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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 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0604256N / <i>Threat Simulator Development</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	0.000	40.178	30.769	16.633	-	16.633	28.494	27.893	22.402	22.875	Continuing	Continuing
0602: <i>Eletronic W/F Env Simulation (ECHO)</i>	0.000	25.563	21.386	3.462	-	3.462	13.743	12.756	7.299	7.452	Continuing	Continuing
0672: <i>Effect Nav E/W (ENEWS)</i>	0.000	14.615	9.383	13.171	-	13.171	14.751	15.137	15.103	15.423	Continuing	Continuing

A. Mission Description and Budget Item Justification

This is a continuing program that consolidates the design, fabrication and integration of Naval Electronic Warfare (EW) threat simulators for increased managerial emphasis and coordination. These simulator development efforts provide realistic Developmental and Operational Test and Evaluation environments to test EW systems and defensive tactics. These projects develop threat Anti-Air and Anti-Ship weapon system simulators in accordance with the Services' requirements.

The 0602 Project, Electronic Warfare Environment Simulation, directly supports the Test and Evaluation resource requirements for all Naval Air EW development programs to include multi-spectral situational awareness and countermeasures. Programs in development and future programs include: ALR-67(v) 3, Integrated Defensive Electronic Countermeasures Suite ALQ-214, the AAR-47 (v) 3, AVR-2, ALQ-144A, Joint Strike Fighter, EA-18G, LR700, Low Band Transmitter, P-8A, and the Next Generation Jammer.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under RESEARCH, DEVELOPMENT, TEST and EVALUATION MANAGEMENT SUPPORT because it supports efforts directed toward sustaining or modernizing installations or operations required for general research, development, test and evaluation.

B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	40.793	30.769	25.642	-	25.642
Current President's Budget	40.178	30.769	16.633	-	16.633
Total Adjustments	-0.615	0.000	-9.009	-	-9.009
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.615	0.000			
• Rate/Misc Adjustments	0.000	0.000	-9.009	-	-9.009

Change Summary Explanation

The FY 2016 funding request was reduced by -\$5.9 million to account for the availability of prior year execution balances.

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1319: <i>Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support</i>	PE 0604256N / <i>Threat Simulator Development</i>

The FY 2017 funding request was reduced by -\$11.1 million to account for the availability of prior year execution balances and by -\$0.895 million as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

Technical: Not applicable.

Schedule: Not applicable.

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy										Date: February 2016		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0604256N / <i>Threat Simulator Development</i>			Project (Number/Name) 0602 / <i>Eletronics W/F Env Simulation (ECHO)</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
0602: <i>Eletronics W/F Env Simulation (ECHO)</i>	0.000	25.563	21.386	3.462	-	3.462	13.743	12.756	7.299	7.452	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The objective of this project is development of necessary simulation facilities and approaches to allow determination of the effectiveness of Electronic Warfare (EW) in real world engagement situations and to support the introduction of modern, effective systems into Naval Aviation. The heavy use of test resources by all Services demonstrates the importance of these assets. The Navy has been very successful in executing all of its major programs, and to date has had no major technical problems.

The Electronic Warfare Environment Simulation project is unique because it is the only program within the Department of Defense which develops and provides Naval anti-air warfare threat assets for Test and Evaluation (T&E).

This project directly supports the T&E resource requirements for all Naval Air EW development programs, to include multi-spectral situational awareness and countermeasures. Programs in development and future programs include: ALR-67(v) 3, Integrated Defensive Electronic Countermeasures Suite ALQ-214, the AAR-47 (v) 3, AVR-2, ALQ-144A, Joint Strike Fighter, EA-18G, LR700, Low Band Transmitter, P-8A, and the Next Generation Jammer.

This project provides for the development of an Integrated Air Defense T&E capability to be fielded at each of the three sites comprising the Navy's Tri-Center complex: Naval Air Warfare Center Weapons Division, China Lake and Point Mugu in CA, and Naval Air Warfare Center Aircraft Division, Patuxent River, MD.

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

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: ACQUISITION AND MEASUREMENT CAPABILITIES	5.778	5.109	0.250	0.000	0.250
Articles:	-	-	-	-	-
Description: Provide the test community with the modern threat acquisition systems and effectiveness measurement systems necessary for Test and Evaluation of airborne alert, Situation Awareness, targeting systems and airborne response systems.					
Funding decrease from FY15 to FY16 because the majority of material purchases for radio frequency beam measurement capability are complete.					

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Appropriation/Budget Activity 1319 / 6		R-1 Program Element (Number/Name) PE 0604256N / <i>Threat Simulator Development</i>		Project (Number/Name) 0602 / <i>Eletronics W/F Env Simulation (ECHO)</i>																
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)																				
Funding decrease from FY16 to FY17 due to the completion of the laboratory simulators of foreign radars upgrades and the remaining material purchases for radio frequency beam measurement capability are complete and system integration and test is under way.																				
<p>FY 2015 Accomplishments:</p> <ul style="list-style-type: none"> - Completed the update to existing laboratory simulators of foreign radars. - Continued the upgrade of open-loop threat simulators at Electronic Combat Range (ECR). - Continued the development of an open air radio frequency beam measurement capability. - Continued the upgrade of open air radio frequency signal density enhancement systems. <p>FY 2016 Plans:</p> <ul style="list-style-type: none"> - Continue the development of an open air radio frequency beam measurement capability. - Complete the upgrade of open-loop threat simulators at ECR. - Complete the upgrade of open air radio frequency signal density enhancement systems. <p>FY 2017 Base Plans:</p> <ul style="list-style-type: none"> - Complete the development of an open air radio frequency beam measurement capability. <p>FY 2017 OCO Plans: N/A</p>																				
Title: REQUIREMENTS AND VALIDATION																				
Articles:																				
<table border="1"> <thead> <tr> <th>FY 2015</th> <th>FY 2016</th> <th>FY 2017 Base</th> <th>FY 2017 OCO</th> <th>FY 2017 Total</th> </tr> </thead> <tbody> <tr> <td align="right">0.964</td> <td align="right">0.878</td> <td align="right">0.627</td> <td align="right">0.000</td> <td align="right">0.627</td> </tr> <tr> <td align="right">-</td> <td align="right">-</td> <td align="right">-</td> <td align="right">-</td> <td align="right">-</td> </tr> </tbody> </table>						FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	0.964	0.878	0.627	0.000	0.627	-	-	-	-	-
FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total																
0.964	0.878	0.627	0.000	0.627																
-	-	-	-	-																
<p>Description: Validate and track intel updates of the threat systems necessary for the operation and continuous improvement of Navy laboratories and ranges which provide engineering support, testing and analysis to the developers, integrators, testers and users of systems and technologies that counter or penetrate air defenses.</p> <p>FY 2015 Accomplishments:</p> <ul style="list-style-type: none"> - Continued to provide program management, systems engineering, and requirements identification for the development of simulators and foreign material acquisition. - Continued to validate simulators and stimulators at the Navy tri-lab centers. <p>FY 2016 Plans:</p> <ul style="list-style-type: none"> - Continue to provide program management, systems engineering, and requirements identification for the development of simulators and foreign material acquisition. 																				

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0604256N / <i>Threat Simulator Development</i>	Project (Number/Name) 0602 / <i>Eletronics W/F Env Simulation (ECHO)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<p>- Continue to validate simulators and stimulators at the Navy tri-lab centers.</p> <p>FY 2017 Base Plans:</p> <p>- Continue to provide program management, systems engineering, and requirements identification for the development of simulators and foreign material acquisition.</p> <p>- Continue to validate simulators and stimulators at the Navy tri-lab centers.</p> <p>FY 2017 OCO Plans:</p> <p>N/A</p>					
<p>Title: ENGAGEMENT CAPABILITIES</p> <p align="right">Articles:</p> <p>Description: Provide the test community with the modern threat engagement systems necessary for Test and Evaluation of airborne alert, Situation Awareness, targeting systems and airborne response systems.</p> <p>Funding decreases from FY15 to FY16 because the majority of the long lead item material purchases were completed for the development of a closed-loop threat surface to air missile system simulator.</p> <p>Funding decreased from FY16 to FY17 because the purchase of the remaining materials for the development of a closed-loop threat surface to air missile system simulator is complete.</p> <p>FY 2015 Accomplishments:</p> <ul style="list-style-type: none"> - Continued the upgrade and integration of missile simulation models. - Continued the development of a closed-loop threat surface to air missile system simulator. - Continued the conversion of a threat system. - Continued the minor upgrades to open air and laboratory threat systems. - Completed the development of the Long Range Threat System simulator at Electronic Combat Range (ECR). <p>FY 2016 Plans:</p> <ul style="list-style-type: none"> - Continue the upgrade and integration of missile simulation models. - Continue the development of a closed-loop threat surface to air missile system simulator. - Continue the conversion of a threat system. - Continue the minor upgrades to open air and laboratory threat systems. <p>FY 2017 Base Plans:</p>	18.821	15.399	2.585	0.000	2.585
	-	-	-	-	-

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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
<ul style="list-style-type: none"> - Continue the upgrade and integration of missile simulation models. - Continue the development of a closed-loop threat surface to air missile system simulator. - Continue the conversion of a threat system. - Continue the minor upgrades to open air and laboratory threat systems. - Initiate the integration of a threat engagement system at ECR. <p>FY 2017 OCO Plans: N/A</p>					
Accomplishments/Planned Programs Subtotals	25.563	21.386	3.462	0.000	3.462

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

N/A

Remarks

D. Acquisition Strategy

Not Applicable.

E. Performance Metrics

Successfully achieve Initial Operational Capability of Navy Threat Simulation projects within 60 days of approved schedule and have test capabilities scheduled in support of Navy test programs within 180 days.

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Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0604256N / <i>Threat Simulator Development</i>				Project (Number/Name) 0672 / <i>Effect Nav E/W (ENEWS)</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
0672: <i>Effect Nav E/W (ENEWS)</i>	0.000	14.615	9.383	13.171	-	13.171	14.751	15.137	15.103	15.423	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The objective of the Effectiveness of Navy Electronic Warfare (EW) Systems (ENEWS) Project is the development and application of necessary simulation assets to determine the effectiveness of EW for Navy ships in simulated real-world engagement situations. The project primarily supports the introduction of modern, effective shipboard and off-board EW systems, and tactics for the Surface Navy. The heavy use of ENEWS resources by Naval Sea Systems Command, Operational Test and Evaluation (OT&E) Force, Special Operations, and other EW Research, Development, Test and Evaluation (T&E) agencies speaks to the overall importance of this project. The project provides support for EW system design, Engineering Test (ET), Development Test (DT), Operational Test (OT), and the development of utilization tactics. In the past ENEWS quick reaction capabilities have had great impact on crisis situations such as the Libyan crises, Iran threat, Persian Gulf crisis, and Operation Desert Shield/Storm. Simulation Display (SIMDIS) is an ENEWS modeling tool that was developed to support T&E. SIMDIS has been adopted by most Department of Defense (DoD) T&E and training ranges to provide visualization of T&E and training scenarios. One of the primary threats to surface ships is Anti-Ship Capable Missile systems. The ENEWS Project is unique in that it is the only project within DoD dedicated to developing and providing realistic Anti-Ship Capable Missile assets to test and evaluate the effectiveness of shipboard EW systems and tactics against these type threats. The ENEWS Project is a critical part of the Office of the Secretary of Defense Test Resource Master Plan. This plan employs many of the ENEWS assets for planning, analysis, testing, and verification of shipboard and off-board EW systems techniques and tactics. As part of its normal activities, ENEWS provides Development Test and Evaluation (DT&E), OT&E, and Follow-on Operational Test and Evaluation (FOT&E) support to the surface Navy for all ship classes. DT, OT and FOT&E support includes AN/SLQ-32 Surface Electronic Warfare Improvement Program (SEWIP), Nulka, Rapid Anti-ship Integrated Defense System, all MK245 Giant tests, advanced InfraRed (IR) decoys, decoy placement, ship IR signature and radar cross section measurement of DDG-51, LPD-17, DD-21 and PC class ships, High Power Microwave program, and other ship self-defense initiatives, including T&E of Future Naval Capability process. In addition, ENEWS assets are regularly employed to test the effectiveness of North Atlantic Treaty Organization (NATO) ships' EW systems in joint allied exercises. ENEWS assets also support Joint EW exercises that are conducted with Rim of the Pacific (RIMPAC) nations.

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

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: CLASSIFIED PROGRAM	7.438	3.161	8.100	0.000	8.100
Articles:	-	-	-	-	-
Description: Details about this program are classified.					
Details about this program and any changes are classified.					
FY 2015 Accomplishments:					

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
<p>- Details are of a higher classification.</p> <p>FY 2016 Plans:</p> <p>- Details are of a higher classification.</p> <p>FY16 funds were realigned to support the Electronic Attack (EA) Test and Evaluation (T&E) for Surface Electronic Warfare Improvement Program (SEWIP) Block 3 POR.</p> <p>FY 2017 Base Plans:</p> <p>- Details are of a higher classification.</p> <p>FY 2017 OCO Plans:</p> <p>N/A</p>					
<p>Title: HARDWARE SIMULATION SYSTEMS</p> <p align="right">Articles:</p>					
<p>Description: Maintain and perform Hardware and Software Upgrades to the inventory of ENEWS flyable and shore based Anti-Ship Capable Missile (ASCM) Electro-Optic/Infrared (EO/IR), Visible and Radio Frequency (RF) Simulators. Perform characterization of IR and RF simulators as part of the periodic evaluation of simulation performance and collect performance data for comparison with previously recorded data. Also includes development and maintenance of all simulator control panels.</p> <p>The increase between FY 2015 and FY 2016 is due to the Effectiveness of Naval EW Systems Technical Change. This funding increase supports critical simulator capability upgrades necessary to test, evaluate and demonstrate the effectiveness of Surface Electronic Warfare.</p> <p>The decrease between FY 2016 and FY 2017 is due to the completion of a simulator capability upgrade.</p> <p>FY 2015 Accomplishments:</p> <ul style="list-style-type: none"> - Continued annual maintenance of ENEWS simulators to support flight/shore based tests. - Continued hardware upgrades to the SUMMIT Simulator. - Continued software upgrades to the VICTOR Standard Instrumentation Pod (SIP). - Initiated hardware upgrades to the FOXTROT 3 TOWSIM(IOTA). <p>FY 2016 Plans:</p>					
	1.771	3.336	2.201	0.000	2.201
	-	-	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)										
<ul style="list-style-type: none"> - Continue all efforts of FY 2015. - Initiate hardware and software upgrades for the ASCM signal processor in the loop (ASPIL) - Initiate software upgrades for the MEIR 3, MIKE 3, TOWSIM Electro-Optical (EO) and (NU) VICTOR 1 SIP simulators <p>FY 2017 Base Plans: Continue all efforts of FY 2016.</p> <ul style="list-style-type: none"> - Complete software upgrades for ASPIL - Complete software upgrades for the MEIR 3, MIKE 3, NU and VICTOR 1 Standard Instrumentation Pod (SIP) simulators - Complete IOTA hardware upgrades - Initiate hardware upgrades for VICTOR 1 SIP and Anti-Ship Imaging Missile (AIMS) simulators - Initiate software upgrade for FOXTROT 1 Sim 1 simulator - Maintain and upgrade 20 simulators and the Antenna Test Rig to support the Surface Electronic Warfare Improvement Program (SEWIP) Block 3 and Advanced Offboard Electronic Warfare (AOEW) effectiveness evaluations. <p>FY 2017 OCO Plans: N/A</p>						FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: SIMULATION CHARACTERIZATION, VERIFICATION AND REQUIREMENTS										
Articles:										
<p>Description: Provides for the documentation of ASCM threat simulators. Develops reports that contain detailed descriptions and parametric data of the Anti-Ship Capable Missile (ASCM) threat simulators and compares the simulator's parametric data to the actual threat's parametric data. Provide technical management functions in support of the ENEWS project; engineering and technical support requirements for the ASCM simulators and upgrades to meet DT/ OT testing requirements, development of detailed test resource requirements and provides an interface between OPNAV N2/N6, Office of Naval Research, and ENEWS oversight activities.</p> <p>The decrease between FY 2015 and FY 2016 is due to the termination of the simulator validation effort. Beginning in FY 2015 the simulator validation effort was terminated and no more validation reports will be published. ENEWS will continue to develop simulator documentation reports that will include a simulator description with a comparison to the threat it represents.</p>						0.644	0.521	0.596	0.000	0.596

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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>Development of T&E scenarios and environmental modeling to support electronic support (ES) and electronic attack (EA) testing; modify ASCM threat simulators based on the latest intelligence data obtained from threat databases.</p> <p>The decrease between FY 2015 and FY 2016 is due to completion of a simulator capability upgrade in FY 2015.</p> <p>FY 2015 Accomplishments:</p> <ul style="list-style-type: none"> - Continued maintenance and upgrades to shore-based test facilities and mobile test vans as required to conduct testing in support of SEWIP, Nulka and multi-function EW programs. - Continued to transition environmental, threat and platform simulations from Subversion to Mercurial Distributed Version Control System. - Continued upgrades to configuration control software library as new releases became available. - Continued to develop new digital models of Anti-ship Cruise Missile (ASCM) threats as they became available. - Continued upgrades and maintenance of flight support systems as necessary to support the IR/RF ENEWS simulators. - Continued upgrades and user friendly enhancements to the Simulation Display (SIMDIS) toolset - Continued development of LIMA III and LIMA IV digital models - Initiated digital model upgrades to support Surface Electronic Warfare Improvement Program (SEWIP) Block 3 test and evaluation. - Initiate and continue simulator upgrades to support Surface Electronic Warfare Improvement Program (SEWIP) Block 3 test and evaluation. <p>FY 2016 Plans:</p> <ul style="list-style-type: none"> - Continue all efforts of FY 2015, less those noted as completed above. - Maintain and update target models to support SEWIP Block 3 and Advanced Offboard Electronic Warfare (AOEW) effectiveness assessments. - Initiate update to the Scenario and Environment Model used to support open and closed loop simulations. <p>FY 2017 Base Plans:</p> <ul style="list-style-type: none"> - Continue all efforts of FY 2016 less those noted as completed above. - Complete update to the Scenario and Environment Model used to support open and closed loop simulations. <p>FY 2017 OCO Plans:</p>					

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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
N/A					
Accomplishments/Planned Programs Subtotals	14.615	9.383	13.171	0.000	13.171

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

N/A

Remarks

D. Acquisition Strategy

Not applicable.

E. Performance Metrics

Performance metrics are discussed within each project (R2a).