EXHIBIT R-2, RDT&E Budget Item Justification						DATE: February 2004	
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-4**				R-1 ITEM NOMENCLATURE 0603513N/Shipboard System Component Development			
COST ($ in Millions)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Total PE Cost	**247.513**	**36.664**	**18.993**	**33.276**	**23.125**	**21.393**	**21.780**
2465/DC/Survivability	**5.488**	**6.443**	**6.142**	**4.032**	**1.952**	**1.940**	**1.965**
2467/AGS - Advanced Gun System	**102.328**	**0.000***	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
2468/Undersea Warfare (USW)	**18.644**	**1.419**	**1.669**	**4.178**	**1.976**	**0.000**	**0.000**
2469/ Open Systems Architecture (OSA)	**4.358**	**3.723**	**3.463**	**2.520**	**2.013**	**2.042**	**2.077**
2470/Integrated Topside Design (ITD)	**4.001**	**3.665**	**3.589**	**2.773**	**0.816**	**0.813**	**0.822**
2471/Integrated Power Systems (IPS)	**94.528**	**4.949**	**4.130**	**9.750**	**9.562**	**9.664**	**9.844**
2858/MTTC/IPI	**7.998**	**8.900**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
4019/Radar Upgrades	**0.000**	**0.000**	**0.000**	**10.023****	**6.806**	**6.934**	**7.072**
9038/Automated Maintenance Environment	**3.259**	**2.374**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
9182/Advanced Variable Speed Drive	**0.959**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
9183/Electro-Magnetic Launcher	**3.094**	**0.989**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
9185/Airbag Technology	**2.856**	**1.483**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
9350/Circuit Breakers	**0.000**	**0.989**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
9351/Power & Propulsion Technologies	**0.000**	**1.730**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**

Note: * (U) FY 04 and out funding for this project was reprogrammed to BA-5 PE 0604300N, AGS Project 4009.
****(U) FY 06 and out funding for this project was reprogrammed from BA-5 PE 0604300N, MFR Project 2466.**

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This PE focuses on the development of shipboard system components and technologies for the future surface combatant family of ships. The Radar Upgrade funds future upgrades/technology insertion efforts for the Multi Function Radar (MFR)/Volume Search Radar (VSR) radar suite. The MTTC/IPI Congressional add is to perform Manufacturing Technology (MANTECH) studies at the McConnell Technology Transition Center, operated by Innovative Productivity, Inc. (MTTC/IPI). The MTTC/IPI funds are to work with Navy, DoD, government, laboratories, universities, and industry to identify innovative technologies, processes and concepts that can help Navy activities and contractors, while reducing operating costs and increasing product quality . The Congressional add for Automated Maintenance Environment is an effort that focuses on connecting ships with other ships in a battle group via wireless networks, and connecting the battle group with the shore-based facility for routing to support services. The Advanced Variable Speed Drive (AVSD) Congressional add will re-engineer the high voltage VSD technology for application to the 450 VAC operating level. The Electro-Magnetic Launcher Congressional add will be used to demonstrate the feasibility of a kinetic energy electromagnetic railgun. The Airbag Technology Congressional add focuses on the development and evaluation of replacing the current high-pressure air system used to launch over-the-side torpedoes with commercial off the shelf automobile air bag inflators for launch energy. The Circuit Breakers Congressional add funds development and qualification of a second source for Navy AQB-type circuit breakers with Root Mean Square (RMS) current sensing, electronic trip feature. The Power and Propulsion Technologies Congressional add funds will be used to conduct modeling and simulation in some additional areas of Navy interest linked to the Integrated Fight Through Power (IFTP) concept. Additionally, funds would be applied towards enhanced risk reduction efforts associated with survivable Integrated Power System (IPS) architectures.

EXHIBIT R-2a, RDT&E Project Justification						DATE: February 2004	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 2465/DC/Survivability		
COST ($ in Millions)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost	**5.488**	**6.443**	**6.142**	**4.032**	**1.952**	**1.940**	**1.965**
RDT&E Articles Qty	**0**	**0**	**0**	**0**	**0**	**0**	**0**

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project funds development of DD(X) applicable and future surface combatant survivability and damage control (DC)/ firefighting systems and features that reduce vulnerability against weapons (e.g., missiles, mines, torpedoes) and enable effective recovery of mission capability under reduced manning conditions. Additionally, this project supports development of systems that reduce susceptibility to magnetic and acoustic influence mines. The requirements for this project are based on the need to develop affordable, balanced survivability designs that address recent wartime lessons learned and emerging and future threats.

(U) System development areas include: 1) automated degaussing control system that maintains a reduced, constant electromagnetic signature level for an extended deployment and provides on-board, real-time, tactical information on safe operating areas; 2) underwater shock isolation systems that use rafting and advanced mounts to provide increased survivability while operating in littoral environments; 3) ship design modeling and simulation program that predicts the vulnerability and recoverability response time of the ship, systems, and crew to primary and secondary weapons effects 4) advanced DC and auxiliary system architectures and control methods that enable automated isolation, reconfiguration and fire suppression actions after damage; and 5) low cost ship shock testing methods that eliminate the need for costly environmental assessments and at-sea measures.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2004**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2465/DC/Survivability

B. Accomplishments/Planned Program

	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.999	1.164	1.000
RDT&E Articles Quantity	0	0	0

(U) For FY 03, completed development of control logic for rapidly isolating a fault on 450 volt electrical systems and integrated software with commercial control technology; conducted laboratory demonstration and transitioned to the DDG 51 program. In FY 04, conduct tests to determine the fault susceptibility of 13.8 KV switch gear to water mist; develop switch gear control system doctrine that defines if the power must be secured prior to activation of the water mist fire suppression system. In FY 04 through FY 05, develop fault isolation approaches for 13.8KV electrical systems that prevent peacetime arcing faults within switchgear and approaches for rapidly isolating bus level combat induced faults; identify fault isolation approaches and initiate testing in FY 04.

	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	1.024	1.764	1.300
RDT&E Articles Quantity	0	0	0

(U) In FY 03, conducted survivability demonstration of a candidate automated fire suppression system piping architecture under realistic live ordnance and shipboard conditions and conducted laboratory fire suppression effectiveness testing of alternative water mist nozzle configurations that provide for directly cooling the blast area; transitioned to DD(X) program. In FY 04 through FY 05, develop survivable control system architectures that provide a cost effective, redundant communications path after blast or fire damage to the network; in FY 04 develop a control system demonstration platform including fluid system piping and control components for demonstrating the performance of alternative computing architectures including wireless inter compartment networks and ring network topologies using network fragment healing control processing

	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	1.198	0.800	0.843
RDT&E Articles Quantity			

(U) In FY 03 developed an advanced prototype shock mount concept that provides an ultra low shock environment ensuring a very high probability of equipment survival and enabling a streamlined, low cost shock qualification process; transitioned to the DD(X) program. In FY 04, conduct an underwater explosion shock test employing a raft, prototype shock mount and representative electronic equipment to demonstrate equipment survivability . For FY 05, develop a low-cost, portable shock testing device/ machine for rapidly shock qualifying commercial off the shelf (COTS) equipment; demonstrate the ability of the devices to replicate the shock environment and conduct tests using representative COTS equipment.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2004**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2465/DC/Survivability

B. Accomplishments/Planned Program (Cont.)

	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	1.167	1.515	1.799
RDT&E Articles Quantity	0	0	0

(U) In FY 03 continued development of the real-time, closed loop degaussing control system; complete rangings in FY 04 to monitor stability of control algorithm/ system aboard the USS HIGGINS, DDG 76, and transition to the DD(X) program. For FY 03 through FY 05, develop a software upgrade for the closed loop degaussing system that provides for a low signature during ship rolling conditions by compensating for eddy currents. Developed eddy current control system algorithm approaches in FY 03; develop control algorithm and initiate scaled model testing in FY 04.
For FY 03 through FY 05, develop a real-time tactical decision aid that provides safe operating areas as a function of mine threat. Developed decision aid requirements in FY 03 ; initiate coding in FY 04.
In FY 05, initiate development of a closed loop de-amping system that will reduce the near-field underwater corrosion-related magnetic and electric field signatures emanating from a steel hull surface ship. Initiate plans for installation aboard an operational destroyer.

	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	1.100	0.900	0.600
RDT&E Articles Quantity	0	0	0

(U) Continued development of the ship survivability design modeling and simulation program, Advanced Survivability Assessment Program (ASAP); for FY 03 completed development of crew casualty and electrical models. In FY 04 and FY 05, conduct verification and validation and develop new weapons effect and recoverability models.

	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.000	0.300	0.600
RDT&E Articles Quantity	0	0	0

(U) For FY 04 through FY 05, develop environmentally safe shock testing methods for conducting at-sea, or pier side ship shock trials that eliminate the need for costly environmental impact assessments and at-sea measures. In FY 04, conduct scaled demonstration tests of alternative methods including the use of innovative approaches for focusing the energy from conventional explosives in one direction. □

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2004**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2465/DC/Survivability

C. (U) PROGRAM CHANGE SUMMARY:

(U)Funding:	FY 2003	FY 2004	FY 2005
Previous President's Budget:(FY 04 Pres Controls)	5.665	6.515	6.268
Current BES/President's Budget: (FY 05 Pres Controls)	5.488	6.443	6.142
Total Adjustments	-0.177	-0.072	-0.126
(U)Summary of Adjustments			
Congressional program reductions		-0.072	
SBIR/STTR Transfer	-0.163		
Miscellaneous Minor Adjustments	-0.014		-0.126
Subtotal	-0.177	-0.072	-0.126

(U)Schedule:

Not Applicable

(U)Technical:

Not Applicable

R-1 SHOPPING LIST - Item No. 39

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2004**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2465/DC/Survivability

D. (U) OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Complete	Total Cost
PE 0604300N/ DD(X) Total Ship Sys Engineering	668.472	1052.273	1431.585	1701.238	1314.772	897.563	592.981	CONT.	CONT.
PE 211900 / SCN	0.000	0.000	0.000	99.418	3,594.003	3,320.500	4,695.647	CONT.	CONT.

E. ACQUISITION STRATEGY:

F. (U) MAJOR PERFORMERS:

(U) Government Field Activities - NSWC Carderock

R-1 SHOPPING LIST - Item No. 39

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)								DATE: **February 2004**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**		PROGRAM ELEMENT 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 2465/DC/Survivability						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	CPAF	DD(X) Design Agent	1.500	0.000	N/A	0.000	N/A	0.000	N/A	0.000	1.500	
Ancillary Hardware Development												
Product Development	WX	NSWC CD Bethesda, MD	7.868	4.543	11/02	6.443	12/03	6.142	12/04	CONT	CONT	
	Various	Other Contractors	5.251	0.000	N/A	0.000	N/A	0.000	N/A	CONT	CONT	
Ship Integration												
Ship Suitability												
Systems Engineering												
Training Development												
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development			14.619	4.543		6.443		6.142		CONT	CONT	
Remarks:												
Development Support											0.000	
Software Development											0.000	
Training Development											0.000	
Integrated Logistics Support											0.000	
Configuration Management											0.000	
Technical Data											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)								DATE: **February 2004**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**		PROGRAM ELEMENT 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 2465/DC/Survivability						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation											0.000	
Operational Test & Evaluation											0.000	
Live Fire Test & Evaluation											0.000	
Test Assets											0.000	
Tooling											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal T&E			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
Contractor Engineering Support	GSA	Anteon Arlington, VA	0.000	0.234	01/03	0.000	N/A	0.000	N/A	CONT	CONT	
Government Engineering Support	VAR	Othe Gov't Act	0.000	0.590	02/03	0.000	N/A	0.000	N/A	CONT	CONT	
Program Management Support	WX	NSWC CD Bethesda, MD	0.075	0.000	N/A	0.000	N/A	0.000	N/A	0.000	0.075	
Travel												
Labor (Research Personnel)	CPFF	Various	0.000	0.121	Various	0.000	N/A	0.000	N/A	CONT	CONT	
SBIR Assessment												
Subtotal Management			0.075	0.945		0.000		0.000		CONT	CONT	
Remarks:												
Total Cost			14.694	5.488		6.443		6.142		CONT	CONT	
Remarks:												

R-1 SHOPPING LIST - Item No. 39

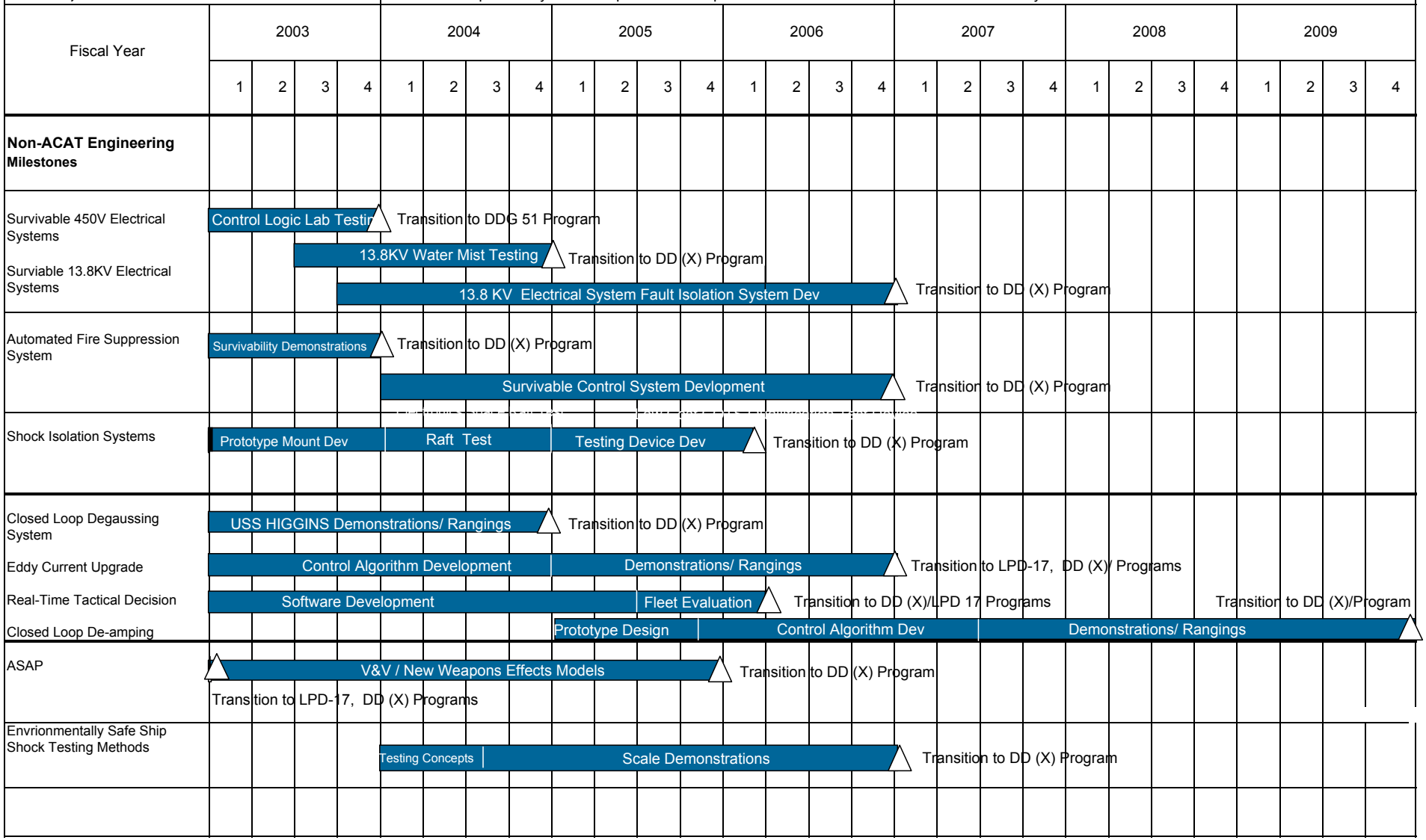
CLASSIFICATION:

EXHIBIT R4, Schedule Profile | DATE: **February 2004**

APPROPRIATION/BUDGET ACTIVITY: **RDT&E, N / BA-4**

PROGRAM ELEMENT NUMBER AND NAME: 0603513N/Shipboard System Component Development

PROJECT NUMBER AND NAME: 2465/DC/Survivability



CLASSIFICATION:

Exhibit R-4a, Schedule Detail					DATE: **February 2004**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 2465/DC/Survivability		
Schedule Profile	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
450 Volt Electrical Control Logic	4Q						
13.8KV Water Mist Tests		4Q					
13.8KV Peactime Fault Isolation Approaches		2Q					
13.8KV Fault Isolation Tests		4Q	1Q				
13.8 KV Bus Level Fault Isolation Approaches			IQ				
13.8KV Bus Level Fault Testing			4Q	3Q			
Automated Fire Suppression Piping Architecture Demo	2Q						
Fire Suppression Effectiveness Lab Demonstrations	4Q						
Control System Demonstration Platform		4Q					
Survivable Control System Software		4Q	2Q				
Survivable Control System Testing			3Q	3Q			
Ultra Low G Shock Mount	1Q						
Ultra Low G Shock Mount Test	3Q						
Electronics Space Raft Test		4Q					
Low Cost COTS Qualification Test Devices			4Q				
Low Cost COTS Qualification Test Demonstrations				1Q			
Closed Loop Degaussing Rangings		2Q-4Q					
Eddy Current Compensation Control Algorithm		3Q					
Eddy Current Demonstrations		4Q	4Q	4Q			
Tactical Decision Aid Requirements	4Q						
Tactical Decision Aid Prototype Code		4Q					
Tactical Decision Aid Fleet Evaluation			3Q	1Q			
De-Amping System Prototype Design			4Q				
De-Amping System Control Algorithm			4Q	1Q-4Q	1Q-2Q		
De-Amping System Prototype Installation					4Q		
De-Amping System Demonstrations					3Q-4Q	1Q-4Q	1Q-4Q
ASAP Crew Casualty and Electrical Models	4Q						
ASAP V&V		4Q					
ASAP Recoverability/ New Weapons Effects models			4Q				
Envrionmentally Safe Ship Shock Testing Concepts		3Q					
Alternative Test Method Scale Demonstrations		3Q	4Q	4Q			

R-1 SHOPPING LIST - Item No. 39

EXHIBIT R-2a, RDT&E Project Justification						DATE: February 2004	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 2467/AGS-Advanced Gun System		
COST ($ in Millions)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost	**102.328**	**0.000***	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
RDT&E Articles Qty	**2**	**0**	**0**	**0**	**0**	**0**	**0**

Note: * (U) FY04 and out funding for this project was reprogrammed to BA-5 PE 0604300N, DD(X) Total Ship Systems Engineering, AGS Project 4009.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: These funds provide for the development of the Advanced Gun System (AGS) associated with the development of DD(X). The AGS will consist of a major caliber gun, an automated ammunition handling system, and a family of munitions/propelling charges. The AGS will, at a minimum, meet the Land Attack and Surface Dominance Missions assigned to the gun system. The system will provide a high rate of fire (approximately 12 rounds per minute) with a magazine capacity sufficient in size for meeting USMC operational requirements. Land Based testing of Engineering Development Model (EDM) hardware components to verify system design will commence in FY 03.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2004**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2467/AGS-Advanced Gun System

B. Accomplishments/Planned Program

	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	24.359	0.000	0.000
RDT&E Articles Quantity	0	0	0

(U) Initiated AGS System design and DD(X) Spiral Development Study. In FY04 and out, funding was reprogrammed to PE 0604300N, Project 4009.

	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	56.144	0.000	0.000
RDT&E Articles Quantity	2	0	0

(U) Commenced EDM fabrication for Gun, magazine, and Control system. In FY04 and out, funding was reprogrammed to PE 0604300N, Project 4009.

	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	9.475	0.000	0.000
RDT&E Articles Quantity	0	0	0

(U) Continued Risk Reduction Phase for AGS Long Range Land Attack Projectile (LRLAP). In FY04 and out, funding was reprogrammed to PE 0604300N, Project 4009.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2004**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2467/AGS-Advanced Gun System

B. Accomplishments/Planned Program (Cont.)

	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	12.350	0.000	0.000
RDT&E Articles Quantity	0	0	0

Initiate LRLAP EDM Development and Testing. In FY04 and out, funding was reprogrammed to PE 0604300N, Project 4009.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2004**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2467/AGS-Advanced Gun System

C. (U)PROGRAM CHANGE SUMMARY:

(U)Funding:	FY 2003	FY 2004	FY 2005
Previous President's Budget:(FY 04 Pres Controls)	105.791	0.000	0.000
Current BES/President's Budget: (FY 05 Pres Controls)	102.328	0.000	0.000
Total Adjustments	-3.463	0.000	0.000
(U)Summary of Adjustments			
SBIR/STTR Transfer	-3.016		
Miscellaneous Minor Adjustments	-0.447		
Subtotal	-3.463	0.000	0.000

(U) Schedule:

Not Applicable

(U)Technical:

Not Applicable

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2004**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2467/AGS-Advanced Gun System

D. (U) PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Complete	Total Cost
PE 0604300N/ DD(X) Total Ship Sys Engineerin	668.472	1052.273	1431.585	1701.238	1314.772	897.563	592.981	CONT.	CONT.
PE 211900 / SCN	0.000	0.000	0.000	99.418	3,594.003	3,320.500	4,695.647	CONT.	CONT.

E. (U)ACQUISITION STRATEGY:

(U) The Navy conducted a comparison of concepts for the DD(X) Advanced Gun System, the results of which were reported to Congress by SECNAV on 10/99. The Advanced Gun System will be acquired in conjunction with the DD(X) development schedule. Initial phases will be conducted under section 845/804 other transaction authority. Initial phases include: Phase I – Concept Formulation, and Phase II - Initial Prototype Development. Downselection to a single DD(X) Design Agent occurred in the Third Quarter, FY 02 to begin Phase III. The AGS EDM development will continue under this contract.

F. (U)MAJOR PERFORMERS:

(U) Contractors - United Defense Limited Partnership, Northrop Grumman Ship Systems, Bath Iron Works

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)								DATE: **February 2004**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**		PROGRAM ELEMENT 0603513N/Shipboard System Component Development			PROJECT NUMBER AND NAME 2467/AGS-Advanced Gun System							
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	845/804	DD(X) Industry Teams	177.435	0.000	N/A					0.000	177.435	
	CPAF	DD(X) Design Agent	62.342	95.000	1QFY03					CONT	CONT	
Ancillary Hardware Development												
Product Development												
Ship Integration												
Ship Suitability												
Systems Engineering												
Training Development												
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development			239.777	95.000		0.000		0.000		CONT	CONT	

Remarks: FY04 and outyear funding for this effort was reprogrammed to PE 0604300N, Project 4009. See those exhibits for FY 04 and FY 05 data.

Development Support											0.000	
Software Development											0.000	
Training Development											0.000	
Integrated Logistics Support											0.000	
Configuration Management											0.000	
Technical Data											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	

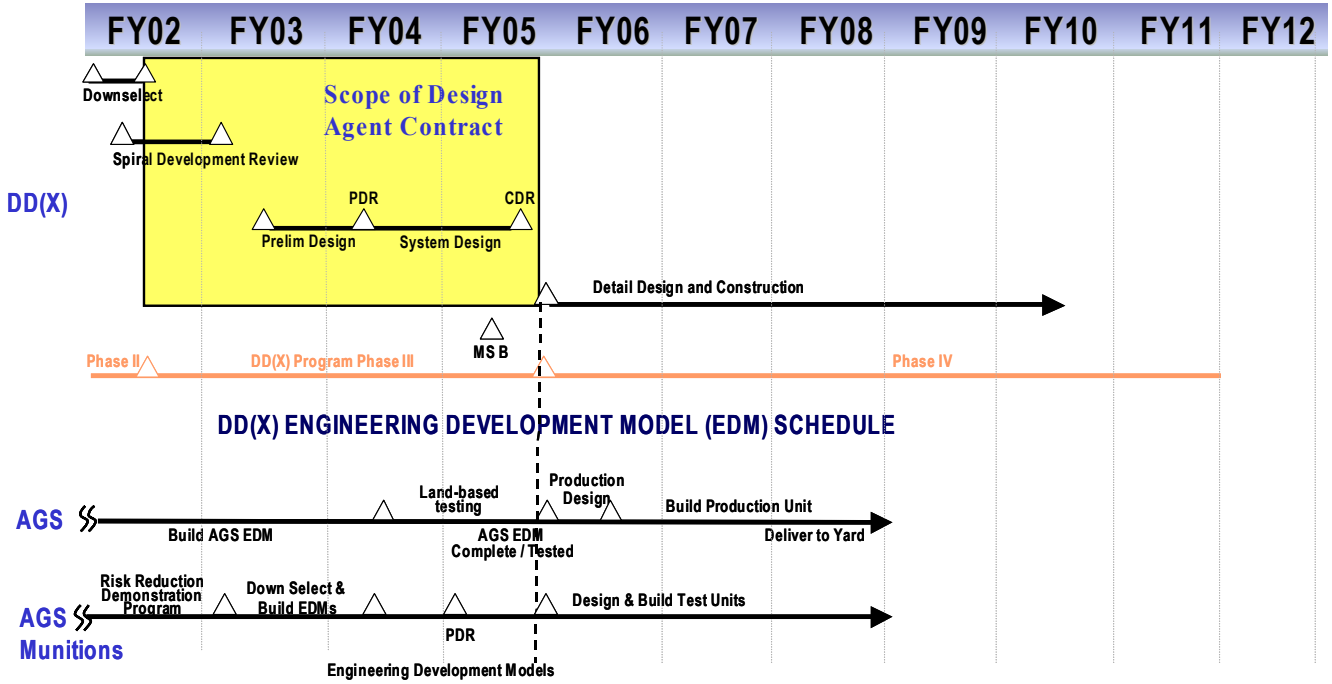
Remarks:

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)								DATE: **February 2004**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**		PROGRAM ELEMENT 0603513N/Shipboard System Component Development			PROJECT NUMBER AND NAME 2467/AGS-Advanced Gun System							
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation												
Operational Test & Evaluation												
Live Fire Test & Evaluation												
Test Assets												
Tooling												
GFE												
Award Fees												
Subtotal T&E			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
Contractor Engineering Support	GSA/FFP	Anteon Arlington, VA	2.776	1.000	10/02					CONT	CONT	
	Various	Other Contractors	1.444	0.000	N/A					CONT	CONT	
Government Engineering Support	WX	NSWC DD Dahlgren, VA	11.478	2.533	10/02					CONT	CONT	
	WX	NSWC PHD Pt. Hueneme, CA	5.342	1.600	10/02					CONT	CONT	
	WX	Other Gov't Activities	8.629	2.195	Various					CONT	CONT	
Program Management Support												
Travel												
Labor (Research Personnel)												
SBIR Assessment												
Subtotal Management			29.669	7.328		0.000		0.000		CONT	CONT	
Remarks: For FY 2004 and outyear funding for this effort was reprogrammed to PE 0604300N, Project 4009. See those exhibits for FY04 and FY05 data.												
Total Cost			269.446	102.328		0.000		0.000		CONT	CONT	
Remarks:												

CLASSIFICATION:

EXHIBIT R4, Schedule Profile		DATE: February 2004
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603513N/Shipboard System Component Development	PROJECT NUMBER AND NAME 2467/AGS-Advanced Gun System



CLASSIFICATION:

Exhibit R-4a, Schedule Detail					DATE: **February 2004**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 2467/AGS-Advanced Gun System		
Schedule Profile	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009

The milestones on this page are covered under PE0604300N, Project 4009, Advanced Gun System.

EXHIBIT R-2a, RDT&E Project Justification						DATE: February 2004	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 2468/Undersea Warfare		
COST ($ in Millions)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost	**18.644**	**1.419**	**1.669**	**4.178**	**1.976**	**0.000**	**0.000**
RDT&E Articles Qty	**0**	**0**	**0**	**0**	**0**	**0**	**0**

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Undersea Warfare (USW) project provides advanced development demonstration and validation of technology through a build-test-build process for potential surface sonar and combat system application. Efforts focus on resolution of technical issues associated with providing capability against the year 2010 and beyond threat with emphasis on shallow water/littoral area USW and on Demonstration and Validation (DEM/VAL) of DD(X) Integrated Undersea Warfare (IUSW-21) Advanced Development Model (ADM). The key technology areas being investigated include: (1) improvements in signal processing, (2) advanced information processing, (3) multi-sensor data fusion, (4) towed array technology, (5) hull array technology and (6) transducer technology to improve target detection and classification performance and reduce system manning requirements for anti-submarine, torpedo defense and in-stride mine avoidance. FY 2002 and subsequent efforts will focus on major technological and performance thrusts for DD(X) USW, which will define surface combatant USW capability for the Navy in the next century. These efforts will continue beyond DD(X) and provide improvements that apply across surface ship USW platforms.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2004**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2468/Undersea Warfare

B. Accomplishments/Planned Program

	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	5.000	0.374	0.472
RDT&E Articles Quantity	0	0	0

(U) IUSW-21 Risk reduction contracts/tasks - Completed integration of FY99 Broad Agency Announcements (BAAs) into the Advanced Development Model (ADM). Awarded DD(X) Design Agent (DA) contract to support the build-test-build process and the FY05 sea tests. DA will continue risk reduction tasks to further define advanced information processing for automated detect classify and localize, data fusion, automated environmental adaptation, mine avoidance, torpedo defense, and displays for reduced manning. In FY 03, began FY02 sea test data analysis, began integration of risk reduction tasks to support the build -test-build process and the FY 05 sea tests; continue risk reduction tasks to further define advanced information. For FY 04, continue risk reduction tasks to further define advanced information processing and complete integration of risk reduction into the ADM/EDM to support the build-test-build process and the FY 05 sea tests. In FY 05, execute risk reduction tasks into the ADM to support the build-test-build process and the FY 07 sea tests.

	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	10.045	0.730	0.823
RDT&E Articles Quantity	0	0	0

(U) IUSW-21 ADM/EDM Development - Performed Integrated Peer Group (IPG) engineering reviews of IUWS-21 advanced technologies. Finished the development and integration of IUSW-21 advanced technologies into ADM demonstration system for FY 02 sea test. For FY 03, began FY02 sea test data analysis and continued development and integration of IUSW-21 advanced technologies for the FY05 sea tests. Perform Integrated Product Team (IPT) engineering reviews of IUSW advanced technologies. In FY 04, continue IPT (IPT) engineering reviews of IUSW-21 advanced technologies. Complete the development and integration of IUSW-21 advanced technologies into ADM/EDM demonstration system for FY05 sea tests. In FY 05, complete the development and integration of IUSW-21 advanced technologies into ADM/EDM demonstration system for FY05 sea tests. Continue to perform IPT engineering reviews of IUSW-21 advanced technologies.

	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	3.599	0.315	0.374
RDT&E Articles Quantity	0	0	0

(U) FY02 Sea Test - Completed equipment preparation and integrated Multi-Function Towed Array (MFTA) into ADM. Shipped and installed equipment, conducted sea test and collected data. In FY 03, removed and transported equipment, refurbished ship, performed data analysis, and began planning for FY05 sea tests. In FY 04, complete equipment preparation for FY 05 sea tests. In FY 05, complete equipment preparation for FY 05 sea test. Ship and install equipment, conduct FY 05 sea tests and collect data.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2004**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2468/Undersea Warfare

C. (U)PROGRAM CHANGE SUMMARY:

(U)Funding:	FY 2003	FY 2004	FY 2005
Previous President's Budget:(FY 04 Pres Controls)	20.093	1.435	1.684
Current BES/President's Budget: (FY 05 Pres Controls)	18.644	1.419	1.669
Total Adjustments	-1.449	-0.016	-0.015
(U)Summary of Adjustments			
Congressional program reductions		-0.016	
Realignment	-0.822		
SBIR/STTR Transfer	-0.576		
Miscellaneous Minor Adjustments	-0.051		-0.015
Subtotal	-1.449	-0.016	-0.015

(U)Schedule:

Not Applicable

(U)Technical:

Not Applicable

R-1 SHOPPING LIST - Item No. 39

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2004**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2468/Undersea Warfare

D. (U) OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Complete	Total Cost
PE 0604300N/ DD(X) Total Ship Sys Engineerir	668.472	1052.273	1431.585	1701.238	1314.772	897.563	592.981	CONT.	CONT.
PE 211900 / SCN	0.000	0.000	0.000	99.418	3,594.003	3,320.500	4,695.647	CONT.	CONT.

E. (U) ACQUISITION STRATEGY:

(U) In Contracting Phase I and II, DD(X) used Section 845/804 agreement authority for the efforts conducted by the DD(X) Industry Teams. BAAs were competitively awarded to further refine advanced information processing for automated detect classify and localize, data fusion, automated environmental adaptation, mine avoidance, torpedo defense, and displays for reduced manning to provide further risk mitigation for DD(X) USW activities. In Contract Phase III responsibility for IUSW-21 ADM/EDM development for the FY04 and FY05 sea tests will be with the DD(X) Design Agent.

F. (U)MAJOR PERFORMERS:

(U) DD(X) Design Agent-Ingalls Shipbuilding Inc (ISI)
(U) Field Activities - Naval Undersea Warfare Center, Newport .

CLASSIFICATION:

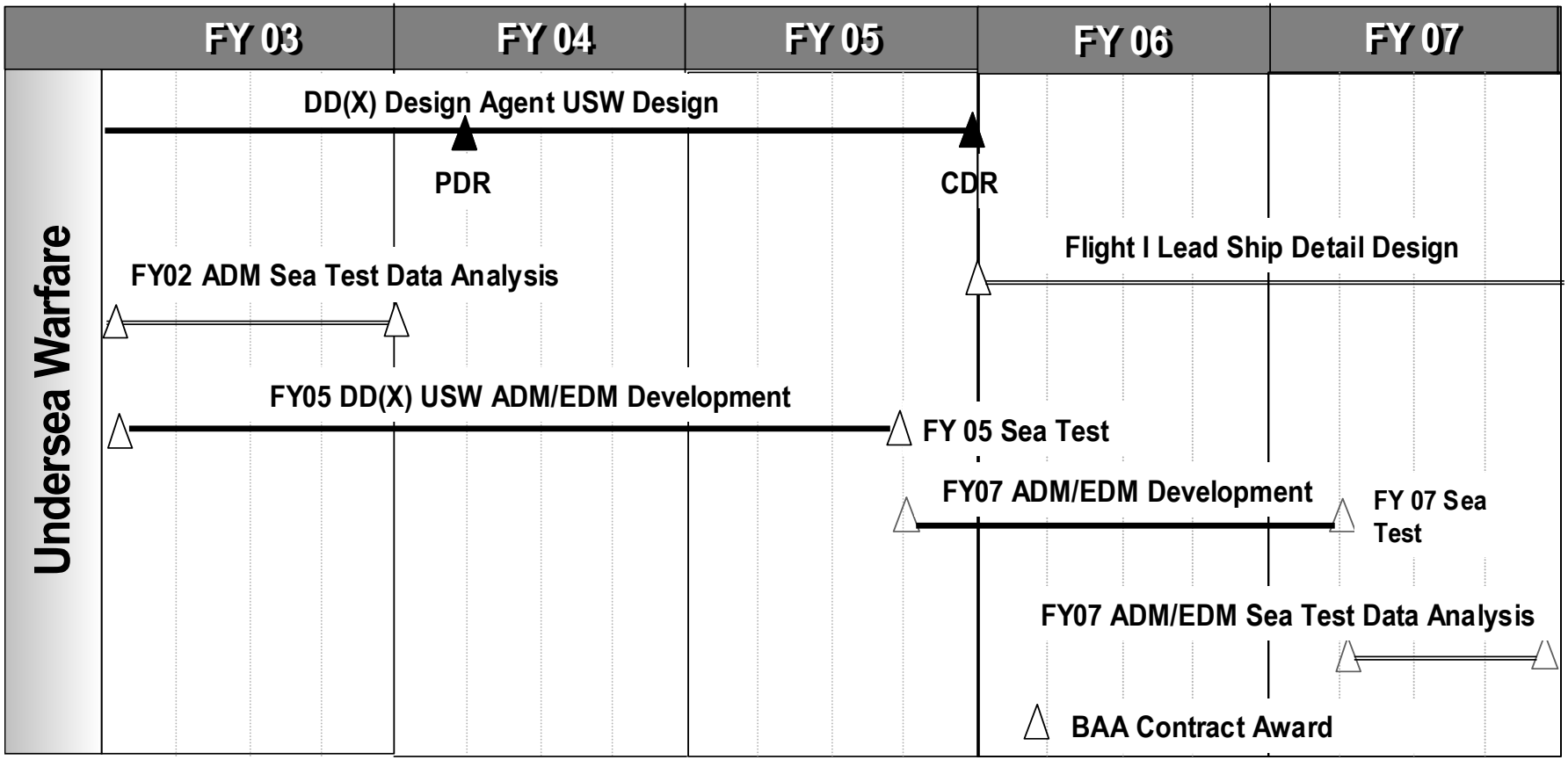
Exhibit R-3 Cost Analysis (page 1)								DATE: **February 2004**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**		PROGRAM ELEMENT 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 2468/Undersea Warfare						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	845/804	DD(X) Industry Teams	11.104	0.000	N/A	0.000	N/A	0.000	N/A	0.000	11.104	
	CPAF	DD(X) Design Agent	4.000	4.000	1QFY03	0.000	N/A	0.000	N/A	CONT	CONT	
	BAA/CPFF	Competition	14.176	0.600	Various	0.374	Various	0.472	Various	CONT	CONT	
Ancillary Hardware Development												
Systems Engineering	C/CPFF	LMC, Syracuse, NY	0.813	0.000	N/A	0.000	N/A	0.000	N/A	CONT	CONT	
	WX	Other Gov't Activities	0.000	0.400	1QFY03	0.000	N/A	0.000	N/A	CONT	CONT	
	C/CPFF	RSC, Newport, RI	0.827	0.000	N/A	0.000	N/A	0.000	N/A	CONT	CONT	
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development			30.920	5.000		0.374		0.472		CONT	CONT	
Remarks:												
Development Support											0.000	
Software Development	C/CPFF	LMC, Syracuse, NY	11.589	0.000	N/A	0.000	N/A	0.000	N/A	CONT	CONT	
	C/CPFF	RSC, Newport, RI	10.316	0.000	N/A	0.000	N/A	0.000	NA	CONT	CONT	
	WX	Other Gov't Activities	0.000	0.750	1QFY03	0.000	N/A	0.000	N/A	CONT	CONT	
	CPAF	DD(X) Design Agent	0.000	6.000	1QFY03	0.000	N/A	0.000	N/A	CONT	CONT	
Training Development											0.000	
Integrated Logistics Support											0.000	
Configuration Management											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal Support			21.905	6.750		0.000		0.000		CONT	CONT	
Remarks:												

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)								DATE: **February 2004**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**		PROGRAM ELEMENT 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 2468/Undersea Warfare						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WX	NUWC/N Newport, RI	5.238	2.599	1QFY03	0.000	N/A	0.000	N/A	CONT	CONT	
	SS/CPFF	APL/JHU Laurel, MD	1.430	0.000	N/A	0.000	N/A	0.000	N/A	CONT	CONT	
	CPAF	DD(X) Design Agent	0.000	1.000	1QFY03	0.000	N/A	0.000	N/A	CONT	CONT	
	PD/WR	Other Gov't Activities	0.000	0.000	N/A	0.315	Various	0.374	Various	CONT	CONT	
Operational Test & Evaluation												
Test Assets												
Tooling												
GFE												
Award Fees												
Subtotal T&E			6.668	3.599		0.315		0.374		CONT	CONT	
Remarks:												
Contractor Engineering Support										0.000	0.000	
Government Engineering Support	WX	Other Gov't Activities	1.631	0.200	Various	0.237	1QFY04	0.276	1QFY05	CONT	CONT	
	SS/CPFF	NUWC/N Newport, RI	4.415	2.362	12/02	0.374	1QFY04	0.436	1QFY05	CONT	CONT	
	SS/CPFF	Various	2.055	0.300	12/02	0.000	N/A	0.000	N/A	CONT	CONT	
Program Management Support	GSA/FFP	Anteon Arlington, VA	2.090	0.234	12/02	0.119	1QFY04	0.111	1QFY05	CONT	CONT	
	PD/WX	Other Gov't Activities	0.091	0.199	Various	0.000	N/A	0.000	N/A	CONT	CONT	
Travel												
Labor (Research Personnel)												
SBIR Assessment												
Subtotal Management			10.282	3.295		0.730		0.823		CONT	CONT	
Remarks:												
Total Cost			69.775	18.644		1.419		1.669		CONT	CONT	
Remarks:												

CLASSIFICATION:

EXHIBIT R4, Schedule Profile		DATE: February 2004
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2468/Undersea Warfare



CLASSIFICATION:

Exhibit R-4a, Schedule Detail					DATE: **February 2004**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 2468/Undersea Warfare		
Schedule Profile	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
FY02 ADM Sea Test Data Analysis	1Q-4Q						
DD(X) Preliminary Design Review (PDR)		2Q-3Q					
FY05 DD(X) USW ADM/EDM Development/Integration	1Q-4Q	1Q-4Q	1Q-3Q				
FY05 DD(X) USW ADM/EDM Sea Tests			3Q				
DD(X) Critical Design Review (CDR)			4Q				
FY07 ADM/EDM Development			4Q	1Q-4Q	1Q		
BAA Contract Award				1Q			
FY07 ADM/EDM Sea Test					1Q		
FY07 ADM/EDM Sea Test Data Analysis					2Q-4Q		

EXHIBIT R-2a, RDT&E Project Justification						DATE: February 2004	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 2469/Open Systems Architecture (OSA)		
COST ($ in Millions)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost	**4.358**	**3.723**	**3.463**	**2.520**	**2.013**	**2.042**	**2.077**
RDT&E Articles Qty	**0**	**0**	**0**	**0**	**0**	**0**	**0**

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The following provides a mission description for each major development area (i.e., Fleet-Focused Initiative (FFI) and Open Systems Architecture (OSA):

(U) Fleet-Focused Initiative: For existing and future ships, this funding: 1) improves reliability/maintainability of fluid, electrical, and mechanical systems and 2) supports reduced manning through automation of operational, maintenance, and day-to-day functions traditionally performed by the crew, and supports development of auxiliary systems to reduce ship magnetic signature and vulnerability to mines.

(U) Architectures, Interfaces & Modular Systems (AIMS): This funding supports PEO Ships implementation of modular standard open systems architecture (OSA) at the total system/ship level. These modular interfaces facilitate mission and market adaptability, technology refresh and insertion, and competition. This funding supports the market surveillance and technology and other projections, cost and logistics analyses, process development, industry partnering, demonstrations and assessments necessary to translate into total ship acquisition.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2004**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2469/Open Systems Architecture (OSA)

B. Accomplishments/Planned Program

	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	1.000	0.960	0.963
RDT&E Articles Quantity	0	0	0

(U) Open Systems Architecture - Common Family of Ships (FOS) Business/Technical Architecture and Technology Management: FY03: Common AIMS / Modularity assessed for FOS / Spiral Design Reviewed with processes and metrics to assess/validate system architecture and interface adaptability for technology refresh and insertion. FY04: Draft architecture for common FOS AIMS. FY05: Integrate common PEO Ships FOS AIMS. Yearly: update TM plans.

	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	1.806	2.571	2.500
RDT&E Articles Quantity	0	0	0

(U) Open Systems Architecture - Implementation: Transition with industry common Architectures, Interfaces, and Modular Systems (AIMS) for shipboard zones A-E below.

A. Open Command and Control (C&C) Zone, FY03: Concept development, FY04-05: Architecture development, FY05: Interface development
The following two efforts are subsets of the C&C Zone:
1. Open C4ISR Zone, FY03: Foundation Interface promulgated and HVAC Interface developed and HVAC Interface refined and promulgated
2. Open C&C Zone Sensor/Network and Supply, Maintenance and Monitoring Open Architecture (SMMOA) Interfaces, FY03: risk reduced with demonstrators and industry and Navy outreach, FY03-4: Interface concepts, FY04-5: Interfaces.
B. Open Offboard Vehicle Zone, FY 03: Concepts, FY03-4: Architecture, FY05: Interfaces.
C. Open Weapons/Power Projection Zone: FY03: Concept, FY04: Architecture, FY05: Interfaces
D. Open Sensors Zone, FY05: Concepts
E. Open Machinery Zones, continuing: Support the implementation of common interfaces for environmental systems.

	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.862	0.000	0.000
RDT&E Articles Quantity	0	0	0

(U) Fleet-Focused Initiatives - Fuel Cell - Continued Ship Surface Fuel Cell (SSFC) ship impact assessments and model analysis of molten carbonate reduced scale demonstrator and PEM integrated fuel processor. For FY 03, validated static and dynamic models of molten carbonate SSFC.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2004**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2469/Open Systems Architecture (OSA)

B. Accomplishments/Planned Program (Cont.)

	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.345	0.000	0.000
RDT&E Articles Quantity	0	0	0

(U) Fleet-Focused Initiatives - Salvage and Underwater Ship Husbandry - Performed prototype assembly and testing for the Smart Tow Monitoring System. Continued development of materials for the improved Shaft Coating Systems. Acquired diagnostic hardware for evaluating Shaft Coating System performance. For FY 03, completed preliminary testing of the Smart Tow System. Evaluated inspection/diagnostic techniques and documented protocol for inspecting Shaft Coating Systems underwater.

	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.345	0.192	0.000
RDT&E Articles Quantity	0	0	0

(U) Fleet-Focused Initiatives - TOC Initiatives - Continued development of improved fuel system training that reduced sailor workload for the existing fleet. For FY 04, complete efforts to improve fuel system training that reduces workload for the existing fleet and issue final report.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2004**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2469/Open Systems Architecture (OSA)

C. (U) PROGRAM CHANGE SUMMARY:

(U)Funding:	FY 2003	FY 2004	FY 2005
Previous President's Budget:(FY 04 Pres Controls)	4.499	3.765	3.504
Current BES/President's Budget: (FY 05 Pres Controls)	4.358	3.723	3.463
Total Adjustments	-0.141	-0.042	-0.041
(U)Summary of Adjustments			
Congressional program reductions		-0.042	
SBIR/STTR Transfer	-0.129		
Miscellaneous Minor Adjustments	-0.012		-0.041
Subtotal	-0.141	-0.042	-0.041

(U)Schedule:

Not Applicable

(U)Technical:

Not Applicable

R-1 SHOPPING LIST - Item No. 39

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2004**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2469/Open Systems Architecture (OSA)

D. (U) OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Complete	Total Cost
PE 0604300N/ DD(X) Total Ship Sys Engineerir	668.472	1052.273	1431.585	1701.238	1314.772	897.563	592.981	CONT.	CONT.
PE 211900 / SCN	0.000	0.000	0.000	99.418	3,594.003	3,320.500	4,695.647	CONT.	CONT.

E. ACQUISITION STRATEGY:

F. (U)MAJOR PERFORMERS:

(U) Government Field Activities- NSWC Carderock and NSWC Dahlgren

R-1 SHOPPING LIST - Item No. 39

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)								DATE: **February 2004**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**		PROGRAM ELEMENT 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 2469/Open Systems Architecture (OSA)						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	845/804	DD(X) Industry Teams	35.327	0.000	N/A	0.000	N/A	0.000	N/A	0.000	35.327	
	WX	NSWC CD Bethesda, MD	10.023	0.000	N/A	0.000	N/A	0.000	N/A	0.000	10.023	
	Various	Other Gov't Activities	4.987	0.000	N/A	0.000	N/A	0.000	N/A	0.000	4.987	
	Various	Other Contractors	2.735	0.000	N/A	0.000	N/A	0.000	N/A	0.000	2.735	
Ancillary Hardware Development											0.000	
Systems Engineering											0.000	
Licenses											0.000	
Tooling											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal Product Development			53.072	0.000		0.000		0.000		0.000	53.072	
Remarks:												
Development Support											0.000	
Software Development											0.000	
Training Development											0.000	
Integrated Logistics Support											0.000	
Configuration Management											0.000	
Technical Data											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												

R-1 SHOPPING LIST - Item No. 39

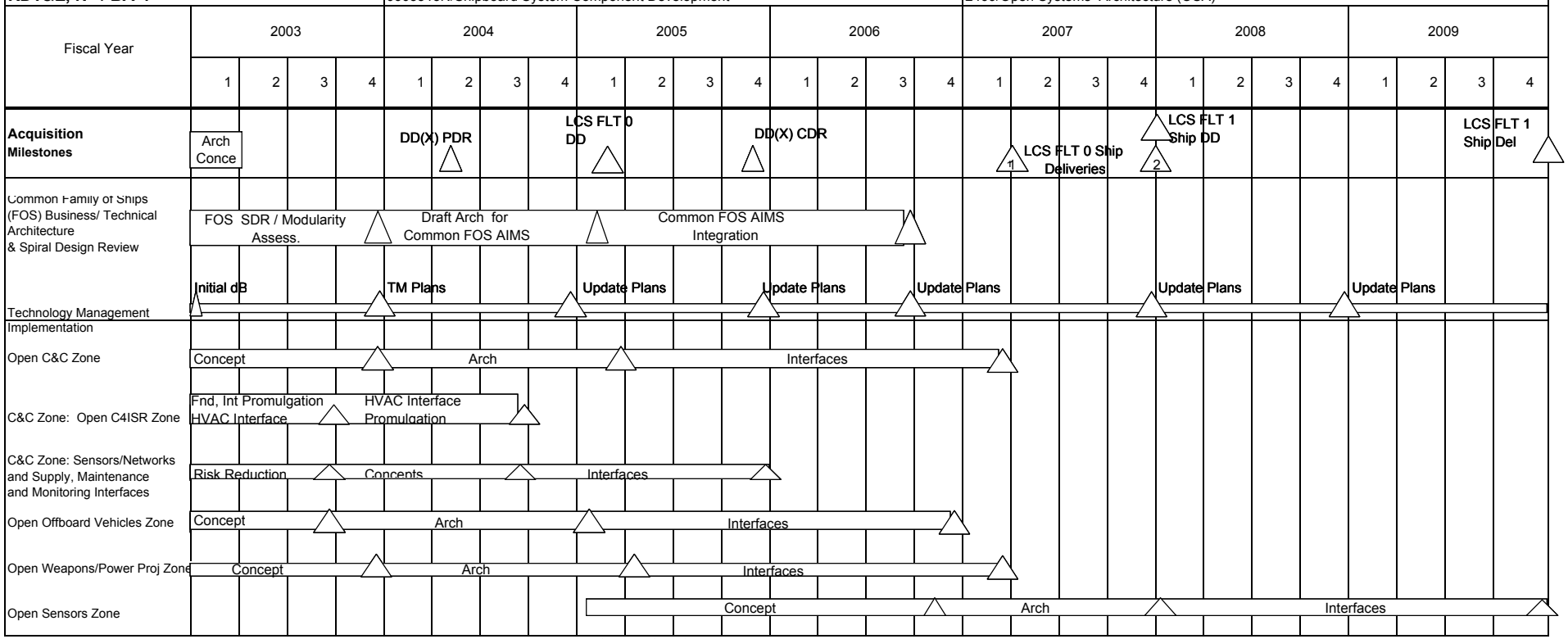
CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)								DATE: **February 2004**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0603513N/Shipboard System Component Development			PROJECT NUMBER AND NAME 2469/Open Systems Architecture (OSA)						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation											0.000	
Operational Test & Evaluation											0.000	
Test Assets											0.000	
Tooling											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal T&E			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
Contractor Engineering Support	Various	Other Contractors	7.210	1.519	Various	0.531	Various	0.000	N/A	CONT	CONT	
Government Engineering Support	WX	NSWC CD Philadelphia, PA	2.556	1.207	Various	0.000	N/A	0.000	N/A	0.000	3.763	
	WX	NSWC Dahlgren, Va.	0.000	0.000	N/A	1.050	10/03	1.075	10/04	CONT	CONT	
	WX	NSWC Carderock, Md.	0.000	0.000	N/A	1.550	10/03	1.593	10/04	CONT	CONT	
	Various	Other Gov't Activities	28.728	1.632	Various	0.592	Various	0.795	Various	CONT	CONT	
Program Management Support											0.000	
Travel											0.000	
Labor (Research Personnel)											0.000	
SBIR Assessment											0.000	
Subtotal Management			38.494	4.358		3.723		3.463		CONT	CONT	
Remarks:												
Total Cost			91.566	4.358		3.723		3.463		CONT	CONT	
Remarks:												

CLASSIFICATION:

EXHIBIT R4, Schedule Profile | DATE: **February 2004**

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2469/Open Systems Architecture (OSA)



R-1 SHOPPING LIST - Item No. 39

* Not required for Budget Activities 1, 2, 3, and 6

CLASSIFICATION:

Exhibit R-4a, Schedule Detail					DATE: February 2004		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT PE 0603513N Shipboard System Component Developmen				PROJECT NUMBER AND NAME 2469/ Open Systems Architecture (OSA)		
Schedule Profile	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Business/Technical Architecture							
FOS SDR / Modularity Assessment complete	4Q						
Draft Architecture for Common FOS AIMS Complete			1Q				
Common FOS AIMS Modularity Integration Complete				3Q			
Technology Management:							
Initial Database Complete	1Q						
TM Plans Issues	4Q						
Update TM plans		4Q/yearly					
Implementation							
Open Command and Control Zone							
Open C&C Zone Concept Complete	4Q						
Open C&C Zone Architecture Complete			1Q				
Open C&C Zone Interfaces Defined					1Q		
Open C4I Zone Foundation Promulgation	3Q						
Open C4I Zone HVAC Interface Defined	3Q						
Open C4I Zone HVAC Implementation Complete		3Q					
Sensor/Networks and SMMOA Risk Reduction	3Q						
Sensor/Networks and SMMOA Interface Concepts Complete		3Q					
Sensor/Networks and SMMOA Interfaces Defined			4Q				
Open Offboard Vehicles Zone:							
Open Offboard Vehicles Zone Concept Complete	3Q						
Open Offboard Vehicles Zone Architecture Complete			1Q				
Open Offboard Vehicles Zone Interfaces Defined				4Q			
Open Weapons/Power Projection Zone:							
Open Weapons Zone Concept Complete	4Q						
Open Weapons Zone Arch Complete			2Q				
Open Weapons Zone Interfaces Defined					1Q		
Open Sensors Zone:							
Open Sensors Zone Concept Complete				4Q			
Open Sensors Zone Architecture Complete						1Q	
Open Sensors Zone Interfaces Defined							4Q

R-1 SHOPPING LIST - Item No. 39

EXHIBIT R-2a, RDT&E Project Justification						DATE: February 2004	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 2470/Integrated Topside Design (ITD)		
COST ($ in Millions)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost	**4.001**	**3.665**	**3.589**	**2.773**	**0.816**	**0.813**	**0.822**
RDT&E Articles Qty	**0**	**0**	**0**	**0**	**0**	**0**	**0**

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project develops the necessary technologies to achieve a total integrated topside design focused on DD(X) and other future surface combatant ships as well as supporting upgrades to existing ships in the Fleet. Technology focus areas include the development, enhancement, validation and verification of modeling and simulation (M&S) tools to support topside signature control, electronic warfare effectiveness, and electromagnetic engineering. This project also develops technical data to support the use of large-scale marine composites on surface combatants to facilitate topside signature control. Topside signature control and electronic warfare effectiveness M&S tools supported by this project enable Navy transformation efforts related to sea strike by facilitating the cost effective design, design approval, and Live Fire Test and Evaluation of low signature surface ships. The validated, integrated, physics-based, electromagnetic radiation (VIPER) M&S tool suite currently being developed under this project will provide the Navy with a state-of-the-art electromagnetic engineering (EME) capability that is applicable to both new construction and existing ships in the Fleet. By providing the design community with tools able to accurately predict the optimum arrangement of topside sensors to minimize electromagnetic interference (EMI), this project enables Navy transformation efforts by facilitating FORCEnet, the connection of sensors, networks, weapons, decision aids and warriors from seabed to space. Development of marine composite technical data supports Navy transformation efforts by enabling the cost effective design of stealthy surface ship topsides that have improved corrosion control which, in turn enables optimized manning. This project also develops improved components of non-propulsion HM&E systems. This program is directed toward improved affordability, performance, reduced life cycle cost, reliability and maintainability, signature reduction, standardization, and weight and manning reductions for the existing and future Fleet.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2004**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2470/Integrated Topside Design (ITD)

B. Accomplishments/Planned Program

	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	1.319	1.555	1.512
RDT&E Articles Quantity	0	0	0

Completed Aperture Signature Prediction Tool Assessment Study. Began development of Advanced EMI Design and Analysis Modeling Tool (Ver. 1.0). Completed collection and analysis of infrared (IR) signature data from SIMVEX 02 in Halifax, Nova Scotia. Completed collection of range data to Validation &Verification (V&V) radar cross section (RCS) signature prediction tool for low observable ships. Initiated collection of at-sea data to V&V IR signature prediction tool for low observable ships. Continue the development, enhancement, validation and verification of topside signature control and electronic warfare effectiveness for Materials & Signature (M&S) tools.

	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	1.335	1.551	1.500
RDT&E Articles Quantity	0	0	0

Completed V&V of Advanced Antenna Electronics, Advanced Array Antenna (Ver. 1.0), and Advanced Frequency Selective Surface (Ver. 1.0) Design and Analysis Modeling Tools. Completed Composite Materials Fire Safety Goals and Qualification Procedures and Composite Materials Outfitting Performance Design Guides. Completed development and V&V of Composite Materials Joint Analysis M&S Tool (SPLICE Ver. 2). Completed reports on Composite Material External Doubler Joint and Composite Material Adhesive Shear Testing. Completed development of Analytical Design Tool to Establish Performance Standards for Critical Flaw Evaluation in Marine Composites. Continue development, enhancement, validation and verification of topside Electro Magnetic Engineering (EME) Materials & Signature tools.

	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.887	0.000	0.000
RDT&E Articles Quantity	0	0	0

Continued development of auxiliary machinery, alternative hydrogen fuel, fuel storage, and architectures to support fleet and Strategic Studies Groups 19 and 20 initiatives. Continue development of affordable, efficient HM&E machinery and architectures for existing and future fleets.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2004**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2470/Integrated Topside Design (ITD)

B. Accomplishments/Planned Program

	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.460	0.559	0.577
RDT&E Articles Quantity	0	0	0

Continue development of acceptance guides for marine composites for surface ships.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2004**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2470/Integrated Topside Design (ITD)

C.(U) PROGRAM CHANGE SUMMARY:

(U)Funding:	FY 2003	FY 2004	FY 2005
Previous President's Budget:(FY 04 Pres Controls)	4.129	3.711	3.638
Current BES/President's Budget: (FY 05 Pres Controls)	4.001	3.665	3.589
Total Adjustments	-0.128	-0.046	-0.049
(U)Summary of Adjustments			
Congressional program reductions		-0.041	
SBIR/STTR Transfer	-0.117		
Miscellaneous Minor Adjustments	-0.011	-0.005	-0.049
Subtotal	-0.128	-0.046	-0.049

(U)Schedule:

Not Applicable

(U)Technical:

Not Applicable

R-1 SHOPPING LIST - Item No. 39

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2004**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2470/Integrated Topside Design (ITD)

D. (U)OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Complete	Total Cost
PE 0604300N/ DD(X) Total Ship Sys Engineerin	668.472	1052.273	1431.585	1701.238	1314.772	897.563	592.981	CONT.	CONT.
PE 211900 / SCN	0.000	0.000	0.000	99.418	3,594.003	3,320.500	4,695.647	CONT.	CONT.

E. ACQUISITION STRATEGY:

F. (U) MAJOR PERFORMERS:

(U)Government Field Activities-NRL Washington DC, and SPAWAR Systems Center San Diego.

R-1 SHOPPING LIST - Item No. 39

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)								DATE: **February 2004**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**		PROGRAM ELEMENT 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 2470/Integrated Topside Design (ITD)						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	845/804	DD(X) Industry Teams	24.556	0.000	N/A	0.000	N/A	0.000	N/A	0.000	24.556	
Ancillary Hardware Development											0.000	
Systems Engineering										0.000	0.000	
Licenses											0.000	
Tooling											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal Product Development			24.556	0.000		0.000		0.000		0.000	24.556	
Remarks:												
Development Support											0.000	
Software Development											0.000	
Training Development											0.000	
Integrated Logistics Support											0.000	
Configuration Management											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												

R-1 SHOPPING LIST - Item No. 39

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)								DATE: **February 2004**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0603513N/Shipboard System Component Development			PROJECT NUMBER AND NAME 2470/Integrated Topside Design (ITD)						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation											0.000	
Operational Test & Evaluation											0.000	
Test Assets											0.000	
Tooling											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal T&E			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
Contractor Engineering Support	GSA/FFP	Anteon Arlington, Va.	3.408	0.052	Various	0.048	Various	0.041	Various	CONT	CONT	
Government Engineering Support	WX	NSWC CD Bethesda, MD	1.414	0.000	N/A	0.000	N/A	0.000	N/A	CONT	CONT	
	WX	NRL, Washington DC	0.000	1.120	10/02	1.025	10/03	0.993	10/04	CONT	CONT	
	WX	SSCSD, San Diego, CA	1.566	0.000	N/A	1.140	10/03	1.113	10/04	CONT	CONT	
	Various	Other Gov't Activities	20.823	2.829	Various	1.452	Various	1.442	Various	CONT	CONT	
Program Management Support											0.000	
Travel											0.000	
Labor (Research Personnel)											0.000	
SBIR Assessment											0.000	
Subtotal Management			27.211	4.001		3.665		3.589		CONT	CONT	
Remarks:												
Total Cost			51.767	4.001		3.665		3.589		CONT	CONT	
Remarks:												

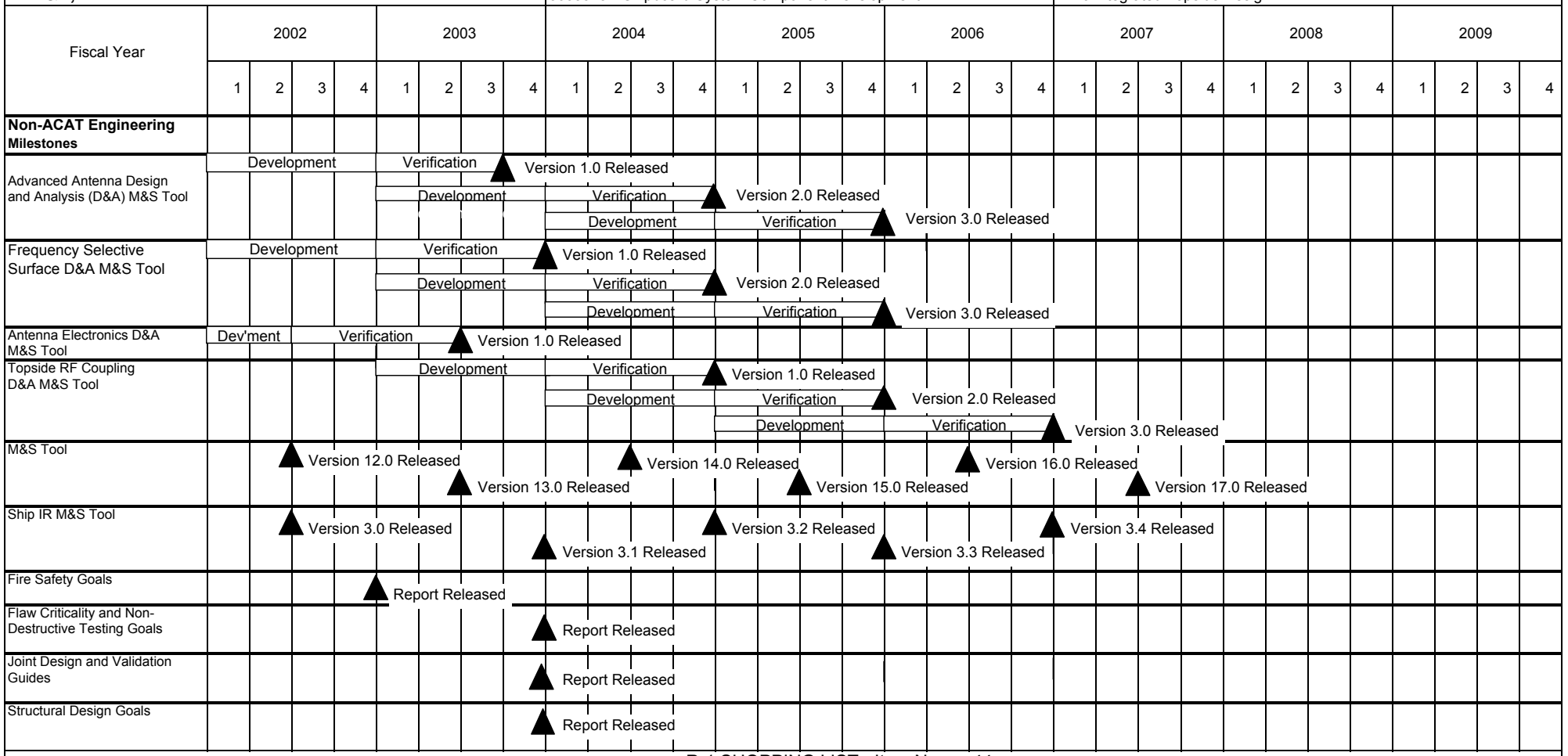
CLASSIFICATION:

EXHIBIT R4, Schedule Profile — DATE: **February 2004**

APPROPRIATION/BUDGET ACTIVITY: **RDT&E, N / BA-4**

PROGRAM ELEMENT NUMBER AND NAME: 0603513N/Shipboard System Component Development

PROJECT NUMBER AND NAME: 2470/Integrated Topside Design



R-1 SHOPPING LIST - Item No. 44

CLASSIFICATION:

Exhibit R-4a, Schedule Detail					DATE: **February 2004**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 2470/Integrated Topside Design		
Schedule Profile	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Electromagnetic Engineering							
Advanced Antenna Design and Analysis (D&A) M&S Tool							
Version 1.0 Released	3Q						
Version 2.0 Released		4Q					
Version 3.0 Released			4Q				
Frequency Selective Surface D&A M&S Tool							
Version 1.0 Released	4Q						
Version 2.0 Released		4Q					
Version 3.0 Released			4Q				
Antenna Electronics D&A M&S Tool							
Version 1.0 Released	2Q						
Topside RF Coupling D&A M&S Tool							
Version 1.0 Released		4Q					
Version 2.0 Released			4Q				
Version 3.0 Released				4Q			
Electronic Warfare Effectiveness and Topside Signatures							
Radar Target Signature M&S Tool							
Version 13.0 Released	2Q						
Version 14.0 Released		2Q					
Version 15.0 Released			2Q				
Version 16.0 Released				2Q			
Version 17.0 Released					2Q		
ShipIR M&S Tool							
Version 3.1 Released	4Q						
Version 3.2 Released		4Q					
Version 3.3 Released			4Q				
Version 3.4 Released				4Q			
Composite Materials							
Flaw Criticality and Non Destructive Testing Goals	4Q						
Joint Design and Validation Guide	4Q						
Structural Design Goals	4Q						
R-1 SHOPPING LIST - Item No.			39				

EXHIBIT R-2a, RDT&E Project Justification						DATE: February 2004	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 2471/Integrated Power Systems		
COST ($ in Millions)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost	**94.528**	**4.949**	**4.130**	**9.750**	**9.562**	**9.664**	**9.844**
RDT&E Articles Qty	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: (U) FY 2004 and FY 2005 IPS DD(X) funds transferred to BA-5 PE 0604300N IPS Project 4010.

A. (U) **MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:** This project supports the Integrated Power Systems (IPS) program. IPS provides total ship electric power, including electric propulsion, power conversion and distribution, and mission load interfaces to the electric power system. IPS supports multiple ship class applications for future surface ships, with DD (X) being the primary ship application target. On 6 January 2000, SECNAV announced Navy intent that DD(X) be an electric drive ship with integrated power architecture. IPS reduces acquisition and operating costs of naval ships and increases military effectiveness. IPS leverages investments in technologies that will be useable by both military and commercial sectors.

- (U) IPS has the potential to revolutionize the design, construction, and operation of U.S. naval ships by using electricity as the primary energy transfer medium aboard ship. The flexibility of electric power transmission allows power generating modules with various power ratings to be connected to propulsion loads and ship service in any arrangement that supports the ship's mission at lowest overall cost. Systems engineering in IPS is focused on increasing the commonality of components used across ship types and in developing modules which will be integral to standardization, zonal system architectures, and generic shipbuilding strategies. The purpose of increased commonality is to reduce the total cost of ship ownership by using common modules composed of standard components and/or standard interfaces.

- (U) IPS addresses ship platform program goals through: reduced ship acquisition cost through integration of propulsion and ship's service prime movers; lower ship operational costs resulting from more flexible operating characteristics and more efficient components; reduced ship construction costs by allowing more extensive modular construction of power generation, distribution, and loads; improved ship survivability and reduced vulnerability through increased arrangement flexibility and improved electrical system survivability; reduced manning through improved power management systems and reduced on-board maintenance requirements; improved ship signature characteristics; improved design adaptability to meet future requirements of multiple ship types or missions; integrating power management and protection by fully utilizing the power electronics in the system to perform fault protection as well as power conversion and load management functions; simplified technology insertion which allows new technologies to be installed within IPS much less expensively than presently possible; and, reduced machinery system acquisition costs through utilization of commercially shared technologies and components. The efforts in this project are divided into three major areas as follows:

- (U) System development: consists of the efforts necessary to develop and demonstrate broadly applicable warfighting improvements and cost reductions as well as related efforts for ship platform and mission load interface applications.

- (U) Platform Specific Development: includes all efforts to design, develop and test integrated power system equipment for ship specific application including DD(X) family of ships. This includes Permanent Magnet (PM) motor and motor drive technologies

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2004**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2471/Integrated Power Systems

- (U) RV Triton At Sea Testing: At Sea Testing of IPS subsystems and components will be conducted on the RV Triton Trimaran Demonstrator developed and built under a US/UK cooperative Memorandum of Understanding (MOU) signed 3 September 1997. The RV Triton was launched on 6 May 2000 under the contract for construction awarded in July 1998. The RV Triton is constructed with a commercial electric drive system as well as provisions for fitting and testing of IPS components. Initial testing on the RV Triton is non-IPS and will focus on Naval Architectural and sea-keeping aspects of the trimaran hull form. An opportunity for the US to backfit IPS components and conduct follow-on at sea testing is built into the MOU. The US financial contribution to the MOU is also funded from this project. The efforts in this project support the procurement, installation, and at sea testing of IPS components on the RV Triton.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2004**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2471/Integrated Power Systems

B. Accomplishments/Planned Program

	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	2.612	1.500	0.978
RDT&E Articles Quantity	0	0	0

Systems Development: IPS design, development, and integration including performance analysis and testing, modeling and simulation, life cycle cost analysis, producibility studies, manning studies, module development, ship integration, architecture design and related efforts. Demonstrate automated system reconfiguration and start-up. Mitigate potential risks associated with a fielded IPS Integrated Fight Through Power (IFTP) system by fabricating hardware required to populate IPS baseline configuration and conducting testing. Modify test site design for IPS integrated fight through power testing at NSWCCD, Philadelphia PA. Evaluate emerging technologies for ship applications to determine future feasibility and development requirements. Emerging technologies include technologies such as fuel cells and power electronics. Conduct combat systems/survivability demonstration to show improved performance and potential to reduce combat system costs. Develop IPS configurations in support of all future surface ship programs. Develop/modify IPS ship configuration documentation including CONOPS, System Level Description/Requirements, and module performance specifications as necessary to support power system requirements for TAOE (X) and LHR (X) and MPF future. Develop ship power system Smart Product Model to support cost/performance tradeoffs of alternative IPS ship configurations and evaluation of emerging electric power system and component technologies.

	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	82.000	0.000	0.000
RDT&E Articles Quantity	0	0	0

Platform Specific Development: NOTE: FY 04 and FY 05 funds for IPS on DD(X) have been transferred to PE 0604300N/Project 4010. Award contract for DD(X) IPS land-based and at-sea Engineering Development Models (EDMs). In support of DD(X) IPS EDM land-based and at-sea testing: determine representative test hardware configurations; and develop test site designs; order Long Lead Material (LLM) and other material for large generators and prime movers. Perform DD(X) spiral development review studies. Conduct detailed design of DD(X) IPS system including design and fabrication of IPS EDMs. Perform studies of ship electric architectures and high power weapons system requirements.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2004**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2471/Integrated Power Systems

B. Accomplishments/Planned Program

	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	9.916	3.449	3.152
RDT&E Articles Quantity	0	0	0

R/V Triton At Sea Testing: Design, build, test IFTP hardware in an IPS configuration onboard the RV Triton. Perform detailed development and design of the RV Triton IPS configuration for at sea testing. Develop IPS control system modifications for use during at-sea testing. Conduct risk reduction efforts and ship modifications. Conduct modeling and simulation studies of system stability and interfaces. Conduct at sea testing onboard the RV Triton.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2004**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2471/Integrated Power Systems

C. PROGRAM CHANGE SUMMARY:

Funding:	FY 2003	FY 2004	FY 2005
Previous President's Budget:(FY 04 Pres Controls)	97.559	5.005	4.157
Current BES/President's Budget: (FY 05 Pres Controls)	94.528	4.949	4.130
Total Adjustments	-3.031	-0.056	-0.027
Summary of Adjustments			
Congressional program reductions		-0.056	
SBIR/STTR Transfer	-2.782		
Miscellaneous Minor Adjustments	-0.249		-0.027
Subtotal	-3.031	-0.056	-0.027

Schedule:

Not Applicable

Technical:

Not Applicable

R-1 SHOPPING LIST - Item No. 39

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2004**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	2471/Integrated Power Systems

D. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Complete	Total Cost
PE 0604300N/ DD(X) Total Ship Sys Engineerin	668.472	1052.273	1431.585	1701.238	1314.772	897.563	592.981	CONT.	CONT.
PE 211900 / SCN	0.000	0.000	0.000	99.418	3,594.003	3,320.500	4,695.647	CONT.	CONT.

E. (U)ACQUISITION STRATEGY:

(U) IPS is a candidate system for DD(X) and all other future surface ships.

F. (U)MAJOR PERFORMERS:

(U) IPS DD(X) Design Agent, Ingalls Shipbuilding Iinc. General Atomics and DRS Power and Controls Technologies Inc., IPS IFTP contractors.

R-1 SHOPPING LIST - Item No. 39

CLASSIFICATION:

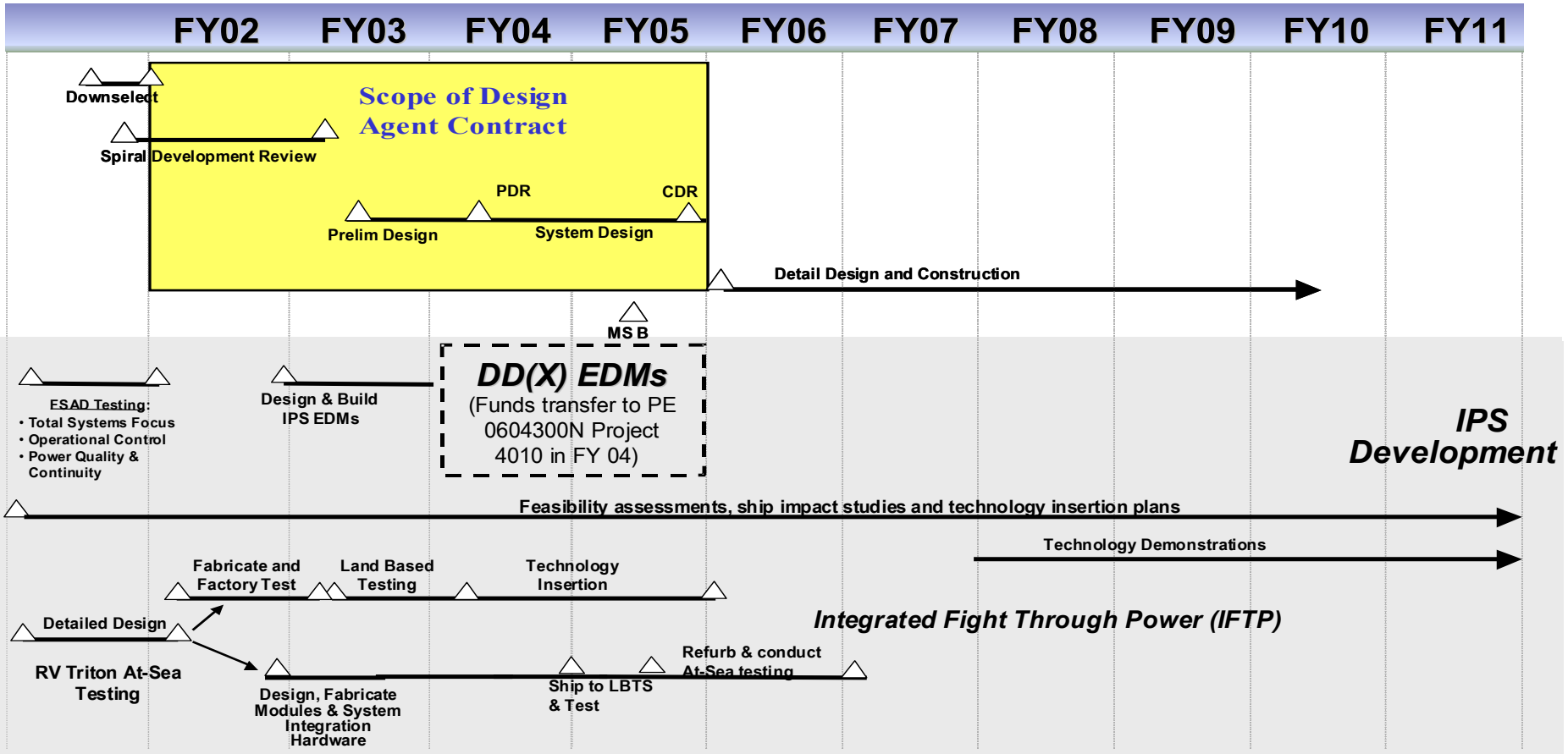
Exhibit R-3 Cost Analysis (page 1)								DATE: February 2004			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**		PROGRAM ELEMENT 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 2471/Integrated Power Systems					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/CPAF	Lockheed M Syracuse, NY	23.572	0.000	N/A	0.000	N/A	0.000	N/A	CONT	CONT	
	Sec845/804	DD (X) Industry Teams	66.661	0.000	N/A	0.000	N/A	0.000	N/A	CONT	CONT	
	CPAF	DD (X) Design Agent	72.500	82.000	1QFY03	0.000	N/A	0.000	N/A	CONT	CONT	
	Sec845/804	IFTP Teams	39.885	9.828	10/02	3.474	10/03	3.157	10/04	CONT	CONT	
	US/UK MOU	DERA, UK	1.350	0.000	N/A	0.000	N/A	0.000	N/A	CONT	CONT	
	WX	NSWCCD Philadelphia, PA	23.005	1.150	10/02	0.550	10/03	0.278	10/04	CONT	CONT	
	WX	NSWCCD Dahlgren, Va.	2.806	0.000	N/A	0.000	N/A	0.000	N/A	CONT	CONT	
	Various	Other Contractors	9.500	0.450	12/02	0.400	12/03	0.175	12/04	CONT	CONT	
	Various	Other Govt Activities	1.895	0.000	N/A	0.000	N/A	0.000	N/A	CONT	CONT	
Ancillary Hardware Development											0.000	
Systems Engineering											0.000	
Licenses											0.000	
Tooling											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal Product Development			241.174	93.428		4.424		3.610		CONT	CONT	
Remarks:												
Development Support											0.000	
Software Development											0.000	
Training Development											0.000	
Integrated Logistics Support											0.000	
Configuration Management											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)								DATE: **February 2004**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**		PROGRAM ELEMENT 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 2471/Integrated Power Systems						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WX	NSWC CD Philadelphia, PA	16.576	1.050	10/02	0.500	10/03	0.500	10/04	CONT	CONT	
Operational Test & Evaluation												
Test Assets												
Tooling												
GFE												
Award Fees												
Subtotal T&E			16.576	1.050		0.500		0.500		CONT	CONT	
Remarks:												
Contractor Engineering Support											0.000	
Government Engineering Support											0.000	
Program Management Support											0.000	
Travel	Various	Various	0.524	0.050	10/02	0.025	10/03	0.020	10/04	CONT	CONT	
Labor (Research Personnel)											0.000	
SBIR Assessment											0.000	
Subtotal Management			0.524	0.050		0.025		0.020		CONT	CONT	
Remarks:												
Total Cost			258.274	94.528		4.949		4.130		CONT	CONT	
Remarks:												

CLASSIFICATION:

EXHIBIT R4, Schedule Profile		DATE: February 2004
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603513N/Shipboard System Component Development	PROJECT NUMBER AND NAME 2471/Integrated Power Systems



CLASSIFICATION:

Exhibit R-4a, Schedule Detail					DATE: **February 2004**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 2471/Integrated Power Systems		
Schedule Profile	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
IPS DD(X) EDMs							
Design & Build	1Q-4Q						
IPS IFTP Land Based							
Fabrication & Factory Testing	1Q						
Land Based Testing	2Q-4Q	1Q-2Q					
Technology Insertion		2Q-4Q	1Q-4Q	1Q			
IPS IFTP At Sea RV Triton							
Design, Fabrication & Integration	1Q-4Q	1Q-4Q					
Ship/Land Based Testing		4Q	1Q-3Q				
Refurb/At sea testing			4Q	1Q-4Q	1Q		
IPS Technology Insertions							
Engineering Studies				1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Ship Concept Studies				3Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Test Site Support					4Q	1Q-4Q	1Q-4Q
Technology Development						1Q-4Q	1Q-4Q