CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**			R-1 ITEM NOMENCLATURE **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMENT**				
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	42.565	26.824	1.691				
2465 / DC/SURVIVABILITY	1.648	0.000	0.000				
2468 / Undersea Warfare	0.000	0.000	0.000				
2469 / Open System Architecture (OSA)	1.575	0.861	1.691				
2470 / ITD-Integrated Topside Design	0.401	0.011	0.000				
2471 / Integrated Power Systems (IPS)	5.534	3.115	0.000				
4019 / Radar Upgrades	0.000	0.000	0.000				
9999 / CONGRESSIONAL ADDS	33.407	22.837	0.000				

A. MISSION DESCRIPTION:

This PE 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.

The following Congressional adds are contained in this Program Element:

FY 08 Congressional Adds

Project 9999 - Congressional Adds: $33,407-This project consists of the following FY 08 Congressional adds: Advanced Navy Boat Lift Research and Development, Advanced Fluid Controls for Shipboard Applications, Advanced Repair Technology for Expeditionary Navy, Air Gun Ship Shock Testing of Naval Vessels, Circuit Breaker for Navy Shipboard Power Distribution, High Efficiency Quiet Electric Drive, High Temperature Superconducting Motor for DDG 1000, Integrated Power System Converter, Internet Protocol Over Power Line Carrier Technology, Naval Flywheel Energy Storage System, Smart Valve, Shipboard Wireless Maintenance Assistant, Advanced Steam Turbine, DDG-51 Homopolar Hybrid Drive, MTTC/IPI and National Surface Treatment Center, Power Conversion Equipment for High Density Power, Propulsor Manufacturing Technology Development, and High Temperature Superconductor AC Synchronous Propulsion Motor.

FY09 Congressional Adds:

Project 999 - Congressional Adds: $22,837 - this project consists of the following FY09 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, 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, and Landing Craft Composite Lift Fan.

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	43.529	4.003	7.781
FY10 President's Budget	42.565	26.824	1.691
Total Adjustments	-0.964	22.821	-6.090
(U) Summary of Adjustments			
Congressional Rescissions	0.000	0.000	0.000
Congressional Adjustments	0.000	22.827	0.000
SBIR/STTR/FTT Assessment	-0.952	0.000	0.000
Program Adjustments	0.000	0.000	-6.072
Rate/Misc Adjustments	-0.012	-0.006	-0.018
Total	-0.964	22.821	-6.090

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMENT**				PROJECT NUMBER AND NAME **2465/DC/SURVIVABILITY**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	1.648	0.000	0.000				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This project funds development of DDG 1000 specific and future surface combatant survivability and damage control (DC)/ firefighting systems and features that reduce vulnerability against weapons (e.g., missiles, mines, torpedoes) and enables effective recovery of mission capability under reduced manning conditions. Additionally, this project supports development of systems that reduce susceptibility to magnetic and acoustic influence mines. The requirements for this project are based on the need to develop affordable, balanced survivability designs that address recent wartime lessons learned and emerging and future threats.

System development areas include: 1) development of electrical fault isolation control methods that enable the rapid detection and isolation of combat-induced faults ensuring an effective DC response after damage, 2) wireless machinery control system technologies that will reduce installation costs through the elimination of wires and significantly increase the survivability of control systems ensuring the availability of mission critical systems following damage, and 3) development of electromagnetic signature reduction technologies that provide for jamming sweep resistant magnetic influence mines using advanced degaussing and impressed cathodic protection systems and a closed-loop deamping system that uses existing cathodic protections systems to reduce the near field electric signatures emanating from a steel hulled surface ship.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMEN**	PROJECT NUMBER AND NAME **2465/DC/SURVIVABILITY**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.693	0.000	0.000
RDT&E Articles Quantity	0	0	0

For 08, developed wireless machinery control system approaches and architectures that significantly improved survivability and reduced installation costs through the elimination of cabling. Integrated a commercial wireless fire detection system/sensors with a representative ship level supervisory control system and developed architecture options.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.955	0.000	0.000
RDT&E Articles Quantity	0	0	0

In FY 08 developed advanced electromagnetic (EM) signature reduction technology requirements and architecture options for a closed-loop deamping system that reduced the near field electric signature and a system for jamming magnetically influenced mines.

C. OTHER PROGRAM FUNDING SUMMARY:

D. ACQUISITION STRATEGY:

E. MAJOR PERFORMERS:

Government Field Activities - Naval Surface Warfare Center, Carderock, Md.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMENT**				PROJECT NUMBER AND NAME **2469/Open System Architecture (OSA)**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	1.575	0.861	1.691				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Architectures, Interfaces & Modular Systems (AIMS): This funding supports PEO Ships 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.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMEN**	PROJECT NUMBER AND NAME **2469/Open System Architecture (OSA)**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.000	0.000	0.726
RDT&E Articles Quantity	0	0	0

Implementation: Transition with industry common Architectures, Interfaces, and Modular Systems (AIMS) for shipboard zones.

A. Total Open Shipboard Applications and Concepts: FY10: Assess feasibility of open system/modular application to total ship levels, develop interface plan.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.300	0.276	0.541
RDT&E Articles Quantity	0	0	0

Implementation: Transition with industry common Architectures, Interfaces, and Modular Systems (AIMS) for shipboard zones.

A. Open Sensors Zone: FY 08: Architectures Developed; FY 09: Continue Architecture Development; FY 10: Interface Development.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.539	0.388	0.215
RDT&E Articles Quantity	0	0	0

Implementation: Transition with industry common Architectures, Interfaces, and Modular Systems (AIMS) for shipboard zones.

A. Open Machinery Zone: FY08-09 Architecture Concept; FY 10: Develop architectures.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.736	0.197	0.209
RDT&E Articles Quantity	0	0	0

Implementation: Transition with industry common Architectures, Interfaces, and Modular Systems (AIMS) for shipboard zones.

A. Open Weapons/Power Projection Zone: FY08: Interfaces developed; FY09-10: Interface Implementation.

C. OTHER PROGRAM FUNDING SUMMARY:

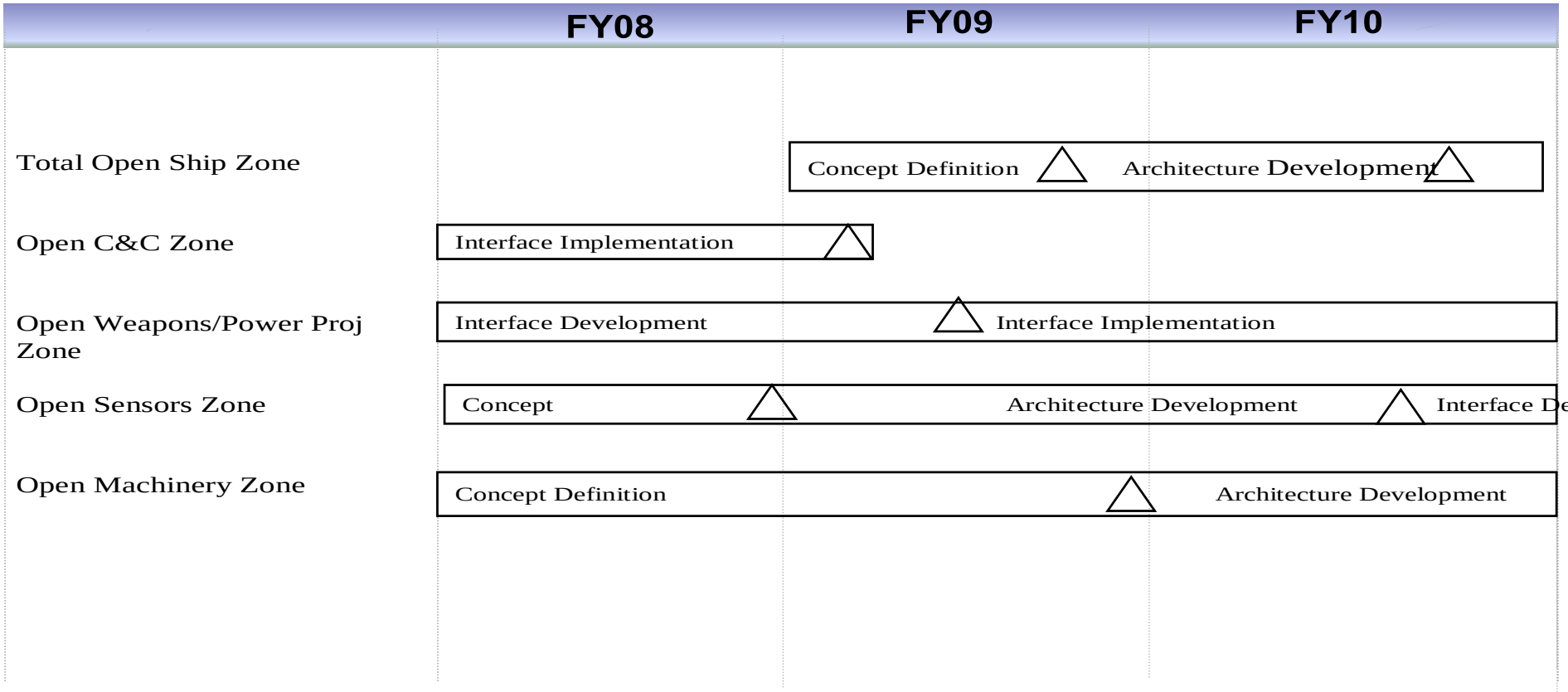
D. ACQUISITION STRATEGY:

E. MAJOR PERFORMERS:

(U) Government Field Activities- Naval Surface Warfare Center, Carderock, Md.

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMENT**					PROJECT NUMBER AND NAME **2469/Open System Architecture (OSA)**					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost ($000)	FY 2009 Cost ($000)	FY 2009 Award Date	FY 2010 Cost ($000)	FY 2010 Award Date			Cost to Complete ($000)	Total Cost ($000)	Target Value of Contract
Primary Hardware Development	845/804	DDG 1000 Industry Teams	35.327	0.000		0.000				0.000	35.327	35.327
Primary Hardware Development	WR	NSWC CD Bethesda, MD	10.023	0.000		0.000				0.000	10.023	0.000
Primary Hardware Development	Various	Other Gov't Activities	4.987	0.000		0.000				0.000	4.987	0.000
Primary Hardware Development	Various	Other Contractors	2.735	0.000		0.000				0.000	2.735	2.735
Subtotal Product Development			**53.072**	**0.000**		**0.000**				**0.000**	**53.072**	**38.062**
Remarks:												
Subtotal Support Costs			**0.000**	**0.000**		**0.000**				**0.000**	**0.000**	**0.000**
Remarks:												
Subtotal Test and Evaluation			**0.000**	**0.000**		**0.000**				**0.000**	**0.000**	**0.000**
Remarks:												
Contractor Engineering Support	Various	Other Contractors	9.668	0.000		0.000				0.000	9.668	0.000
Government Engineering Support	WR	NSWC CD Philadelphia, PA	3.763	0.000		0.000				0.000	3.763	0.000
Government Engineering Support	WR	NSWC Carderock, Md.	8.903	0.000		1.691	OCT-09			0.000	10.594	0.000
Government Engineering Support	Various	Other Gov't Activities	32.809	0.861	VAR	0.000				0.000	33.670	0.000
Subtotal Management Services			**55.143**	**0.861**		**1.691**				**0.000**	**57.695**	**0.000**
Remarks:												
Total Cost			**108.215**	**0.861**		**1.691**				**0.000**	**110.767**	**38.062**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPM**	PROJECT NUMBER AND NAME **2469/Open System Architecture (OSA)**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMENT**			PROJECT NUMBER AND NAME **2469/Open System Architecture (OSA)**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Total Ship Open Zone Concept		1Q-3Q					
Total Ship Open Zone Architecture Development		3Q-4Q	1Q-3Q				
Total Ship Open Zone Interface Development			3Q-4Q				
Open C&C Zone Interfaces Implemented Cross-Platform	1Q-4Q	1Q					
Open Weapons Zone Interface Development	1Q-4Q	1Q-2Q					
Open Weapons Zone Interfaces Implemented		2Q-4Q	1Q-4Q				
Open Sensors Zone Concept	1Q-4Q						
Open Sensors Zone Architecture Development	4Q	1Q-4Q	1Q-3Q				
Open Sensors Zone Interface Development			3Q-4Q				
Open Machinery Zone Concept	1Q-4Q	1Q-4Q					
Open Machinery Zone Architecture Development		4Q	1Q-4Q				

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMENT**				PROJECT NUMBER AND NAME **2470/ITD-Integrated Topside Design**		
COST (In Millions)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
Project Cost	0.401	0.011	0.000	0.000	0.000	0.000	0.000
RDT&E Articles Qty	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.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMEN**	PROJECT NUMBER AND NAME **2470/ITD-Integrated Topside Design**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.401	0.011	0.000
RDT&E Articles Quantity	0	0	0

FY08: Started Ver 5.0 Advanced Antenna Design and Analysis (D&A) M&S Tool Development.

FY09: Conduct assessment of Topside modeling and simulation tools.

C. OTHER PROGRAM FUNDING SUMMARY:

D. ACQUISITION STRATEGY:

E. MAJOR PERFORMERS:

Government Field Activities-Naval Research Laboratory, Washington DC, and
Space and Naval Warfare Systems Center, San Diego, Ca.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMENT**				PROJECT NUMBER AND NAME **2471/Integrated Power Systems (IPS)**		
COST (In Millions)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
Project Cost	5.534	3.115	0.000	0.000	0.000	0.000	0.000
RDT&E Articles Qty	0	0	0	0	0	0	0

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The FY 10 funding for Integrated Power Systems (IPS) is reflected in Program Element (PE) 0603573N.

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, with DDG 1000, DDG 1000 future flight upgrades, and CG(X) being the primary ship application target. On 6 January 2000, SECNAV announced Navy intent that DDG 1000 be an electric drive ship with integrated power architecture. IPS reduces acquisition and operating costs of naval ships and increases military effectiveness. IPS leverages investments in technologies that will be useable by both military and commercial sectors.

- (U) IPS has the potential to revolutionize the design, construction, and operation of U.S. naval ships by using electricity as the primary energy transfer medium aboard ship. The flexibility of electric power transmission allows power generating modules with various power ratings to be connected to propulsion loads and ship service in any arrangement that supports the ship's mission at lowest overall cost. Systems engineering in IPS is focused on increasing the commonality of components used across ship types and in developing modules which will be integral to standardization, zonal system architectures, and generic shipbuilding strategies. The purpose of increased commonality is to reduce the total cost of ship ownership by using common modules composed of standard components and/or standard interfaces.
- (U) IPS addresses ship platform program goals through: reduced ship acquisition cost through integration of propulsion and ship's service prime movers; lower ship operational costs resulting from more flexible operating characteristics and more efficient components; reduced ship construction costs by allowing more extensive modular construction of power generation, distribution, and loads; improved ship survivability and reduced vulnerability through increased arrangement flexibility and improved electrical system survivability; reduced manning through improved power management systems and reduced on-board maintenance requirements; improved ship signature characteristics; improved design adaptability to meet future requirements of multiple ship types or missions; integrating power management and protection by fully utilizing the power electronics in the system to perform fault protection as well as power conversion and load management functions; simplified technology insertion which allows new technologies to be installed within IPS much less expensively than presently possible; and, reduced machinery system acquisition costs through utilization of commercially shared technologies and components.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDTEN/BA 4	**0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMEN**	**2471/Integrated Power Systems (IPS)**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	3.250	1.114	0.000
RDT&E Articles Quantity	0	0	0

System Development: Completed prototype of detailed design and manufacture of high-speed generator. Commence preliminary and detailed design of power conversion equipment for advanced architecture.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	2.134	1.926	0.000
RDT&E Articles Quantity	0	0	0

System Test: Completed Land Based Test Site modifications for High Speed Generator (HSG). Conduct testing of the HSG at the land based test site at NSWCCD, Philadelphia PA.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.150	0.075	0.000
RDT&E Articles Quantity	0	0	0

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.

C. OTHER PROGRAM FUNDING SUMMARY:

D. ACQUISITION STRATEGY:

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

E. MAJOR PERFORMERS:

IPS DDG 1000 Design Agent, Ingalls Shipbuilding, General Atomics and DRS Power and Controls Technologies Inc., IPS IFTP contractors. Curtiss Wright, High Speed Generator contractor. Northrop-Grumman Electronic Systems, power electronics contractor.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMEN**	PROJECT NUMBER AND NAME **9999/CONGRESSIONAL ADDS**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
2858A MTTC/IPI and National Surface Treatment Center	3.094	0.000	0.000
RDT&E Articles Quantity	0	0	0

This Congressional add funded the continuous operation of the McConnell Technology and Training Center (MTTC/IPI) and the National Surface Treatment Center. This effort funds projects targeted at resolving fleet maintenance problems/issues through the rapid insertion of new technologies.

	FY 2008	FY 2009	FY 2010
9D30A Data Acquisition Reporting and Trending System (DARTS)	0.000	2.393	0.000
RDT&E Articles Quantity	0	0	0

The Data Acquisition Reporting and Trending System (DARTS) is an acquisition application which provides log sheet capabilities. This add will enhance and integrate parts of DARTS functionality into both legacy and new Condition Based Maintenance (CBM) applications, where applicable.

	FY 2008	FY 2009	FY 2010
9D25A/DDG-51 Hybrid Drive System	0.000	6.581	0.000
RDT&E Articles Quantity	0	0	0

Funds for the DDG51 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 DDG51 Class mission effectiveness through longer time on station.

	FY 2008	FY 2009	FY 2010
9D26A Mobile Valve and Flex Hose Maintenance (MVFM)	0.000	0.997	0.000
RDT&E Articles Quantity	0	0	0

Funds will be used 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. When fully implemented and operational the MVFM will save approximately 8-10% of typical ship availability. Without MVFM, Shipboard PMS and Quality of Life for the sailor is severely reduced due to time constraints and lack of available personnel to accomplish PMS.

	FY 2008	FY 2009	FY 2010
9D27A Power Dense Integrated Power System for CG(X)	0.000	2.992	0.000
RDT&E Articles Quantity	0	0	0

Funds will continue the development of a power dense Integrated Power System (IPS) suitable for surface combatant main power generation, distribution and conversion. These funds will be used to perform a system level analysis of future electrical power needs and design and manufacture of prototype demonstration hardware.

	FY 2008	FY 2009	FY 2010
9D29A Extreme Torque (XTM) Propulsion Motor	0.000	0.798	0.000
RDT&E Articles Quantity	0	0	0

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDTEN/BA 4	**0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMEN**	**9999/CONGRESSIONAL ADDS**	

Funds will continue design and development of Full Scale Extreme Torque Density (XTM) Propulsion Motor technology for future Naval vessels. More power dense, efficient, and reduced noise signature propulsion systems may be necessary to meet evolving requirements for future combatants.

	FY 2008	FY 2009	FY 2010
9D31A Infrared LED Free Space Optics Communications Advancement	0.000	0.399	0.000
RDT&E Articles Quantity	0	0	0

Funds used 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, will develop effective Infrared LED Free Space Optics in support of Navy secure communications concepts.

	FY 2008	FY 2009	FY 2010
9D32A Landing Craft Composite Lift Fan	0.000	0.997	0.000
RDT&E Articles Quantity	0	0	0

Funds used to support the design, development and manufacture of two sets of prototype composite material lift fans for application on current and next generation Navy landing craft vessels. The initiative will address an ongoing problem the Navy has been experiencing with current generation metal lift fan blades that have to be replaced every few months at a cost of approximately $1.4M a year. This technology will extend the life of landing craft lift fans, reducing failures, maintenance, and life cycle costs.

	FY 2008	FY 2009	FY 2010
9972A Advanced Fluid Controls for Shipboard Applications	2.326	2.493	0.000
RDT&E Articles Quantity	0	0	0

The Advanced Fluid Controls for Shipboard Applications, develops materials, including composites and ceramics, for a variety of fluid control solutions that focused on providing intelligent control and interface directly with the ship's main computer.

	FY 2008	FY 2009	FY 2010
9973A Advanced Repair Technology for Expeditionary Navy	0.771	0.798	0.000
RDT&E Articles Quantity	0	0	0

The Advanced Repair Technology for Expeditionary Navy focuses on providing innovations in repair technology to the Expeditionary Navy aboard ships at sea and at forward repair sites.

	FY 2008	FY 2009	FY 2010
9974A Advanced Steam Turbine	3.855	1.596	0.000
RDT&E Articles Quantity	0	0	0

The Advanced Steam Turbine, develops advanced technologies that resulted in a quieter, smaller turbine generator for the US Navy.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMEN**	PROJECT NUMBER AND NAME **9999/CONGRESSIONAL ADDS**	

	FY 2008	FY 2009	FY 2010
9975A Air Gun Shock Testing of Naval Vessels	1.549	0.000	0.000
RDT&E Articles Quantity	0	0	0

The Air Gun Shock Testing of Naval Vessels develops a low cost, environmentally safe underwater shock testing method employing non-explosive energy sources suitable for shock testing the ship or shock qualifying major shipboard systems.

	FY 2008	FY 2009	FY 2010
9980A High Efficiency Quiet Electric Drive	1.552	0.000	0.000
RDT&E Articles Quantity	0	0	0

High Efficiency Quiet Electric Drive develops and demonstrates an advanced propulsion motor drive by utilizing a hybrid power electronics approach.

	FY 2008	FY 2009	FY 2010
9981A Integrated Power System Converter	0.776	1.995	0.000
RDT&E Articles Quantity	0	0	0

Integrated Power System Converter develops integrated power system propulsion motor drive power electronics technologies for future surface combatants that allows for rapid response to electrical system load demands.

	FY 2008	FY 2009	FY 2010
9982A Propulsor Manufacturing Technology Development	2.324	0.000	0.000
RDT&E Articles Quantity	0	0	0

Propulsor Manufacturing Technology Development develops coatings for propellers to improve erosion resistance, fouling resistance and efficiency characteristics.

	FY 2008	FY 2009	FY 2010
9983A Smart Valve	2.326	0.798	0.000
RDT&E Articles Quantity	0	0	0

Smart Valve develops linear electromechanical actuator technology to help eliminate high pressure hydraulic and pneumatic systems in a shipboard environment.

	FY 2008	FY 2009	FY 2010
9B60A Advanced Navy Boat Lift Research and Development	0.970	0.000	0.000
RDT&E Articles Quantity	0	0	0

Advanced Navy Boat Lift Research and Development funds an effort so that many boats, including larger force protection boats and maritime expeditionary security force boats, do not sit in corrosive marine environments increasing the maintenance requirements on the hull and propulsion systems. The ability to remove a boat from this environment without hauling onto a terrestrial trailer or maintenance cradle is vital to minimize these maintenance requirements and allows hull and propulsion system work to be performed over the water. The use of boat lifts improves the boat's performance, also saves time, fuel and money, while prolonging the life of the boats.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMEN**	PROJECT NUMBER AND NAME **9999/CONGRESSIONAL ADDS**	

	FY 2008	FY 2009	FY 2010
9B61A Circuit Breaker for Navy Shipboard Power Distribution Center	0.582	0.000	0.000
RDT&E Articles Quantity	0	0	0

Funds for Circuit Breakers for Navy Shipboard Power Distribution Center are used for the development of a militarized version of a commercial off the shelf direct current (DC) circuit breaker rated at 800 amp/650 VDC in shock isolation mounted electrical assemblies for Naval ship low voltage power system applications.

	FY 2008	FY 2009	FY 2010
9B62A DDG-51 Homopolar Hybrid Drive	5.320	0.000	0.000
RDT&E Articles Quantity	0	0	0

Funds for the DDG 51 Homopolar Hybrid Drive are used to develop, build, and test proof of concept equipment for a hybrid electric drive system. Development of this technology significantly reduces fuel consumption and increases DDG 51 Class mission effectiveness through longer time on station.

	FY 2008	FY 2009	FY 2010
9B63A High Temperature Superconductor AC Synchronous Propulsion Motor	1.940	0.000	0.000
RDT&E Articles Quantity	0	0	0

Funds for the High Temperature Superconducting AC Synchronous Motor are used for the continued testing of the high temperature superconducting motor to support full power testing of the prototype motor as well as completed preliminary design for militarization of the HTS-AC motor and associated drive system for potential application to a future surface combatant.

	FY 2008	FY 2009	FY 2010
9B64A High Temperature Superconductor (HTS) Navy propulsion Motor/DDG1000	1.940	0.000	0.000
RDT&E Articles Quantity	0	0	0

Funds for the High Temperature Superconductor (HTS) Navy propulsion Motor for DDG-1000 are used for the continued testing of the high temperature superconducting motor up to full power.

	FY 2008	FY 2009	FY 2010
9B65A Internet Protocol over Power Line Carrier Tech Integration w/ ICAS	1.562	0.000	0.000
RDT&E Articles Quantity	0	0	0

Internet Protocol over Power Line Carrier Technology (ICAS) is funded to develop a high bandwidth PLC (Power Line Communication) FIPS 140-2 certified IP over power line product, which served to enable and support further development and enhancement of the current PLC technology for Navy applications.

	FY 2008	FY 2009	FY 2010
9B66A Naval Flywheel Energy Storage System	0.582	0.000	0.000
RDT&E Articles Quantity	0	0	0

Funds for Naval Flywheel Energy Storage System are used to develop and test a flywheel energy storage system with greater power density and output that is fully adapted to the shipboard environment.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMEN**	PROJECT NUMBER AND NAME **9999/CONGRESSIONAL ADDS**	

	FY 2008	FY 2009	FY 2010
9B67A Power Conversion Equipment for High Density Power Generation	0.775	0.000	0.000
RDT&E Articles Quantity	0	0	0

Funds for the Power Conversion Equipment for High Density Power are used to develop proof of concept power conversion equipment for an advanced high density power generation system.

	FY 2008	FY 2009	FY 2010
9B68A Shipboard Wireless Maintenance Assistant (SWMA)	1.163	0.000	0.000
RDT&E Articles Quantity	0	0	0

Funding for Shipboard Wireless Maintenance Assistant (SWMA) is used for development of mobile, hand-held information technology and technical tools for shipboard maintenance personnel. The handheld computing device supports wired or wireless networking, enabled technical data access, and display and collaborative resource sharing through live video, audio capability, and diagnostic tools and modules.