Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Navy										DATE: February 2011	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603563N: *Ship Concept Advanced Design*							
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	23.166	17.883	14.308	-	14.308	14.114	11.552	5.585	5.843	Continuing	Continuing
2196: *Design, Tools, Plans and Concepts*	0.566	0.621	0.529	-	0.529	0.542	0.554	0.494	0.506	Continuing	Continuing
3161: *NAVSEA Tech Authority*	22.600	17.262	13.779	-	13.779	13.572	10.998	5.091	5.337	Continuing	Continuing

A. Mission Description and Budget Item Justification

Explore alternative surface ship force structures, advanced surface ship and unmanned surface vehicles concepts, and the potential technologies for these force structures and advanced concepts in support of pre-acquisition mission needs analysis, mission area analysis, and planning. The objective is a more affordable, mission capable surface ship force including ships with reduced manning, increased ability to produce, reduced operating and support costs, and greater utilization of the latest technology. The program directly supports the Navy Shipbuilding Plan with state-of-the-art design tools and methods for surface ship force structure alternative studies, ship & unmanned vehicle concept studies, and the actual conduct of surface ship force structure alternative studies and advanced design concept studies for the ships that may become part of the shipbuilding plan.

Project 2196 - This project funds concept development engineering, mission effectiveness analysis, and other analyses for formulation of future surface ship force structure along with development of the tools to accomplish these efforts. Advanced ship concept studies, ship and ship systems technology assessments, and the development and upgrade of
ship concept design and engineering tools, methods, and criteria.

Project 3161 - This project funds a prioritized portfolio of time-sensitive initiatives supporting NAVSEA Technical Authority through integrated efforts in Cross Platform Systems Development (CPSD), furthering Sea Enterprise through the development of support elements for Technical Warrant Holders and meeting relevant needs of the warfare community. The areas of exploration for CPSD include surface ship concept advanced development, submarine concepts, next generation unmanned surface vehicle, high speed ships/craft, tool integration and technical data exchange, embedded interoperability engineering, and mission capability system engineering. The research products developed by this project directly influence future acquisition programs by providing a range of technically acceptable alternatives and evaluation of emerging technologies.

Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Navy	DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603563N: *Ship Concept Advanced Design*

B. Program Change Summary ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	22.387	17.883	17.254	-	17.254
Current President's Budget	23.166	17.883	14.308	-	14.308
Total Adjustments	0.779	-	-2.946	-	-2.946
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	1.416	-			
• SBIR/STTR Transfer	-0.218	-			
• Program Adjustments	-	-	-2.318	-	-2.318
• Section 219 Reprogramming	-0.396	-	-	-	-
• Rate/Misc Adjustments	-	-	-0.628	-	-0.628
• Congressional General Reductions Adjustments	-0.023	-	-	-	-

Change Summary Explanation

FY12 Program decrease reflects overhead and contract services adjustments.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603563N: *Ship Concept Advanced Design*	PROJECT 2196: *Design, Tools, Plans and Concepts*	

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
2196: *Design, Tools, Plans and Concepts*	0.566	0.621	0.529	-	0.529	0.542	0.554	0.494	0.506	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This project develops and explores alternative surface ship force structures, advanced surface ship and unmanned surface vehicles concepts, and the potential technologies for these force structures, along with advanced concepts in support of pre-acquisition mission needs analysis, mission area analysis, and planning. The objective is a more affordable, mission capable surface ship force including ships with reduced manning, increased ability to produce, reduced operating and support costs, and greater utilization of the latest technology. The program directly supports the Navy Shipbuilding Plan with state-of-the-art design tools and methods for surface ship force structure alternative studies, ship & unmanned vehicle concept studies, surface ship mission effectiveness studies, and advanced design concept studies for the ships that may become part of the shipbuilding plan.

(U) This project provides the foundation for an affordable and mission capable surface ship force. It also supports the next step in the development of a transformed naval force by accomplishing the pre-milestone A (especially pre-concept decision) efforts for all potential surface ships and craft. These efforts are the required first step in the integration of total ship systems, including combat systems, weapons systems and Hull, Mechanical and Electrical (HM&E) systems. Inadequate early planning and ship concept formulation can result in down-stream design, construction and operational problems. A more subtle and severely negative impact of neglecting this early effort is that the "best" concepts and technologies may never even be considered and our greatest potential ship design advances never realized. Designs and technologies must meet the threat. This project supports this requirement.

(U) This project funds concept development engineering, mission effectiveness analysis, and other analyses for formulation of future surface ship force structure along with development of the tools to accomplish these efforts. Advanced ship concept studies, ship and ship systems technology assessments, and the development and upgrade of ship concept design and engineering tools, methods, and criteria are also funded in this project.

(U) This project accomplishes the following: (1) Develops alternative surface ship force structure concepts including the ships and unmanned vehicles; (2) Evaluates the mission capability effectiveness and costs for these alternative surface fleet architectures; (3) Performs fleet war fighting/mission effectiveness assessment studies; (4) Identifies future surface ship requirements and characteristics necessary to meet future threats and support mission needs; (5) Investigates new affordable ship concepts and evaluates technologies necessary to support these concepts; (6) Provides design methods and automated design tools to develop and evaluate ship concepts; and (7) Supports development of Initial Capabilities Documents (ICD) and analogous early requirements documents for future ships. These efforts are done to support mission analysis; mission needs development and technology assessment in support of future fleet concepts and potential ship acquisition programs. These efforts are fundamental to the Navy's formulation of the future fleet.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603563N: *Ship Concept Advanced Design*	PROJECT 2196: *Design, Tools, Plans and Concepts*

(U) Supports concept exploration and mission needs assessment for potential future ship acquisition programs, however, these are not direct efforts for specific, authorized shipbuilding programs. This project is the only R&D effort (Government or commercial) that supports and maintains this country's naval ship design and engineering capabilities in the area of very early stage (Concept Design) design tools, criteria, and methods.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: Ship Concepts and Mission Need Analysis	0.403	0.534	0.456
Articles:	0	0	0
Description: (U) Develop ship concepts and perform analysis for potential ships and Force Architecture 5-10 years out in shipbuilding plan. ***FY 2010 Accomplishments:*** Designed concepts for Maritime Presence Gap Analyses. ***FY 2011 Plans:*** Concept designs for small and medium surface combatants with a broad mix of gun, missile, and other emerging weapon topics (high energy, etc.) ***FY 2012 Plans:*** Continuation of concept designs for small and medium surface combatants with a broad mix of gun, missile, and other emerging weapon topics (high energy, etc), also to include energy- and cost-reducing technologies and concepts as related to ship systems.			
Title: Total Ship Technology Assessment (TSTA)	0.084	0.087	0.073
Articles:	0	0	0
Description: (U) Analyze the benefits and impacts of new ship, Hull, Mechanical & Electrical (HM&E) concepts, technologies and warfare systems. ***FY 2010 Accomplishments:*** Focus directed towards ship impacts of enhancing Anti-Ship Cruise Missiles (ASCM) defense systems, such as the installation of directed energy weapons, increasing the lethality of an installed direct fire railgun, and the integration of soft kill weapon systems. Expanded Total Ship Technology Assessment (TSTA) to ongoing surface combatant concept and Auxiliary Tug Fleet Salvage Ship (ATFSS) Design Team. ***FY 2011 Plans:*** Expand TSTA methodology to Advanced Ship Warfare (ASW), Advanced Ship Undersea Warfare (ASUW) products developed under FY10 Concepts and Mission Needs Analysis. ***FY 2012 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Continuation of expanded TSTA methodology with ASW, ASUW products developed under FY11 Concepts and Mission Needs Analysis, also to include energy and cost-reducing technologies and concepts as related to ship systems.			
Title: Ship Concept Design and Engineering Tools, Methods, and Criteria ***Articles:*** ***Description:*** (U) Improve capability for rapid and accurate ship performance/cost/risk assessments and tradeoff studies. ***FY 2010 Accomplishments:*** Completed testing of Advanced Ship Synthesis Evaluation Tool (ASSET) for ongoing and emerging ship concepts; including new hull forms and technologies, emerging combat system concepts.	0.037 0	-	-
Title: Mission Systems Interface Development and Demonstration ***Articles:*** ***Description:*** (U) Requirements development to counter asymmetric, peer and littoral enemies with tailored, modularized mission systems. ***FY 2010 Accomplishments:*** Completed Open-ocean ASW technology insertion analysis.	0.042 0	-	-
Accomplishments/Planned Programs Subtotals	0.566	0.621	0.529

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• RDTEN/0204202N: *DDG-1000*	507.742	549.241	261.604	0.000	261.604	340.009	168.344	164.089	100.335	0.000	2,091.364
• RDTEN/0603512N: *Carrier Systems Development*	171.441	93.830	54.072	0.000	54.072	47.867	46.291	47.837	48.723	0.000	510.061
• RDTEN/0603513N: *Shipboard Systems Component Development*	32.008	0.051	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	32.059
• RDTEN/0603564N: *Ship Preliminary Design/Feasibility*	30.928	1.796	22.213	0.000	22.213	26.522	35.965	35.660	19.399	0.000	172.483
• RDTEN/0604567N: *Ship Contract Design/Live Fire T&E*	91.771	153.686	161.099	0.000	161.099	190.301	138.186	104.039	93.153	0.000	932.235
	20.822	24.344	34.157	0.000	34.157	33.517	33.135	29.961	30.809	0.000	206.745

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
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C. Other Program Funding Summary ($ in Millions)

Line Item	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
• RDTEN/0603582N: *Combat System Integration*											

D. Acquisition Strategy

This is a non acquisition program that develops, evaluates, and validates early stages of total ship concepts and technologies in support of SCN planning and potential future ship acquisition programs. This program also supports development, demonstration, evaluation, and validation of engineering tools, methods, and criteria for those concept designs and assessments.

E. Performance Metrics

None

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy			DATE: February 2011
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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
3161: *NAVSEA Tech Authority*	22.600	17.262	13.779	-	13.779	13.572	10.998	5.091	5.337	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This project has been established to support NAVSEA Technical Authority through coordinated, collaborative, cross-platform systems development resulting in advanced capabilities across business lines through development adaptation and extension of processes, procedures, and tools necessary to develop and explore alternative surface ship and submarine force structures; advanced submarine, surface ship & unmanned surface vehicle concepts; interoperability; and development of systems level engineering criteria and options to support these force structures and advanced concepts as part of pre-acquisition mission needs analysis, mission area analysis, SCN, and R&D planning. The objective is the coordination of ongoing early-stage concept design and development efforts for cross-platform applicability to result in a more affordable, mission-capable, and interoperable surface ship and submarine forces including ships and submarines with reduced manning, increased ability to produce, reduced operating and support costs, and greater utilization of the latest technology.

NAVSEA Tech Authority efforts under Project 3161, known as the Cross Platform Systems Development (CPSD) Program enhance ongoing efforts within Project 2196 and transition directly to early-stage ship design for Ship and Submarine Preliminary Design and Feasibility Studies and other Program Executive Office (PEO) ship and submarine design programs. While these efforts support concept exploration and mission needs assessment for potential future ship and submarine acquisition programs, they are not direct efforts for specific, authorized shipbuilding programs. This project is the only R&D effort (Government or commercial) that provides a coordinated, collaborative approach to the development of cross-platform naval ship, submarine, and weapon system design and engineering capabilities in the areas of design tools, criteria, and methods. This project also provides innovative solutions for current Fleet issues involving Technical Authority, such as current interoperability issues with new systems or platforms.

Naval Ship System Engineering Tech Authority recapitalization and product development consolidates platform advanced concept development and design tool development in CPSD 1.0 (Platform Concept Advanced Development) and CPSD 2.0 (Platform Design and Certification Tools/Engineering and Tech Data Exchange Development); and aligned standards and requirements development for modularity and system / component commonality within CPSD 3.0 (Ship Systems Engineering/Modular Ship Systems Development). Program product areas support: platform-centric force architecture and concept development and tools (CPSD 1.0, CPSD 2.0), engineering products and system development (CPSD 3.0, CPSD 5.0), and system interoperability and mission capability for delivering ships and submarines (CPSDs 6.0, 8.0, 9.0). CPSD develops and transitions products to Technical Warrant Holder (TWH) community and develop prioritized plans and activities for future products from emerging cross platform technical requirements and associated capabilities.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: Platform Concept Advanced Development (CPSD 1.0)	1.964	2.190	1.544
Articles:	0	0	0

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Description: (U) This effort directly supports the Navy's ability to understand risk and associated cost of surface and submarine warfare assets; Pre-Milestone A ship, craft, and unmanned surface vehicle (USV) design and analysis. ***FY 2010 Accomplishments:*** Future Expeditionary Warfare Concept Study and capability assessment; Developed future surface combatant concept options incorporating emerging combat system, propulsor/propulsion, powering, and modular architectures; Developed future auxiliary concepts including replenishment and fleet support; Integrated future submarine concepts and force architecture options; Developed green/brown water support and presence concepts; Examined common cross platform architectures, interfaces, and modular approaches to leverage common mission capability and achieve ability to produce efficiencies; Developed High Speed Open Ocean concepts leveraging results of ongoing technology development; Competed for New Work Area Projects. Supported development of DDG III Flight upgrade study trade studies and ship concept design. Supported requirements development including the Capability Development Document (CDD). ***FY 2011 Plans:*** Expand Capability assessment begun in FY10 to other warfare areas; Continue operational assessment of Long Range Endurance prototype and Autonomous Health Monitoring and Recovery prototype; Continue development of USV interoperability concepts and architectures including technical architectures for USV operations aboard manned and unmanned surface combatants; Continue platform design processes and Standards in development support of next generation submarine concept exploration; Continue development of cross-platform, common modular payload and interface concepts. Continue supporting DDG III Flight upgrade study trade studies, ship concept design, and requirements development. ***FY 2012 Plans:*** Continue the integration of modular-open systems architectures into warship design and acquisition, (b) continue to research the power requirements of Unmanned Surface Vehicle (USV) payloads, investigating power conversion equipment monitoring and controls systems and additional USV system monitoring and control systems, and (c) continue Comparative Naval Architecture (CAN) effort evaluating different individual ships from various navies (some co-operative, some hostile).			
Title: Platform Design and Certification Tools/Engineering and Tech Data Exchange (CPSD 2.0) ***Articles:*** ***Description:*** (U) This effort supports the development and validation tools to certify the safety and mission capability of platform concepts and subsequently ships and submarines; establishes the integrated NAVSEA tool suite to support execution of NAVSEA Tech Authority. ***FY 2010 Accomplishments:***	2.136 0	3.657 0	3.514 0

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Continued integration of analytical tools supporting high performance naval ship technologies; Continued assessment of data exchange standards between Live Fire Test & Evaluation Modeling & Simulation (LFT&E M&S) and shipbuilder CAD environments; began certification process; Continued expansion of M&S integrated environment to additional engineering disciplines; Coordinated data development and data exchange requirements to minimize data regeneration and modification efforts between disciplines and support reuse through design and acquisition process. ***FY 2011 Plans:*** Continue Technical Warrant Holder Concept Validation Support; continue Concept Design Tool Development - implementation and validation; Continue integration of analytical tools supporting high performance naval ship technologies; Continue assessment of data exchange standards between LFT&E M&S and shipbuilder CAD environments; Continue expansion of M&S integrated environment to additional engineering disciplines. Coordinate data development and data exchange requirements to minimize data regeneration and modification efforts between disciplines and support reuse through design and acquisition process. ***FY 2012 Plans:*** Continue the ASSET synthesis program development to modularize its architecture to accommodate insertion of new modules and updating existing needed for advanced ship concepts and emerging ship technology. Continue concept design tool development - implementation and validation; begin certification process.			
Title: Ship Systems Engineering /Modular Ship Systems Development (CPSD 3.0)	2.056	3.062	2.658
Articles:	0	0	0
Description: (U) This effort supports Ship system development with a focus on technology transition, modularity, ship system technology integration, and design standards for new ship classes for pre-Alternative of Analysis (AoA) studies and ongoing POR ship and submarine development. ***FY 2010 Accomplishments:*** Expanded Full Ship Finite Element Modeling Baseline and expand resolution into survivability, vulnerability and recoverability analyses; Incorporated integrated topside design tool set and methodologies; Expanded Cost Analysis modeling and simulation via improved cost estimating relationships that included concepts of equipment density and fabrication complexity; Articulated developing combat system architectures in terms of ship system impacts and cost; Included emerging power and propulsion system architectures into Modeling Baseline. Supported development of DDG III Flight upgrade study trade studies and ship concept design. Supported requirements development including the Capability Development Document (CDD). ***FY 2011 Plans:*** Continue Cost Analysis modeling and simulation via improved cost estimating relationships that include concepts of fabrication complexity; continue survivability, recoverability and vulnerability analyses; Continue developing hydrodynamic safe operating			

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
envelope analysis methods and design processes; articulate development of combat system architectures in terms of ship system impacts and cost; Include emerging power, propulsion and auxiliary system architectures and technologies into Modeling Baselines; incorporate integrated power and combat system architectures; Develop open and modular system technical architectures for various platforms development transition of open architecture standards and tools to NAVSEA community. Continue supporting DDG III Flight upgrade study trade studies, ship concept design, and requirements development. ***FY 2012 Plans:*** Continue SEAQUEST development, enabling the combination of multiple cross-disciplinary models and applications together in a simulation process flow, automate execution across distributed computer resources, explore the resulting design space, and identifies the optimal design parameters subject to required constraints, (b)support implementation and transition of the commonality approach based on Navy and private sector best practices for the implementation of commonality initiatives, (c)develop a long term strategic roadmap that incorporates the varied technology gaps and ongoing initiatives within the surface ship structural discipline.			
Title: Next Generation USV (CPSD 4.0) ***Articles:*** ***Description:*** (U) Development and demonstration of Unmanned Surface Vehicle (USVs) with focus on autonomous behavior, modularity, new ship classes for pre Alternative of Analysis (AoA) studies. ***FY 2010 Accomplishments:*** Conducted operational assessment of Long Range Endurance prototype and Autonomous Health Monitoring and Recovery prototype; Continued development of USV interoperability concepts and architectures; developed open architecture & modular system and technical architectures for USV operations aboard manned and unmanned surface combatants; Competed for New Risk Area Projects.	1.371 0	-	-
Title: High Speed Ships and Craft Engineering (CPSD 5.0) ***Articles:*** ***Description:*** (U) This effort supports the development of concepts for future high speed ships and craft that promise improved mission effectiveness in mobility, survivability, and warfare mission areas. ***FY 2010 Accomplishments:*** Weapon Effects testing of Aluminum Structures (MOA - FIN-GER USA) tri lateral testing of Ship 2 of Helsinki Class Fast Missile Craft; High Speed Ships tools, guidelines, validated data sets and training: High speed human systems (trials, testing, numeric	2.486 0	1.770 0	1.337 0

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
modeling, guidelines for early stage design); Light Weight Structures cooperative research with NATO partners; Light Weight Structures Shock (Helsinki Class) Shock Trial. ***FY 2011 Plans:*** Reliability Based Structural Design of Aluminum Ships - Helsinki Class Life Time Loads and Fatigue analyses; Composite propulsor construction and testing; Trials, testing, numeric modeling, guidelines supporting for early stage design of High Speed Ships and Craft. ***FY 2012 Plans:*** Continues the development of an advanced hydrodynamic simulation tool that has adequate fidelity for all environmental conditions required to define a Safe Operating Envelope. The effort addresses this need for an analytic approach, which will be verified and validated through correlation with data obtained from analytic tests, sub-scale trials, and ultimately full scale trails.			
Title: Alternative Power Systems Engineering (CPSD 6.0) ***Articles:*** ***Description:*** (U) This effort investigates concepts for ships and craft with alternative power/propulsion systems evaluating effectiveness in mobility, survivability, and warfare mission areas. ***FY 2010 Accomplishments:*** Alternate propulsion tools, guidelines, validated data sets and training: Extreme wave modeling cooperative research project with NATO partners; Hydrodynamics force and moment modeling supporting dynamic stability simulation; Next Generation Integrated Propulsion systems architecting, survivability and propulsor. ***FY 2011 Plans:*** Commercial Pod Foreign Comparative Testing numeric simulations, purpose built podded propulsion design to vulnerability; next generation Integrated prop systems engineering; Shaft and strut hydro numeric modeling of lateral plane force and moment effects on ship stability. ***FY 2012 Plans:*** Continue investigation of alternative power/propulsion systems evaluating effectiveness in mobility, survivability and warfare mission areas. Begin targeted implementation of weapon systems roadmap. Support modeling of propulsor out of plane force and moment modeling needed for Safe Operating Envelope ship dynamics simulations. This work area supports hydrodynamic capabilities from design through certification.	2.328 0	1.627 0	1.254 0
Title: Future Submarine Design (CPSD 7.0) ***Articles:***	3.044 0	-	-

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Description: (U) This effort supports development of ship concept studies and evaluates technologies to define the Next Generation Submarine, common SSN-SSBN Hull and Payload Modularity. ***FY 2010 Accomplishments:*** Navy After Next Tech Validated; Technical Warrant Holder Concept Validation Support; ASSET Submarine Concept Design Tool Dev - integration and testing phase; Submarine Design Processes and Standards Development; next generation submarine concept explored; modular payload and interface concept developed.			
Title: Embedded Interoperability (I/O) Engineering (CPSD 8.0)	3.186	2.407	1.667
Articles:	0	0	0
Description: (U) This effort establishes and executes a dedicated process for evaluating the interoperability performance of warfare systems early in the acquisition cycle, prior to certification. Embedded I/O ensures that fewer mission critical system failures degrade the ultimately fielded war fighting capability. Focus on emerging Open Architecture warfare systems, including LCS 1 & 2. ***FY 2010 Accomplishments:*** Completed development of Tactics, Techniques and Procedures (TTP) for CVN 77 and DDG Modernization; continued pre-certification for the interoperability test and assessment of LCS, DDG 1000 and CVN 21 (CVN 78); Continued interoperability efforts LPD 17 (class); Completed TTP for LCS 1 & 2. ***FY 2011 Plans:*** Continue interoperability test and assessment of DDG 1000 and CVN 21 (CVN 78); Complete interoperability efforts LPD 17 (class). ***FY 2012 Plans:*** DDG 51 Upgrade (ACB 12) - Review of system design related to interoperability will continue to occur in FY12. Developmental test and assessment activity planned for FY12 and the final cert planned for early FY14. CG Mod (ACB 12)- Review of system design related to interoperability will continue to occur in FY12. Developmental test and assessment activity planned for FY12 and the final cert planned for early FY14. DDG 1000 - Review of system design related to interoperability will continue to occur in FY12. Developmental test and assessment activities are scheduled for FY 14-18. CVN 78 - Review of system design related to interoperability will continue to occur in FY12. Developmental test and assessment activities are scheduled for FY 14-18. Focus on emerging Open Architecture warfare systems, including LCS 1 & 2.			
Title: Mission Capability Systems Engineering (CPSD 9.0)	3.102	2.549	1.805
Articles:	0	0	0

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APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603563N: *Ship Concept Advanced Design*	PROJECT 3161: *NAVSEA Tech Authority*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Description: (U) This effort supports the development of force-level systems engineering criteria and guidance at the Systems of Systems (SoS) and Family of Systems (FoS) level. ***FY 2010 Accomplishments:*** Continued to provide technical standards, definitions and requirements for National Security Systems (NSS), integrated architecture views for warfare systems of systems, independent technical analysis of warfare systems design and development options and the development of technical artifacts and associated products required by applicable source references by using specially selected Technical Authority Warrant Holders. ***FY 2011 Plans:*** Continue to provide technical standards, definitions and requirements for National Security Systems (NSS), integrated architecture views for warfare systems of systems, independent technical analysis of warfare systems design and development options and the development of technical artifacts and associated products required by applicable source references by using specially selected Technical Authority Warrant Holders; Expand independent technical analysis of warfare systems design and development options to additional Technical Authority Warrant Holders. ***FY 2012 Plans:*** Continue to provide technical standards, definitions and requirements for National Security Systems (NSS). Continue Force level systems engineering criteria. Develop and establish the standards and processes required to develop, test, and deploy Open Architecture as well as Automated Software Test and the Tactical Situation (TACSIT) systems to the Fleet.			
Title: Ship Engineering & Analysis Technology Center (CPSD 10.0) ***Articles:*** ***Description:*** (U) Provides Government activities, shipbuilders, academia and contractors the following: ***FY 2010 Accomplishments:*** Expanded high performance computing system efforts; leveraging commercial and research software and connectivity; Develop security, visualization and collaborative processes to leverage common centralized data storage; Conduct hydrodynamic analyses of emerging ship and craft concepts in various mission performance and geographic regimes; Conduct airwake analysis of emerging high-speed ship concepts including impact of modular mission and payload architectures and configurations.	0.927 0	-	-
Accomplishments/Planned Programs Subtotals	22.600	17.262	13.779

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603563N: *Ship Concept Advanced Design*	PROJECT 3161: *NAVSEA Tech Authority*

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• RDTEN/0204202N: *DDG-1000*	507.742	549.241	261.604	0.000	261.604	340.009	168.344	164.089	100.335	0.000	2,091.364
• RDTEN/0603512N: *Carrier Systems Development*	171.441	93.830	54.072	0.000	54.072	47.867	46.291	47.837	48.723	0.000	510.061
• RDTEN/0603513N: *Shipboard Systems Component Development*	32.008	0.051	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	32.059
• RDTEN/0603564N: *Ship Preliminary Design/Feasibility Studies*	30.928	1.796	22.213	0.000	22.213	26.522	35.965	35.660	19.399	0.000	172.483
• RDTEN/0604567N: *Ship Contract Design/Live Fire T&E*	91.771	153.686	161.099	0.000	161.099	190.301	138.186	104.039	93.153	0.000	932.235
• RDTEN/0603582N: *Combat System Integration*	20.822	24.344	34.157	0.000	34.157	33.517	33.135	29.961	30.809	0.000	206.745

D. Acquisition Strategy

This is a non acquisition program that develops, evaluates, and validates early stages of total ship concepts and technologies in support of SCN planning and potential future ship and submarine acquisition programs. This program also supports development, demonstration, evaluation, and validation of engineering tools, methods, and criteria for those concept designs and assessments. This program supports the NAVSEA Technical Warrant Holders by providing validated engineering tools, methods, and criteria for ship, submarine and weapon system concept designs and assessments while fostering collaboration and coordination of efforts resulting in more effective use of funding.

E. Performance Metrics

Quarterly Program Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603563N: *Ship Concept Advanced Design*	PROJECT 3161: *NAVSEA Tech Authority*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	C/CPFF	Various Contractors:Various	11.665	2.036	Apr 2011	1.532	Apr 2012	-		1.532	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC, NUWC, CDSA:Various	31.141	6.350	Jan 2011	4.952	Jan 2012	-		4.952	Continuing	Continuing	Continuing
Engineering Development	WR	NSWC, NUWC:Various	30.392	6.361	Mar 2011	5.183	Mar 2012	-		5.183	Continuing	Continuing	Continuing
Demonstration & Evaluation	WR	NSWC:Various	12.873	2.305	Feb 2011	1.928	Feb 2012	-		1.928	Continuing	Continuing	Continuing
Demonstration & Evaluation	WR	SPAWAR:Various	1.812	0.110	Mar 2011	0.084	Mar 2012	-		0.084	Continuing	Continuing	Continuing
		Subtotal	87.883	17.162		13.679		-		13.679			

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Allot	NAVSEA HQ:Washington, DC	0.400	0.100	Sep 2011	0.100	Sep 2012	-		0.100	Continuing	Continuing	Continuing
DAWDF	Various	Not Specified:Not Specified	0.145	-		-		-		-	0.000	0.145	
		Subtotal	0.545	0.100		0.100		-		0.100			

	Total Prior Years Cost	FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	88.428	17.262		13.779		-		13.779			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603563N: *Ship Concept Advanced Design*	PROJECT 3161: *NAVSEA Tech Authority*

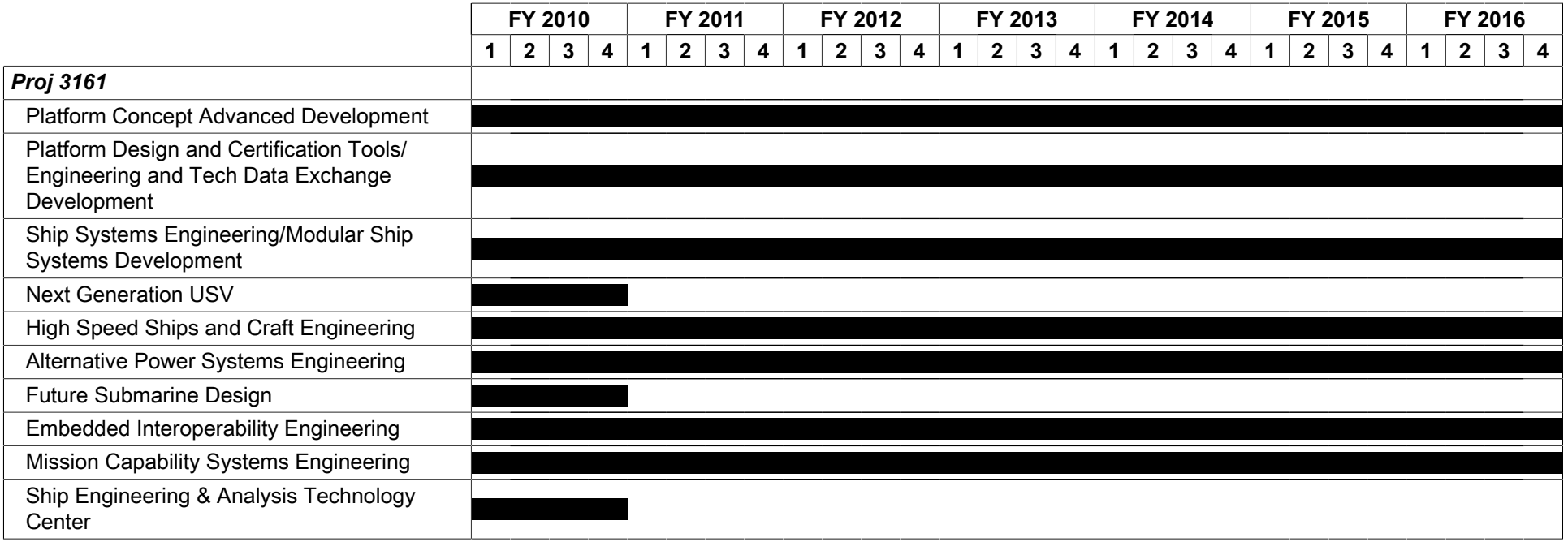

Exhibit R-4A, RDT&E Schedule Details: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603563N: *Ship Concept Advanced Design*	**PROJECT** 3161: *NAVSEA Tech Authority*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3161				
Platform Concept Advanced Development	1	2010	4	2016
Platform Design and Certification Tools/Engineering and Tech Data Exchange Development	1	2010	4	2016
Ship Systems Engineering/Modular Ship Systems Development	1	2010	4	2016
Next Generation USV	1	2010	4	2010
High Speed Ships and Craft Engineering	1	2010	4	2016
Alternative Power Systems Engineering	1	2010	4	2016
Future Submarine Design	1	2010	4	2010
Embedded Interoperability Engineering	1	2010	4	2016
Mission Capability Systems Engineering	1	2010	4	2016
Ship Engineering & Analysis Technology Center	1	2010	4	2010