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Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Navy **Date:** February 2015

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>							
COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
Total Program Element	0.000	42.177	40.793	30.769	-	30.769	25.642	23.530	21.875	22.431	Continuing	Continuing
0602: <i>Eletrronics W/F Env Simulation (ECHO)</i>	0.000	29.267	26.057	21.386	-	21.386	10.973	9.285	7.097	7.348	Continuing	Continuing
0672: <i>Effect Nav E/W (ENEWS)</i>	0.000	12.910	14.736	9.383	-	9.383	14.669	14.245	14.778	15.083	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, Advanced 6" Expendable, Advanced Strategic Tactical Expendable, 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 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Previous President's Budget	43.261	45.272	41.861	-	41.861
Current President's Budget	42.177	40.793	30.769	-	30.769
Total Adjustments	-1.084	-4.479	-11.092	-	-11.092
• Congressional General Reductions	-	-	-	-	-
• Congressional Directed Reductions	-	-4.479	-	-	-
• Congressional Rescissions	-	-	-	-	-
• Congressional Adds	-	-	-	-	-
• Congressional Directed Transfers	-	-	-	-	-
• Reprogrammings	-	-	-	-	-
• SBIR/STTR Transfer	-1.084	-	-	-	-
• Program Adjustments	-	-	-0.040	-	-0.040
• Rate/Misc Adjustments	-	-	-11.052	-	-11.052

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<u>Change Summary Explanation</u> The FY 2016 funding request was reduced by -\$5.9 million to account for the availability of prior year execution balances. Technical: Not applicable. Schedule: Not applicable.		

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Navy										Date: February 2015		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0604256N / Threat Simulator Development				Project (Number/Name) 0602 / Eletronics W/F Env Simulation (ECHO)			
COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
0602: Eletronics W/F Env Simulation (ECHO)	-	29.267	26.057	21.386	-	21.386	10.973	9.285	7.097	7.348	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, Advanced 6" Expendable, Advanced Strategic Tactical Expendable, 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 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Title: REQUIREMENTS AND VALIDATION	1.115	0.981	0.878	-	0.878
Articles:	-	-	-	-	-
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.					
FY 2014 Accomplishments:					
- Continue to provide program management, systems engineering, and requirements identification for the development of simulators and foreign material acquisition.					

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Appropriation/Budget Activity 1319 / 6		R-1 Program Element (Number/Name) PE 0604256N / Threat Simulator Development		Project (Number/Name) 0602 / Eletronics W/F Env Simulation (ECHO)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
- Continue to validate simulators and stimulators at the Navy tri-lab centers. FY 2015 Plans: - Continue to provide program management, systems engineering, and requirements identification for the development of simulators and foreign material acquisition. - Continue to validate simulators and stimulators at the Navy tri-lab centers. FY 2016 Base Plans: - Continue to provide program management, systems engineering, and requirements identification for the development of simulators and foreign material acquisition. - Continue to validate simulators and stimulators at the Navy tri-lab centers. FY 2016 OCO Plans: N/A						
Title: ACQUISITION AND MEASUREMENT CAPABILITIES 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 increase from FY 2014 to FY 2015 required for material purchases for radio frequency beam measurement capability. Funding decrease from FY 2015 to FY 2016 because the majority of material purchases for radio frequency beam measurement capability are complete. FY 2014 Accomplishments: - Continue the update to existing laboratory simulators of foreign radars. - Continue the upgrade of open-loop threat simulators at Electronic Combat Range (ECR). - Continue the development of an open air radio frequency beam measurement capability. - Initiate the upgrade of open air radio frequency signal density enhancement systems. - Complete the development of an advanced Early Warning and Acquisition radar hybrid laboratory simulator. FY 2015 Plans: - Complete the update to existing laboratory simulators of foreign radars. - Continue the upgrade of open-loop threat simulators at ECR.		5.711 -	9.030 -	5.109 -	- -	5.109 -

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Appropriation/Budget Activity 1319 / 6		R-1 Program Element (Number/Name) PE 0604256N / Threat Simulator Development		Project (Number/Name) 0602 / Eletronics W/F Env Simulation (ECHO)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
- Continue the development of an open air radio frequency beam measurement capability. - Continue the upgrade of open air radio frequency signal density enhancement systems. FY 2016 Base Plans: - Continue the development of an open air radio frequency beam measurement capability. - Complete the upgrade of open-loop threat simulators at Electronic Combat Range (ECR). - Complete the upgrade of open air radio frequency signal density enhancement systems. FY 2016 OCO Plans: N/A						
Title: ENGAGEMENT CAPABILITIES Articles: 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. Funding decrease from FY 2014 to FY 2015 in order to properly align the execution due to the late award of the contract for the conversion of a threat system. Development, integration and site acceptance have moved out to FY 2017 and FY 2018 as a result. FY 2014 Accomplishments: - 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 development of the Long Range Threat System (LRTS) simulator at ECR. - Complete the development of a Digital Radio Frequency Memory Jammer simulator. - Complete the upgrade to the J-32B Advanced Threat System at ECR. - Initiate the minor upgrades to open air and laboratory threat systems. FY 2015 Plans: - 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.		22.441 -	16.046 -	15.399 -	- -	15.399 -

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
- Complete the development of the LRTS simulator at ECR. <i>FY 2016 Base Plans:</i> - 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. <i>FY 2016 OCO Plans:</i> N/A						
Accomplishments/Planned Programs Subtotals		29.267	26.057	21.386	-	21.386
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 / Threat Simulator Development				Project (Number/Name) 0672 / Effect Nav E/W (ENEWS)			
COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
0672: Effect Nav E/W (ENEWS)	-	12.910	14.736	9.383	-	9.383	14.669	14.245	14.778	15.083	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 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Title: CLASSIFIED PROGRAM								8.494	7.500	3.161	-	3.161
								Articles: -	-	-	-	-
Description: Details about this program are classified.												
Details about this program and any changes are classified.												
FY 2014 Accomplishments:												

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
- Details are of a higher classification. FY 2015 Plans: - Details are of a higher classification. FY 2016 Base Plans: - Details are of a higher classification. Funds are being moved to support Electronic Attack (EA) Test and Evaluation (T&E) for Surface Electronic Warfare Improvement Program (SEWIP) Block 3 POR. FY 2016 OCO Plans: N/A						
Title: HARDWARE SIMULATION SYSTEMS Articles: 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. 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. FY 2014 Accomplishments: - Continued annual maintenance of ENEWS simulators to support flight/shore based tests. - Completed software intelligence upgrades to the MEIR 3 and MIKE 3 simulators. - Initiated hardware upgrades to the SUMMIT Simulator. - Initiated software upgrades to the VICTOR Standard Instrumentation Pod (SIP). FY 2015 Plans: - Continue all efforts of FY 2014 less those noted completed above.		1.773 -	1.786 -	3.336 -	- -	3.336 -

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
- Initiate hardware upgrades to the FOXTROT 3 TOWSIM. FY 2016 Base Plans: - Continue all efforts of FY 2015 less those noted completed above. - 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 VICTOR 1 SIP simulators FY 2016 OCO Plans: N/A					
Title: SIMULATION VALIDATION AND REQUIREMENTS Articles: Description: Provides for the validation of hardware simulators and digital models. Develops reports that contain detailed descriptions and parametric data of the threat simulators or digital models 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 overall efforts of ASCM simulator and digital model development to meet DT/OT testing requirements, development of detailed test resource requirements and provides an interface between OPNAV N2/N6, Office of Naval Research, Naval Post Graduate School (NPS) and other ENEWS oversight activities. The decrease between 2014 and 2015 is due to the completion of the SIGMA, OMEGA 2 and ZETA simulator hardware validation reports. The decrease between FY 2015 and FY 2016 is due to a reduction in the simulator validation effort. No validation reports are scheduled to be published in FY 2016. FY 2014 Accomplishments: - Continued management of the SVWG. - Continued SIGMA simulator hardware validation report. - Initiated and completed update of the FY 2014 Program Management Plan. - Initiated and completed FY 2014 monthly reports, performance based management and analysis, financial execution reporting and assessment. - Initiated OMEGA 2 and ZETA simulator hardware validation report. FY 2015 Plans:					
	0.832	0.649	0.521	-	0.521
	-	-	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
- Continue all efforts of FY 2014 less those noted completed above. - Complete SIGMA, OMEGA 2 and ZETA simulator hardware validation reports. - Initiate and complete update of the FY 2015 Program Management Plan. - Initiate and complete FY 2015 monthly reports, performance based management and analysis, financial execution reporting and assessment. - Initiate LAMBDA simulator hardware validation report. FY 2016 Base Plans: - Continue all efforts of FY 2015 less those noted completed above. - Initiate and complete update of the FY 2016 ENEWS Program Management Plan. - Initiate and complete FY 2016 monthly reports, performance based management and analysis, financial execution reporting and assessment. - Initiate and complete all FY 2015 Planning, Programming and Budgeting Systems submissions. - Initiate BETA simulator hardware validation report. - Initiate and complete the LAMBDA simulator characterization assessment. FY 2016 OCO Plans: N/A						
Title: SUPPORT AND COMPUTERS SIMULATION SYSTEMS		1.811	4.801	2.365	-	2.365
Articles:		-	-	-	-	-
Description: Perform maintenance and intelligence upgrades to EO/IR, Digital, and RF Laboratory Simulation testing facilities and flight support equipment based on existing and emerging complex threat systems. Development of T&E scenarios and environmental modeling to support electronic support (ES) and electronic attack (EA) testing; modify ASCM Digital Models based on the latest intelligence data obtained from threat databases. The increase between FY 2014 and FY 2015 is due to the Effectiveness of Naval EW Systems Technical Change. This funding increase supports critical simulator capability upgrades and digital model development necessary to test, evaluate and demonstrate effectiveness of Surface Electronic Warfare. The decrease between FY 2015 and FY 2016 is due to completion of a simulator capability upgrade in FY 2015. FY 2014 Accomplishments:						

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
- 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 - Completed simulator user friendly enhancements for the NOVEMBER IV digital model. - Completed improvements and intelligence upgrades to the mmW digital models. - Initiated development of LIMA III and LIMA IV digital models FY 2015 Plans: - Continue all efforts of 2014, less those noted as completed above. - Initiate digital model upgrades to support Surface Electronic Warfare Improvement Program (SEWIP) Block 3 test and evaluation. FY 2016 Base Plans: - Continue all efforts of 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 FY 2016 OCO Plans: N/A						
Accomplishments/Planned Programs Subtotals		12.910	14.736	9.383	-	9.383
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks						
D. Acquisition Strategy Not applicable.						

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E. Performance Metrics

Performance metrics are discussed within each project (R2a).