EXHIBIT R-2, RDT&E Budget Item Justification							DATE: February 2003	
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-4**					R-1 ITEM NOMENCLATURE 0603513N/Shipboard System Component Development			
COST ($ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Total PE Cost	**280.795**	**256.366**	**20.431**	**19.251**	**33.646**	**23.513**	**21.763**	**22.132**
32465/DC/Survivability	**4.928**	**5.665**	**6.515**	**6.268**	**4.198**	**2.141**	**2.146**	**2.177**
32467/AGS - Advanced Gun System	**130.767**	**105.791**	*** **0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
32468/Undersea Warfare (USW)	**24.505**	**20.093**	**1.435**	**1.684**	**4.207**	**2.002**	**0.000**	**0.000**
32469/ Open Systems Architecture (OSA)	**5.391**	**4.499**	**3.765**	**3.504**	**2.571**	**2.070**	**2.103**	**2.137**
32470/Integrated Topside Design (ITD)	**5.239**	**4.129**	**3.711**	**3.638**	**2.823**	**0.873**	**0.874**	**0.884**
32471/Integrated Power Systems (IPS)	**100.910**	**97.559**	**5.005**	**4.157**	**9.796**	**9.607**	**9.699**	**9.866**
32858/MTTC/IPI	**5.768**	**8.216**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
34019/Radar Upgrades	**0.000**	**0.000**	**0.000**	**0.000**	** **10.051**	**6.820**	**6.941**	**7.068**
39038/Automated Maintenance Environment	**3.287**	**3.325**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
39182/Advanced Variable Speed Drive	**0.000**	**0.977**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
39183/Electro-Magnetic Launcher	**0.000**	**3.179**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
39185/Airbag Technology	**0.000**	**2.933**	**0.000**	**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 34009.

****(U) FY 06 and out funding for this project was reprogrammed from BA-5 PE 0604300N, MFR Project 32466.**

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 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 initiative will re-engineer the high voltage VSD technology for application to the 450 VAC operating level. The Electro-Magnetic Launcher Congressional add initiative 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.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **February 2003**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 32465/DC/Survivability			
COST ($ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost	**4.928**	**5.665**	**6.515**	**6.268**	**4.198**	**2.141**	**2.146**	**2.177**
RDT&E Articles Qty	**0**	**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 and acoustic main machinery 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 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N /BA-4	0603513N/Shipboard System Component Development	32465/DC/Survivability

B. Accomplishments/Planned Program

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.561	1.100	1.500	1.000
RDT&E Articles Quantity	0	0	0	0

(U) Supported development of survivable 450 volt electrical system architectures/components that enable uninterrupted damage control operations and continued combat capability after damage. For FY 03, complete development of control logic for rapidly isolating a fault and integrate software with commercial control technology; conduct laboratory demonstration and transition to the DDG 51 program. In FY 04, develop survivable 4160 volt electrical architectures; and for FY 05, develop a bus level control alogorithum for isolating faults and initiate plans for live fire demonstration tests.

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.532	1.100	1.800	1.300
RDT&E Articles Quantity	0	0	0	0

(U) Supported development of survivable automated firefighting systems that enable automated isolation, reconfiguration and fire suppression following damage. In FY 03, conduct survivability demonstration of a candidate automated fire suppression system piping architecture under realistic live ordnance and shipboard conditions and conduct laboratory fire suppression effectiveness testing of alternative water mist nozzle configuarations that provide for direct cooling in the blast area. For FY 04 and FY 05, initiate and install a prototype system aboard the ex-USS SHADWELL located in Mobile, Alabama and demonstrate performance under realistic fire threat and shipboard conditions ; transition data to ship acquisition programs.

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.400	1.198	0.800	0.800
RDT&E Articles Quantity				

(U) Supported development of electronics and machinery shock isolation systems (structural support raft and mounts) that enable continued operation after close-in underwater explosion. Developed an advanced shock mount concept that provides for an ultra low shock environment ensuring a very high probability of equipment survival. In FY 03, conduct an underwater explosion shock test employing a raft, shock mounts and representative electronic equipment to demonstrate equipment survivability . For FY 04, develop a low-cost, portable shock testing device/ machine for rapidly shock qualifying commercial of the shelf (COTS) equipment in support of ship acquisition programs and technology refresh upgrades. In FY 05, 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 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N /BA-4	0603513N/Shipboard System Component Development	32465/DC/Survivability

37653

B. Accomplishments/Planned Program (Cont.)

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.850	1.167	1.515	1.897
RDT&E Articles Quantity	0	0	0	0

(U) Continued demonstrations of real-time, closed loop degaussing control system aboard USS Higgins, DDG 76; conduct rangings to monitor stability of control algorithm/ system and transition to ship acquisition programs. In FY 03, initiate development of a software upgrade that provides for a low signature during rolling by compensating for eddy currents. In FY 04, continue development of the eddy current software upgrade and initiate development of a real-time tactical decision aid that provides safe operating areas as a function of mine threat. 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. Also, continue development of the real time tactical decision aid and eddy current upgrade.

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	1.500	0.000	0.000	0.000
RDT&E Articles Quantity	0	0	0	0

(U) Spiral Development Study to assess surface combatant force capabilities and to conduct survivability assessments.

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.595	1.100	0.900	0.600
RDT&E Articles Quantity	0	0	0	0

(U) Continued development of the ship survivability design modeling and simulation program, Advanced Survivability Assessment Program (ASAP). For FY 03, complete 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.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N /BA-4	0603513N/Shipboard System Component Development	32465/DC/Survivability

B. Accomplishments/Planned Program (Cont.)

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.000	0.000	0.000	0.671
RDT&E Articles Quantity	0	0	0	0

(U) Initiate development of 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 measures. Initiate demonstration tests of alternative methods to characterize the pressure time-history verses conventional explosives.

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.490	0.000	0.000	0.000
RDT&E Articles Quantity	0	0	0	0

(U) Closed-out the composite pump development contract.

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost				
RDT&E Articles Quantity	0	0	0	0

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	32465/DC/Survivability

C. (U) PROGRAM CHANGE SUMMARY:

(U)Funding:	FY 2002	FY 2003	FY 2004	FY 2005
Previous President's Budget: (FY 03 Pres Controls)	4.991	5.792	6.928	6.671
Current BES/President's Budget: (FY04 Pres Controls)	4.928	5.665	6.515	6.268
Total Adjustments	-0.063	-0.127	-0.413	-0.403
(U)Summary of Adjustments				
Congressional program reductions				
Congressional undistributed reductions	-0.037	-0.034		
Congressional rescissions				
SBIR/STTR Transfer	-0.012			
Economic Assumptions	-0.014	-0.032		
Reprogrammings				
Miscellaneous Minor Adjustments		-0.061	-0.413	-0.403
Congressional increases				
Subtotal	-0.063	-0.127	-0.413	-0.403

(U)Schedule:
Not Applicable

(U)Technical:

Not Applicable

R-1 SHOPPING LIST - Item No. 44

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: **February 2003**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603513N/Shipboard System Component Development	PROJECT NUMBER AND NAME 32465/DC/Survivability	

D. (U) OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2002	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	235.952	688.170	1037.987	1438.998	1708.398	1320.320	901.070	595.107	CONT.	CONT.
PE 211900 / SCN	0.000	0.000	0.000	0.000	1,842.142	1,409.086	2,297.603	3,549.907		

E. ACQUISITION STRATEGY:

F. (U) MAJOR PERFORMERS:

(U) Government Field Activities - NSWC Carderock

R-1 SHOPPING LIST - Item No. 44

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)								DATE: **February 2003**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**		PROGRAM ELEMENT 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 32465/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	WR	NSWC CD Bethesda, MD	7.868	4.841	11/02	6.515	12/03	6.268	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	4.841		6.515		6.268		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 2003**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0603513N/Shipboard System Component Development			PROJECT NUMBER AND NAME 32465/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	WR	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)												
SBIR Assessment												
Subtotal Management			0.075	0.824		0.000		0.000		0.000	0.899	
Remarks:												
Total Cost			14.694	5.665		6.515		6.268		CONT	CONT	
Remarks:												

R-1 SHOPPING LIST - Item No. 44

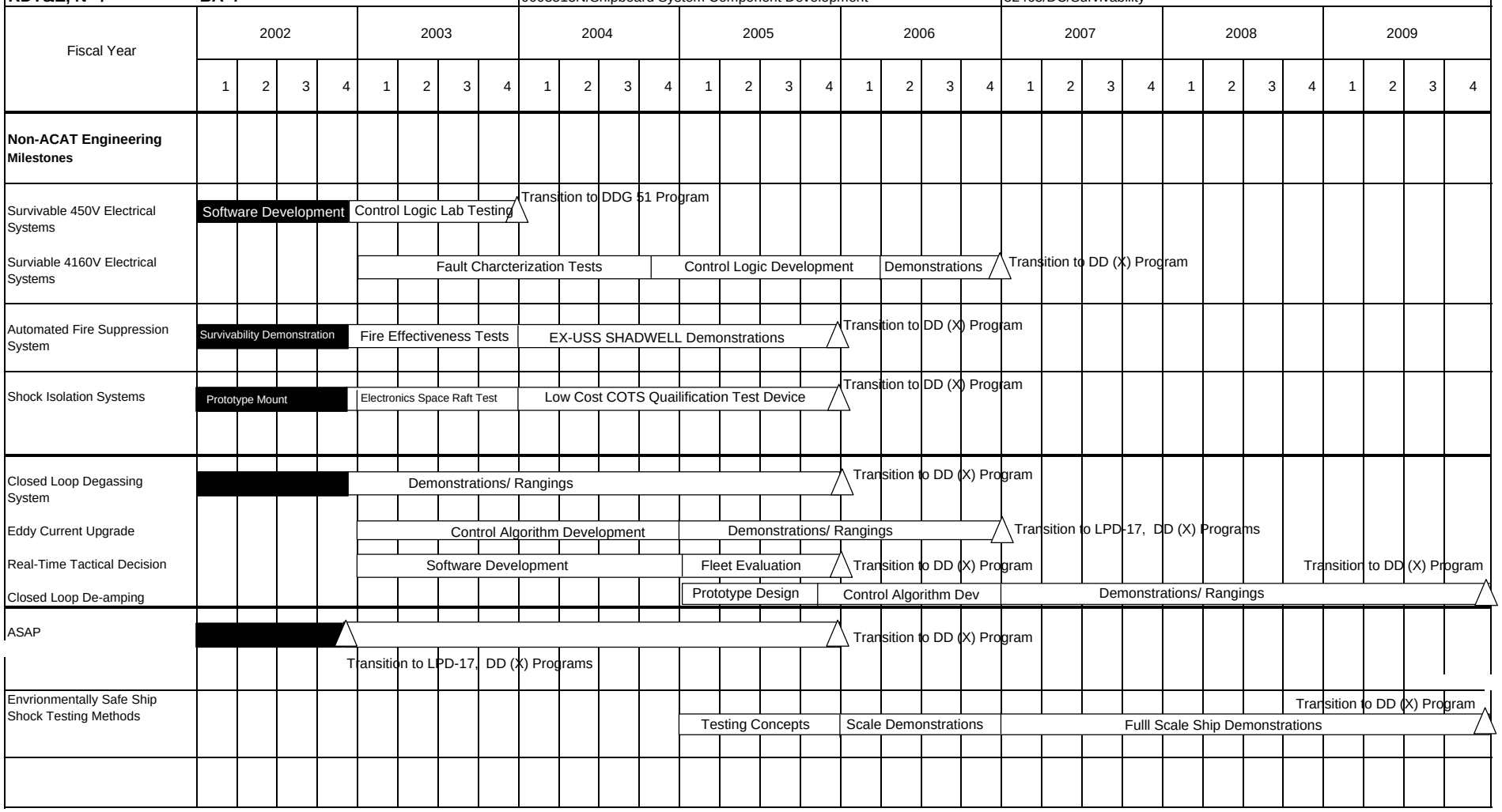
CLASSIFICATION:

EXHIBIT R4, Schedule Profile — DATE: **February 2003**

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

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

PROJECT NUMBER AND NAME: 32465/DC/Survivability



R-1 SHOPPING LIST - Item No. 44

CLASSIFICATION:

Exhibit R-4a, Schedule Detail					DATE: February 200anuary 2003			
APPROPRIATION/BUDGET ACTIVITY **RDT&BA-4**	PROGRAM ELEMENT 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 32465/DC/Survivability			
Schedule Profile	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Survivable 450 Volt Software Development Plan	4Q							
450 Volt Electrical Control Logic		3Q						
4160 Fault Characterization Tests			4Q					
4160 Volt Electrical Control Logic				4Q				
4160 Volt System Level Live Ordnance Demonstrations					4Q			
Automated Fire Suppression Piping Architecture Demo		2Q						
Fire Suppression Effectiveness Lab Demonstrations		4Q						
EX-USS SHADWELL Demonstrations			4Q	3Q				
Ultra Low G Shock Mount	4Q							
Electronics Space Raft Test		4Q						
Low Cost COTS Qualification Test Devices				4Q				
Closed Loop Degaussing Rangings	2Q	2Q	2Q-4Q					
Eddy Current Compensation Control Algorithm			4Q					
Eddy Current Demonstrations				4Q	4Q			
Tactical Decsion Aid Prototype			4Q					
De-Amping System Prototype Design				4Q				
De-Amping System Control Algorithm					4Q			
De-Amping System Prototype Installation						4Q		
De-Amping System Demonstrations							2Q-4Q	2Q
ASAP Crew Casualty and Electrical Models		4Q						
ASAP V&V			4Q					
ASAP Recoverability/ New Weapons Effects models				4Q				
Envrionmentally Safe Ship Shock Testing Concepts				4Q				
Alternative Test Method Scale Demonstrations					2Q-4Q			
Full Scale Ship Shock Demonstrations						4Q	2Q	2Q

R-1 SHOPPING LIST - Item No. 44

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **February 2003**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 32467/AGS-Advanced Gun System			
COST ($ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost	**130.767**	**105.791**	**0.000***	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
RDT&E Articles Qty	**0**	**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 34009.

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 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N /BA-4	0603513N/Shipboard System Component Development	32467/AGS-Advanced Gun System

B. Accomplishments/Planned Program

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	26.635	24.359	0.000	0.000
RDT&E Articles Quantity	0	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 34009.

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	51.269	59.607	0.000	0.000
RDT&E Articles Quantity	0	2	0	0

(U) Commenced EDM fabrication for Gun, magazine, and Control system. In FY04 and out, funding was reprogrammed to PE 0604300N, Project 34009.

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	34.237	9.475	0.000	0.000
RDT&E Articles Quantity	0	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 34009.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N /BA-4	0603513N/Shipboard System Component Development	32467/AGS-Advanced Gun System

B. Accomplishments/Planned Program (Cont.)

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	15.926	0.000	0.000	0.000
RDT&E Articles Quantity	0	0	0	0

(U) Validated and verified the suitability and effectiveness of Validation & Verification (V&V) tools for AGS and AGS munitions. In FY04 and out, funding was reprogrammed to PE 0604300N, Project 34009.

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	2.700	0.000	0.000	0.000
RDT&E Articles Quantity	0	0	0	0

(U) Continued EDM test fixture development. In FY04 and out, funding was reprogrammed to PE 0604300N, Project 34009.

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.000	12.350	0.000	0.000
RDT&E Articles Quantity	0	0	0	0

Initiate LRLAP EDM Development and Testing. In FY04 and out, funding was reprogrammed to PE 0604300N, Project 34009.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	32467/AGS-Advanced Gun System

C. (U)PROGRAM CHANGE SUMMARY:

(U)Funding:	FY 2002	FY 2003	FY 2004	FY 2005
Previous President's Budget: (FY 03 Pres Controls)	139.031	108.184	52.158	47.736
Current BES/President's Budget: (FY04 Pres Controls)	130.767	105.791	0.000	0.000
Total Adjustments	-8.264	-2.393	-52.158	-47.736
(U)Summary of Adjustments				
Congressional program reductions				
Congressional undistributed reductions	-0.982	-0.631		
Congressional rescissions				
POM-04 realignment from DD(X) BA-4 budget to BA-5			-52.158	-47.736
FFRDC Reduction	-0.025	-0.007		
SBIR/STTR Transfer	-5.446			
Economic Assumptions	-0.367	-0.607		
Reprogrammings	-1.000			
Miscellaneous Minor Adjustments	-0.444	-1.148		
Subtotal	-8.264	-2.393	-52.158	-47.736

(U) Schedule:

Not Applicable

(U)Technical:

Not Applicable

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	32467/AGS-Advanced Gun System

D. (U) PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2002	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	235.952	688.170	1037.987	1438.998	1708.398	1320.320	901.070	595.107	CONT.	CONT.
PE 211900 / SCN	0.000	0.000	0.000	0.000	1,842.142	1,409.086	2,297.603	3,549.907		

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:

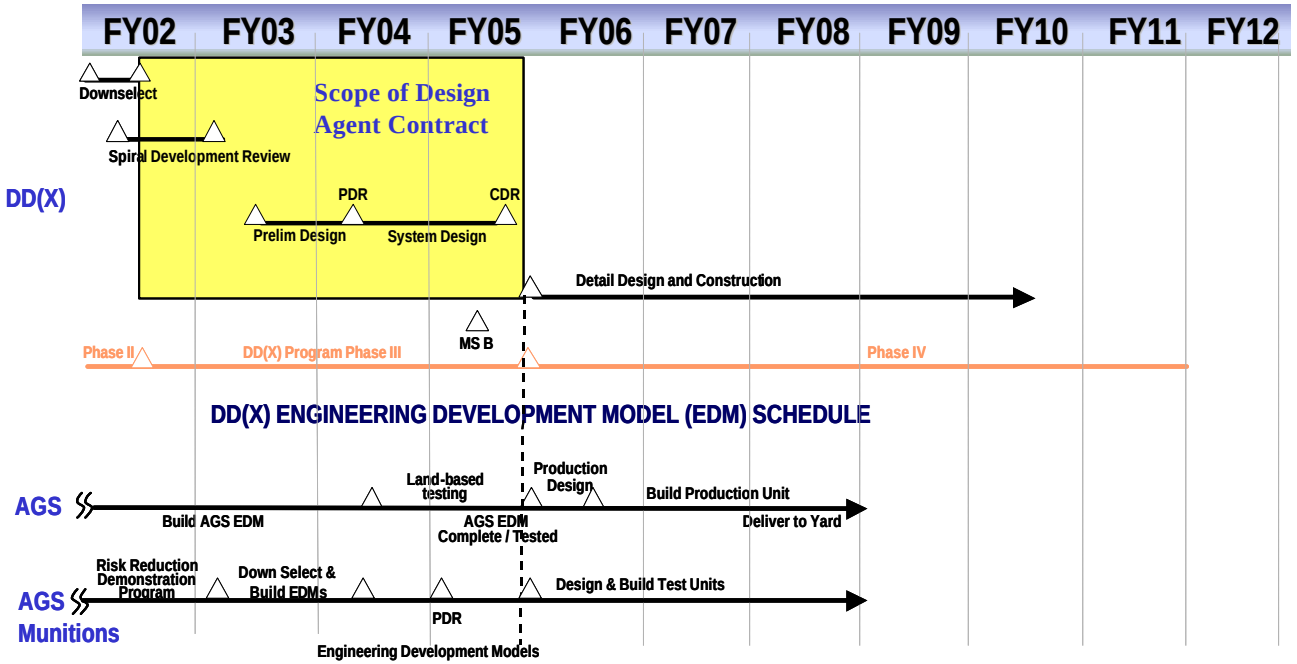
Exhibit R-3 Cost Analysis (page 1)								DATE: **February 2003**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**		PROGRAM ELEMENT 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 32467/AGS-Advanced Gun System						
Cost Categories	Contract Method & Type	Performing Activity & 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	97.115	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	97.115		0.000		0.000		CONT	CONT	
Remarks: FY04 and out fund for this effort was reprogrammed to PE 0604300N, AGS Project 34009.												
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 2003**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0603513N/Shipboard System Component Development			PROJECT NUMBER AND NAME 32467/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	0.500	Various					CONT	CONT	
Government Engineering Support	WR	NSWC DD Dahlgren, VA	11.478	3.000	10/02					CONT	CONT	
	WR	NSWC PHD Pt. Hueneme, CA	5.342	1.514	10/02					CONT	CONT	
	WR	Other Gov't Activities	8.629	2.662	Various					CONT	CONT	
Program Management Support												
Travel												
Labor (Research Personnel)												
SBIR Assessment												
Subtotal Management			29.669	8.676		0.000		0.000		CONT	CONT	
Remarks: For FY 2004 and out, this effort was reprogrammed to PE 0604300N, Project 34009. See those exhibits for FY04 and FY05 data.												
Total Cost			269.446	105.791		0.000		0.000		CONT	CONT	
Remarks:												

CLASSIFICATION:

EXHIBIT R4, Schedule Profile		DATE: February 2003
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603513N/Shipboard System Component Development	PROJECT NUMBER AND NAME 32467/AGS-Advanced Gun System



CLASSIFICATION:

Exhibit R-4a, Schedule Detail						DATE: **February 2003**		
APPROPRIATION/BUDGET ACTIVITY **RDT&BA-4**	PROGRAM ELEMENT 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 32467/AGS-Advanced Gun System			
Schedule Profile	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
DD(X) Design/Development Contract Award	3Q							
System Design and Development	1Q-4Q	1Q-4Q	1Q-4Q					
Preliminary Design Review			2Q-3Q					
Milestone B				3Q				
Lead Ship Award				3Q				
Critical Design Review				4Q				
Detail Design and Construction				4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Developmental Testing (DT-IIB1)				4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Developmental Testing (DT-IIB2)								3Q-4Q

R-1 SHOPPING LIST - Item No. 44

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **February 2003**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603513N/Shipboard Sys Component Development				PROJECT NUMBER AND NAME 32468/Undersea Warfare			
COST ($ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost	**24.505**	**20.093**	**1.435**	**1.684**	**4.207**	**2.002**	**0.000**	**0.000**
RDT&E Articles Qty	**0**	**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 defence 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 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N /BA-4	0603513N/Shipboard System Component Development	32468/Undersea Warfare

B. Accomplishments/Planned Program

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	4.877	5.860	0.374	0.472
RDT&E Articles Quantity	0	0	0	0

(U) IUSW-21 Risk reduction contracts/tasks - Completed integration of FY99 Broad Agency Announcements (BAAs) into the ADM. Awarded DD(X) Design Agent (DA) contract to support the build-test-build process and the FY04 sea test. 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, begin integration of risk reduction tasks to support the build -test-build process and the FY 04 sea test; 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 to support the build-test-build process and the FY 04 sea test. In FY 05, complete integration of risk reduction tasks into the ADM to support the build-test-build process and the FY 07 sea test.

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	15.026	10.634	0.736	0.840
RDT&E Articles Quantity	0	0	0	0

(U) IUSW-21 ADM Development - Performed Integrated Peer Group (IPG) engineering reviews of IUSW-21 advanced technologies. Finished the development and integration of IUSW-21 advanced technologies into ADM demonstration system for FY02 sea test. For FY 03, continue the development and integration of IUSW-21 advanced technologies for the FY04 sea test. 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 demonstration system for FY05 sea test. In FY 05, complete the development and integration of IUSW-21 advanced technologies into ADM demonstration system for FY07 sea test. Continue to perform IPT engineering reviews of IUSW-21 advanced technologies.

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	4.602	3.599	0.325	0.372
RDT&E Articles Quantity	0	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, remove and transport equipment, refurbish ship, perform data analysis, and begin planning for FY04 sea tests. In FY 04, complete equipment preparation for FY 04 sea test. Ship equipment, conduct FY 04 sea test, collect data and begin data analysis. In FY 05, complete equipment preparation for FY 05 sea test. Ship and install equipment, conduct FY 05 sea test and collect data.

R-1 SHOPPING LIST - Item No. 44

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	32468/Undersea Warfare

C. (U)PROGRAM CHANGE SUMMARY:

(U)Funding:	FY 2002	FY 2003	FY 2004	FY 2005
Previous President's Budget: (FY 03 Pres Controls)	25.315	20.546	16.812	13.764
Current BES/President's Budget: (FY04 Pres Controls)	24.505	20.093	1.435	1.684
Total Adjustments	-0.810	-0.453	-15.377	-12.080
(U)Summary of Adjustments				
Congressional program reductions				
Congressional undistributed reductions	-0.181	-0.120		
Congressional rescissions				
POM-04 realignment from DD(X) BA-4 budget to BA-5			-15.300	-12.000
SBIR/STTR Transfer	-0.860			
Economic Assumptions	-0.067	-0.115		
Reprogrammings				
Miscellaneous Minor Adjustments	0.298	-0.218	-0.077	-0.080
Subtotal	-0.810	-0.453	-15.377	-12.080

(U)Schedule:

Not Applicable

(U)Technical:

Not Applicable

R-1 SHOPPING LIST - Item No. 44

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	32468/Undersea Warfare

D. (U) OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2002	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	235.952	688.170	1037.987	1438.998	1708.398	1320.320	901.070	595.107	CONT.	CONT.
PE 211900 / SCN	0.000	0.000	0.000	0.000	1,842.142	1,409.086	2,297.603	3,549.907		

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 development for the FY04 and FY05 sea tests will be with the DD(X) Design Agent.

F. (U)MAJOR PERFORMERS:

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

R-1 SHOPPING LIST - Item No. 44

CLASSIFICATION:

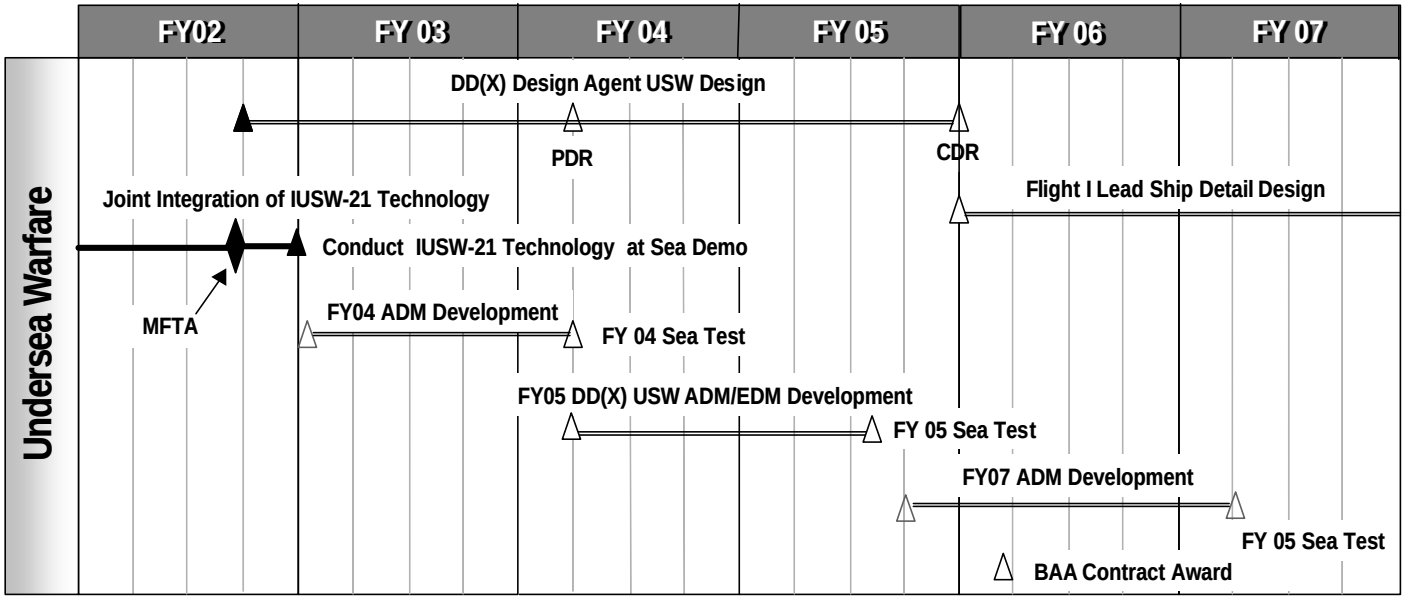
Exhibit R-3 Cost Analysis (page 1)								DATE: **February 2003**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**		PROGRAM ELEMENT 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 32468/Undersea Warfare						
Cost Categories	Contract Method & Type	Performing Activity & 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	4.260	1QFY03	0.000	N/A	0.000	N/A	CONT	CONT	
	BAA/CPF	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	
	WR	Other Gov't Activities	0.000	1.000	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	5.860		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	
	WR	Other Gov't Activities	0.000	1.000	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	7.000		0.000		0.000		CONT	CONT	
Remarks:												

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)								DATE: **February 2003**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0603513N/Shipboard System Component Development			PROJECT NUMBER AND NAME 32468/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	WR	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	0.325	Various	0.372	Various	CONT	CONT	
Operational Test & Evaluation												
Test Assets												
Tooling												
GFE												
Award Fees												
Subtotal T&E			6.668	3.599		0.325		0.372		CONT	CONT	
Remarks:												
Contractor Engineering Support											0.000	
Government Engineering Support	WR	Other Gov't Activities	1.631	0.725	Various	0.237	1QFY04	0.293	1QFY05	CONT	CONT	
	SS/CPFF	NUWC/N Newport, RI	4.415	1.624	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	0.225	12/02	0.125	1QFY04	0.111	1QFY05	CONT	CONT	
	PD/WR	Other Gov't Activities	0.091	0.760	Various	0.000	N/A	0.000	N/A	CONT	CONT	
Travel												
Labor (Research Personnel)												
SBIR Assessment												
Subtotal Management			10.282	3.634		0.736		0.840		CONT	CONT	
Remarks:												
Total Cost			69.775	20.093		1.435		1.684		CONT	CONT	
Remarks:												

CLASSIFICATION:

EXHIBIT R4, Schedule Profile		DATE: February 2003
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	32468/Undersea Warfare



CLASSIFICATION:

Exhibit R-4a, Schedule Detail						DATE: **February 2003**		
APPROPRIATION/BUDGET ACTIVITY **RDT&BA-4**	PROGRAM ELEMENT 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 32468/Undersea Warfare			
Schedule Profile	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
FY02 ADM Sea Test	4Q	1Q						
FY04 ADM Development		1Q-4Q	1Q					
FY04 ADM Sea Test			2Q					
DD(X) Preliminary Design Review (PDR)			2Q-3Q					
FY05 DD(X) USW ADM/EDM Development			2Q-4Q	1Q-2Q				
FY05 DD(X) USW ADM/EDM Sea Test				3Q				
DD(X) Critical Design Review (CDR)				4Q				
FY07 ADM Development				4Q	1Q-4Q			
BAA Contract Award					1Q			
FY07 ADM Sea Test						1Q		
FY07 ADM Sea Test Data Analysis						2Q-4Q		

R-1 SHOPPING LIST - Item No. 44

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: 4	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603513N/Shipboard Sys Component				PROJECT NUMBER AND NAME 32469/Open Systems Architecture (OSA)			
COST ($ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost	**5.391**	**4.499**	**3.765**	**3.504**	**2.571**	**2.070**	**2.103**	**2.137**
RDT&E Articles Qty	**0**	**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 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N /BA-4	0603513N/Shipboard System Component Development	32469/Open Systems Architecture (OSA)

B. Accomplishments/Planned Program

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	1.953	1.126	0.960	0.956
RDT&E Articles Quantity	0	0	0	0

(U) Open Systems Architecture - Common Family of Ships (FOS) Business/Technical Architecture and Technology Management: FY02: Spiral Design Reviewed (SDR) and drafted business architecture for common FOS Architectures, Interfaces and Modular Systems (AIMS) implementation and DD(X) Family of Ships (FOS) with Technology Management (TM)--projections of technology, operational and technical architectures, regulatory, market and cost drivers, benchmarking and market research--initial plans and database. FY03: Common AIMS / Modularity assessments for FOS / SDR 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 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	2.302	1.806	2.613	2.548
RDT&E Articles Quantity	0	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, FY02-3: Concept development, FY04-05: Architecture development, FY05: Interface development.
The following two efforts are subsets of the C&C Zone:
1. Open C4ISR Zone, FY02: Open Foundation interface, FY02-03: Foundation Interface promulgation and HVAC Interface development, FY02-3: HVAC Interface refinement and promulgation
2. Open C&C Zone Sensor/Network and Supply, Maintenance and Monitoring Open Architecture (SMMOA) Interfaces, FY02: Developed preliminary concepts, FY02-3: risk reduction with demonstrators and industry and Navy outreach, FY03-4: Interface concepts, FY04-5: Interfaces.
B. Open Offboard Vehicle Zone, FY02: Developed preliminary Concepts, FY02-3: 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 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.670	0.877	0.000	0.000
RDT&E Articles Quantity	0	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, validate static and dynamic models of molten carbonate SSFC.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N /BA-4	0603513N/Shipboard System Component Development	32469/Open System Architecture (OSA)

B. Accomplishments/Planned Program (Cont.)

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.267	0.345	0.000	0.000
RDT&E Articles Quantity	0	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, complete preliminary testing of the Smart Tow System. Evaluate inspection/diagnostic techniques and document protocol for inspecting Shaft Coating Systems underwater.

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.199	0.345	0.192	0.000
RDT&E Articles Quantity	0	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.

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.000	0.000	0.000	0.000
RDT&E Articles Quantity	0	0	0	0

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	32469/Open Systems Architecture (OSA)

C. (U) PROGRAM CHANGE SUMMARY:

(U)Funding:	FY 2002	FY 2003	FY 2004	FY 2005
Previous President's Budget: (FY 03 Pres Controls)	5.556	4.600	3.945	3.656
Current BES/President's Budget: (FY04 Pres Controls)	5.391	4.499	3.765	3.504
Total Adjustments	-0.165	-0.101	-0.180	-0.152
(U)Summary of Adjustments				
Congressional program reductions				
Congressional undistributed reductions	-0.025	-0.026		
Congressional rescissions				
SBIR/STTR Transfer	-0.126			
Economic Assumptions	-0.015	-0.026		
Reprogrammings				
Miscellaneous Minor Adjustments	0.001	-0.049	-0.180	-0.152
Subtotal	-0.165	-0.101	-0.180	-0.152

(U)Schedule:

Not Applicable

(U)Technical:

Not Applicable

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	32469/Open Systems Architecture (OSA)

D. (U) OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2002	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	235.952	688.170	1037.987	1438.998	1708.398	1320.320	901.070	595.107	CONT.	CONT.
PE 211900 / SCN	0.000	0.000	0.000	0.000	1,842.142	1,409.086	2,297.603	3,549.907		

E. ACQUISITION STRATEGY:

F. (U)MAJOR PERFORMERS:

Government Field Activities- NSWC Carderock and NSWC Dahlgren

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)								DATE: **February 2003**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**		PROGRAM ELEMENT 0603513N/Shipboard System Component Development			PROJECT NUMBER AND NAME 32469/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
Survivability												
Primary Hardware Development	845/804	DD(X) Industry Teams	22.777	0.000	N/A	0.000	N/A	0.000	N/A	0.000	22.777	
	WR	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			40.522	0.000		0.000		0.000		0.000	40.522	
Remarks:												
Architecture, Interfaces & Modular Systems (AIMS)												
Engineering Dev, Demo & Eval	845/804	DD(X) Industry Teams	12.550	0.000	N/A	0.000	N/A	0.000	N/A	0.000	12.550	
	Various	Other Gov't Activities	14.733	1.818	Various	2.200	Various	1.900	Various	CONT	CONT	
	Various	Other Contractors	5.870	1.114	Various	1.373	Various	1.604	Various	CONT	CONT	
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			33.153	2.932		3.573		3.504		CONT	CONT	
Remarks:												

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)								DATE: **February 2003**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**		PROGRAM ELEMENT 0603513N/Shipboard System Component Development			PROJECT NUMBER AND NAME 32469/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:												
Fleet Focused Initiatives												
Contractor Engineering Support	Various	Other Contractors	1.340	0.345	Various	0.000	N/A	0.000	N/A	0.000	1.685	
Government Engineering Support	WR	NSWC CD Philadelphia, PA	2.556	1.222	Various	0.192	10/03	0.000	N/A	0.000	3.970	
	Various	Other Gov't Activities	13.995	0.000	N/A	0.000	N/A	0.000	N/A	0.000	14.104	
Program Management Support											0.000	
Travel											0.000	
Labor (Research Personnel)											0.000	
SBIR Assessment											0.000	
Subtotal Management			17.891	1.567		0.192		0.000		0.000	19.650	
Remarks:												
Total Cost			91.566	4.499		3.765		3.504		CONT	CONT	
Remarks:												

R-1 SHOPPING LIST - Item No. 44

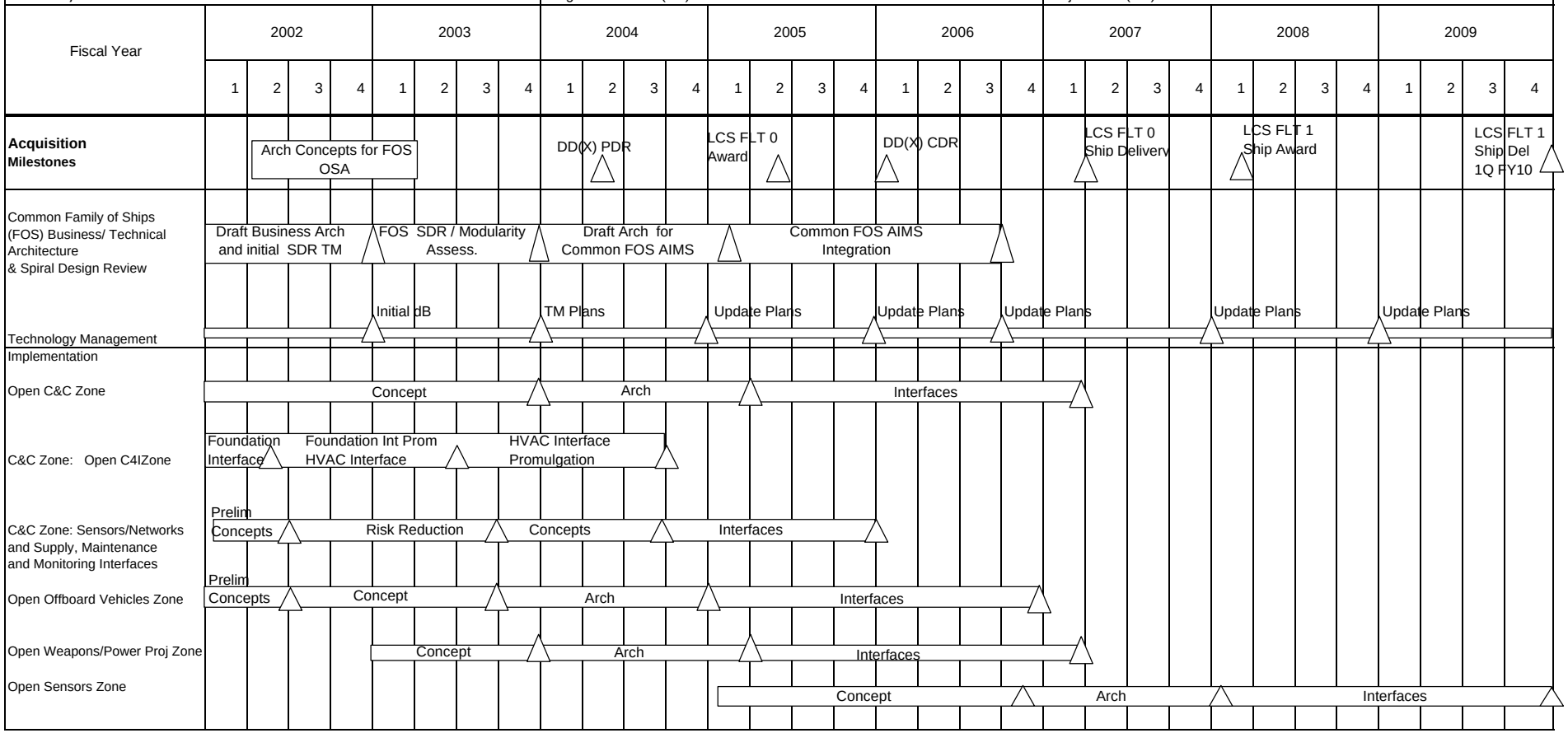
CLASSIFICATION:

EXHIBIT R4, Schedule Profile | DATE: **February 2003**

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

PROGRAM ELEMENT NUMBER AND NAME: Program Element (PE) No. and Name

PROJECT NUMBER AND NAME: Project Unit (PU) No. and Name



R-1 SHOPPING LIST - Item No. 44

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

CLASSIFICATION:

Exhibit R-4a, Schedule Detail						DATE: **February 2003**		
APPROPRIATION/BUDGET ACTIVITY **RDT&BA-4**	PROGRAM ELEMENT PE 0603513N Shipboard Sys Component Development				PROJECT NUMBER AND NAME 32469/ Open Systems Architecture (OSA)			
Schedule Profile	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Business/Technical Architecture								
Draft Business Arch and initial SDR TM Complete	4Q							
FOS SDR / Modularity Assessment complete			1Q					
Draft Architecture for Common FOS AIMS Complete				1Q				
Common FOS AIMS Modularity Integration Complete					3Q			
Technology Management								
Initial Database Complete	4Q							
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 Interface Development	2Q							
Open C4I Zone Foundation Promulgation		2Q						
Open C4I Zone HVAC Interface Defined		4Q						
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

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **February 2003**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603513N/Shipboard Sys Component				PROJECT NUMBER AND NAME 32470/Integrated Topside Design (ITD)			
COST ($ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost	**5.239**	**4.129**	**3.711**	**3.638**	**2.823**	**0.873**	**0.874**	**0.884**
RDT&E Articles Qty	**0**	**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 electromatgnetic 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 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	32470/Integrated Topside Design (ITD)

B. Accomplishments/Planned Program

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	1.045	1.387	1.560	1.534
RDT&E Articles Quantity	0	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 deveopment, enhancement, validation and verification of topside signature control and electronic warfare effectiveness for Materials & Signature (M&S) tools.

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	3.532	1.395	1.551	1.530
RDT&E Articles Quantity	0	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 Eelectro Magnetic Engineering (EME) Materials & Signature tools.

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.662	0.887	0.000	0.000
RDT&E Articles Quantity	0	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 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N /BA-4	0603513N/Shipboard System Component Development	32470/Integrated Topside Design (ITD)

B. Accomplishments/Planned Program

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.000	0.460	0.600	0.574
RDT&E Articles Quantity	0	0	0	0

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

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost				
RDT&E Articles Quantity	0	0	0	0

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost				
RDT&E Articles Quantity	0	0	0	0

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	32470/Integrated Topside Design (ITD)

C.(U) PROGRAM CHANGE SUMMARY:

(U)Funding:	FY 2002	FY 2003	FY 2004	FY 2005
Previous President's Budget: (FY 03 Pres Controls)	5.348	4.224	3.886	3.795
Current BES/President's Budget: (FY04 Pres Controls)	5.239	4.129	3.711	3.638
Total Adjustments	-0.109	-0.095	-0.175	-0.157
(U)Summary of Adjustments				
Congressional program reductions				
Congressional undistributed reductions	-0.039	-0.026		
Congressional rescissions				
SBIR/STTR Transfer	-0.050			
Economic Assumptions	-0.015	-0.024		
Reprogrammings				
Miscellaneous Minor Adjustments	-0.005	-0.045	-0.175	-0.157
Subtotal	-0.109	-0.095	-0.175	-0.157

(U)Schedule:

Not Applicable

(U)Technical:

Not Applicable

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / B4	0603513N/Shipboard System Component Development	32470/Integrated Topside Design (ITD)

D. (U)OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2002	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	235.952	688.170	1037.987	1438.998	1708.398	1320.320	901.070	595.107	CONT.	CONT.
PE 211900 / SCN	0.000	0.000	0.000	0.000	1,842.142	1,409.086	2,297.603	3,549.907		

E. ACQUISITION STRATEGY:

F. (U) MAJOR PERFORMERS:

Government Field Activities-NRL Washington DC, NSWC Carderock, SPAWAR Systems Center San Diego.

R-1 SHOPPING LIST - Item No. 44

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)								DATE: **February 2003**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**		PROGRAM ELEMENT 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 32470/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			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	
Remarks:												

R-1 SHOPPING LIST - Item No. 44

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)								DATE: **February 2003**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0603513N/Shipboard System Component Development			PROJECT NUMBER AND NAME 32470/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	Various	Other Contractors	3.408	0.060	Various	0.048	Various	0.041	Various	CONT	CONT	
Government Engineering Support	WR	NSWC CD Bethesda, MD	1.414	0.000	0.000	0.000	N/A	0.000	N/A	CONT	CONT	
	WR	SSCSD, San Diego, CA	1.566	0.000	0.000	0.000	N/A	0.000	N/A	CONT	CONT	
	Various	Other Gov't Activities	20.823	4.069	Various	3.663	Various	3.597	Various	CONT	CONT	
Program Management Support											0.000	
Travel											0.000	
Labor (Research Personnel)											0.000	
SBIR Assessment											0.000	
Subtotal Management			27.211	4.129		3.711		3.638		CONT	CONT	
Remarks:												
Total Cost			51.767	4.129		3.711		3.638		CONT	CONT	
Remarks:												

CLASSIFICATION:

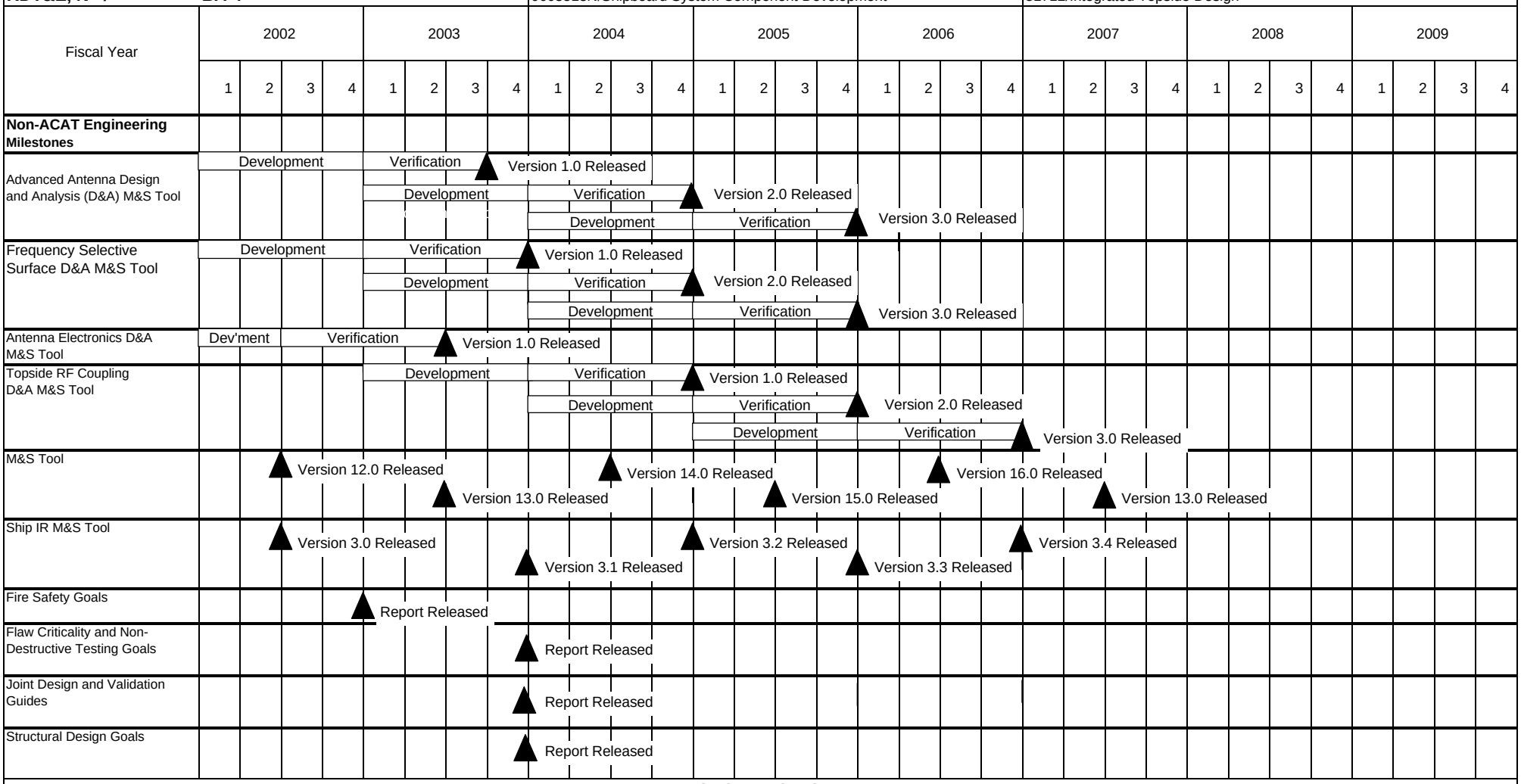
EXHIBIT R4, Schedule Profile

DATE: **February 2003**

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

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

PROJECT NUMBER AND NAME: 51712/Integrated Topside Design



R-1 SHOPPING LIST - Item No. 44

CLASSIFICATION:

Exhibit R-4a, Schedule Detail						DATE: February 2003		
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT				PROJECT NUMBER AND NAME			
RDT&E BA-4	0603513N/Shipboard System Component Dev				51712/Integrated Topside Design			
Schedule Profile	FY 2002	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			3Q					
Version 3.0 Released				3Q				
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			3Q					
Version 2.0 Released				4Q				
Version 3.0 Released					4Q			
Electronic Warfare Effectiveness and Topside Signatures								
Radar Target Signature M&S Tool								
Version 12.0 Released	2Q							
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 3.0 Released	3Q							
Version 3.1 Released		4Q						
Version 3.2 Released			4Q					
Version 3.3 Released				4Q				
Version 3.4 Released					4Q			
Composite Materials								
Fire Safety Goals	Q4							
Flaw Criticality and Non Destructive Testing Goals		Q4						
Joint Design and Validation Guide		Q4						
Structural Design Goals			Q2					
R-1 SHOPPING LIST - Item No. 44								

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **February 2003**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603513N/Shipboard Sys Component				PROJECT NUMBER AND NAME 32471/Integrated Power Systems			
COST ($ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost	**100.910**	**97.559**	**5.005**	**4.157**	**9.796**	**9.607**	**9.699**	**9.866**
RDT&E Articles Qty	**0**	**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 34010.

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 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N /BA-4	0603513N/Shipboard System Component Development	32471/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 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N /BA-4	0603513N/Shipboard System Component Development	32471/Integrated Power Systems

B. Accomplishments/Planned Program

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	23.145	2.612	1.500	1.000
RDT&E Articles Quantity	0	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 JCC (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 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	72.500	82.000	0.000	0.000
RDT&E Articles Quantity	0	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 34010. 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 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N /BA-4	0603513N/Shipboard System Component Development	32471/Integrated Power Systems

B. Accomplishments/Planned Program

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	5.265	12.947	3.505	3.157
RDT&E Articles Quantity	0	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 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	32471/Integrated Power Systems

C. PROGRAM CHANGE SUMMARY:

Funding:	FY 2002	FY 2003	FY 2004	FY 2005
Previous President's Budget: (FY 03 Pres Controls)	105.577	99.765	79.889	65.902
Current BES/President's Budget: (FY04/05 OSD/OMB Controls)	100.910	97.559	5.005	4.157
Total Adjustments	-4.667	-2.206	-74.884	-61.745
Summary of Adjustments				
Congressional program reductions				
Congressional undistributed reductions	-0.754	-0.589		
Congressional rescissions				
SBIR/STTR Transfer	-4.177			
Economic Assumptions	-0.279	-0.559		
POM-04 realignment from DD(X) BA-4 budget to BA-5			-74.700	-61.600
Navy Undistributed Adjustments				
Miscellaneous Minor Adjustments	0.543	-1.058	-0.184	-0.145
Subtotal	-4.667	-2.206	-74.884	-61.745

Schedule:

Not Applicable

Technical:

Not Applicable

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603513N/Shipboard System Component Development	32471/Integrated Power Systems

D. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2002	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	235.952	688.170	1037.987	1438.998	1708.398	1320.320	901.070	595.107	CONT.	CONT.
PE 211900 / SCN	0.000	0.000	0.000	0.000	1,842.142	1,409.086	2,297.603	3,549.907		

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. 44

Exhibit R-3 Cost Analysis (page 1)										DATE: February 2003		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**		PROGRAM ELEMENT 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 32471/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	
	Sec845/8(	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	
	Sec845/8(	IFTP Teams	39.885	12.859	10/02	3.505	10/03	3.157	10/04	CONT	CONT	
	US/UK M(	DERA, UK	1.350	0.000	N/A	0.000	N/A	0.000	N/A	CONT	CONT	
	WR	NSWCCD Philadelphia, PA	23.005	1.150	10/02	0.550	10/03	0.300	10/04	CONT	CONT	
	WR	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	10/02	0.000	10/03	0.000	10/04	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	96.459		4.455		3.632		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	
Remarks:												

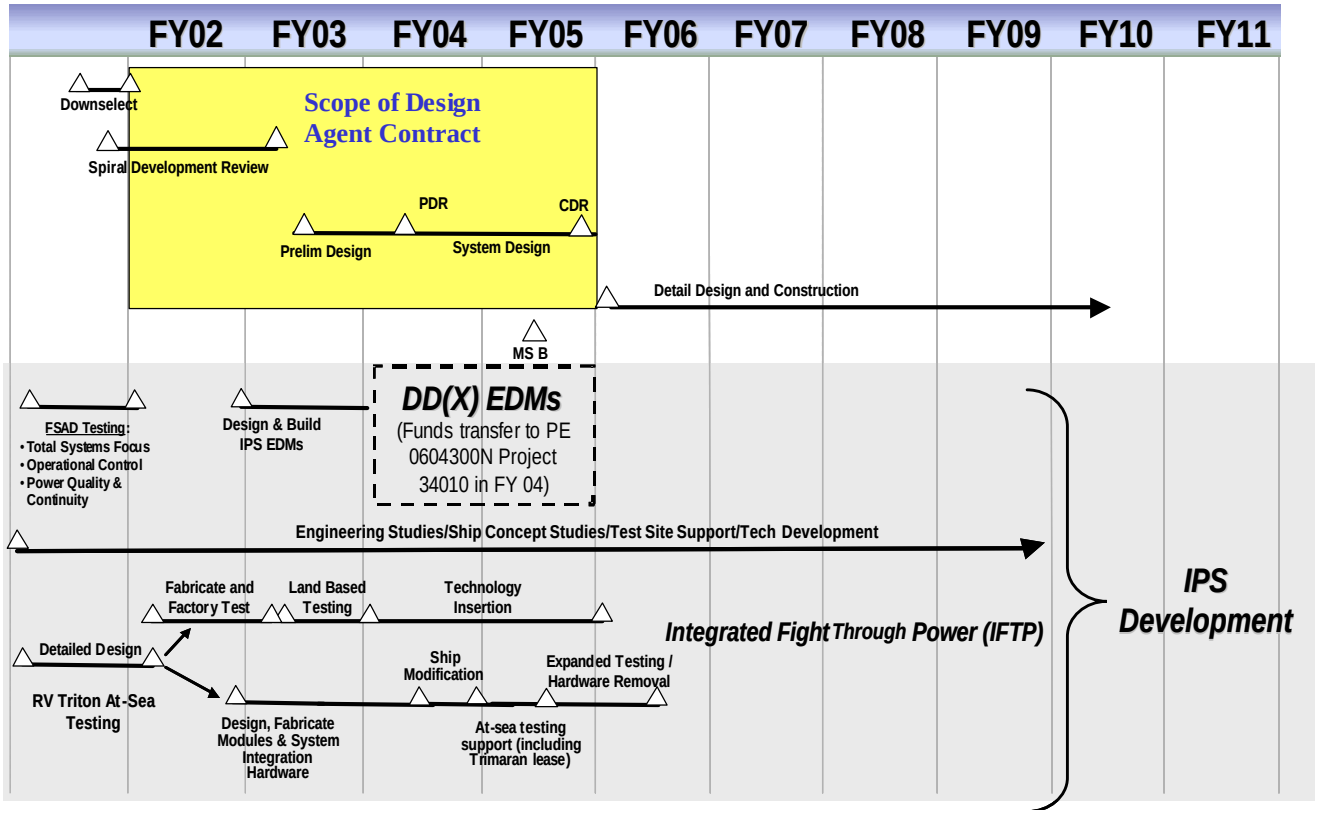
CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)								DATE: **February 2003**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**		PROGRAM ELEMENT 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 32471/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	WR	NSWC CD Philadelphia, PA	16.576	1.000	10/02	0.500	10/03	0.500	10/04	CONT	CON	
Operational Test & Evaluation												
Test Assets												
Tooling												
GFE												
Award Fees												
Subtotal T&E			16.576	1.000		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	0.100	10/02	0.050	10/03	0.025	10/04	CONT	CONT	
Labor (Research Personnel)											0.000	
SBIR Assessment											0.000	
Subtotal Management			0.524	0.100		0.050		0.025		CONT	CONT	
Remarks:												
Total Cost			258.274	97.559		5.005		4.157		CONT	CONT	
Remarks:												

R-1 SHOPPING LIST - Item No. 44

CLASSIFICATION:

EXHIBIT R4, Schedule Profile		DATE: **February 2003**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603513N/Shipboard System Component Development	PROJECT NUMBER AND NAME 32471/Integrated Power Systems



CLASSIFICATION:

Exhibit R-4a, Schedule Detail						DATE: **February 2003**		
APPROPRIATION/BUDGET ACTIVITY **RDT&BA-4**	PROGRAM ELEMENT 0603513N/Shipboard System Component Development				PROJECT NUMBER AND NAME 32471/Integrated Power Systems			
Schedule Profile	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
IPS DD(X) EDMs								
Design & Build	4Q	1Q-4Q						
IPS IFTP Land Based								
Fabrication & Factory Testing	2Q-4Q	1Q						
Land Based Testing		2Q-4Q	1Q					
Technology Insertion			1Q-4Q	1Q-4Q	1Q			
IPS IFTP At Sea RV Triton								
Detailed Design	2Q							
Design, Fabrication & Integration	4Q	1Q-4Q	1Q-2Q					
Ship Modifications			3Q-4Q					
At sea testing			4Q	1Q-3Q				
Extended testing and hardware removal				3Q-4Q	1Q-3Q			
IPS Technology Insertions								
Engineering Studies					1Q-4Q	1Q	1Q-4Q	1Q-4Q
Ship Concept Studies					3Q-4Q	1Q-3Q		1Q-4Q
Test Site Support						4Q	1Q-3Q	
Technology Development							2Q-4Q	1Q-4Q

R-1 SHOPPING LIST - Item No. 44