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Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Navy **DATE:** February 2011

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603513N: <i>Shipboard Sys Component Dev</i>
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COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
Total Program Element	32.008	0.051	-	-	-	-	-	-	-	0.000	32.059
2469: <i>Open System Architecture (OSA)</i>	1.635	0.051	-	-	-	-	-	-	-	0.000	1.686
9999: <i>Congressional Adds</i>	30.373	-	-	-	-	-	-	-	-	0.000	30.373

A. Mission Description and Budget Item Justification

Funded the development of shipboard system components and technologies for the future surface combatant family of ships and focused on the following efforts: (1) development of specific and future surface combatant survivability and damage control/firefighting systems and features that reduce vulnerability against weapons, (2) implement modular standard open systems architecture at the total ship/system level and support reduced manning efforts through automation, (3) develop technologies to achieve a total integrated topside design focused on future surface ships, and (4) support the Integrated Power System effort that provides total ship electric power, including electric propulsion, power conversion and distribution, combat system and mission load interfaces to the electric power system.

All tasking will be completed for this project during FY 2011 and no other funding will be required going forward.

Project 9999 - Congressional Adds: Advanced Fuel Filtration System, Advanced Steam Turbine, High Shock 100 Amp Current Limiting Circuit Breaker, Integrated Condition Assessment and Reliability Engineering, IP Over Power Line Carrier Network Integration with ICAS, Propulsion Manufacturing Technology Development, Shipboard Wireless Maintenance Assistant, Fan Coil of the Future, Microdrive for Future HVAC Systems, Advanced Fluid Controls for Shipboard Applications, Integrated Power System Converter, and DDG-51 Hybrid Drive System.

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B. Program Change Summary (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	30.224	0.051	0.699	-	0.699
Current President's Budget	32.008	0.051	-	-	-
Total Adjustments	1.784	-	-0.699	-	-0.699
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	-1.195	-			
• SBIR/STTR Transfer	-0.033	-			
• Program Adjustments	-	-	-0.699	-	-0.699
• Section 219 Reprogramming	-0.016	-	-	-	-
• Congressional General Reductions Adjustments	-0.012	-	-	-	-
• Congressional Add Adjustments	3.040	-	-	-	-

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

Project: 9999: *Congressional Adds*

- Congressional Add: *Advanced Fuel Filtration System*
- Congressional Add: *Advanced Steam Turbine*
- Congressional Add: *High Shock 100 Amp Current Limiting Circuit Breaker*
- Congressional Add: *Integrated Condition Assessment and Reliability Engineering*
- Congressional Add: *IP Over Power Line Carrier Network Integration with ICAS*
- Congressional Add: *Propulsion Manufacturing Technology Development*
- Congressional Add: *Shipboard Wireless Maintenance Assistant*
- Congressional Add: *Fan Coil of the Future*
- Congressional Add: *Microdrive for Future HVAC Systems*
- Congressional Add: *Adv Fluid Controls For Shipboard Applications*
- Congressional Add: *Integrated Power System Converter*
- Congressional Add: *DG-51 Hybrid Drive System*

	FY 2010	FY 2011
	1.195	-
	3.983	-
	0.598	-
	0.797	-
	1.593	-
	3.744	-
	1.195	-
	2.709	-
	1.912	-
	2.988	-
	1.593	-
	8.066	-

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<u>Congressional Add Details (\$ in Millions, and Includes General Reductions)</u>	FY 2010	FY 2011
Congressional Add Subtotals for Project: 9999	30.373	-
Congressional Add Totals for all Projects	30.373	-

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APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603513N: <i>Shipboard Sys Component Dev</i>	PROJECT 2469: <i>Open System Architecture (OSA)</i>
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COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
2469: <i>Open System Architecture (OSA)</i>	1.635	0.051	-	-	-	-	-	-	-	0.000	1.686
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Architectures, Interfaces & Modular Systems (AIMS) support implementation of Modular Standard Open Systems architecture (MOSA) at the total system/ship level. These modular interfaces facilitate mission and market adaptability, technology refresh and insertion, and competition. This funding supports the market surveillance and technology and other projections, cost and logistics analyses, process development, industry partnering, demonstrations and assessments necessary to translate into total ship acquisition.

All tasking will be completed for this project during FY121 and no other funding will be required going forward.

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

	FY 2010	FY 2011	FY 2012
<p>Title: Total Open Shipboard Applications and Concepts</p> <p align="right">Articles:</p> <p>Description: Implementation: Transition with industry common Architectures, Interfaces, and Modular Systems (AIMS) for shipboard zones.</p> <p>FY 2010 Accomplishments: Developed total ship modularity and open system concepts to include Hull, Mechanical & Electrical systems. Determined the feasibility of total ship solutions and recommended technologies and concepts. Identified common interfaces and potential applications, based on historical Fleet data, for cross-platform use.</p> <p>FY 2011 Plans: Complete all efforts associated with Total Ship interface standards development and implementation.</p>	<p>0.678</p> <p>0</p>	<p>0.051</p> <p>0</p>	<p>-</p>
<p>Title: Open Sensors Zone</p> <p align="right">Articles:</p> <p>Description: Implementation: Transition with industry common Architectures, Interfaces, and Modular Systems (AIMS) for shipboard zones.</p> <p>FY 2010 Accomplishments:</p>	<p>0.537</p> <p>0</p>	<p>-</p>	<p>-</p>

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Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011		
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603513N: <i>Shipboard Sys Component Dev</i>	PROJECT 2469: <i>Open System Architecture (OSA)</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2010	FY 2011	FY 2012
Identified sensor systems, and their support systems within the sensors zone, for modularity applications and open systems/ interface development from an Hull, Mechanical & Electrical perspective. Included structural and installation considerations in the analysis.				
Title: Open Machinery Zone				
Articles:		0.213	-	-
Description: Implementation: Transition with industry common Architectures, Interfaces, and Modular Systems (AIMS) for shipboard zones.		0		
FY 2010 Accomplishments: Identified machinery systems and components for modularity and open system applications. Determined the effect on the total ship for open machinery zones and interfaces/access routes needed for design and installation.				
Title: Open Weapons/Power Projection Zone				
Articles:		0.207	-	-
Description: Implementation: Transition with industry common Architectures, Interfaces, and Modular Systems (AIMS) for shipboard zones.		0		
FY 2010 Accomplishments: Identified aspects of modular weapons, and the impact on the ship, for installation. Identified needed structure, interfaces, and installation procedures for weapon modules.				
Accomplishments/Planned Programs Subtotals		1.635	0.051	-
C. Other Program Funding Summary (\$ in Millions)				
N/A				
D. Acquisition Strategy				
Not Applicable				
E. Performance Metrics				
Quarterly Program Reviews				

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APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603513N: <i>Shipboard Sys Component Dev</i>	PROJECT 9999: <i>Congressional Adds</i>
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COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
9999: <i>Congressional Adds</i>	30.373	-	-	-	-	-	-	-	-	0.000	30.373
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Project 9999 - Congressional Adds: Advanced Fuel Filtration System, Advanced Steam Turbine, High Shock 100 Amp Current Limiting Circuit Breaker, Integrated Condition Assessment and Reliability Engineering, IP Over Power Line Carrier Network Integration with ICAS, Propulsion Manufacturing Technology Development, Shipboard Wireless Maintenance Assistant, Fan Coil of the Future, Microdrive for Future HVAC Systems, Advanced Fluid Controls for Shipboard Applications, Integrated Power System Converter, and DDG-51 Hybrid Drive System.

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

	FY 2010	FY 2011
Congressional Add: Advanced Fuel Filtration System FY 2010 Accomplishments: Funding supported the development of the Advanced Fuel Filtration (AFF) system.	1.195	-
Congressional Add: Advanced Steam Turbine FY 2010 Accomplishments: Funds supported the continued engineering, technical services, manufacturing and testing indicated for the Advanced Steam Turbine (AST) Project.	3.983	-
Congressional Add: High Shock 100 Amp Current Limiting Circuit Breaker FY 2010 Accomplishments: Funding supported the development of a new 100 amp breaker that will complete a family of current limiting AQB circuit breakers used in electrical distribution systems onboard Navy combatant vessels.	0.598	-
Congressional Add: Integrated Condition Assessment and Reliability Engineering FY 2010 Accomplishments: Funding supported the Integrated Condition Assessment and Reliability Engineering with Integrated Condition Assessment System (ICAS) efforts. The Integrated Condition Assessment & Reliability Engineering (ICARE) project delivers a predictive capability for the Navy to forecast maintenance problems for critical shipboard equipment and enable advance maintenance and logistics decision making.	0.797	-
Congressional Add: IP Over Power Line Carrier Network Integration with ICAS FY 2010 Accomplishments: Funding supported IP Over Power Line Carrier Network Integration with Integrated Condition Assessment System (ICAS) efforts. Utilizing Internet Protocol over Power Line Carrier technology, the	1.593	-

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2010	FY 2011
concept of Affordable Flexible Controls Network (AFCN) will provide for the necessary network infrastructure for the rapid movement of data and video to ICAS.		
Congressional Add: Propulsion Manufacturing Technology Development FY 2010 Accomplishments: Funding supported proving the benefits of Nickel Boron (NiB) coating in large scale naval propulsion equipment applications.	3.744	-
Congressional Add: Shipboard Wireless Maintenance Assistant FY 2010 Accomplishments: Funding supported rugged, handheld wireless device providing information to maintenance personnel as part of the Navy's Smart Ship Program.	1.195	-
Congressional Add: Fan Coil of the Future FY 2010 Accomplishments: Funding provided to develop a revolutionary new prototype HVAC System for Future Surface Combatants consisting of a Fan Coil Assembly (FCA) utilizing state-of-the-art aerodynamic and permanent magnet technology, which is lightweight and reduced in size. The fan coil assembly shall be a complete assembly that contains all components necessary for providing cooling and air recirculation required to satisfy compartment environmental design conditions.	2.709	-
Congressional Add: Microdrive for Future HVAC Systems FY 2010 Accomplishments: Funding provided to develop a new family of variable speed drives that are efficient, quiet, utilizing state-of-the-art silicon carbide technology, which are lightweight and reduced size. The primary objective of this initial funding is to design and develop a prototype variable speed drive, preferably in the 10 horsepower size range to evaluate different topologies to optimize overall design for a shipboard environment.	1.912	-
Congressional Add: Adv Fluid Controls For Shipboard Applications FY 2010 Accomplishments: Funding provided to continue development and verification of an automated fluid system applicable to the Vertical Launching System (VLS) Deluge System. This system will have reduced weight, higher reliability and will require less manning than the current system. Marotta will provide two (2) in-line composite valves, two (2) controllers, and two (2) back-up power supplies, for Navy system testing. The testing efforts will yield a completely qualified system design.	2.988	-
Congressional Add: Integrated Power System Converter	1.593	-

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2010	FY 2011
<i>FY 2010 Accomplishments:</i> Funding provided to continue the development of the integrated power system propulsion motor drive power electronics technologies for future surface combatants that allows for rapid response to electrical system load demands.		
<i>Congressional Add:</i> DG-51 Hybrid Drive System	8.066	-
<i>FY 2010 Accomplishments:</i> Funding provided to continue development efforts in support of the DDG-51 Hybrid Drive System.		
Congressional Adds Subtotals	30.373	-

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

N/A

D. Acquisition Strategy

Congressional Adds

E. Performance Metrics

Congressional Adds