CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		R-1 ITEM NOMENCLATURE **0603563N/SHIP CONCEPT ADVANCED DESIGN**

COST (In Millions)	FY 2008	FY 2009	FY 2010
Total PE Cost	39.652	30.970	22.541
2196 / NACT	1.322	1.374	0.681
3161 / NAVSEA Tech Authority	29.436	29.596	21.860
9999 / CONGRESSIONAL ADDS	8.894	0.000	0.000

A. MISSION DESCRIPTION:

Explore alternative surface ship force structures, advanced surface ship & 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, SCN and R&D planning. The objective is a more affordable, mission capable surface ship force including ships with reduced manning, increased producibility, 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 SCN plan.

(U) 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 are also funded in this project.

(U) Project 3161 - This project funds a broad assortment of 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 and craft, ship engineering and analysis technology center, 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.

(U) Project 9999: See project description on the R2a.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	R-1 ITEM NOMENCLATURE **0603563N/SHIP CONCEPT ADVANCED DESIGN**	

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	39.341	31.111	30.154
FY10 President's Budget	39.652	30.970	22.541
Total Adjustments	0.311	-0.141	-7.613
(U) Summary of Adjustments			
Congressional Rescissions	0.000	0.000	0.000
Congressional Adjustments	0	-0.084	0.000
SBIR/STTR/FTT Assessment	-0.547	0.000	0.000
Program Adjustments	0.858	-0.008	-7.364
Rate/Misc Adjustments	0.000	-0.049	-0.249
Total	0.311	-0.141	-7.613

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**		PROJECT NUMBER AND NAME **2196/NACT**

COST (In Millions)	FY 2008	FY 2009	FY 2010
Project Cost	1.322	1.374	0.681
RDT&E Articles Qty	0	0	0

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This project develops and explores alternative surface ship force structures, advanced surface ship & 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 SCN and R&D planning. The objective is a more affordable, mission capable surface ship force including ships with reduced manning, increased producibility, 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 SCN 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 warfighting/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.

(U) Efforts under Project 2196 transition directly to early stage ship design in PE 0603564N, Ship Preliminary Design and Feasibility Studies, and similar Program Executive Office (PEO) ship design programs. While these efforts support concept exploration and mission needs assessment for potential future ship acquisition programs, they 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.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**	PROJECT NUMBER AND NAME **2196/NACT**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Ship Concepts and Mission Need Analysis	0.630	0.641	0.486
RDT&E Articles Quantity	0	0	0

U) Ship Concepts and Mission Need Analysis: Develop ship concepts and perform analysis for potential ships and Force Architecture 5-10 years out in SCN plan.
FY08: LSD (X) concept studies; Directed Energy Impacts-Phase 2; Barely Manned Patrol Craft Design; Gap analysis for Expeditionary Strike Force; Competition for New Risk Area Projects.
FY09: Concept designs for Navy Expeditionary Combat Command/Expeditionary Security Force (NECC/ESF) Gap Analysis; Competition for New Risk Area Projects.
FY10: Concept designs for Surface Combatant Anti Submarine Warfare (ASW), Anti Surface Warfare (ASuW) and Maritime Presence Gap Analyses; Competition for New Risk Area Projects.

	FY 2008	FY 2009	FY 2010
Total Ship Technology Assessment	0.058	0.245	0.101
RDT&E Articles Quantity	0	0	0

(U) Total Ship Technology Assessment: Analyze the benefits and impacts of new ship and hull, mechanical & electrical (HM&E) concepts, technologies and warfare systems.
FY08: Support LSD Replacement Analysis of Alternatives (AOA) effort with technology identification using Technology Knowledge Management Systems (TKMS); Competition for New Risk Area Projects.
FY09: Support LSD Replacement Design Team with technical assessment, selection, and monitoring using TKMS; Analyze TKMS needs of T Auxiliary Oiler (TAO) Replacement; Competition for New Risk Area Projects.
FY10: Expand Total Ship Technology Assessment to Auxiliary Tug Fleet Salvage Ship (ATFSS) Design Team with technical assessment, selection, and monitoring using TKMS; Analyze TKMS needs of TAO and LSD Replacement; document technology assessment & insertion instances from ongoing acquisition.

	FY 2008	FY 2009	FY 2010
Ship Concept Design and Engineering Tools, Methods, and Criteria	0.374	0.313	0.044
RDT&E Articles Quantity	0	0	0

U) Ship Concept Design and Engineering Tools, Methods, and Criteria: Improve capability for rapid and accurate ship performance/cost/risk assessments and tradeoff studies.
FY08: ASSET Expanded Capability; Leading Edge Architecture for Prototyping Systems (LEAPS) Composites Analysis (II); LEAPS Distribution System Modeling; LEAPS Applications (Apps)- for Small Craft (II); Competition for New Risk Area Projects.
FY09: Advanced Ship Synthesis Evaluation Tool (ASSET) Expanded Capability; LEAPS Distribution System Modeling (II);LEAPS Apps for Small Craft (III); Competition for New Risk Area Projects.
FY10: Integration and testing of ASSET and LEAPS tools as applied to ongoing and emerging ship concepts. Including synthesis of new hullforms & technologies, emerging combat system concepts, inclusion of concept-level cost analysis.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**	PROJECT NUMBER AND NAME **2196/NACT**	

	FY 2008	FY 2009	FY 2010
Mission Systems Interface Development and Demonstration	0.260	0.175	0.050
RDT&E Articles Quantity	0	0	0

((U) Mission Systems Interface Development and Demonstration: Requirements development to counter asymmetric, peer and littoral enemies with tailored, modularized mission systems.

FY08: Over the Horizon (OTH) - Unmanned Vehicle test and evaluation; Small combatant/craft stabilized weapon system concept development and ship impact analysis.

FY09: Expeditionary Strike Force modular mission package definition; small combatant in-theater rearming concept development.

FY10: Open-ocean ASW technology insertion analysis.

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name of Related RDT&E	FY 2008	FY 2009	FY 2010	Total Cost
(U) PE 0603512N (Carrier Systems Development)	85.742	147.205	173.594	406.541
(U) PE 0603513N (Shipboard Systems Component Development)	42.565	26.824	1.691	71.080
(U) PE 0603564N Ship Preliminary Design/Feasibility Studies	25.611	24.781	28.135	78.527
(U) PE 0604300N (SC21 Total Ship Systems Engineering)	622.812	596.109	0	1218.921
(U) PE 0604567N (Ship Contract Design/Live Fire T&E)	61.528	80.869	89.988	232.385
(U) PE 0603582N (Combat Sys Integ/Strike Force Interoperab.	52.316	64.172	22.558	139.046

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. MAJOR PERFORMERS:

Field Activities & Locations - Work Performed:

NSWC Carderock, Bethesda, MD - Future ship open architectures, advanced ship concepts, ship & ship system technology assessments, design & engineering tool upgrades

NSWC Dahlgren, Dahlgren, VA - Future force architectures, mission effectiveness analyses, analytical tool development

Contractors & Locations - Work Performed

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**		PROJECT NUMBER AND NAME **3161/NAVSEA Tech Authority**

COST (In Millions)	FY 2008	FY 2009	FY 2010
Project Cost	29.436	29.596	21.860
RDT&E Articles Qty	0	0	0

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

(U) 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 NAVSEA business lines through reuse, adaptation and extension of processes, procedures, and tools necessary to develop and explore alternative surface ship and submarine force structures; advanced submarine concepts, surface ship & unmanned surface vehicle concepts; interoperability; and development of systems level engineering criteria 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 producibility, reduced operating and support costs, and greater utilization of the latest technology.

(U) Efforts under Project 3161 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.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**	PROJECT NUMBER AND NAME **3161/NAVSEA Tech Authority**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Ship Concept Advanced Development	2.555	2.504	1.900
RDT&E Articles Quantity	0	0	0

(U) Ship Concept Advanced Development: Directly supports the Navy's ability to understand risk and ROM cost of surface warfare assets; Pre-Milestone A ship and craft design and analysis. (CPSD 1)

FY08: Friction Stir Welding of Al for Naval Applications; Future Expeditionary Warfare Concept Study; Unmanned Carrier Air Vehicles (UCAV) Ship Support Study; High Speed Open Ocean Phase 2; Competition for New Risk Area Projects

FY09: Friction Stir Welding of Al for Naval Applications phase 2; Future Expeditionary Warfare Concept Designs; UCAV Ship Support Study Phase 2; Competition for New Risk Area Projects.

FY10: Complete Future Expeditionary Warfare Concept Study; Develop future surface combatant concept options incorporating emerging combat system, propulsor/propulsion, powering, and modular architectures; develop future auxiliary concepts including replenishment and fleet support; develop green/brown water support and presence concepts in context of maritime strategy; examine common cross-platform architectures, interfaces, and modular approaches to leverage common mission capability and achieve producibility efficiencies; develop High Speed Open Ocean concepts leveraging results of ongoing technology development; Competition for New Risk Area Projects

	FY 2008	FY 2009	FY 2010
Ship Design and Certification Tools and Technical Data Exchange	2.757	2.728	2.066
RDT&E Articles Quantity	0	0	0

(U) Ship Design and Certification Tools and Technical Data Exchange: Evaluation tools to certify the safety and mission capability of ships and submarines. Integrated strategy for NAVSEA suite used to support of ship certs. (CPSD 2)

FY08: Extend tools and ship model integration (M&S) supporting Fleet Incident Situational Response program. Extend and integrate modeling & simulation tools supporting Live Fire Test & Evaluation (LFT&E). Competition for New Risk Area Projects.

FY09: Extend and integrate analytical tools supporting high performance naval ship technologies. Demo tech data exchange between LFT&E M&S environment and shipbuilder CAD environments; Extend M&S integrated environmental to additional engineering disciplines. Competition for New Risk Area Projects.

FY10: 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; begin certification process. 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.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**	PROJECT NUMBER AND NAME **3161/NAVSEA Tech Authority**	

	FY 2008	FY 2009	FY 2010
Advanced Ship Systems Development	2.659	2.677	1.989
RDT&E Articles Quantity	0	0	0

(U) Advanced Ship Systems Development: Develop and validate advanced tools and processes to reduce technical risk to naval platform acquisition programs in support of naval Technical Authority (CPSD 3).

FY08: Continue development and validation of Full Ship Finite Element Modeling Baseline; Expand development of Acoustic Spectrum Management Tools for Surface Ships capabilities and resolution; Initiate platform ballasting and deballasting design tool studies. Initiate Open Systems Architecture Baseline Combat System Studies for transition into new acquisition platforms and in-service ship upgrades.

FY09: Validate Future Fleet Engineering Systems and Service Life Studies; Continue development and validation of Full Ship Finite Element Modeling Baseline and expand resolution for damage control assessment; Continue platform ballasting and deballasting design tool studies; Validate ship system commercial design tools for advanced material handling and machining.

FY10: Expand Full Ship Finite Element Modeling Baseline and expand resolution into survivability, vulnerability and recoverability analyses. Incorporate integrated topside design tool set and methodologies. Expand Cost Analysis modeling & simulation via improved cost estimating relationships that include concepts of equipment density and fabrication complexity. Articulate developing combat system architectures in terms of ship system impacts and cost. Include emerging power and propulsion system architectures into Modeling Baseline.

	FY 2008	FY 2009	FY 2010
Next Generation USV	1.791	1.779	1.325
RDT&E Articles Quantity	0	0	0

(U) Next Generation USV: Development and demonstration of Unmanned Surface Vehicle (USVs) with focus on autonomous behavior, modularity, new ship classes for pre Alternative of Analysis (AoA) studies. (CPSD 4)

FY08: Rapidly Deployable MUTE USV Prototype; Payload Power Support Prototype; Long Range Endurance design; Autonomous Health Monitoring and Recovery design; Competition for New Projects.

FY09: Long Range Endurance prototype; Autonomous Health Monitoring and Recovery prototype; Competition for New Risk Area Projects.

FY10: Conduct operational assessment of Long Range Endurance prototype and Autonomous Health Monitoring and Recovery prototype; continue development of USV interoperability concepts and architectures; development of open architecture & modular system and technical architectures for USV operations aboard manned and unmanned surface combatants; Competition for New Risk Area Projects.

	FY 2008	FY 2009	FY 2010
High Speed Ships and Craft	3.200	3.226	2.405
RDT&E Articles Quantity	0	0	0

(U) High Speed Ships and Craft: Investigate concepts for future high speed ships and craft that promise improved mission effectiveness in mobility, survivability, and warfare mission areas. (CPSD 5)

FY08: High Speed Advanced Actuators design and prototype construction; Plant architecture systems engineering process integration into Naval Vessel Rules (NVR); Competition for New Risk Area Projects

FY09: Drag Reduction Transition to fleet demonstrator; AWJ-21 design tool validation and NVR integration; Competition for New Risk Area Projects.

FY10: High Speed Ships tools, guidelines, validation data sets and training: High speed human systems (trials, testing, numeric modeling, guidelines for early stage design). Light weight "Structures cooperative research with NATO partners. Light Weight Structures Shock (Helsinki Class) Shock Trial.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**	PROJECT NUMBER AND NAME **3161/NAVSEA Tech Authority**	

	FY 2008	FY 2009	FY 2010
Alternative Power Systems	3.001	3.027	2.252
RDT&E Articles Quantity	0	0	0

(U) Alternative Power Systems: Investigate concepts for ships and craft with alternative power/propulsion systems evaluating effectiveness in mobility, survivability, and warfare mission areas. (CPSD 6)

FY08: Fuel Cell At Sea Demonstration design; Rim Driven Ducted Propulsor design; Competition for New Risk Area Projects

FY09: Fuel Cell At Sea Demonstration prototype construction; Rim Driven Ducted Propulsor prototype construction; Competition for New Risk Area Projects.

FY10: Alternate propulsion tools, guidelines, validation 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 2008	FY 2009	FY 2010
Ship Engineering & Analysis Technology Center	1.231	1.207	0.898
RDT&E Articles Quantity	0	0	0

(U) Ship Engineering & Analysis Technology Center (formerly Hydrodynamic/Hydroacoustic Technology Center (H/HTC)): Provides Government activities, shipbuilders, academia and contractors the following:

FY08-FY09: high performance computing systems; commercial and research software libraries; classified and unclassified connectivity; high end data visualization; and collaboration tools/Centralized data repository. Provide the framework of continued world class computing upon which specific task funding will build. (project 2196 in FY06) (CPSD 7)

FY10: Expand 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.

	FY 2008	FY 2009	FY 2010
Future Submarine Design	3.904	3.921	2.944
RDT&E Articles Quantity	0	0	0

(U) Future Submarine Design: Develop ship concept studies and evaluate technologies to define the Next Generation Submarine, common SSN-SSBN Hull and Payload Modularity. (CPSD 8)

FY08: Navy After Next Tech Validations; Technical Warrant Holder Concept Validation Support; SUBCODE Concept Design Tool Dev - phase 3; Submarine Design Processes and Standards Development

FY09: Navy After Next Tech Validations; Technical Warrant Holder Concept Validation Support; SUBCODE Concept Design Tool Dev - phase 4; Submarine Design Processes and Standards Development.

FY10: Navy After Next Tech Validations; Technical Warrant Holder Concept Validation Support; SUBCODE Concept Design Tool Dev - integration and testing phase; Submarine Design Processes and Standards Development; next generation submarine concept exploration; modular payload and interface concept development.

	FY 2008	FY 2009	FY 2010
Embedded Interoperability (I/O) Engineering	4.078	4.160	3.081
RDT&E Articles Quantity	0	0	0

(U) Embedded Interoperability (I/O) Engineering: 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 warfighting capability. Focus on emerging Open Architecture warfare systems. (CPSD 9)

FY08: Develop Tactics, Techniques & Procedures (TTP) for LPD 18; pre-certification for the interoperability test and assessment of CVN 77, CVN 73,LHD 7, DDG Modernization and DDG 1000. Enhance BFIMS capabilities.

FY09: Develop TTP for CVN 77 and DDG Modernization based on FY 08 work; pre-certification for the interoperability test and assessment of LCS 1 & 2, CG Modernization, DDG 1000 and CVN 21 (CVN 78). Develop TTP for LCS 1 & 2 based on FY 09 work.

FY10: Complete development of TTP for CVN 77 and DDG Modernization; continue pre-certification for the interoperability test and assessment of LCS, CG Modernization, DDG 1000 and CVN 21 (CVN 78); complete interoperability efforts LPD 17 (class); complete TTP for LCS 1 & 2; continue interoperability planning for CG(X).

	FY 2008	FY 2009	FY 2010
Mission Capability Systems Engineering	4.260	4.367	3.000
RDT&E Articles Quantity	0	0	0

(U) Mission Capability Systems Engineering: Develop force level systems engineering criteria and guidance at the Systems of Systems (SoS) and Family of Systems (FoS) level. (CPSD 10)

FY08 and beyond: 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.

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name	FY 2008	FY 2009	FY 2010	Total Cost
(U) Related RDT&E				
(U) PE 0603512N (Carrier Systems Development)	85.742	147.205	173.594	406.541
(U) PE 0603513N (Shipboard Systems Component Development)	42.565	26.824	1.691	71.080
(U) PE 0603564N Ship Preliminary Design/Feasibility Studies	25.611	24.781	28.135	78.527
(U) PE 0604300N (SC21 Total Ship Systems Engineering)	622.812	596.109	0	1,218.921
(U) PE 0604567N (Ship Contract Design/Live Fire T&E)	61.528	80.869	89.988	232.385

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**	PROJECT NUMBER AND NAME **3161/NAVSEA Tech Authority**

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. MAJOR PERFORMERS:

Field Activities & Locations - Work Performed:

NSWC Carderock, Bethesda, MD - Future ship open architectures, advanced ship concepts, ship & ship system technology assessments, design & engineering tool upgrades

NSWC Dahlgren, Dahlgren, VA - Future force architectures, mission effectiveness analyses, analytical tool development

SPAWAR, San Diego, CA - C4ISR systems concept development & integration

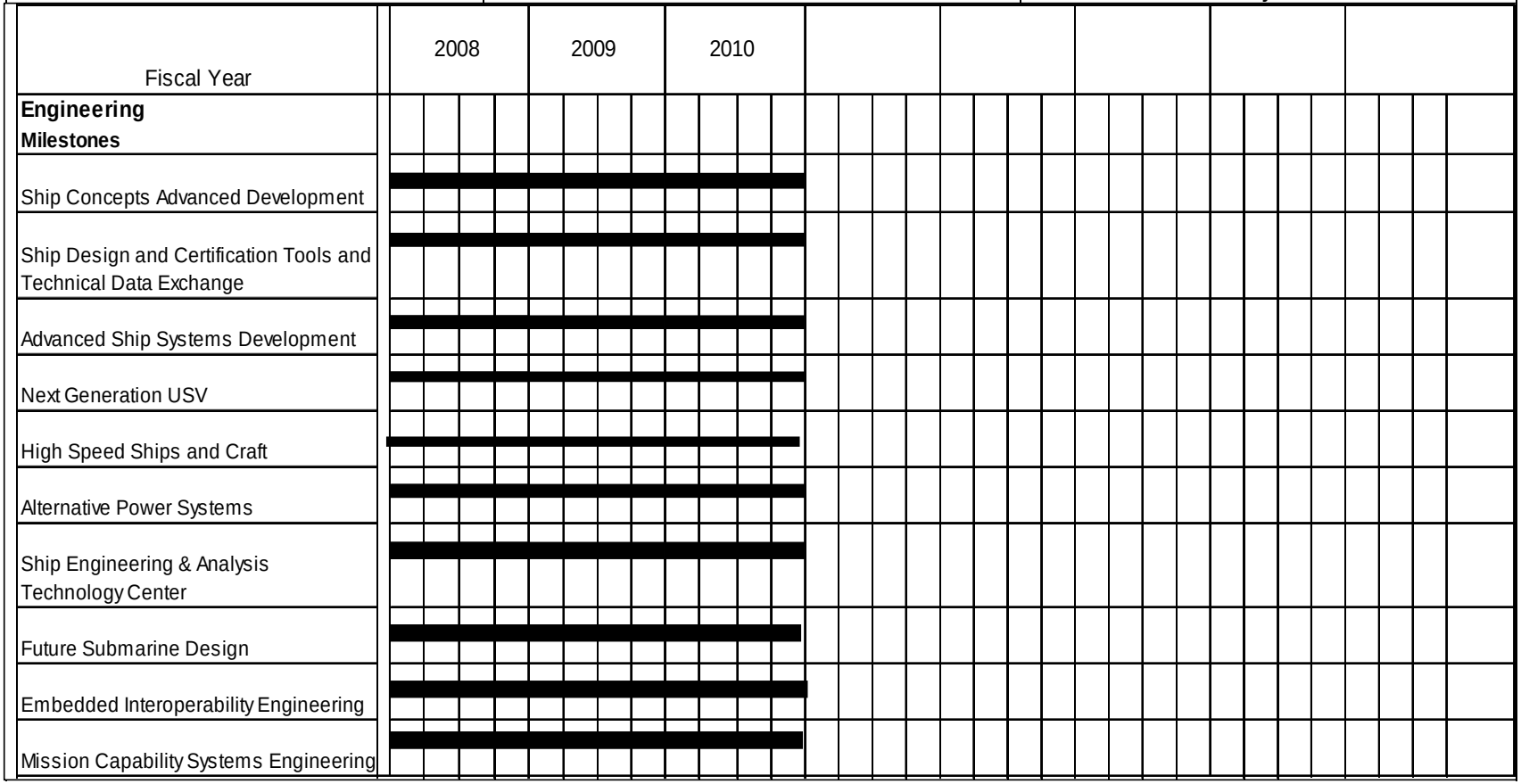
Contractors & Locations - Work Performed

TBD - Systems engineering analyses, trade studies, ship concept design, cost impact analysis

TBD - Software, tools development

CLASSIFICATION:	UNCLASSIFIED								
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS							DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**			PROJECT NUMBER AND NAME **3161/NAVSEA Tech Authority**				
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	Total Cost ($000)	Target Value of Contract
Systems Engineering	various	Various Contractors	5.275	2.513	Jan/Feb-09	1.864	Dec-09	9.652	0.000
Systems Engineering	WR	NSWC, NUWC, CDSA	13.265	11.094	Jan-09	8.097	Dec-09	32.456	0.000
Engineering Development	WR	NSWC, NUWC	12.969	11.463	Jan-09	8.441	Dec-09	32.873	0.000
Demonstration & Evaluation	WR	NSWC	5.683	4.324	Jan-09	2.664	Dec-09	12.671	0.000
	WR	SPAWAR	1.600	0.102	Mar-09	0.694	Dec-09	2.396	0.000
Subtotal Product Development			**38.792**	**29.496**		**21.760**		**90.048**	**0.000**
Remarks:									
Subtotal Support Costs			**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**
Remarks:									
Travel			0.200	0.100		0.100		0.400	0.000
Subtotal Management Services			**0.200**	**0.100**		**0.100**		**0.400**	**0.000**
Remarks:									
Total Cost			**38.992**	**29.596**		**21.860**		**90.448**	**0.000**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**	PROJECT NUMBER AND NAME **3161/NAVSEA Tech Authority**



CLASSIFICATION:	UNCLASSIFIED			
EXHIBIT R-4a, SCHEDULE DETAIL				DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**			PROJECT NUMBER AND NAME **3161/NAVSEA Tech Authority**

Schedule Profile	FY 2008	FY 2009	FY 2010
Cross Platform Systems Development	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4
Ship Concepts Advanced Development	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4
Ship Design and Certification Tools and Technical Data Exchange	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4
Advanced Ship Systems Development	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4
Next Generation USV	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4
High Speed Ships and Craft	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4
Alternative Power Systems	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4
Ship Engineering & Analysis Technology Center	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4
Future Submarine Design	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4
Embedded Interoperability Engineering	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4
Mission Capability Systems Engineering	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**	PROJECT NUMBER AND NAME **9999/CONGRESSIONAL ADDS**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
9816A/Autonomous Maritime Navigation Program	4.639	0.000	0.000
RDT&E Articles Quantity	0	0	0

U) Autonomous Maritime Navigation Program - AMN involves development of sensor fusion processing; development of automated data interpretation processing; development of intelligent autonomy and control , integration of these components into a fully autonomous dynamic navigation planning and operations capability, and integration into Navy test craft for system maturing and testing. System by design will be portable to other military platforms, both unmanned and manned, to enable very high levels of autonomous operations to reduce manpower requirements and improve both war fighter safety and conditions.

	FY 2008	FY 2009	FY 2010
9992A/Scout Radar Stealth Upgrades for Special Warfare Crafts	0.968	0.000	0.000
RDT&E Articles Quantity	0	0	0

(U) Scout Radar Stealth Upgrades for Special Warfare Crafts - To further refine the initial process of converting a Low Probability of Intercept (LPI) Radar with a six foot scanner to a LPI Radar with a smaller scanner capable of being used on Combatant Craft (small boats).

	FY 2008	FY 2009	FY 2010
9B81A/Advanced Video Processing Technologies (AVPT)	0.964	0.000	0.000
RDT&E Articles Quantity	0	0	0

(U) This congressional add will fund the research, development and evaluation of advanced video sensor and processing technologies that can mitigate the bandwidth required to efficiently transfer video imagery off the ship to subject matter experts ashore. This technology will provide the capability to transfer bandwidth intensive video information via existing ship to shore communications networks which currently have limited bandwidth.

	FY 2008	FY 2009	FY 2010
98B2A/Low-Signature Modular Weapon Platform	2.323	0.000	0.000
RDT&E Articles Quantity	0	0	0

(U) This effort will support the seal delivery vehicle (SDV) as technology demonstrators to explore enhanced sea keeping performance, payload modularity, integrated command and control, advanced construction techniques, reliability and maintainability. This task will conduct a craft survey and report of the Sealion I vessel and extend the length of Sealion I to mirror Sealion II.