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Exhibit R-2, PB 2010 Navy RDT&E Budget Item Justification								DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY 1319 - Research, Development, Test & Evaluation, Navy/BA 3 - Advanced Technology Development (ATD)					R-1 ITEM NOMENCLATURE PE 0603758N NAVY WARFIGHTING EXPERIMENTS AND DEMONSTRATIONS					
COST (\$ in Millions)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
Total Program Element	41.100	66.138	52.643						Continuing	Continuing
2918: NAVY WARFIGHTING EXPERIMENTS AND DEMONSTRATIONS	41.100	59.955	52.643						Continuing	Continuing
9999: CONGRESSIONAL PLUS-UPS	0.000	6.183	0.000						Continuing	Continuing

A. Mission Description and Budget Item Justification

This Program Element (PE) addresses the development of recent technology breakthroughs to meet current operational needs from a subscale proof-of-principle into a full-scale prototype for warfighter experimentation during laboratory and operational demonstrations, Fleet Battle Experiments (FBE), Limited Objective Experiments (LOEs) and Sea Trial Exercises. The key aspects of this PE are divided into four areas: (1) SwampWorks develops and demonstrates newly invented or recently discovered technologies that address emergent and enduring operational problems in an accelerated timeframe; (2) Naval Warfare Experimentation develops prototypes of recent technology breakthroughs and provides them to the warfighter for experimentation during FBEs, LOEs or Sea Trials; (3) Tech Solutions resolves operational problems submitted by Sailors, Marines and Science Advisors via a collaborative working environment, applies scientific applications to solve these problems, and provides the solution to the sailor for evaluation and use; and (4) Operations Analysis provides the Navy and Marine Corps the means to identify capability needs that can be addressed with science and technology solutions.

Due to the number of efforts in this PE, the programs described herein are representative of the work included in this PE.

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B. Program Change Summary (\$ in Millions)

	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>
Previous President's Budget	40.612	70.216	55.988	
Current BES/President's Budget	41.100	66.138	52.643	
Total Adjustments	0.488	-4.078	-3.345	
Congressional Program Reductions		-10.243		
Congressional Rescissions				
Total Congressional Increases		6.200		
Total Reprogrammings	0.651			
SBIR/STTR Transfer	-0.163			
Program Adjustments			-3.377	
Rate/Misc Adjustments		-0.035	0.032	

Congressional Increase Details (\$ in Millions)

Project: 9999, IMMERSIVE NAVAL OFFICER TRAINING SYSTEMS

Project: 9999, PORTABLE LAUNCH AND RECOVERY SYSTEM FOR UAV OPERATION FROM SMALL VESSELS

	FY 2008	FY 2009
Project: 9999, IMMERSIVE NAVAL OFFICER TRAINING SYSTEMS	0.000	2.992
Project: 9999, PORTABLE LAUNCH AND RECOVERY SYSTEM FOR UAV OPERATION FROM SMALL VESSELS	0.000	3.191

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

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COST (\$ in Millions)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2918: NAVY WARFIGHTING EXPERIMENTS AND DEMONSTRATIONS	41.100	59.955	52.643						Continuing	Continuing
A. Mission Description and Budget Item Justification										
This project focuses on the development of recent technology breakthroughs to meet current operational needs from a subscale proof-of-principle into a full-scale prototype for warfighter experimentation during laboratory and operational demonstrations, FBE, LOEs and Sea Trial Exercises.										
B. Accomplishments/Planned Program (\$ in Millions)										
						FY 2008	FY 2009	FY 2010	FY 2011	
NAVAL WARFARE EXPERIMENTATION The objective of this project is to capitalize on recent technology breakthroughs to develop prototypes quickly and provide them to the warfighter for experimentation during laboratory and operational demonstrations, Sea Trials or LOEs. Current efforts include experimentation with Electronics Warfare (EW) technologies, development of test simulation technology for ship affordability, technology to advance riverine warfare operations, development and demonstration of real time situational awareness technologies, fuel cell power for unmanned air vehicles, and technology investigation studies. The funding level increase in FY 2009 is due to additional experimentation with technologies developed in SwampWorks' power and energy initiative, the Maritime Domain Awareness (MDA) Initiative, the Operational Adaptation Technology Demonstration, and Advanced multi Function Radio Frequency Technology. The funding level decrease in FY 2010 is due to completion of experimentation funded initially by the FY 2009 increase. <i>FY 2008 Accomplishments:</i> - Continued concept based technology program efforts. - Continued experimentation efforts with technologies developed in SwampWorks/Tech Solutions.						15.892	36.094	26.516		

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B. Accomplishments/Planned Program (\$ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
<ul style="list-style-type: none"> - Continued to identify other promising technology breakthroughs that can be prototyped and delivered to the warfighter for experimentation. - Continued development and demonstration of real time situational awareness technologies. - Continued Ship Affordability program to examine ship designs and construction processes and develop technologies that can significantly reduce the costs to conceive, design and construct naval ships. - Continued development of AUV large sensor network for persistent pervasive surveillance. - Completed effort to experiment and demonstrate technologies to improve warfighter survivability using electronic warfare systems. - Completed effort to experiment and demonstrate technology for riverine warfare. - Completed program to develop technologies to enhance vehicle tactical situational awareness and fuse with intelligence products. - Initiated DDG-51 fuel efficient power & propulsion demonstrator effort. <p><i>FY 2009 Plans:</i></p> <ul style="list-style-type: none"> - Continue all FY 2008 efforts less those noted as complete above. - Initiate and complete Maritime Domain Awareness augmentation. - Initiate and complete effort to develop and demonstrate an integrated, affordable and minimally-manned warfighting sensor capability to provide adaptive persistent surveillance leading to Operational Adaptation by Naval forces in defeating the Asymmetric and Irregular Warfare threat. - Initiate effort to develop and demonstrate integrated intelligence, surveillance, observation, and navigation technologies into a common operation picture accessible throughout the U.S. Government. - Initiate effort to demonstrate shipboard high temperature degaussing technologies. - Initiate development of network attack option models for near real time forensics and social network mapping. - Initiate at sea laser technology experimentation. <p><i>FY 2010 Plans:</i></p> <ul style="list-style-type: none"> - Continue all FY 2009 efforts less those noted as complete above. - Complete development of AUV large sensor network for persistent pervasive surveillance. - Complete at sea laser technology experimentation. 				

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B. Accomplishments/Planned Program (\$ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
<ul style="list-style-type: none"> - Complete experiments to demonstrate shipboard high efficiency solid state lighting technologies. - Complete effort to demonstrate shipboard high temperature degaussing technologies. - Initiate and complete advanced coupling for integrated in line high speed generator energy storage effort. - Initiate and complete experiments to demonstrate shipboard high efficiency solid state lighting technologies. - Initiate technology experimentation for Total Ownership Cost (TOC) reduction. 				
<p>OPERATIONS ANALYSIS</p> <p>The objective of this project is to provide operational analysis through studies, analyses, gaming and experimentation to identify Navy and Marine Corps capability needs that can be addressed with Science and Technology (S&T) solutions. The effort includes core analysis of S&T programs, military utility / capability gaps analyses, war gaming and fleet experimentation analysis. Recent work includes development and execution of an MDA war game as part of an MDA Simulation Experiment (SIMEX); participation in SIMEX data collection and analysis; support of Joint Capabilities Integration Development System capabilities; development of a Code of Best Practices for Operational Experimentation; analytical, strategic planning, and wargaming support of Innovative Naval Prototype efforts; organizing and conducting workshops and symposia that increase innovative outreach; fleet operational readiness assessments; and, Red Team conceptual analysis.</p> <p><i>FY 2008 Accomplishments:</i></p> <ul style="list-style-type: none"> - Continued to conduct Military Utility Analyses of future naval capability technologies. - Continued to conduct capability gaps analyses to identify areas that can be addressed with products from the science and technology portfolio. - Continued to conduct war games focused on technical issues for S&T transitions to acquisition and the fleet. <p><i>FY 2009 Plans:</i></p> <ul style="list-style-type: none"> - Continue all FY 2008 efforts. 	2.895	2.835	2.819	

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B. Accomplishments/Planned Program (\$ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
<p><i>FY 2010 Plans:</i></p> <ul style="list-style-type: none"> - Continue all FY 2009 efforts. 				
<p>SWAMPWORKS</p> <p>SwampWorks seeks to develop and demonstrate technologies that address emergent and enduring operational problems in an accelerated timeframe. Some of these technologies may end up in the hands of the warfighter for experimentation, or may culminate in a significant exercise that demonstrates capability then transitions into the Acquisition Program of Record (POR). Examples of recent successes are the half-length torpedo which led to the development of the SwampWorks Broadband Sonar and transitioned to the Mk 48 Advanced Capability program and the Aircraft Carrier Situational Awareness System, which will be incorporated into a POR. Examples of current efforts include a high resolution sonar for the new lightweight torpedo, energy storage and reduced energy consumption technologies, coherent stand-in jammer, full ship shock test simulation, effective active acoustics simulation, and technology investigation studies.</p> <p>The decrease in funding in FY 2009 and out reflects cancellation of the Hypersonics effort.</p> <p><i>FY 2008 Accomplishments:</i></p> <ul style="list-style-type: none"> - Continued to identify enduring and emergent operational barriers identified by naval leadership and responded with relevant technology developments and demonstrations. - Continued the development of new technologies that are responsive to Taskforce Antisubmarine Warfare (TF ASW), a recently developed Concept of Operation. - Continued an investigation and development of technologies that reduce energy consumption losses during recent operations. - Continued novel heavy fuel propulsion system development. <p><i>FY 2009 Plans:</i></p> <ul style="list-style-type: none"> - Continue all FY 2008 efforts. - Complete development of new technologies that are responsive to Taskforce Antisubmarine Warfare. 	15.265	13.226	13.911	

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B. Accomplishments/Planned Program (\$ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
<ul style="list-style-type: none"> - Complete development of technologies that reduce energy consumption losses during recent operations. - Initiate and complete development of electronic warfare technologies that are responsive to fleet needs to counter emerging threats. - Initiate and complete flight deck non-skid project. - Initiate disruptive commercial technology studies at varied military, government, and educational institutions. - Initiate thermal management project. - Initiate underwater communication technology development project. <p><i>FY 2010 Plans:</i></p> <ul style="list-style-type: none"> - Continue all FY 2009 efforts, less those noted as completed above. - Complete thermal management project. - Complete underwater communication technology development project. - Initiate exploration of technologies to address emergent EW threats for surface and air platforms. - Initiate high risk/high payoff projects to explore significant reduction in Total Ownership Cost (TOC). 				
<p>TECH SOLUTIONS</p> <p>The objective of this program is to provide deckplate Sailors and Marines in the field with technical solutions to common operational problems and the Office of Naval Research Science Advisors with solutions to current technology gaps. The Sailors, Marines and Science Advisors provide their operational issues and technology gaps throughout the year via a collaborative online working environment.</p> <p>The funding increase in FY 2010 is due to the initiation and ramping up of a series of new science and technology programs focused on anti-terrorism and force protection as identified by Science Advisors and the Fleet/Force.</p> <p><i>FY 2008 Accomplishments:</i></p> <ul style="list-style-type: none"> - Continued to obtain operational problems from the sailors via the web and developed, demonstrated and delivered technical solutions. 	7.048	7.800	9.397	

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B. Accomplishments/Planned Program (\$ in Millions)							FY 2008	FY 2009	FY 2010	FY 2011		
<ul style="list-style-type: none"> - Completed immersive infantry trainer effort. - Completed portable acoustic contraband detector effort. - Completed UAV sub-launch capability effort. - Completed high performance/high sensitivity magnetometer effort. - Initiated development of projects that provide solutions to problems identified by Science Advisors, as well as the Fleet/Force to address emergent critical needs. <p><i>FY 2009 Plans:</i></p> <ul style="list-style-type: none"> - Continue all FY 2008 efforts, less those noted as completed above. - Initiate development of projects that provide prototype solutions to problems identified by Fleet/Force members and Science Advisors to address emergent critical needs. <p><i>FY 2010 Plans:</i></p> <ul style="list-style-type: none"> - Continue all FY 2009 efforts. - Initiate development of projects that provide prototype solutions to problems identified by Fleet/Force members and Science Advisors to address emergent critical needs. 												
C. Other Program Funding Summary (\$ in Millions)												
	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost		
Not applicable./Not applicable.									Continuing	Continuing		
D. Acquisition Strategy												
Not applicable.												
E. Performance Metrics												
Overall metric goals are to transition the 6.3 advanced technology projects into acquisition programs of record, demonstrate successful technologies to enable new operational concepts, and enable the production of technology products such as proofs of concept and manufacturing packages. The performance of the work funded in this PE is reviewed at several levels to ensure that the investment is relevant and productive.												

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<p>At the macroscopic level, the investment is coordinated with Navy Warfare Development Command and Commander, Fleet Forces Command to address the goals and objectives identified for Sea Trials and LOEs.</p> <p>At the microscopic level, the work funded in this PE is reviewed periodically by the Program Manager to ensure the investment is meeting the goals defined for each project. This review includes feedback collected from the warfighter community on all Sea Trials and LOE to support the Program Manager's assessment of the value and relevance of each investment. Furthermore, the entire program is reviewed yearly by the Chief of Naval Research.</p>		

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COST (\$ in Millions)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: CONGRESSIONAL PLUS-UPS	0.000	6.183	0.000						Continuing	Continuing

A. Mission Description and Budget Item Justification

N/A

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

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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