

CLASSIFICATION:		UNCLASSIFIED					
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION							DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4				R-1 ITEM NOMENCLATURE 0603573N/ADVANCED SURFACE MACHINERY SYSTEMS			
COST (In Millions)				FY 2008	FY 2009	FY 2010	
Total PE Cost				1.555	9.175	5.599	
2471 / Integrated Power Systems (IPS)				0.000	0.000	5.599	
9999 / Congressional Add				1.555	9.175	0.000	
A. MISSION DESCRIPTION: The Integrated Power System (IPS), Project 2471, was previously budgeted in RD TEN PE 0603513N for FY2008 & FY2009. The Electric Ship Office (ESO) is responsible for developing and executing the Next Generation IPS (NGIPS) technology development and transition plan. The ESO's initial efforts are to coordinate the ongoing electric power efforts of the PEOs and Office of Naval Research, establishing the technical basis and strategic direction for Naval power system architectures, developing decision making tools, and establishing technical standards. This PE funds the development of specific and future electric ship technologies for surface combatants family of ships, such as DDG 1000 and CG(X) with focus on the Integrated Power System which 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 included in this budget: FY08: 9971A Advanced Combatant Materials Research FY09: 9807A Smart Machinery Spaces Systems 9B82A Low Signature Modular Weapon Platform 9D38A Analytics for Shipboard Monitoring Systems 9D40A Ship Affordability through Advanced Aluminum Structures.							

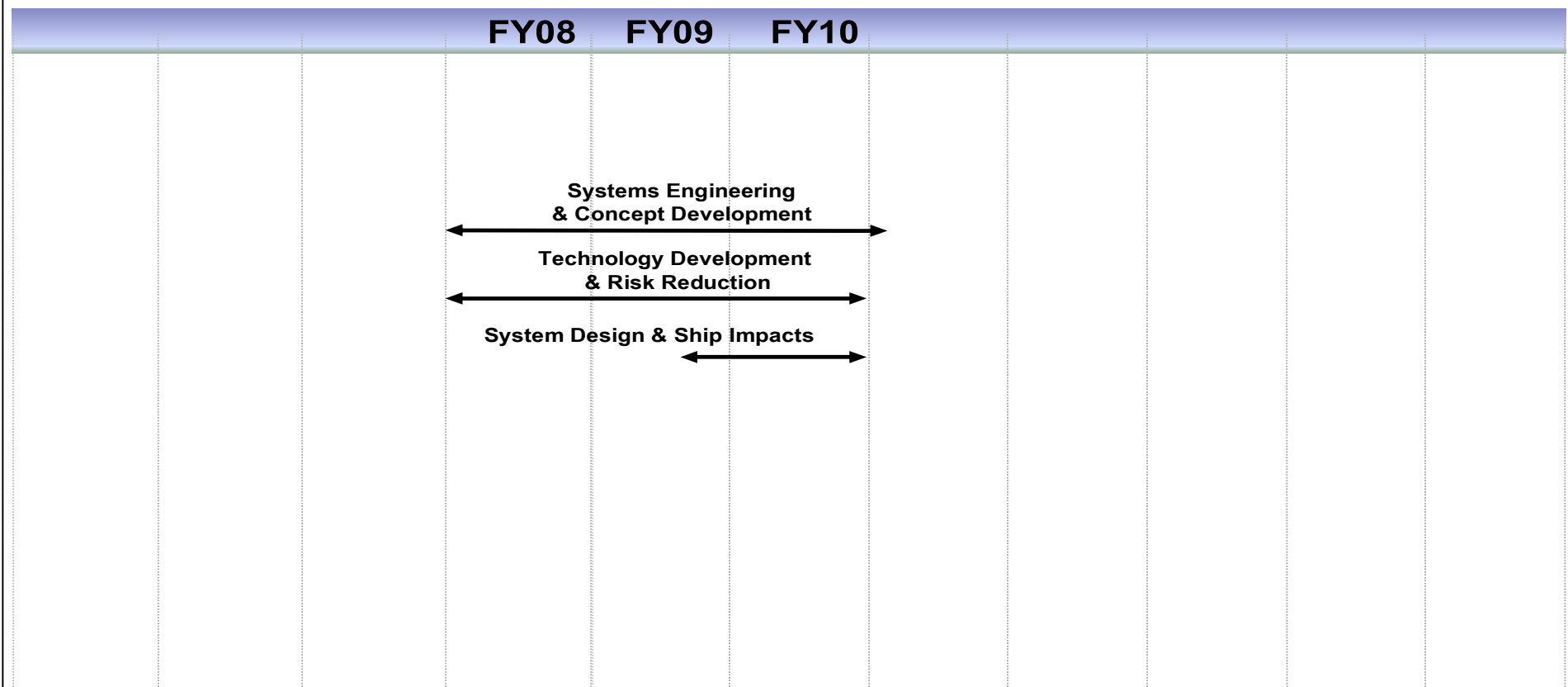
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EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION (CONTINUATION)				DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RDTEN/BA 4		R-1 ITEM NOMENCLATURE 0603573N/ADVANCED SURFACE MACHINERY SYSTEMS		
B. PROGRAM CHANGE SUMMARY:				
Funding:	FY 2008	FY 2009	FY 2010	
FY09 President's Budget	1.590	0.000	0.000	
FY10 President's Budget	1.555	9.175	5.599	
Total Adjustments	-0.035	9.175	5.599	
(U) Summary of Adjustments				
Congressional Rescissions	0.000	0.000	0.000	
Congressional Adjustments	0.000	9.175	0.000	
SBIR/STTR/FTT Assessment	-0.035	0.000	0.000	
Program Adjustments	0.000	0.000	5.678	
Rate/Misc Adjustments	0.000	0.000	-0.079	
Total	-0.035	9.175	5.599	
C. OTHER PROGRAM FUNDING SUMMARY:				
D. ACQUISITION STRATEGY:				
IPS is a candidate system for DDG 1000, CG(X), and other surface combatants.				

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EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4		PROGRAM ELEMENT NUMBER AND NAME 0603573N/ADVANCED SURFACE MACHINERY SYSTEMS			PROJECT NUMBER AND NAME 2471/Integrated Power Systems (IPS)		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	0.000	0.000	5.599				
RDT&E Articles Qty	0	0	0				
A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Integrated Power System (IPS), Project 2471, was previously budgeted in RD TEN PE 0603513N for FY2008 & FY2009. This project supports the Integrated Power Systems (IPS) program. IPS provides total ship electric power, including electric propulsion, power conversion and distribution. The DDG 1000 will 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. 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. 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.							

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B. ACCOMPLISHMENTS/PLANNED PROGRAM:			
	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.000	0.000	2.500
RDT&E Articles Quantity	0	0	0
System Development: Conduct detailed design and prototype fabrication of power conversion equipment for advanced architecture. Continue to improve baseline power system performance by performing analysis, modeling and simulation, life cycle cost analysis, producibility studies, module development, ship integration, architecture design, ship electric architectures and high power weapons systems requirements, and related efforts. Evaluate emerging technologies for ship applications to determine future feasibility and development requirements. Emerging technologies include fuel cells, high-energy weapons, high power radars, and advanced power electronics.			
	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.000	0.000	2.899
RDT&E Articles Quantity	0	0	0
System Test: Conduct land based testing of power conversion equipment at NSWCCD, Philadelphia PA. Mitigate potential risks associated with a fielded IPS system to reduce ship's signature, improve survivability and efficiency by fabricating components, inserting into the IPS test site or an appropriate test platform. Conduct demonstrations to maintain and develop the critical engineering capability and capacity to insert future high power weapon systems (radars, lasers and electromagnetic launch weapons) into DDG1000 and future ship classes including CG(X). Conduct demonstrations to show improved performance and potential to reduce combat system costs.			
	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.000	0.000	0.200
RDT&E Articles Quantity	0	0	0
Platform Specific: Develop IPS configurations in support of all future surface ship programs. Develop/modify IPS ship configuration documentation including concepts of operations, System Level Description/Requirements, and module performance specifications as necessary to support power system requirements for CG(X) and other surface combatants. Improve ship power system smart product model to support cost/performance tradeoffs of alternative IPS ship configurations and evaluation of emerging electric power system and component technologies.			

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EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS							DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4		PROGRAM ELEMENT NUMBER AND NAME 0603573N/ADVANCED SURFACE MACHINERY SYS			PROJECT NUMBER AND NAME 2471/Integrated Power Systems (IPS)					
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			
Primary Hardware Development	C/CPFF	Anteon Corp. Fairfax VA	4.925	0.000		0.700	OCT-09			
Primary Hardware Development	WR	NSWCCD Philadelphia, PA	26.741	0.000		0.500	OCT-09			
Primary Hardware Development	C/CPFF	ADV PWR Elec TBD	0.000	0.000		2.221	OCT-09			
Subtotal Product Development			31.666	0.000		3.421				
Remarks:										
Subtotal Support Costs			0.000	0.000		0.000				
Remarks:										
Developmental Test & Evaluation	WR	NSWCCD Philadelphia, PA	20.005	0.000		2.178	OCT-09			
Subtotal Test and Evaluation			20.005	0.000		2.178				
Remarks:										
Subtotal Management Services			0.000	0.000		0.000				
Remarks:										
Total Cost			51.671	0.000		5.599				

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EXHIBIT R-4, SCHEDULE PROFILE			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4	PROGRAM ELEMENT NUMBER AND NAME 0603573N/ADVANCED SURFACE MACHINERY SYSTEMS	PROJECT NUMBER AND NAME 2471/Integrated Power Systems (IPS)	



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EXHIBIT R-4a, SCHEDULE DETAIL							DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4		PROGRAM ELEMENT NUMBER AND NAME 0603573N/ADVANCED SURFACE MACHINERY SYSTEMS			PROJECT NUMBER AND NAME 2471/Integrated Power Systems (IPS)		
Schedule Profile		FY 2008	FY 2009	FY 2010			
System Engineering & Concept Development		1Q-4Q	1Q-4Q	1Q-4Q			
Technology Development & Risk Reduction		1Q-4Q	1Q-4Q	1Q-4Q			
System Design & Ship Impact			3Q-4Q	1Q-4Q			

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APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4	PROGRAM ELEMENT NUMBER AND NAME 0603573N/ADVANCED SURFACE MACHINERY SYSTEMS	PROJECT NUMBER AND NAME 9999/Congressional Add	
B. ACCOMPLISHMENTS/PLANNED PROGRAM:			
	FY 2008	FY 2009	FY 2010
9D40A/SHIP AFFORDABILITY THROUGH ADVANCED ALUMINUM STRUCTURES	0.000	1.995	0.000
RDT&E Articles Quantity	0	0	0
Provides funding for the development, testing, and evaluation of aluminum components optimized for cost/weight reduction for Littoral Combat Ship (LCS) and other high speed shallow draft vessels designed for littoral combat, multi-mission capability, and intra-theater transport. In addition to design optimization, these tools will also be used to identify specific needs and material solutions in defined thrust areas where validation is necessary to overcome technical barriers to the use of aluminum. These needs may include optimization of existing aluminum alloys and/or development of new aluminum alloys for enhanced corrosion resistance, development of manufacturing technologies to reduce cost and part count, and development of advanced joining technologies such as friction stir welding.			
	FY 2008	FY 2009	FY 2010
9807A/Smart Machinery Space System	0.000	2.393	0.000
RDT&E Articles Quantity	0	0	0
Funds the development of a comprehensive, automated CBM+ solution that incorporates Configuration Management (CM), Condition-Based Maintenance (CBM), and Automated Logistics functions.			
	FY 2008	FY 2009	FY 2010
9B82A/Low Signature Modular Weapon Platform	0.000	3.191	0.000
RDT&E Articles Quantity	0	0	0
Funding for the Low Signature Modular Weapons Platform was an FY08 Congressional add under RD TEN PE 0603513N. The FY08 Low Signature Modular Weapons Platform project identifies upgrades to the SEALION I first-generation low signature craft. These upgrades are structural modifications to the vessel to support a future modular weapons platform. Previous Congressional adds associated with the SEALION special operations craft have been successfully executed via an effective Government-Industry Integrated Product Team (IPT), responsible for design, construction, technical oversight, and operational test and evaluation. The IPT determined that the FY08 funding was sufficient only to lengthen the SEALION I craft to resemble SEALION II. Having two craft of the same size (equivalent range, speed, endurance and payload capacity) will allow testing and evaluation of multi-craft concepts of operation in support of future special operations craft requirements development.			
	FY 2008	FY 2009	FY 2010
9D38A/Analytics For Shipboard Monitoring Systems	0.000	1.596	0.000
RDT&E Articles Quantity	0	0	0
Analytics for Shipboard Monitoring Systems (ASMS) is an open architecture model that will enhance legacy and new ship capabilities while saving acquisition dollars and yield workload reduction. Moving from stove piped and proprietary systems to open systems will streamline current processes, reduce supporting infrastructure and will support rapid deployment of emerging diagnostic technologies to optimize Fleet readiness and maintenance funds allocation.			

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	FY 2008	FY 2009	FY 2010
9971A/ADVANCED COMBATANT MATERIALS RESEARCH	1.555	0.000	0.000
RDT&E Articles Quantity	0	0	0
Advanced Combatant Materials Research: Due to changing operational requirements, ships will require improved stealth, speed, and payload flexibility, which can place additional burdens on ship weight. The Advanced Combatant Materials funding will investigate high strength, damage tolerant, lightweight materials and associated advanced fabrication technologies that can achieve significant weight reduction or improved performance. These include improved marine aluminum alloys, solid state welding processes, novel titanium alloy processing, advanced steels for improved blast and ballistic protection, and a breakthrough in composite - metal joining invented in the UK.			