Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*							
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	35.748	30.224	0.051	0.000	0.051	0.699	0.728	0.747	0.762	Continuing	Continuing
2469: *Open System Architecture (OSA)*	0.861	1.684	0.051	0.000	0.051	0.699	0.728	0.747	0.762	Continuing	Continuing
2470: *ITD-Integrated Topside Design*	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	63.465
2471: *Integrated Power Systems (IPS)*	3.064	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	369.829
9999: *Congressional Adds*	31.812	28.540	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	145.486

A. Mission Description and Budget Item Justification

Funds the development of shipboard system components and technologies for the future surface combatant family of ships and focuses on the following efforts: (1) development of DDG 1000 specific and future surface combatant survivability and damage control/firefighting systems and features that reduce vulnerability against weapons, (2) implements modular standard open systems architecture at the total ship/system level and supports reduced manning efforts through automation, (3) develops technologies to achieve a total integrated topside design focused on DDG 1000 and other future surface ships, and (4) supports 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.

Project 9999 - Congressional Adds: Advanced Fluid Controls for Shipboard Applications, Advanced Repair Technology for the Expeditionary Navy, Advanced Steam Turbine, Integrated Power System Converter, Smart Valve, DDG-51 Hybrid Drive System, DDG-51 Permanent Magnet Hybrid Electronic Propulsion, Mobile Valve and Flex Hose Maintenance (MVFM), Power Dense Integrated Power System for CG(X), Extreme Torque (XTM) Propulsion Motor, Data Acquisition Reporting and Trending System (DARTS), Infrared LED Free Space Optics Communications Advancement, Smart Machinery Spaces, Landing Craft Composite Lift Fan, Advance Fuel Filtration System, High Shock 100 Amp Current Limiting Circuit Breaker, Integrated Condition Assessment and Reliability Engineering, Integrated Power System Dense Harmonic Filter Design, IP Over Power Line Carrier Network Integration with ICAS, Propulsion Manufacturing Technology Development, and Shipboard Wireless Maintenance Assistant.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603513N: *Shipboard Sys Component Dev*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	26.824	1.691	0.000	0.000	0.000
Current President's Budget	35.748	30.224	0.051	0.000	0.051
Total Adjustments	8.924	28.533	0.051	0.000	0.051
• Congressional General Reductions		-0.127			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		28.660			
• Congressional Directed Transfers		0.000			
• Reprogrammings	8.975	0.000			
• SBIR/STTR Transfer	-0.051	0.000			
• Program Adjustments	0.000	0.000	0.051	0.000	0.051

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Advanced Fuel Filtration System*	0.000	1.195
Congressional Add: *Advanced Steam Turbine*	0.000	3.983
Congressional Add: *High Shock 100 Amp Current Limiting Circuit Breaker*	0.000	0.598
Congressional Add: *Integrated Condition Assessment and Reliability Engineering*	0.000	0.797
Congressional Add: *Integrated Power System Dense Harmonic Filter Design*	0.000	1.593
Congressional Add: *IP Over Power Line Carrier Network Integration with ICAS*	0.000	1.593
Congressional Add: *Propulsion Manufacturing Technology Development*	0.000	3.744
Congressional Add: *Shipboard Wireless Maintenance Assistant*	0.000	1.195
Congressional Add: *Smart Machinery Spaces System*	2.393	0.000
Congressional Add: *ADV FLUID CONTROLS FOR SHIPBOARD APPLICATIONS*	2.493	2.988
Congressional Add: *ADVANCED REPAIR TECHNOLOGY FOR THE EXPEDITIONARY N*	0.798	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603513N: *Shipboard Sys Component Dev*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Congressional Add: *ADV STEAM TURBINE*	1.596	0.000
Congressional Add: *INTEGRATED POWER SYSTEM CONVERTER*	1.995	1.593
Congressional Add: *SMART VALVE*	0.798	0.000
Congressional Add: *DG-51 Hybrid Drive System*	6.581	8.066
Congressional Add: *Mobile Valve and Flex Hose Maintenance (MVFM)*	0.997	0.000
Congressional Add: *Power Dense Integrated Power System fo C(X)*	2.992	0.000
Congressional Add: *Extreme Torque (XTM) Propulsion Motor*	0.798	0.000
Congressional Add: *Data Acquisition Reporting and Trending System (DA*	2.393	0.000
Congressional Add: *Infrared LED Free Space Optics Communications Adva*	0.399	0.000
Congressional Add: *Landing Craft Composite Lift Fan*	0.000	1.195
Congressional Add: *DDG-51 Permanent Magnet Hybrid Electronic Propulsi*	7.579	0.000
Congressional Add Subtotals for Project: 9999	31.812	28.540
Congressional Add Totals for all Projects	31.812	28.540

Change Summary Explanation

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 2469: *Open System Architecture (OSA)*	

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
2469: *Open System Architecture (OSA)*	0.861	1.684	0.051	0.000	0.051	0.699	0.728	0.747	0.762	Continuing	Continuing
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): This funding supports 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.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Total Open Shipboard Applications and Concepts	0.000	0.719	0.051	0.000	0.051
Implementation: Transition with industry common Architectures, Interfaces, and Modular Systems (AIMS) for shipboard zones. A. Total Open Shipboard Applications and Concepts: *FY 2010 Plans:* Assess feasibility of open system/modular application to total ship levels, develop interface plan. *FY 2011 Base Plans:* Continue Total Ship interface standards development and implementation.					
Open Sensors Zone	0.276	0.541	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 2469: *Open System Architecture (OSA)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Implementation: Transition with industry common Architectures, Interfaces, and Modular Systems (AIMS) for shipboard zones. A. Open Sensors Zone. *FY 2009 Accomplishments:* Continued Architecture Development. *FY 2010 Plans:* Interface Development.					
Open Machinery Zone Implementation: Transition with industry common Architectures, Interfaces, and Modular Systems (AIMS) for shipboard zones. A. Open Machinery Zone. *FY 2009 Accomplishments:* Architecture Concept. *FY 2010 Plans:* Develop architectures.	0.388	0.215	0.000	0.000	0.000
Open Weapons/Power Projection Zone Implementation: Transition with industry common Architectures, Interfaces, and Modular Systems (AIMS) for shipboard zones. A. Open Weapons/Power Projection Zone *FY 2009 Accomplishments:* Interface Implementation *FY 2010 Plans:* Interface Implementation.	0.197	0.209	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 2469: *Open System Architecture (OSA)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Accomplishments/Planned Programs Subtotals	0.861	1.684	0.051	0.000	0.051

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Not Applicable

E. Performance Metrics

Quarterly Program Reviews

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603513N: *Shipboard Sys Component Dev*	**PROJECT** 2469: *Open System Architecture (OSA)*

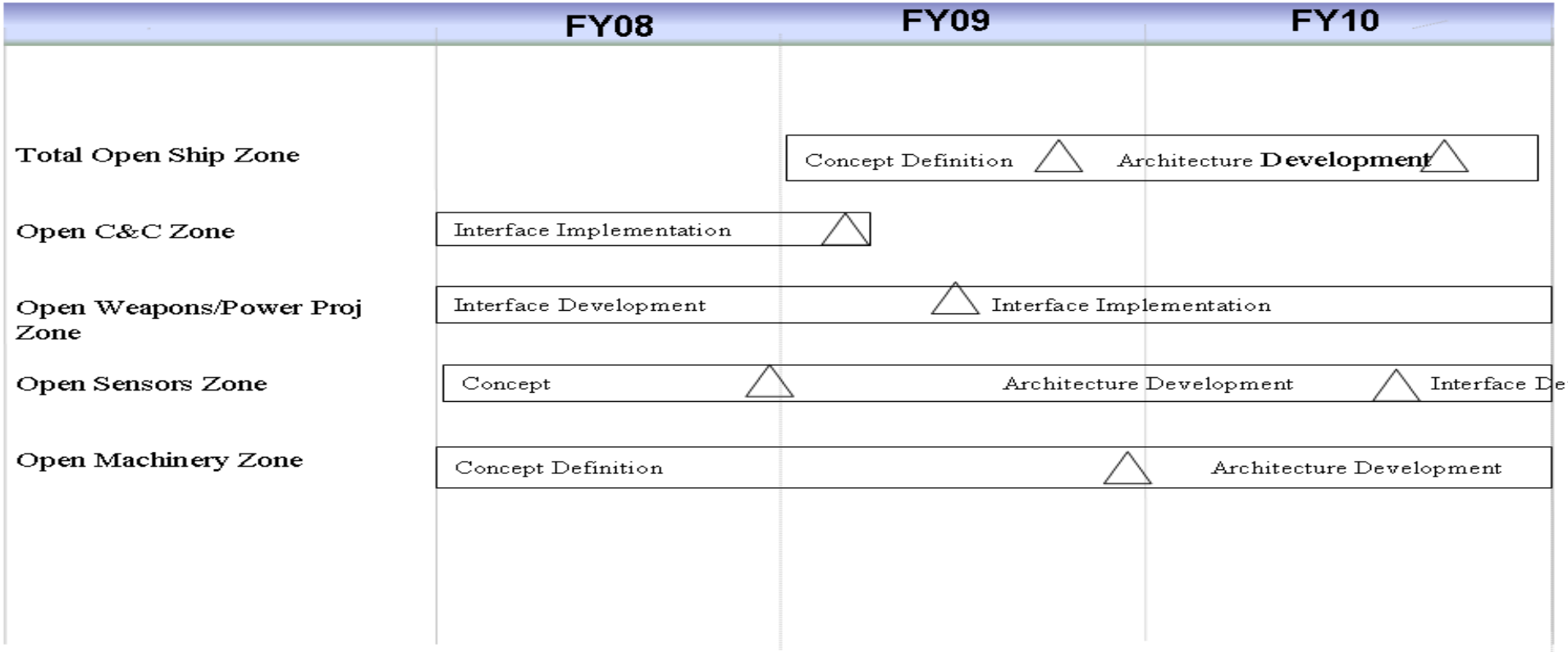

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 2470: *ITD-Integrated Topside Design*	

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
2470: *ITD-Integrated Topside Design*	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	63.465
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This project develops the necessary technologies to achieve a total integrated topside design focused on DDG 1000 and other future surface combatant ships as well as supporting upgrades to existing ships in the Fleet. Technology focus areas include the development, enhancement, validation and verification of modeling and simulation (M&S)
tools to support topside signature control, electronic warfare effectiveness, and electromagnetic engineering. This project also develops technical data to support the use of large-scale marine composites on surface combatants to facilitate topside signature control. Topside signature control and electronic warfare effectiveness M&S tools
supported by this project enable Navy transformation efforts related to sea strike by facilitating the cost effective design, design approval, and Live Fire Test and Evaluation of low signature surface ships. The validated, integrated, physics-based, electromagnetic radiation (VIPER) M&S tool suite currently being developed under this
project will provide the Navy with a state-of-the-art electromagnetic engineering (EME) capability that is applicable to both new construction and existing ships in the Fleet. By providing the design community with tools able to accurately predict the optimum arrangement of topside sensors to minimize electromagnetic interference (EMI), this
project enables Navy transformation efforts by facilitating FORCEnet, the connection of sensors, networks, weapons, decision aids and warriors from seabed to space. Development of marine composite technical data supports Navy transformation efforts by enabling the cost effective design of stealthy surface ship topsides that have improved
corrosion control which, in turn enables optimized manning. This program is directed toward improved affordability, performance, reduced life cycle cost, reliability and maintainability, signature reduction, standardization, and weight and manning reductions for the existing and future Fleet.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
ITD-Integrated Topside Design	0.011	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 2470: *ITD-Integrated Topside Design*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Conducted assessment of Topside modeling and simulation tools.					
Accomplishments/Planned Programs Subtotals	0.011	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Quarterly Program Reviews

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 2471: *Integrated Power Systems (IPS)*	

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
2471: *Integrated Power Systems (IPS)*	3.064	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	369.829
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Beginning in FY10 funding for PE 0603513N/2471 (Integrated Power Systems (IPS)) has been realigned to PE 0603573N/2471.
This project supports the Integrated Power Systems (IPS) program. IPS provides total ship electric power, including electric propulsion, power conversion and distribution, combat system and mission load interfaces to the electric power system. IPS supports multiple ship class applications for future surface ships.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Integrated Power Systems (IPS)-Acquisition Workforce Acquisition Workforce *FY 2009 Accomplishments:* N/A	0.019	0.000	0.000	0.000	0.000
IPS-System Development System Development: Completed prototype of detailed design and manufacture of high-speed generator. Commence preliminary and detailed design of power conversion equipment for advance architecture. *FY 2009 Accomplishments:* N/A	1.110	0.000	0.000	0.000	0.000
IPS-System Test	1.860	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 2471: *Integrated Power Systems (IPS)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
System Test: Completed Land Based Test Site modifications for High Speed Generator (HSG). Conduct testing of HSG at the land based test site at NSWCCD, Philadelphia PA *FY 2009 Accomplishments:* N/A					
IPS-Platform Specific Platform Specific: Developed IPS configurations in support of all future surface ship programs. Develop/modify IPS ship configuration documentation including concepts of operations, system level descriptions/requirements, and module performance specifications as necessary to support power system requirements for CG(X) and other future ships. *FY 2009 Accomplishments:* N/A	0.075	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	3.064	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

IPS is a candidate system for DDG 1000 and all other future surface ships.

E. Performance Metrics

Quarterly Reviews.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 9999: *Congressional Adds*	

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: *Congressional Adds*	31.812	28.540	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	145.486
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional Adds: Advanced Fluid Controls for Shipboard Applications, Advanced Repair Technology for the Expeditionary Navy, Advanced Steam Turbine, Integrated Power System Converter, Smart Valve, DDG-51 Hybrid Drive System, DDG-51 Permanent Magnet Hybrid Electronic Propulsion, Mobile Valve and Flex Hose Maintenance (MVFM), Power Dense Integrated Power System for CG(X), Extreme Torque (XTM) Propulsion Motor, Data Acquisition Reporting and Trending System (DARTS), Infrared LED Free Space Optics Communications Advancement, Smart Machinery Spaces, Landing Craft Composite Lift Fan, Advance Fuel Filtration System, High Shock 100 Amp Current Limiting Circuit Breaker, Integrated Condition Assessment and Reliability Engineering, Integrated Power System Dense Harmonic Filter Design, IP Over Power Line Carrier Network Integration with ICAS, Propulsion Manufacturing Technology Development, and Shipboard Wireless Maintenance Assistant.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Advanced Fuel Filtration System *FY 2010 Plans:* Apply FY 2010 congressional add funding in support of Advanced Fuel Filtration System efforts as directed by congress. The requested funding will be used for the development of the Advanced Fuel Filtration (AFF) system. AFF is one-third the cost of the legacy centrifugal purifierm, and will save $25 million per year for the Navy from maintenance and operation cost after it is fully implemented to the DDG-51 and CG-47 class ships.	0.000	1.195
Congressional Add: Advanced Steam Turbine	0.000	3.983

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2010 Plans: Funds will be used to continue engineering, technical services, manufacturing and testing indicated for the Advanced Steam Turbine (AST) Project. Currently there is only one qualified submarine Turbine Generator (TG) provider. Qualification of a second submarine TG vendor will create competition and lower overall submarine program costs.		
Congressional Add: High Shock 100 Amp Current Limiting Circuit Breaker *FY 2010 Plans:* Apply FY 2010 congressional add funding in support of High Shock 100 Amp Current Limiting Circuit Breaker efforts as directed by congress. Funding will be used to develop 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. The new breaker will save size and weight, will eliminate the need for current limiting fuses, and will enhance both the survivability of the electrical system and the survivability of the ship's mission. The Navy presently uses current limiting electronic trip AQB circuit breakers in its electrical distribution systems at the 250 amp, 400 amp and 800 amp frame sizes. Missing from this family is a 100 amp frame size breaker. The new 100 amp AQB current limiting breaker will eliminate the need to use current limiting fuses and fuse bases. This will save about 30% space and weight. Circuit breakers can be re-closed after clearing a fault condition in the electrical system instead of the present situation wherein fuse units must be physically replaced. This enhances the survivability of the electrical system, which therefore enhances the survivability of the ship's mission. There are also logistic support savings.	0.000	0.598
Congressional Add: Integrated Condition Assessment and Reliability Engineering *FY 2010 Plans:* Apply FY 2010 congressional add funding in support of Integrated Condition Assessment and Reliability Engineering with ICAS efforts as directed by congress. The Integrated Condition	0.000	0.797

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
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. The project is an important use of taxpayer funds as it would modernize the Navy's Condition Assessment System; enable the Navy to realize significant cost savings by helping equipment maintainers and decision makers more accurately predict equipment problems and prioritize/schedule corrective actions before a major fault occurs. It also addresses #20 on CNO's SURFACE WARFARE ENTERPRISE TOP 31 PROGRAM ISSUES FOR POM-FY10, "Integrated condition assessment system & distance support initiatives." The Navy has been unable to identify funds to integrate maintenance metrics data with equipment sensor monitoring and reporting. Lack of FY10 funds will likely delay the condition-based assessment upgrade for shipboard use which, in turn, could generate larger financial and schedule impacts. ICARE integrates maintenance and equipment metrics with sensor data fundamental to achieving this modernization priority.		
Congressional Add: Integrated Power System Dense Harmonic Filter Design *FY 2010 Plans:* Apply FY 2010 congressional add funding in support of Integrated Power System Dense Harmonic Filter Design with ICAS efforts as directed by congress. Funding would be used to validate models of the existing DDG-1000 baseline harmonic filters through testing at the Florida State University's Center for Advanced Power Systems Facility and to develop models for a hybrid filter design for DDG-1000 to be produced in western Pennsylvania. This is a valuable use of taxpayer funding because it would enhance performance of the hybrid filters for shipboard power systems and create jobs in western Pennsylvania. Converteam, Inc. - Pittsburgh, PA 15238	0.000	1.593
Congressional Add: IP Over Power Line Carrier Network Integration with ICAS	0.000	1.593

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2010 Plans: Apply FY 2010 congressional add funding in support of IP Over Power Line Carrier Network Integration with ICAS efforts as directed by congress. Naval Sea Systems Command has been installing sensing and wireless capabilities for data collection and integration with ICAS. Demonstrations to date have proven successful. However, the costs and time associated with installations has been a limiting factor to the overall success. One of the keys to success is minimizing the cost of installations in order to achieve the associated ROI, while at the same time maintaining the open architecture, enabling the integration of multiple sensing systems. Additional installations, testing and validation are required as new sensor systems are developed and delivered for shipboard evaluation. In order to assist in the transitioning of the technologies it is imperative that we have a highly mobile and flexible system capable of easily adapting to the emerging technologies. Utilizing Internet Protocol over Power Line Carrier technology, the concept of Affordable Flexible Controls Network (AFCN) has been developed utilizing FY08 funding. To date Engineering Design Models (EDM) have been developed and testing and validation is in progress. Additional testing will be conducted 4th quarter FY09 at a Land Based Engineering Test Site. The integrated products such as AFCN will provide for the necessary network infrastructure for the rapid movement of data and video to ICAS without the requirement to pull CAT 5 or 6 cables or deploy other unsecure networking architecture. This will result in a more flexible, scalable and mobile network and significantly reduced deployment and monitoring costs. Additional testing of the AFCN within the environment that includes technologies such as 802.11N, Zigbee and Bluetooth is required to assist in a smooth transition. Installations at Land Based Test Sites and aboard test ships, such as ex-Paul Foster will provide the proper environment to test the integration of the multiple technologies in an open environment.		
Congressional Add: Propulsion Manufacturing Technology Development *FY 2010 Plans:* Apply FY 2010 congressional add funding in support of Propulsion Manufacturing Technology Development efforts as directed by congress. The purpose of this add is to prove the benefits of NiB	0.000	3.744

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
coating in large scale naval propulsion equipment applications and provides significant opportunities for improved operations and fuel efficiency.		
Congressional Add: Shipboard Wireless Maintenance Assistant *FY 2010 Plans:* Apply FY 2010 congressional add funding in support of Shipboard Wireless Maintenance Assistance efforts as directed by congress. This rugged, handheld wireless device will provide information to maintenance personnel as part of the Navy's Smart Ship Program.	0.000	1.195
Congressional Add: Smart Machinery Spaces System *FY 2009 Accomplishments:* Funded the development of a comprehensive, automated Condition-Based Maintenance (CBM) solution that incorporates Configuration Management (CM), CBM and Automated Logistics functions.	2.393	0.000
Congressional Add: ADV FLUID CONTROLS FOR SHIPBOARD APPLICATIONS *FY 2009 Accomplishments:* Funds were applied to develop and verify an automated fluid system applicable to the VLS Deluge System. This system will have reduced weight, higher reliabilty and will require less manning than the current system. Marotta provided two (2) in-line composite valves, two (2) controllers, and two (2) back-up power supplies, for Navy system testing. The testing efforts yielded a completely qualified system design. System components for 3 additional sizes will also be qualified. System components will be qualified to MIL-S-901 shock, MIL-Std-167 vibration, API607 Burn Test (main valve) and Electric Magnetic Interface (EMI) testing (electronic controller with back-up power module). A test facility will be designed at NSWCCD-SSES for funtional testing and demonstration of the advance fluid system.	2.493	2.988

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2010 Plans: Continue development and verification of an automated fluid system applicable to the VLS Deluge System. This system will have reduced weight, higher reliabilty 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. System components for 3 additional sizes will also be qualified. System components will be qualified to MIL-S-901 shock, MIL-Std-167 vibration, API607 Burn Test (main valve) and EMI testing (electronic controller with back-up power module). A test facility will be designed at NSWCCD-SSES for funtional testing and demonstration of the advance fluid system.		
Congressional Add: ADVANCED REPAIR TECHNOLOGY FOR THE EXPEDITIONARY N *FY 2009 Accomplishments:* The Advanced Repair Technology for Expeditionary Navy focused on providing innovations in repair technology to the Expeditionary Navy aboard ships at sea and at forward repair sites.	0.798	0.000
Congressional Add: ADV STEAM TURBINE *FY 2009 Accomplishments:* Funds were applied to provide engineering, technical services, manufacturing and testing indicated for the Advanced Steam Turbine (AST) Project. Currently there is only one qualified submarine Turbine Generator (TG) provider. Qualification of a second submarine TG vendor will create competition and lower overall submarine program costs.	1.596	0.000
Congressional Add: INTEGRATED POWER SYSTEM CONVERTER	1.995	1.593

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603513N: *Shipboard Sys Component Dev*	**PROJECT** 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2009 Accomplishments: Integrated Power System Converter developed integrated power system propulsion motor drive power electronics technologies for future surface combatants that allows for rapid response to electrical system load demands. *FY 2010 Plans:* 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.		
Congressional Add: SMART VALVE *FY 2009 Accomplishments:* Funded the development of prototype smart valves (four 4" valves and two 6" valves) and tested their functionality in a fluid system loop. The valves were then tested in a land based, scaled fluid system.	0.798	0.000
Congressional Add: DG-51 Hybrid Drive System *FY 2009 Accomplishments:* Funds for the DDG-51 Hybrid Drive System are used to develop, build and test proof of concept equipment for a DDG-51 Hybrid Electric Drive System. Development of this technology significantly reduces fuel consumption and increased DDG-51 Class mission effectiveness through longer time on station. *FY 2010 Plans:* Continue FY 2009 development efforts in support of the DDG-51 Hybrid Drive System.	6.581	8.066
Congressional Add: Mobile Valve and Flex Hose Maintenance (MVFM)	0.997	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2009 Accomplishments: Funds were applied to improve the current process of inspecting valves and flex hoses on-board ship from a cumbersome and manpower intensive effort to one that provides ships force and repair activities with one source for Valve and Flex Hose configurations. Fully implemented and operational, the MVFM will save approximately 8-10% of typical ship availability. Without MVFM, Shipboard planning and maintenance and Quality of Life for the sailor is severely reduced due to time constraints and lack of available personnel to accomplish planning and maintenance.		
Congressional Add: Power Dense Integrated Power System fo C(X) *FY 2009 Accomplishments:* Funding continued the development of a power dense Integrated Power System (IPS) suitable for surface combatant main power generation, distribution and conversion. These funds were used to perform a system level analysis of future electrical power needs and design and manufacture of prototype demonstration hardware.	2.992	0.000
Congressional Add: Extreme Torque (XTM) Propulsion Motor *FY 2009 Accomplishments:* Funding continued the design and development of Full Scale Extreme Torque Density (XTM) Propulsion Motor technology for future Naval vessels. More power dense, efficient, and reduced noise singature propulsion systems may be necessary to meet evolving requirements for future combatants.	0.798	0.000
Congressional Add: Data Acquisition Reporting and Trending System (DA	2.393	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2009 Accomplishments: The Data Acquisition Reporting and Trending System (DARTS) is an acquisition application which provides logsheet capabilities. This add has enhanced and integrated parts of DARTS functionality into both legacy and new Condition Based Maintenance (CBM) applications, where applicable.		
Congressional Add: Infrared LED Free Space Optics Communications Adva *FY 2009 Accomplishments:* Funding applied to securely communicate using infrared light, enabling simultaneous data, video and voice communication in environments, where otherwise communication would be impossible or undesirable. Navy, through appropriate work scope definition and coordination with NAVSEA technical authority and operational users, has developed effective Infrared LED Free Space Optics in support of Navy secure communications concepts.	0.399	0.000
Congressional Add: Landing Craft Composite Lift Fan *FY 2010 Plans:* Apply FY 2010 congressional add funding in support of Land Craft Composite Lift Fan efforts as directed by congress. Funding will be used to install, demonstrate and test the composite lift fan prototype on a Navy landing craft (LCAC) and incorporate lessons learned into a final composite lift fan design.	0.000	1.195
Congressional Add: DDG-51 Permanent Magnet Hybrid Electronic Propulsi *FY 2009 Accomplishments:* DDG-51 Permanent Magnet Hybrid Electronic Propulsion project developed and domonstrated an advanced propulsion motor drive for DDG-51 by utilizing a hybrid power electronics approach.	7.579	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Adds Subtotals	31.812	28.540

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Congressional Adds

E. Performance Metrics

Congressional Adds