CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION						DATE February 2008	
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**			R-1 ITEM NOMENCLATURE **0603563N/SHIP CONCEPT ADVANCED DESIGN**				
COST (In Millions)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total PE Cost	21.154	39.341	31.111	30.154	29.573	30.136	30.704
2196 / "Design, Tools, Plans and Concepts"	1.806	1.336	1.380	1.414	1.396	1.424	1.448
3161 / NAVSEA Tech Authority	9.556	28.864	29.731	28.740	28.177	28.712	29.256
9999 / CONGRESSIONAL ADDS	9.792	9.141	0.000	0.000	0.000	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 February 2008
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	R-1 ITEM NOMENCLATURE **0603563N/SHIP CONCEPT ADVANCED DESIGN**	

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2007	FY 2008	FY 2009
FY 2008 President's Budget	21.689	30.858	31.134
FY 2009 President's Budget	21.154	39.341	31.111
Total Adjustments	- 0.535	8.483	-0.023
Summary of Adjustments			
SBIR	-0.520		0.002
Navy Working Capital Fund Rate			-0.025
Cancelled Accounts	- 0.015		
Congressional Add		9.200	
Contractor Efficiencies		-0.065	
Revised Economic Assumptions		-0.190	
Executive Realignment		-0.462	
Total Adjustments	-0.535	8.483	-0.023

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE February 2008		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**				PROJECT NUMBER AND NAME **2196/"Design, Tools, Plans and Concepts"**		
COST (In Millions)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Project Cost	1.806	1.336	1.380	1.414	1.396	1.424	1.448
RDT&E Articles Qty	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 & 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 February 2008
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**	PROJECT NUMBER AND NAME **2196/"Design, Tools, Plans and Concepts"**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2007	FY 2008	FY 2009
Accomplishments/Effort/Subtotal Cost	0.693	0.537	0.647
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.

FY07: Directed Energy Weapon Impacts; Barely Manned Patrol Craft Study; Small Combatant Study-Pase 2; Force Architecture Studies to support NECC; ASW-LCS Studies; T3-LCS concept

FY08: LSD (X) concept studies; Driected 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 NECC/ESF Gap Analysis; Competition for New Risk Area Projects

	FY 2007	FY 2008	FY 2009
Accomplishments/Effort/Subtotal Cost	0.311	0.250	0.245
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.

FY07: Advanced Model TKMS for operational use (PEO LMW and PEO Ships focus); TKMS Capability Extensions based on Operational Feedback and emergent Customer Requirements

FY08: Support LSD Replacement AOA effort with technology identification using TKMS; Competition for New Risk Area Projects

FY09: Support LSD Replacement Design Team with tech. assessment, selection, and monitoring using TKMS; Analyze TKMS needs of TAO Replacement; Competition for New Risk Area Projects

	FY 2007	FY 2008	FY 2009
Accomplishments/Effort/Subtotal Cost	0.516	0.374	0.313
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.

FY07: ASSET Expanded Capability; COGENT UTE/TIES (II); LEAPS Composites Analysis; LEAPS Apps for Small Craft; Competition for New Risk Area Projects

FY08: ASSET Expanded Capability; LEAPS Composites Analysis (II); LEAPS Distribution System Modeling; LEAPS Apps for Small Craft (II); Competition for New Risk Area Projects

FY09: ASSET Expanded Capability; LEAPS Distribution System Modeling (II);LEAPS Apps for Small Craft (III); Competition for New Risk Area Projects

	FY 2007	FY 2008	FY 2009
Accomplishments/Effort/Subtotal Cost	0.286	0.175	0.175
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.

FY07: VTOL AEW requirements analysis and JCTD planning; OTH prototype test and evaluation; Modularized weapon system interface definition and documentation

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE February 2008
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDTEN/BA 4	**0603563N/SHIP CONCEPT ADVANCED DESIGN**	**2196/"Design, Tools, Plans and Concepts"**	

FY08: 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

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	To Complete	Total Cost
(U) Related RDT&E									
(U) PE 0603512N (Carrier Systems Development)	156.248	84.806	72.683	61.070	44.864	44.477	46.373		
Development)	49.993	9.450	9.561	9.606	9.622	9.791	9.967		
Studies	25.766	18.736	10.642	25.794	12.696	3.639	0.638		
(U) PE 0604300N (SC21 Total Ship Systems Engineering)	820.065	621.544	658.223	880.899	1,004.274	839.915	702.464		
(U) PE 0604567N (Ship Contract Design/Live Fire T&E)	51.729	62.404	73.698	69.270	101.536	91.287	90.106		
Interoperab.	64.088	53.427	53.435	39.139	38.621	38.120	37.621		

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

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

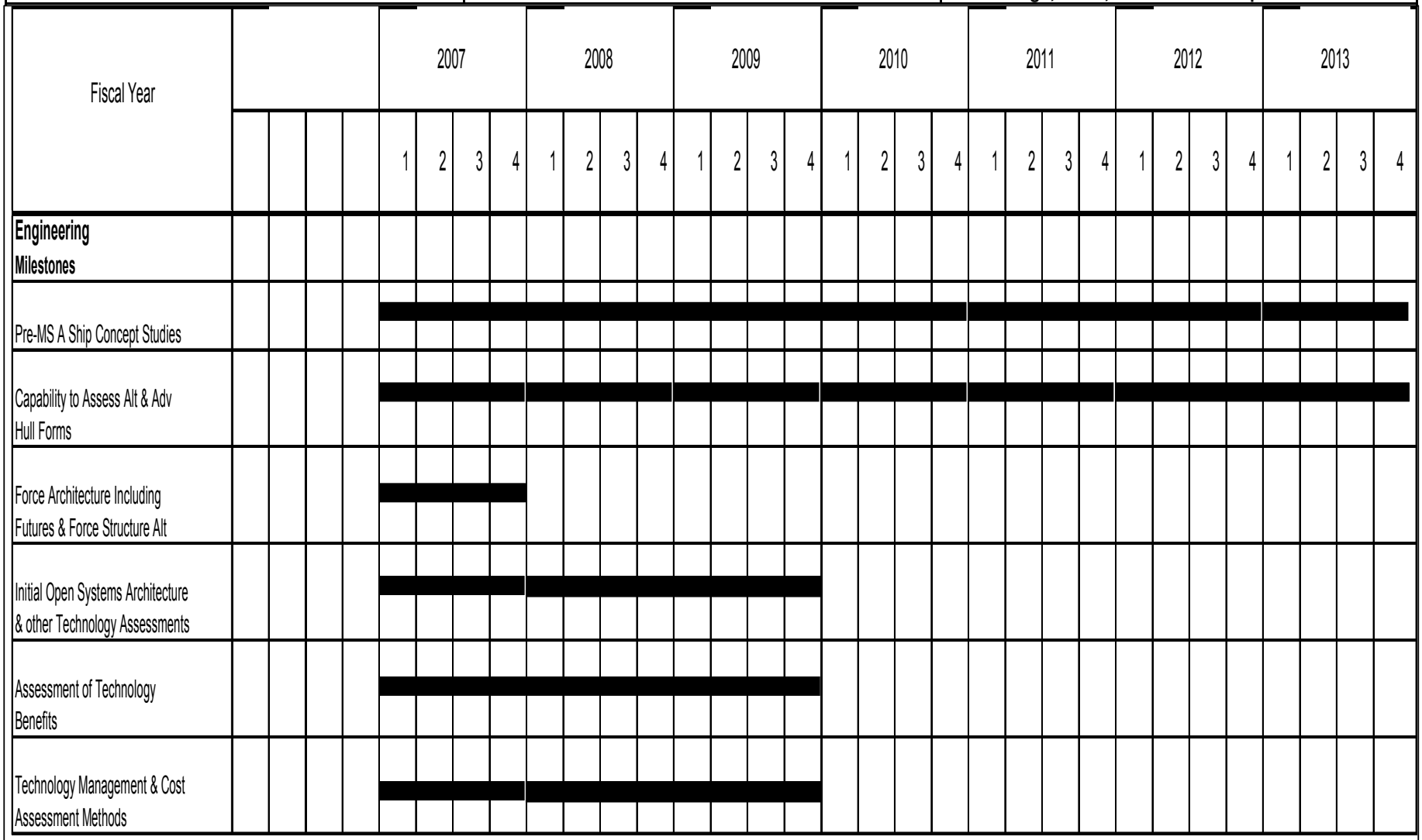
Contractors & Locations - Work Performed

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 February 2008		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**					PROJECT NUMBER AND NAME **2196/"Design, Tools, Plans and Concepts"**					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost ($000)	FY 2007 Cost ($000)	FY 2007 Award Date	FY 2008 Cost ($000)	FY 2008 Award Date	FY 2009 Cost ($000)	FY 2009 Award Date	Cost to Complete ($000)	Total Cost ($000)	Target Value of Contract
Systems Enginerring	various	Other Various Contractors	61.172	0.324	TBD	0.271	TBD	0.273	TBD	CONT	CONT	0.000
Engineering Development	WX & RX	NAVSEA, Dahlgren Div,	6.712	0.652	TBD	0.275	TBD	0.275	TBD	CONT	CONT	0.000
	WX & RX	NSWC PHDNAVSEA, Carderock Div,	1.788	0.000		0.000		0.000			1.788	0.000
Demonstration & Evaluation	WX & RX	NAVSEA, Carderock Div,	39.210	0.710	TBD	0.720	TBD	0.762	TBD	CONT	CONT	0.000
	WX & RX	SPAWAR	0.150	0.100	TBD	0.050	TBD	0.050	TBD	CONT	CONT	0.000
Tooling	WX\RXPD	SPAWAR	10.391	0.000		0.000		0.000		0.000	10.391	0.000
Subtotal Product Development			**119.423**	**1.786**		**1.316**		**1.360**		**CONT**	**CONT**	**0.000**
Remarks:												
Subtotal Support Costs			**0.000**	**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**	**0.000**
Remarks:												
Travel			0.030	0.020		0.020		0.020		CONT	CONT	0.000
Subtotal Management Services			**0.030**	**0.020**		**0.020**		**0.020**		**CONT**	**CONT**	**0.000**
Remarks:												
Total Cost			**119.453**	**1.806**		**1.336**		**1.380**		**CONT**	**CONT**	**0.000**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE February 2008
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**	PROJECT NUMBER AND NAME **2196/"Design, Tools, Plans and Concepts"**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE February 2008		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**			PROJECT NUMBER AND NAME **2196/"Design, Tools, Plans and Concepts"**			
Schedule Profile	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Pre-MS A Ship Concept Studies	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4
Capability to Assess Alt & Adv Hull Forms	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4
Force Architecture Including Futures & Force Structure Alt	Q1 Q2 Q3 Q4						
Initial Open Systems Architecture & Other Technology Assessments	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4				
Assessment of Technology Benefits	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4				
Technology Management & Cost Assessment Methods	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4				
CPSD projects (10), transition to 3161 in FY07							

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE February 2008		
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 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Project Cost	9.556	28.864	29.731	28.740	28.177	28.712	29.256
RDT&E Articles Qty	0	0	0	0	0	0	0

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

A. (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 February 2008
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 2007	FY 2008	FY 2009
Accomplishments/Effort/Subtotal Cost	0.584	2.479	2.554
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)

FY07: Deployable/Recoverable OTH Comm Relays Prototype Development/Transition; High Speed Open Ocean Combatant Structural Design Criteria; Competition for New Risk Area Projects

FY08: Friction Stir Welding of Al for Naval Applications; Future Expeditionary Warfare Concept Study; 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.

	FY 2007	FY 2008	FY 2009
Accomplishments/Effort/Subtotal Cost	1.547	2.695	2.778
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)

FY07: NEMO-LEAPS Integrator phase 4; Fleet Incident Situational Response program; LEAPS Modeling and Simulation Translator phase 2.

FY08: Extend tools and ship model integration supporting Fleet Incident Situational Response program. Extend and integrate modeling & simulation tools supporting 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.

	FY 2007	FY 2008	FY 2009
Accomplishments/Effort/Subtotal Cost	1.509	2.597	2.677
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).

FY07: Conduct Future Fleet Engineering Systems and Service Life Studies; Initiate development of Full Ship Finite Element Modeling Baseline for Future Ships; Initiate development of Acoustic Spectrum Management Tools for Surface Ships.

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 platfoms 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.

	FY 2007	FY 2008	FY 2009
Accomplishments/Effort/Subtotal Cost	0.757	1.729	1.779
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 AoA studies. (CPSD 4)

FY07: Automated Launch and Retrieval System Prototype; Autonomous Path Selection and Collision Avoidance Prototype; Rapidly Deployable MUTE USV Design; Payload Pwr Support Concept Design

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.

	FY 2007	FY 2008	FY 2009
Accomplishments/Effort/Subtotal Cost	1.288	3.138	3.226
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)

FY07: High Speed Propulsion Plant Architecture-phase 2; Ship Synthesis Modeling-phase 2; Propulsion Systems Engineering; Competition for New Risk Area Projects

FY08: High Speed Advanced Actuators design and prototype construction; Plant architecture systems engineering process integration into 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

	FY 2007	FY 2008	FY 2009
Accomplishments/Effort/Subtotal Cost	0.715	2.939	3.027
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)

FY07: Propulsion Plant Architecture Study-phase 2; Nuclear Frigate Preliminary Design; Fuel Cell Concept SYSENG and validation with LDTS Data; Competition for New Risk Area Projects

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

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE February 2008
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**	PROJECT NUMBER AND NAME **3161/NAVSEA Tech Authority**	

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

	FY 2007	FY 2008	FY 2009
Accomplishments/Effort/Subtotal Cost	0.000	1.173	1.207
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 (FY07-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)

	FY 2007	FY 2008	FY 2009
Accomplishments/Effort/Subtotal Cost	0.715	3.842	3.956
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)

FY07: Navy After Next Tech Validations; SUBCODE Concept Design Tool Dev - phase 2; Technical Warrant Holder Concept Validation Support; Submarine Design Processes and Standards Development

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

	FY 2007	FY 2008	FY 2009
Accomplishments/Effort/Subtotal Cost	1.258	4.036	4.160
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 failuresdegrade the ultimately fieldedwarfighting capability. Focus on emerging Open Architecture warefare systems. (CPSD 9)

FY07: Develop tactics, techniques and procedures (TTP) for CVN 69, 74, and 76based on FY06 work; Interoperability test and assessment planning for LCS-1,LPD 18.Develop BFIMS.

FY08: Develop TTP for LPD 18; Pre-certification for the interoperability test and assessment of CVN 77, CVN 73,LHD 7, DDG Modernization and DDG 1000. EnhanceBFIMS 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.

	FY 2007	FY 2008	FY 2009

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE February 2008
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**	PROJECT NUMBER AND NAME **3161/NAVSEA Tech Authority**	
Accomplishments/Effort/Subtotal Cost	1.183	4.236	4.367
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)

FY07: Continue to refine the Warfare Systems Engineering Process; update concepts to Mission Capability Based Requirements; review Warfare System Integrated Architectures for interoperability; evaluate the development of Warfare Systems Integrated Architectures and ensure alignment to FORCEnet Architecture; evaluate systems engineering principles to Sea Trial Experiments aligned with mission capability gaps. Develop transition documentation for experiments achieving positive military utility assessments; analyze and develop ground level Key Performance Parameters for use across all AT/FP programs.

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 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	To Complete	Total Cost
(U) Related RDT&E									
(U) PE 0603512N (Carrier Systems Development)	153.894	88.064	71.937	60.369	44.339	44.097	46.127		
Development)	14.135	9.424	9.456	9.493	9.517	9.719	9.926		
Studies	21.314	18.627	10.560	25.588	12.609	3.622	0.636		
(U) PE 0604300N (SC21 Total Ship Systems Engineering)	817.528	617.923	652.858	873.516	997.010	835.763	700.520		
(U) PE 0604567N (Ship Contract Design/Live Fire T&E)	72.055	62.114	73.073	68.650	100.768	90.811	89.846		

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

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE February 2008
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**	PROJECT NUMBER AND NAME **3161/NAVSEA Tech Authority**

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 February 2008		
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 2007 Cost ($000)	FY 2007 Award Date	FY 2008 Cost ($000)	FY 2008 Award Date	FY 2009 Cost ($000)	FY 2009 Award Date	Cost to Complete ($000)	Total Cost ($000)	Target Value of Contract
Systems Engineering	various	Various Contractors	0.000	2.721	TBD	2.498	TBD	2.548	TBD	CONT	CONT	0.000
	WX&RX	NSWC, NUWC, CDSA	0.000	2.335	TBD	10.760	TBD	11.094	TBD	CONT	CONT	0.000
Engineering Development	WX&RX	NSWC, NUWC	0.000	1.500	TBD	11.215	TBD	11.563	TBD	CONT	CONT	0.000
			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Demonstration & Evaluation	WX&RX	NSWC	0.000	1.400	TBD	4.191	TBD	4.324	TBD	CONT	CONT	0.000
	WX&RX	SPAWAR	0.000	1.500		0.100		0.102		CONT	CONT	0.000
Subtotal Product Development			**0.000**	**9.456**		**28.764**		**29.631**		**CONT**	**CONT**	**0.000**
Remarks:												
Subtotal Support Costs			**0.000**	**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**	**0.000**
Remarks:												
Travel			0.000	0.100		0.100		0.100		CONT	CONT	0.000
Subtotal Management Services			**0.000**	**0.100**		**0.100**		**0.100**		**CONT**	**CONT**	**0.000**
Remarks:												
Total Cost			**0.000**	**9.556**		**28.864**		**29.731**		**CONT**	**CONT**	**0.000**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE February 2008
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**	PROJECT NUMBER AND NAME **3161/NAVSEA Tech Authority**

Fiscal Year	2007				2008				2009				2010				2011				2012				2013			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Engineering																												
Milestones																												
Ship Concepts Advanced Development																												
Ship Design and Certification Tools and Technical Data Exchange																												
Advanced Ship Systems Development																												
Next Generation USV																												
High Speed Ships and Craft																												
Alternative Power Systems																												
Ship Engineering & Analysis Technology Center																												
Future Submarine Design																												
Embedded Interoperability Engineering																												
Mission Capability Systems Engineering																												

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE February 2008		
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 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Cross Platform Systems Development	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	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	Q1 Q2 Q3 Q4	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	Q1 Q2 Q3 Q4	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	Q1 Q2 Q3 Q4	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	Q1 Q2 Q3 Q4	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	Q1 Q2 Q3 Q4	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	Q1 Q2 Q3 Q4	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	Q1 Q2 Q3 Q4	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	Q1 Q2 Q3 Q4	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	Q1 Q2 Q3 Q4	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	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE February 2008
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 2007	FY 2008	FY 2009
Advanced Capabilities Group	2.040	0.000	0.000
RDT&E Articles Quantity	0	0	0

(U) Advanced Capabilities Group - To conduct a series of studies in FY2007 in topics ranging from capability based costing of ship platforms to early stage assessment of mission effectiveness and system performance

	FY 2007	FY 2008	FY 2009
Machinery Analytical for Controls & Monitoring System	1.317	0.000	0.000
RDT&E Articles Quantity	0	0	0

(U) Machinery Analytical for Controls & Monitoring System - This add will integrate remote monitoring technologies with Navy shipboard CBM systems to significantly improve diagnostics, troubleshooting, remote monitoring and assessment for distance support and maintenance planning, informing shipboard operators at the first sign of pending problems and enabling them to take proactive corrective measures before a failure occurs.

	FY 2007	FY 2008	FY 2009
Scout Radar Stealth Upgrades for Special Warfare Crafts	0.979	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 2007	FY 2008	FY 2009
Advanced Video Processing Technologies (AVPT)	0.000	0.986	0.000
RDT&E Articles Quantity	0	0	0

	FY 2007	FY 2008	FY 2009
SCOUT MK3	0.000	0.986	0.000
RDT&E Articles Quantity	0	0	0

	FY 2007	FY 2008	FY 2009
Autonomous Maritime Navigation Program	5.456	4.784	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 2007	FY 2008	FY 2009

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE February 2008
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**	PROJECT NUMBER AND NAME **9999/CONGRESSIONAL ADDS**	
Low-Signature Modular Weapon Platform	0.000	2.385	0.000
RDT&E Articles Quantity	0	0	0