picture reported to the combat system. Without this improvement, PRA of the L-Class ships would continue to degrade to an unsatisfactory point in the mid term.					
B. Accomplishments/Planned Program (\$ in Millions)					
	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
NATO Sea Sparrow integration testing	7.300	6.452	4.000	0.000	4.000
FY 2009 Accomplishments: Continue ESSM SSDS integration testing on CVN platforms. Conduct US-unique DT/OT firings from SDTS and carriers (DT/OT-D2, DT/OT-D3). Conduct ESSM Aegis integration testing and DT/OT firings on Cruisers and Destroyers and SDTS (DT/OT-D4, DT/OT-D5, DT/OT-D6) in support of Aegis Modernization Program. Conduct ESSM DT/OT firings on SDTS (DT/OT-D7) in support of SSDS Open Architecture integration and uplink development. This provides for the U.S. share of cooperative efforts associated with ESSM engineering studies and other development initiatives.					
FY 2010 Plans: Continue ESSM SSDS integration testing on CVN platforms. Conduct US-unique DT/OT firings from SDTS and carriers (DT/OT-D2, DT/OT-D3). Conduct ESSM Aegis integration testing and DT/OT firings on Cruisers and Destroyers and SDTS (DT/OT-D4, DT/OT-D5, DT/OT-D6) in support of Aegis Modernization Program. Conduct ESSM DT/OT firings on SDTS (DT/OT-D7) in support of SSDS Open Architecture integration and uplink development. This provides for the U.S. share of cooperative efforts associated with ESSM engineering studies and other development initiatives.					
FY 2011 Base Plans: Continue ESSM SSDS integration testing on CVN platforms. Conduct US-unique DT/OT firings from SDTS and carriers (DT/OT-D2, DT/OT-D3). Conduct ESSM Aegis integration testing and DT/OT firings on Cruisers and Destroyers and SDTS (DT/OT-D4, DT/OT-D5, DT/OT-D6) in support of Aegis Modernization Program. Conduct ESSM DT/OT firings on SDTS (DT/OT-D7) in support of SSDS Open Architecture integration and uplink development. This provides for the U.S. share of cooperative efforts associated with ESSM engineering studies and other development initiatives.					

UNCLASSIFIED

R-1 Line Item #121

Page 11 of 21

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 5: Development & Demonstration (SDD)		R-1 ITEM NOMENCLATURE PE 0604756N: Ship Self Def (Engage: Hard Kill)		PROJECT 0173: NATO Sea Sparrow		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
NATO Sea Sparrow Amphibious Self-Defense AAW improvements FY 2009 Accomplishments: Conduct Amphibious Self-Defense AAW improvement for LHD 1-6 and LHA class ships leveraging the MK 15 CIWS Blk 2 upgrade program, the MSIT unit developed for the Self-Defense Test Ship and the RAM MOD 3 Launcher upgrade program, L- lass PRA will be greatly enhanced. Improvements to the MK 23 TAS made to support and integrate the RAM Mod 3 Launcher will be leveraged to integrate the MSI unit and the CIWS Blk 2 GFCS. The MSI will have the greatest positive impact on PRA as composite track data will be developed and provided to the combat system. The short range air radar picture will be significantly improved through the use of the CIWS upgraded search and track radar providing track data at a very fast update rate. FY 2010 Plans: Conduct Amphibious Self-Defense AAW improvement for LHD 1-6 and LHA class ships leveraging the MK 15 CIWS Blk 2 upgrade program, the MSIT unit developed for the Self-Defense Test Ship and the RAM MOD 3 Launcher upgrade program, L- lass PRA will be greatly enhanced. Improvements to the MK 23 TAS made to support and integrate the RAM Mod 3 Launcher will be leveraged to integrate the MSI unit and the CIWS Blk 2 GFCS. The MSI will have the greatest positive impact on PRA as composite track data will be developed and provided to the combat system. The short range air radar picture will be significantly improved through the use of the CIWS upgraded search and track radar providing track data at a very fast update rate.		1.717	0.382	0.000	0.000	0.000
NATO Sea Sparrow Combat System Integraton Technical Direction Agent (TDA) FY 2009 Accomplishments: Provides funding for the Combat System Integration Technical Direction Agent (TDA) who will provide engineering support for combat system performance and risk mitigation. The TDA will leverage it's technical expertise & leadership to cover a broad range of activities such as defining near-term and future requirements for current systems and future upgrades, maintain system performance models		0.300	0.307	0.313	0.000	0.313

UNCLASSIFIED

R-1 Line Item #121

Page 12 of 21

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 5: Development & Demonstration (SDD)		R-1 ITEM NOMENCLATURE PE 0604756N: Ship Self Def (Engage: Hard Kill)		PROJECT 0173: NATO Sea Sparrow		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
to evaluate system improvements, threat changes and operational environment conditions, verify models and simulations to promote program success through application of rigorous and disciplined systems engineering principles and practices in a consistent manner across system elements over the program life cycle, make prudent use of authoritative technical expertise for advice and independent review, identify a range of technically acceptable alternatives to resolve engineering issues, assist in development of T&E planning, and continue to maintain NSPO essential research and engineering capabilities and corporate memory.						
FY 2010 Plans: Provides funding for the Combat System Integration Technical Direction Agent (TDA) who will provide engineering support for combat system performance and risk mitigation. The TDA will leverage it's technical expertise & leadership to cover a broad range of activities such as defining near-term and future requirements for current systems and future upgrades, maintain system performance models to evaluate system improvements, threat changes and operational environment conditions, verify models and simulations to promote program success through application of rigorous and disciplined systems engineering principles and practices in a consistent manner across system elements over the program life cycle, make prudent use of authoritative technical expertise for advice and independent review, identify a range of technically acceptable alternatives to resolve engineering issues, assist in development of T&E planning, and continue to maintain NSPO essential research and engineering capabilities and corporate memory.						
FY 2011 Base Plans: Provides funding for the Combat System Integration Technical Direction Agent (TDA) who will provide engineering support for combat system performance and risk mitigation. The TDA will leverage it's technical expertise & leadership to cover a broad range of activities such as defining near-term and future requirements for current systems and future upgrades, maintain system performance models to evaluate system improvements, threat changes and operational environment conditions, verify models and simulations to promote program success through application of rigorous and disciplined						

UNCLASSIFIED

R-1 Line Item #121

Page 13 of 21

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy							DATE: February 2010				
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>			R-1 ITEM NOMENCLATURE PE 0604756N: <i>Ship Self Def (Engage: Hard Kill)</i>			PROJECT 0173: <i>NATO Sea Sparrow</i>					
B. Accomplishments/Planned Program (\$ in Millions)											
						FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	
systems engineering principles and practices in a consistent manner across system elements over the program life cycle, make prudent use of authoritative technical expertise for advice and independent review, identify a range of technically acceptable alternatives to resolve engineering issues, assist in development of T&E planning, and continue to maintain NSPO essential research and engineering capabilities and corporate memory.											
Defense Acquisition Workforce Fund <i>FY 2009 Accomplishments:</i> Funded Defense Acquisition Workforce Fund						0.047	0.000	0.000	0.000	0.000	
Accomplishments/Planned Programs Subtotals						9.364	7.141	4.313	0.000	4.313	
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• WPN 2307: ESSM	84.597	51.229	48.152	0.000	48.152	49.999	53.273	73.142	117.028	778.732	1,876.452
• OPN 5237: NATO SEA SPARROW	10.290	13.514	11.121	0.000	11.121	9.265	9.279	8.609	8.641	0.000	185.619
D. Acquisition Strategy ESSM is a directed sole source contract to Raytheon Missile Systems Company. The MK 29 ESSM Launcher Upgrade and REARC/SSDS Integration effort was a directed sole source contract to Raytheon Company (IDS).											
E. Performance Metrics Successfully complete Developmental Test/Operational testing											

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy											DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 5: Development & Demonstration (SDD)				R-1 ITEM NOMENCLATURE PE 0604756N: Ship Self Def (Engage: Hard Kill)				PROJECT 0173: NATO Sea Sparrow					
Product Development (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
ESSM-Primary Hardware Development	C/CPAF	Raytheon Tucson	143.356	0.000		0.000		0.000		0.000	0.000	143.356	Continuing
ESSM-Primary Hardware Development	Allot	TDW various	3.746	0.000		0.000		0.000		0.000	0.000	3.746	3.746
Amphin Self-Defense PRA Imp	Various/ Various	various various	1.717	0.382	Oct 2009	0.000		0.000		0.000	0.000	2.099	11.200
Ancillary Hardware Development	SS/CPAF	Lockhead/UDLP various	46.706	0.000		0.000		0.000		0.000	0.000	46.706	46.706
Systems Engineering	Various/ Various	various various	22.622	0.000		0.000		0.000		0.000	0.000	22.622	22.622
MK 29/ESSM Launcher upgrade	C/CPAF	Raytheon Sys Tucson	8.521	0.000		0.000		0.000		0.000	0.000	8.521	8.521
NATO-Primary Hdw Dev	SS/CPAF	Raytheon Sys Tucson	30.627	0.000		0.000		0.000		0.000	0.000	30.627	30.627
Software Development/ Test	SS/CPAF	Raytheon Sys Tucson	7.691	0.000		0.000		0.000		0.000	0.000	7.691	Continuing
Systems Engineering/ Firing Spt	Various/ Various	various various	5.731	0.450	Nov 2009	0.475	Nov 2010	0.000		0.475	0.000	6.656	Continuing
Subtotal			270.717	0.832		0.475		0.000		0.475	0.000	272.024	123.422
Remarks													

UNCLASSIFIED

R-1 Line Item #121

Page 15 of 21

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy											DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>				R-1 ITEM NOMENCLATURE PE 0604756N: <i>Ship Self Def (Engage: Hard Kill)</i>				PROJECT 0173: <i>NATO Sea Sparrow</i>					
Support (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Integrated Logistics Support	WR	NSWC PHD CA	3.568	0.000		0.000		0.000		0.000	0.000	3.568	Continuing
Engr Support1	WR	various various	4.207	0.000		0.000		0.000		0.000	0.000	4.207	Continuing
MK 29/ESSM Launcher Support	WR	Dahlgren/PHD VA/CA	0.375	0.000		0.000		0.000		0.000	0.000	0.375	Continuing
Engr Support2	WR	various various	0.195	0.000		0.000		0.000		0.000	0.000	0.195	0.195
NATO-MK 91/SSDS Integ	WR	Dahlgren/PHD VA/CA	0.834	0.000		0.000		0.000		0.000	0.000	0.834	Continuing
Engr Support3	WR	various various	6.364	0.000		0.000		0.000		0.000	0.000	6.364	Continuing
Engr Support4	WR	APL MD	0.600	0.307	Oct 2009	0.313	Oct 2010	0.000		0.313	Continuing	Continuing	Continuing
Subtotal			16.143	0.307		0.313		0.000		0.313			
Remarks													

UNCLASSIFIED

R-1 Line Item #121

Page 16 of 21

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 5: Development & Demonstration (SDD)					R-1 ITEM NOMENCLATURE PE 0604756N: Ship Self Def (Engage: Hard Kill)					PROJECT 0173: NATO Sea Sparrow	

Test and Evaluation (\$ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Developmental Test & Evaluation	WR	NSWC CL CA	14.298	0.735	Nov 2009	0.665	Nov 2010	0.000		0.665	Continuing	Continuing	Continuing
OPEVAL/TECHEVAL/ Test Firings	WR	various (Corona, IHD, Dahlgren, SNSWC, PHD) various	11.878	0.000		0.000		0.000		0.000	0.000	11.878	Continuing
Developmental Test & Evaluation	SS/CPFF	APL MD	2.304	0.300	Oct 2009	0.375	Oct 2010	0.000		0.375	0.275	3.254	2.010
ESSM Test & Evaluation	Various/ Various	various various	4.204	3.203	Dec 2009	0.753	Dec 2010	0.000		0.753	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	Dahlgren VA	0.418	0.000		0.000		0.000		0.000	0.000	0.418	0.836
Subtotal			33.102	4.238		1.793		0.000		1.793			

Remarks

Management Services (\$ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
ESSM-ENGR SPT	WR	various various	4.913	0.000		0.000		0.000		0.000	0.000	4.913	Continuing
ESSM-PM SPT	WR	various	0.498	0.000		0.000		0.000		0.000	0.000	0.498	0.498

UNCLASSIFIED

R-1 Line Item #121

Page 17 of 21

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy											DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 5: Development & Demonstration (SDD)				R-1 ITEM NOMENCLATURE PE 0604756N: Ship Self Def (Engage: Hard Kill)				PROJECT 0173: NATO Sea Sparrow						
Management Services (\$ in Millions)														
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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	
		various												
ESSM-Labor	Allot	various various	10.855	1.564	Oct 2009	1.532	Oct 2010	0.000		1.532	Continuing	Continuing	Continuing	
ESSM-Travel	Allot	various various	2.382	0.200	Oct 2009	0.200	Oct 2010	0.000		0.200	Continuing	Continuing	Continuing	
ESSM-Misc	Various/ Various	various various	2.065	0.000		0.000		0.000		0.000	0.000	2.065	2.065	
NATO Travel/Misc	Various/ Various	various various	1.831	0.000		0.000		0.000		0.000	0.000	1.831	Continuing	
Defense Acquisition Workforce Development Fund	Various/ Various	various various	0.047	0.000		0.000		0.000		0.000	0.000	0.047	Continuing	
Subtotal			22.591	1.764		1.732		0.000		1.732				
Remarks														
			Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals			342.553	7.141		4.313		0.000		4.313				
Remarks														

UNCLASSIFIED

UNCLASSIFIED

DATE: February 2010

R-1 ITEM NOMENCLATURE

PE 0604756N: Ship Self Def (Engage: Hard Kill)

0173: *NATO Sea Sparrow*

Navy

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604756N: <i>Ship Self Def (Engage: Hard Kill)</i>	PROJECT 0173: <i>NATO Sea Sparrow</i>	

Schedule Details

Event	Start		End	
	Quarter	Year	Quarter	Year
Platform Intergration DT/OT	3	2009	3	2014
Expiration of Production MOU	1	2012	1	2012
MOU Extension	1	2011	4	2014
FY 06 FRP DELIVERIES	4	2009	3	2010
FY 07FRP DELIVERIES	4	2010	3	2011
FY 08 FRP DELIVERIES	3	2011	1	2012
FY 09 FRP CONTRACT AWARD	4	2009	4	2009
FY 09 FRP DELIVERIES	1	2012	3	2012
FY 10 FRP CONTRACT AWARD	1	2010	1	2010
FY 10 FRP DELIVERIES	3	2012	1	2013
FY 11 FRP CONTRACT AWARD	1	2011	1	2011
FY 11 FRP DELIVERIES	2	2013	1	2014
FY 12 FRP CONTRACT AWARD	1	2012	1	2012
FY 12 FRP DELIVERIES	1	2014	1	2015
FY 13 FRP CONTRACT AWARD	1	2013	1	2013
FY 13 FRP DELIVERIES	1	2015	4	2015
FY 14 FRP CONTRACT AWARD	1	2014	1	2014
FY 15 FRP CONTRACT AWARD	1	2015	1	2015

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy								DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>				R-1 ITEM NOMENCLATURE PE 0604756N: <i>Ship Self Def (Engage: Hard Kill)</i>				PROJECT 9999: <i>Congressional Adds</i>			
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: <i>Congressional Adds</i>	10.671	11.950	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	37.855
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		
A. Mission Description and Budget Item Justification Congressional Add.											
B. Accomplishments/Planned Program (\$ in Millions)											
							FY 2009	FY 2010			
Congressional Add: PHALANX CIWS FUTURE CONCEPTS/NEXT GEN <i>FY 2009 Accomplishments:</i> FY09 Congressional Add provides funding for Future Phalanx Next Generation improvements. <i>FY 2010 Plans:</i> FY10 Congressional Add provides funding for Laser Phalanx							10.671	11.950			
Congressional Adds Subtotals							10.671	11.950			
C. Other Program Funding Summary (\$ in Millions) N/A											
D. Acquisition Strategy N/A											
E. Performance Metrics Congressional Add											

UNCLASSIFIED

R-1 Line Item #121

Page 21 of 21