EXHIBIT R-2, RDT&E Budget Item Justification						DATE: February 2002			
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-4**				R-1 ITEM NOMENCLATURE Shipboard System Component Development/0603513N					
COST ($ in Millions)	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Cost
Total PE Cost	**246.032**	**295.135**	**243.111**	**163.618**	**141.524**	**81.547**	**72.556**	**CONT.**	**CONT.**
DC/Survivability/32465	**(1) 0.000**	**(2) 4.991**	**5.792**	**6.928**	**6.671**	**4.569**	**2.488**	**CONT.**	**CONT.**
AGS-Advanced Gun System/32467	**96.297**	**139.031**	**108.184**	**52.158**	**47.736**	**47.878**	**47.995**	**CONT.**	**CONT.**
Undersea Warfare (USW)/32468	**20.058**	**25.315**	**20.546**	**16.812**	**13.764**	**13.342**	**8.977**	**CONT.**	**CONT.**
Open Systems Architecture (OSA)^3/32469	**21.017**	**(4) 5.556**	**4.600**	**3.945**	**3.656**	**2.704**	**2.200**	**CONT.**	**CONT.**
Integrated Topside Design (ITD)/32470	**15.775**	**(5) 5.348**	**4.224**	**3.886**	**3.795**	**2.969**	**0.987**	**CONT.**	**CONT.**
Integrated Power Systems (IPS)/32471	**84.874**	**105.577**	**99.765**	**79.889**	**65.902**	**10.085**	**9.909**	**CONT.**	**CONT.**
Man Overboard Indicator/32729	**1.250**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**1.250**
MTTC/IPI/32858	**6.761**	**5.947**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**12.708**
Automated Maintenance Environment/39038	**0.000**	**3.370**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**3.370**
Quantity of RDT&E Articles	**0**	**0**	***2/TBD**	**0**	**0**	**0**	**0**	**CONT.**	**CONT.**

Notes: (1) (U) In FY 2001, funding for this project is contained in PE 0604300N, DD (X) Total Ship Systems Engineering.
(2) (U) Funding for efforts directly related to DD (X) design and systems integration has been reprogrammed from this project to DD (X) Design (PE 0604300N, Project 32464) in FY 2002 and out. Funding for efforts supporting the development of DD (X) ship survivability and auxiliary systems has been reprogrammed to this project from Project 32469 in FY 2002 and out.
(3) Project formerly known as Consolidated Hull, Mechanical, and Electrical (HM&E).
(4) (U) Funding for efforts directly related to DD (X) design and systems integration has been reprogrammed from this project to DD (X) Design (PE 0604300N, Project 32464) in FY 2002 and out. Funding for efforts supporting the development of DD (X) ship survivability and auxiliary systems has been reprogrammed from this project to Project 32465 in FY 2002 and out.
(5) (U) Funding for efforts directly related to DD (X) design and systems integration has been reprogrammed from this project to PE 0604300N, Project 32464 in FY 2002 and out.

* (U) For explanation of Test Articles see Project 32467.

EXHIBIT R-2, RDT&E Budget Item Justification	DATE: February 2002
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-4**	R-1 ITEM NOMENCLATURE Shipboard System Component Development/0603513N

A. (U) Mission DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This Program Element (PE) was modified in FY 2000 and out to focus on DD (X) associated systems development. Specific DD (X) associated systems development efforts that were realigned under this PE include: the Advanced Gun Systems; Undersea Warfare; Integrated Topside Design; and Integrated Power Systems. In addition, a number of HM&E development tasks were incorporated into a the Open Systems Architecture Project (32469) focused on DD (X). In FY 2001, PEO (S) was provided funding to perform Manufacturing Technology (MANTECH) studies at the McConnellTechnology Transition Center, operated by Innovative Productivity, Inc. (MTTC/IPI). The funds will be used to establish the National Surface Treatment Center which will collect and disseminate surface coating systems application and performance data, qualify surface coating systems for military applications, and develop new coating systems. Funding was also provided to complete engineering, testing, and evaluation of commercial Man Overboard Indicator (MOBI)/Personal Tracking Monitoring System (PTMS) devices. In FY 02, Automated Maintenance Environment 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.

(U) In FY 2002 and out, DD (X) design and systems integration elements of Open Systems Architecture (Project 32469) and Integrated Topside Design (Project 32470) were reprogrammed to PE 0604300N, Project 32464. Also in FY 2002 and out, ship survivability and auxiliary system elements of Project 32469 were moved to Project 32465, and Project 32465 was reprogrammed to this PE. This PE focuses on the development of shipboard system components for the DD (X) Class of U. S. Navy surface combatants. The mission of the DD (X) class is to provide affordable and credible independent forward presence/deterrence and operate as an integral part of Naval, Joint, or Combined Maritime Forces. DD (X) will provide advanced land attack capability in support of the ground campaign and contribute to Naval, Joint, or Combined battlespace dominance in littoral operations. It will establish and maintain surface and sub-surface superiority, provide local air defense, and incorporate signature reduction to operate in all threat environments. DD (X) will have seamless Joint Interoperability to integrate all source information for battlespace awareness and weapons direction.

EXHIBIT R-2, RDT&E Budget Item Justification	DATE: February 2002
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-4**	R-1 ITEM NOMENCLATURE Shipboard System Component Development/0603513N

B. (U) PROGRAM CHANGE SUMMARY:

	FY 2001	FY 2002	FY 2003
(U) FY 2002 President's Budget:	256.065	288.382	
(U) Appropriated Value:	258.437	297.782	
(U) Adjustment's to FY 2002/2003 Appropriated Value/FY 2002 President's Budget:	-10.033	+6.753	
(U) FY 2003 President's Budget Submit:	246.032	295.135	243.111

(U) Funding:
The FY 2001 decrease of $10.033M is due to Small Business Innovative Research(SBIR) reductions (-$6.420M) and programmatic adjustments (-$3.613M). The FY 2002 increase of $6.753M is due to Congressional increases for the McConnell Technology Transfer Center (+$6.000M) and Automated Maintenance Environment (+$3.400M); Section 8123 Managment Reform Initiatives (-$2.633M); and minor adjustment (-$.014M).
(U) Schedule: See individual projects

(U) Technical Parameters: Technical parameters are contained in the DD (X) Operational Requirements Document (ORD) approved by JROC on 16 October 1997.

EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2002		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N/BA-4**	PROGRAM ELEMENT NAME AND NUMBER **Shipboard Sys Component Dev/0603513N**			PROJECT NAME AND NUMBER DC/Survivability/32465					
COST ($ in Millions)	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Cost
Project Cost	(1) **0.000**	(2) **4.991**	**5.792**	**6.928**	**6.671**	**4.569**	**2.488**	**CONT.**	**CONT.**
RDT&E Articles Qty	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**CONT.**	**CONT.**

Notes: (1) (U) In FY 2000 and 2001, funding for this project is contained in PE 0604300N, DD (X) Total Ship Systems Engineering, Project 32465.
(2) (U) Funding for efforts directly related to DD (X) design and systems integration has been reprogrammed from this project to DD (X) Design (PE 0604300N, Project 32464) in FY 2002 and out. Funding for efforts supporting the development of DD (X) ship survivability and auxiliary systems has been reprogrammed to this project from Open Systems Architecture (Project 32469) in FY 2002 and out.

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) damage tolerant structures that increase hull girder survival against close-in underwater explosions; 5) advanced damage control (DC) and auxiliary system architectures and control methods that enable automated isolation, reconfiguration and fire suppression actions after damage; 6) personnel protection devices that reduce stress and increase performance; and 7) portable firefighting devices that provide for remote operation with a minimally manned fire party.

1. (U) FY 2001 ACCOMPLISHMENTS:
- Budgeted in PE 0604300N, Project 32465.

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2002**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER
RDT&E, N/BA-4	**Shipboard Sys Component Dev/0603513N**	DC/Survivability/32465

2. (U) FY 2002 PLAN
- (U) ($1.500)-Initiate Spiral Design Study to assess surface combatant force capabilities and to conduct survivability assessments.
- (U) ($ 0.561) Continue development of survivable electrical system architectures/components that enable uninterrupted damage control operations and continued combat capability after damage. Develop hardware and software requirements for a fault-clearing device that rapidly isolates the damaged portion of the system preventing loss of power and darkened ship conditions. Prepare software development plan.
- (U) ($ 0.581) Initiate development of survivable automated firefighting systems including control methods, networks, piping architectures and suppression techniques that enable automated isolation, reconfiguration and fire suppression following damage. Initiate plans for demonstrating the survivability of a candidate automated fire suppression system architecture under realistic live ordnance and shipboard conditions.
- (U) ($ 0.400) Initiate development of electronics and machinery isolation systems (structural support raft and shock/acoustic mounts) that enable continued operation after close-in underwater explosion and provide for acoustic quieting. Develop an advanced shock and acoustic mount concept that provides for an ultra shock low environment ensuring a very high probability of equipment survival.
- (U) ($0.850) Continue demonstration of real-time, closed loop degaussing control system aboard USS Higgins, DDG 76. Deperm the USS Higgins and recalibrate the system for maintaining a low magnetic signature. Monitor stability of control algorithm/ system and conduct ranging. (This is a transition of effort from PE/Project 63513N/32469.)
- (U) ($ 0.609) Continue development of the ship survivability design modeling and simulation program, Advanced Survivability Assessment Program (ASAP). Complete development of crew casualty and electrical models. (This is a transition of effort from PE/Project 63513N/32469.)
- (U) ($0 .490) Close-out the composite pump development contract.

3. (U) FY 2003 PLAN
- (U) ($1.100) Continue development of survivable electrical system architectures/components. Develop control logic for rapidly isolating a fault and integrate software with commercial control system technology; conduct laboratory demonstration. Develop live ordnance test plan for evaluating performance against a broad range of attack (fault) scenarios.
- (U) ($1.100) Continue development of survivable automated fire fighting systems. Conduct live ordnance survivability demonstrations.

EXHIBIT R-2a, RDT&E Project Justification			DATE: **February 2002**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER	
RDT&E, N/BA-4	**Shipboard Sys Component Dev/0603513N**	DC/Survivability/32465	

- (U) ($1.325) Continue development of shock and acoustics isolation systems for electronics/machinery. Conduct an underwater explosion shock test employing a raft, shock mounts and representative machinery/electronic equipment to demonstrate equipment survivability. Evaluate acoustic response of mounts and conduct accelerated aging tests to demonstrate mount suitability in a harsh machinery space environment.
- (U) ($1.167) Continue to monitor the stability of the closed loop degaussing system control algorithm/ system; conduct rangings. Initiate development of a real-time tactical decision aid that provides safe operating areas as a function of mine threat.
- (U) ($1.100) Continue development of the ASAP program. Initiate verification and validation and development of new weapons effect and recoverability models.

B. (U) OTHER PROGRAM FUNDING SUMMARY:

COST ($ in Millions)	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Complete	Total Cost
DD (X) Total Ship Systems Engineering/0604300N	**286.444**	**235.235**	**717.397**	**923.649**	**1354.041**	**1705.084**	**1311.339**	CONT.	CONT.

C. (U) ACQUISITION STRATEGY:

EXHIBIT R-2a, RDT&E Project Justification			DATE: February 2002
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER	
RDT&E, N/BA-4	**Shipboard Sys Component Dev/0603513N**	DC/Survivability/32465	

D. (U) SCHEDULE PROFILE:

FY 2001	FY 2002	FY 2003
See PE 0604300N Exhibits	3Q- Closed Loop Degaussing Ranging	2Q - Automated Fire Suppression Demonstration
	4Q - Survivable Electrical Power Software Development Plan	3Q - Electrical Control Logic
	4Q- Shock and Acoustic Mount	4Q - Underwater Explosion Shock Test
	4Q- ASAP DC and Electrical Models	4Q - ASAP V&V Documentation

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)						DATE: **February 2002**				
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT				PROJECT NAME AND NUMBER				
RDT&E, N/BA-4		**Shipboard Sys Component Dev/0603513N**				DC/Survivability/32465				
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	CPIF	DD(X) Design Agent	0.000	1.500	3QFY 02	0.000	N/A	0.000	1.500	
Ancillary Hardware Development										
Systems Engineering										
Product Development										
	WR	NSWC CD Bethesda, MD	4.515	3.416	02/02	5.267	11/02	CONT.	CONT.	
	Various	Other Contractors	5.251	0.000	N/A	0.450	Various	CONT.	CONT.	
Subtotal Product Development			9.766	4.916		5.717		CONT.	CONT.	
Remarks: See PE 0604300N, Project 32465 Exhibits for FY 01 information.										
Development Support Equipment										
Software Development										
Training Development										
Integrated Logistics Support										
Configuration Management										
Technical Data										
GFE										
Subtotal Support			0.000	0.000		0.000		0.000	0.000	
Remarks:										

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)						DATE: **February 2002**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N/BA-4**		PROGRAM ELEMENT **Shipboard Sys Component Dev/0603513N**				PROJECT NAME AND NUMBER DC/Survivability/32465				
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation										
Operational Test & Evaluation										
Tooling										
GFE										
Subtotal T&E			0.000	0.000		0.000		0.000	0.000	
Remarks:										
Contractor Engineering Support										
Government Engineering Support										
Program Management Support	WR	NSWC CD Bethesda, MD		0.075	02/02	0.075	11/02	CONT.	CONT.	
Travel										
Labor (Research Personnel)										
Overhead										
Subtotal Management			0.000	0.075		0.075		CONT.	CONT.	
Remarks: See PE 0604300N, Project 32465 Exhibits for FY 01 information.										
Total Cost			9.766	4.991		5.792		CONT.	CONT.	
Remarks: See PE 0604300N, Project 32465 Exhibits for FY 01 information.										

EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2002		
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER			PROJECT NAME AND NUMBER					
RDT&E, N/BA-4	**Shipboard Sys Component Dev/0603513N**			AGS-Advanced Gun System/32467					
COST ($ in Millions)	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Cost
Project Cost	**96.297**	**139.031**	**108.184**	**52.158**	**47.736**	**47.878**	**47.995**	**CONT.**	**CONT.**
RDT&E Articles Qty	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**CONT.**	**CONT.**

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 2003.

1. (U) FY 2001 ACCOMPLISHMENTS:
- (U) ($60.502) Completed AGS Sub-system design phase.
- (U) ($16.288) Initiated Risk Reduction Phase for AGS munitions; completed AGS munitions concepts; developed performance and interface specifications.
- (U) ($5.141) Continued EDM text fixture development.
- (U) ($14.366) Continued with the development of Validation and Verification (V&V) tools for AGS and AGS munitions.

2. (U) FY 2002 PLAN:
- (U) ($26.635) Initiate AGS System design and DD(X) Spiral Design Study.
- (U) ($57.708) Commence EDM fabrication for Gun, magazine, and Control system.
- (U) ($34.237) Continue Risk Reduction Phase for AGS Long Range Land Attack Projectile (LRLAP).
- (U) ($17.751) Validate and verify the suitability and effectiveness of V&V tools for AGS and AGS munitions.
- (U) ($ 2.700) Continue EDM test fixture development.

EXHIBIT R-2a, RDT&E Project Justification			DATE: **February 2002**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER	
RDT&E, N/BA-4	**Shipboard Sys Component Dev/0603513N**	AGS-Advanced Gun System/32467	

3. (U) FY 2003 PLAN:
- (U) ($24.359) Continue AGS System detailed design and DD(X) Spiral Design Study.
- (U) ($62.000) Continue EDM fabrication for Gun, magazine, and Control system.
- (U) ($9.475) Complete Risk Reduction Phase for AGS Long Range Land Attack Projectile (LRLAP).
- (U) ($12.350) Initiate LRLAP Engineering and Manufacturing Development.

B. (U) OTHER PROGRAM FUNDING SUMMARY:

COST ($ in Millions)	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Complete	Total Cost
DD (X) Total Ship Systems/Engineering/0604300N	**286.444**	**235.235**	**717.397**	**923.649**	**1354.041**	**1705.084**	**1311.339**	CONT.	CONT.

C. (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, Phase II - Initial Prototype Development, Phase III - Subsystem Testing and Validation.

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2002**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N/BA-4**	PROGRAM ELEMENT NAME AND NUMBER **Shipboard Sys Component Dev/0603513N**	PROJECT NAME AND NUMBER AGS-Advanced Gun System/32467

D. (U) SCHEDULE PROFILE:

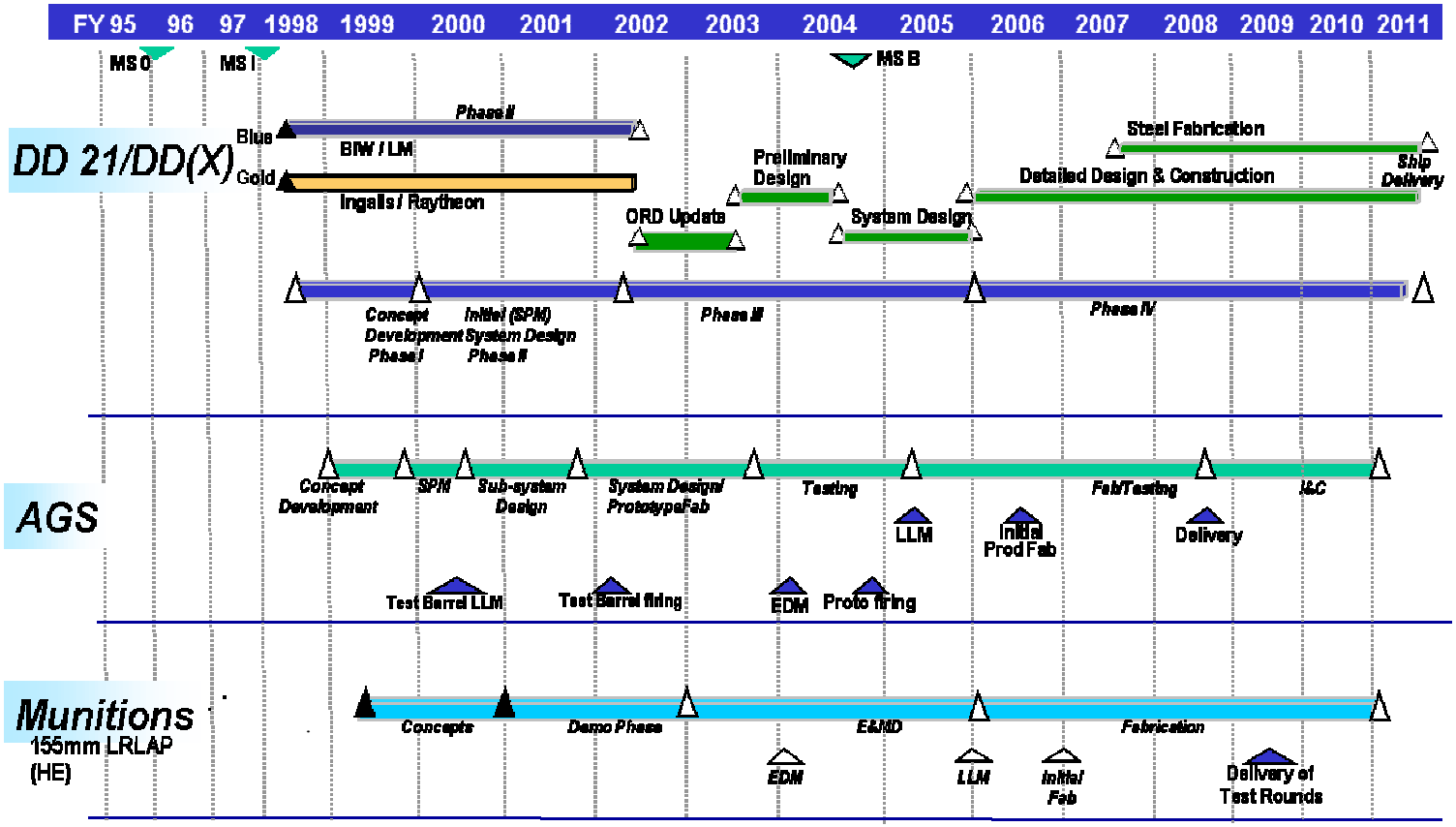

Exhibit R-3 Cost Analysis (page 1)

DATE: **February 2002**

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

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	Sec845/804	DD (X) Industry Teams	34.866	90.661	Various	20.500	Various	0.000	N/A	0.000	146.027	N/A
	CPIF	DD (X) Design Agent	0.000	0.000	N/A	95.000	3QFY02	95.000	1QFY03	CONT.	CONT.	
Ancillary Hardware Development												
Systems Engineering												
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development			34.866	90.661		115.500		95.000		CONT.	CONT.	

Remarks:

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

Remarks:

Exhibit R-3 Cost Analysis (page 2) | DATE: **February 2002**

APPROPRIATION/BUDGET ACTIVITY: **RDT&E, N/BA-4** | PROGRAM ELEMENT: **Shipboard Sys Comp Dev/0603513N** | PROJECT NAME AND NUMBER: AGS-Advanced Gun System/32467

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation												
Operational Test & Evaluation												
Tooling												
GFE												
Subtotal T&E			0.000	0.000		0.000		0.000		0.000	0.000	

Remarks:
(U) No developmental or operational evaluation is scheduled during this period.

Contractor Engineering Support	GSA/FFP	Anteon Arlington, VA	0.000	0.320	11/00	5.500	02/02	4.000	10/02	CONT.	CONT.	CONT.
	Various	Other Contractors	0.000	0.120	10/00	5.000	Various	1.322	10/02	CONT.	CONT.	CONT.
Government Engineering Support	WR	NSWC DD Dahlgren, VA	3.568	3.137	10/00	6.000	02/02	3.050	10/02	CONT.	CONT.	CONT.
	WR	NSWC PHD Pt Hueneme, CA	1.664	1.909	10/00	2.000	02/02	1.705	10/02	CONT.	CONT.	CONT.
	WR	Other Gov't activities	2.284	0.150	Various	5.031	Various	3.107	Various	CONT.	CONT.	CONT.
Travel												
Labor (Research Personnel)												
Overhead												
Subtotal Management			7.516	5.636		23.531		13.184		CONT.	CONT.	

Remarks:

Total Cost			42.382	96.297		139.031		108.184		CONT.	CONT.	

Remarks:

EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2002		
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER			PROJECT NAME AND NUMBER					
RDT&E, N/BA-4	**Shipboard Sys Component Dev/0603513N**			Undersea Warfare (USW)/32468					
COST ($ in Millions)	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Cost
Project Cost	**20.058**	**25.315**	**20.546**	**16.812**	**13.764**	**13.342**	**8.977**	**CONT.**	**CONT.**
RDT&E Articles Qty	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**CONT.**	**CONT.**

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). Key technology areas being investigated include: improvements in signal processing, advanced information processing, and multi-sensor data fusion to improve target detection and classification performance and reduce system manning requirements; and towed array, hull array and transducer technology to improve multi-static operation and in-stride mine avoidance. FY 2001 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.

1 (U) FY 2001 ACCOMPLISHMENTS

- (U) ($2.637) DD (X) Industry Teams - Continued DD (X) USW system design. Participated in IUSW peer group and evaluated USW technologies. Started preparations for FY 02 ADM At-Sea test.
- (U) ($2.598) IUSW-21 Broad Agency Announcement (BAA) risk reduction contracts/tasks - Exercised FY01 option of BAAs awarded in FY99 and other risk reduction efforts 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. Started integration of BAAs into the ADM for the FY02 at sea demonstration.
- (U) ($12.999) IUSW 21 ADM Development - Performed Integrated Peer Group (IPG) engineering reviews of IUSW-21 advanced technologies. Began development and integration of IUSW-21 advanced technologies into ADM demonstration system. Finalized ADM interface specifications and sea test demonstration plan.
- (U) ($1.824) FY02 Sea Test - Conducted installation planning and started development of TEMPALT package. Began Preparation of equipment, buy hardware to integrate Multi-Function Towed Array (MFTA) into ADM.

EXHIBIT R-2a, RDT&E Project Justification			DATE: February 2002
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER	
RDT&E, N/BA-4	**Shipboard Sys Component Dev/0603513N**	Undersea Warfare (USW)/32468	

2. (U) FY 2002 PLAN
- (U) ($4.852) IUSW-21 Risk reduction contracts/tasks - Finish integration of FY99 BAAs into the ADM. Award BAA contracts to support the build-test-build process and the FY04 sea test. BAAs will 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.
- (U) ($15.237) IUSW-21 ADM Development - Perform IPG engineering reviews of IUSW-21 advanced technologies. Finish the development and integration of IUSW-21 advanced technologies into ADM demonstration system for FY02 sea test. Begin development of IUSW-21 advanced technologies for the FY04 sea test.
- (U) ($5.226) FY02 Sea Test - Finish equipment preparation and integrate Multi-Function Towed Array (MFTA) into ADM. Ship and install equipment. Conduct Test. Collect data.

3. (U) FY 2003 PLAN
- (U) ($4.307) IUSW-21 Risk reduction contracts/tasks - Start integration of BAAs to support the build-test-build process and the FY04 sea test. BAAs will 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.
- (U) ($13.489) IUSW-21 ADM Development - Perform IPG engineering reviews of IUSW-21 advanced technologies. Continue development and integration of IUSW-21 advanced technologies into ADM demonstration system for FY04 sea test.
- (U) ($2.750) FY02 Sea Test - Remove and ship back equipment. Refurbish ship. Begin data analysis.

B. (U) OTHER PROGRAM FUNDING SUMMARY:

COST ($ in Millions)	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Complete	Total Cost
DD (X) Total Ship Systems/Engineering/0604300N	**286.444**	**235.235**	**717.397**	**923.649**	**1354.041**	**1705.084**	**1311.339**	CONT.	CONT.

EXHIBIT R-2a, RDT&E Project Justification			DATE: **February 2002**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER	
RDT&E, N/BA-4	**Shipboard Sys Component Dev/0603513N**	Undersea Warfare (USW)/32468	

C. (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 will be 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 (DA).

EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2002
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER
RDT&E, N/BA-4	**Shipboard Sys Component Dev/0603513N**	Undersea Warfare (USW)/32468

D. (U) SCHEDULE PROFILE:

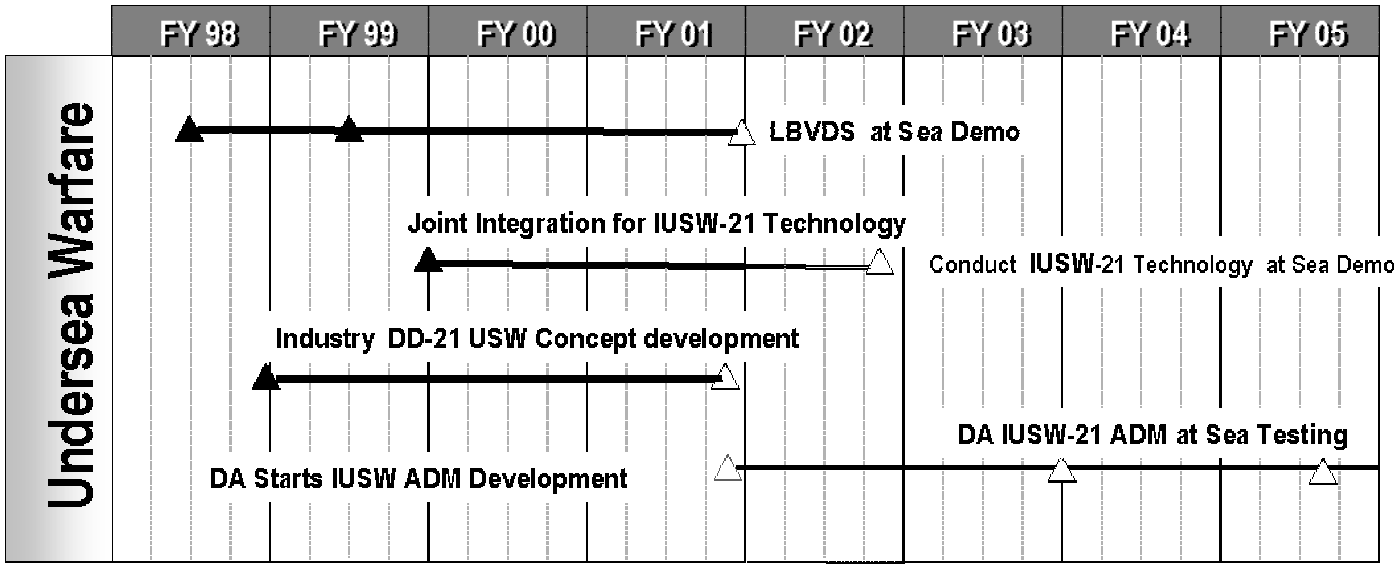

Exhibit R-3 Cost Analysis (page 1) | DATE: **February 2002**

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT	PROJECT NAME AND NUMBER
RDT&E, N/BA-4	**Shipboard Sys Comp Dev/0603513N**	Undersea Warfare (USW)/32468

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	Sec845/804	DD (X) Industry Teams	8.467	2.637	11/00	0.000	N/A	0.000	N/A	0.000	11.104	
	CPIF	DD (X) Design Agent	0.000	0.000	N/A	4.000	3QFY02	11.000	1QFY03	CONT.	CONT.	
	BAA/CPFF	Competition	10.801	2.598	Various	0.852	Various	4.307	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	0.000	0.813	
(ADM Development)	C/CPFF	RSC, Newport, RI	0.827	0.000	N/A	0.000	N/A	0.000	N/A	0.000	0.827	
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development			20.908	5.235		4.852		15.307		CONT.	CONT.	

Remarks:

Development Support Equipment												
Software Development	C/CPFF	LMC, Syracuse, NY	0.000	5.842	11/00	5.257	01/02	0.000	N/A	CONT.	CONT.	
(ADM Development)	C/CPFF	RSC, Newport, RI	0.000	4.807	11/00	5.509	01/02	0.000	N/A	CONT.	CONT.	
Training Development												
Integrated Logistics Support												
Configuration Management												
Engineering Support	WR	NUWC/N Newport, RI	2.078	1.140	11/00	1.159	02/02	0.667	12/02	CONT.	CONT.	
	WR	Other Gov't Activitiea	0.350	0.510	11/00	0.150	02/02	0.150	12/02	CONT.	CONT.	
	SS/CPFF	APL/JHU Laurel, MD	0.688	0.150	11/00	0.030	02/02	0.150	12/02	CONT.	CONT.	
	SS/CPFF	APL/UW Seattle, WA	0.250	0.150	11/00	0.075	02/02	0.150	12/02	CONT.	CONT.	
	SS/CPFF	ARL/UT Austin., TX	0.300	0.150	11/00	0.075	02/02	0.150	12/02	CONT.	CONT.	
	SS/CPFF	ARL/PSU State Col, PA	0.216	0.150	11/00	0.075	02/02	0.150	12/02	CONT.	CONT.	
GFE												
Subtotal Support			3.882	12.899		12.330		1.417		CONT.	CONT.	

Remarks:

Exhibit R-3 Cost Analysis (page 2) | DATE: February 2002

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT	PROJECT NAME AND NUMBER
RDT&E, N/BA-4	**Shipboard Sys Comp Dev/0603513N**	Undersea Warfare (USW)/32468

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NUWC/N Newport, RI	0.000	0.824	11/00	4.696	02/02	1.250	12/02	CONT.	CONT.	
	SS/CPFF	APL/JHU Laurel, MD	0.000	1.000	11/00	0.530	02/02	0.000	N/A	0.000	1.530	
	C/CPFF	TBD						1.500	12/02	CONT.	CONT.	
Operational Test & Evaluation												
Tooling												
GFE												
Subtotal T&E			0.000	1.824		5.226		2.750		CONT.	CONT.	
Remarks:												
Contractor Engineering Support												
Government Engineering Support	WR	Other Gov't Activities	0.000	0.000	N/A	0.735	02/02	0.000	N/A	CONT.	CONT.	
Program Management Support	GSA/FFP	Anteon Arlington, VA	0.331	0.100	12/00	1.504	02/02	0.722	12/02	CONT.	CONT.	
Miscellaneous	PD/WR	Other Gov't Activities	0.091	0.000	Various	0.668	Various	0.350	Various	CONT.	CONT.	
Travel												
Labor (Research Personnel)												
Overhead												
Subtotal Management			0.422	0.100		2.907		1.072		CONT.	CONT.	
Remarks:												
Total Cost			25.212	20.058		25.315		20.546		CONT.	CONT.	
Remarks:												

EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2002		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N/BA-4**	PROGRAM ELEMENT NAME AND NUMBER **Shipboard Sys Component Dev/0603513N**			PROJECT NAME AND NUMBER Open Systems Architecture (OSA)[1] /32469					
COST ($ in Millions)	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Cost
Project Cost	**21.017**	**(2) 5.556**	**4.600**	**3.945**	**3.656**	**2.704**	**2.200**	**CONT.**	**CONT.**
RDT&E Articles Qty	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**CONT.**	**CONT.**

Notes: (1) (U) Project formerly known as Consolidated Hull Mechanical and Electrical (HM&E)
(2) (U) Funding for efforts directly related to DD (X) design and systems integration has been reprogrammed from this project to the DD (X) Design line (PE 0604300N, Project 32464) beginning in FY 2002. Funding for efforts supporting the development of DD (X) ship survivability and auxiliary systems has been reprogrammed from this project to the DC/Survivability line (PE 0603513N, Project 32465) beginning in FY 2002.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: In FY 2001, this project supports the advanced development of DD (X) HM&E ship survivability, auxiliary machinery and, Open Systems Architecture (OSA) technologies. This project also supports several fleet-focused research and development efforts. Beginning in FY 2002, DD (X) design and systems integration elements of this project have been shifted to PE 0604300N, Project 32464, and ship survivability and auxiliary system elements were moved to PE 0603513N, Project 32465. As a result, beginning in FY 2002, this project will focus on the development of open systems architecture for PEO(S), with the efforts for several fleet-focused initiatives continuing as well. The following provides a mission description for each major development area (i.e., Survivability, Fleet-Focused Initiative (FFI), and Open Systems Architecture (OSA):

(U) Survivability: The survivability area supports development of systems and protection concepts that reduce vulnerability to conventional weapons and peacetime accidents and enables, under reduced manning conditions, a rapid recovery of mission capability. Development categories include damage control computer-based systems that provide for rapid systems restoration, fire protection devices that improve probability of ship survival with a reduced crew, and ship protection concepts that reduce magazine and commercial equipment vulnerability.

(U)Fleet-Focused Initiative (formerly known as Auxilary): 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) Open Systems Architecture (formerly known as Affordability Through Commonality): This funding supports the PEO (S) implementation of open systems architecture (OSA) at the total system/ship level. Open Systems Architecture 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 OSA into total ship acquisition.

EXHIBIT R-2a, RDT&E Project Justification			DATE: February 2002
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER	
RDT&E, N/BA-4	**Shipboard Sys Component Dev/0603513N**	Open Systems Architecture (OSA)/32469	

1. (U) FY 2001 ACCOMPLISHMENTS:

(U) SURVIVABILITY/AUXILIARY SYSTEMS:
- (U) ($2.519) Continued development of the time-dependent, computer-based ASAP for use in evaluating ship designs. Continued development of the ASAP crew casualty/damage control model. Continued full scale testing aboard the DDG 76 of the advanced closed loop degaussing system; updated prediction algorithm. Continued development of advanced auxiliary systems, components, and control systems.
- (U) ($8.391) Completed initial system design and engineering of DD (X) survivability/auxiliary systems. Began system/subsystem development of survivability/auxiliary systems.

(U) OPEN SYSTEMS ARCHITECTURE:
- (U) ($0.925) TOSA Business Architecture, Process, Impact Assessments: Continued development with Industry of TOSA architectures, framework, and processes for Fleet wide implementation of open systems architecture in support of future DD (X) use. Continued development of new business architecture, business case analyses, and strategies for TOSA implementation for cross-platform application. Documented metrics to assess system architecture openness for technology upgradability and competition. Completed prioritization with Industry of high payoff opening candidates.
- (U) ($0.995) Total Open Systems Architecture Implementation: Transitioned TOSA concepts with Industry to the existing and future Fleet in support of future DD (X) use. Completed the engineering development of Open C4ISR Zone concepts for surface combatants and implementation in support of future DD (X) use. Completed development of architecture concepts for open sensor interfaces for surface combatants. Completed development of architecture interface requirements for Advanced TOSA concepts selected with Industry for surface combatants.
- (U) ($5.439) Completed Total Ship OSA Concept Demonstration and Validation for DD (X) Initial System Design.

(U) FLEET-FOCUSED INITIATIVES:
(U) FUEL CELL
- (U) ($0.474) Completed design and initiate fabrication of 0.5 MW reduced scale demonstrator. Used current designator, initiate ship impact assessment and cost analysis of Ship Service Fuel Cell(SSFC) for notional ships and compare with IPS baseline.

(U) SALVAGE AND UNDERWATER SHIP HUSBANDRY
- (U) ($0.379) Continued development of the Smart Tow Monitoring System and materials to be used in the Improved Shaft Coating System.

(U) TOC Initiatives
- (U) ($1.895) Continued development of composite components and improved ventilation methods/materials that reduce sailor workload for the existing Fleet.

EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2002
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER
RDT&E, N/BA-4	**Shipboard Sys Component Dev/0603513N**	Open Systems Architecture (OSA)/32469

2. (U) FY 2002 PLAN:

(U) OPEN SYSTEMS ARCHITECTURE:
- (U) ($1.953) TOSA Business/Technical Architecture, Process and Assessments: Complete draft business architecture and business case for TOSA implementation. Complete draft economic and other assessments of TOSA implementation. Conduct projections of technology, operational and technical architectures, regulatory, market and cost drivers, benchmarking and market research to use in assessing PEO(S) systems' architecture and interface openness. Complete processes and metrics to assess/validate system architecture and interface openness for technology refresh and insertion.
-(U) ($2.467) TOSA Implementation: Transition TOSA architectures and interfaces with industry. Complete the development of the Open Sensor/Network and Open Material Condition Interface demonstrators and conduct industry and Navy outreach. Complete the assessment of offboard vehicles-Ship interfaces for development of Fleet-wide offboard vehicles interfaces. Complete the development of an Open C4I Zone Interface demonstrator and conduct industry outreach and testing. Support the implementation of open systems architecture interfaces for environmental systems.

(U) FLEET-FOCUSED INITIATIVES:
(U) FUEL CELL
- (U) ($0.670) Continue SSFC ship impact assessments and model analysis of molten carbonate reduced scale demonstrator and PEM integrated fuel processor.

(U) SALVAGE AND UNDERWATER SHIP HUSBANDRY
- (U) ($0.267) Perform prototype assembly and testing for the Smart Tow Monitoring System. Continue development of materials for the improved Shaft Coating Systems. Acquire diagnostic hardware for evaluating Shaft Coating System performance.

(U) TOC INITIATIVES
-(U) ($0.199) Continue development of improved fuel system training that reduce's sailor workload for the existing fleet.

EXHIBIT R-2a, RDT&E Project Justification			DATE: February 2002
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER	
RDT&E, N/BA-4	**Shipboard Sys Component Dev/0603513N**	Open Systems Architecture (OSA)/32469	

3. (U) FY 2003 PLAN:

(U) OPEN SYSTEMS ARCHITECTURE:
- (U) ($1.126) TOSA Business/Technical Architecture, Process and Assessments: Complete business architecture and business case for TOSA implementation. Complete economic and other assessments of TOSA implementation for prioritized targets. Complete prioritized projections of technology, operational and technical architectures, regulatory, market and cost drivers, benchmarking and market research fo use in assessing PEO(S) systems' architecture and interface openness. Assess system architecture and interface openness for technology refresh and insertion.
- (U) ($1.806) TOSA Implementation: Transition TOSA architectures and interfaces with industry. Conduct risk reduction for the implementation of Open Sensor/Network and Open Material Condition Interfaces. Complete the development of open ship-offboard vehicle interfaces. Implement the Open C4I Zone architecture and appropriate interfaces. Continue the implementation of open systems architecture interfaces for environmental systems. Develop enabling technologies to further the exploitation of standard interfaces for total ship systems.

(U) FLEET-FOCUSED INITIATIVES:
(U) FUEL CELL
- (U) ($0.926) Initiate lab eval of SSFC molten carbonate reduced scale demo and validate static and dynamic models.

(U) SALVAGE AND UNDERWATER SHIP HUSBANDRY
- (U) ($0.371) Complete preliminary testing of the Smart Tow System. Evaluate inspection/diagnostic techniques and document protocol for inspecting Shaft Coating Systems underwater.

(U) TOC INITIATIVES
- (U) ($0.371) Continue development of improved fuel system training that reduce's sailor workload for the existing fleet.

EXHIBIT R-2a, RDT&E Project Justification			DATE: **February 2002**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER	
RDT&E, N/BA-4	**Shipboard Sys Component Dev/0603513N**	Open Systems Architecture (OSA)/32469	

B. (U) OTHER PROGRAM FUNDING SUMMARY:

COST ($ in Millions)	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Complete	Total Cost
DD (X) Total Ship Systems/Engineering/0604300N	**286.444**	**235.235**	**717.397**	**923.649**	**1354.041**	**1705.084**	**1311.339**	CONT.	CONT.

C. (U) ACQUISITION STRATEGY:

EXHIBIT R-2a, RDT&E Project Justification			DATE: February 2002
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER	
RDT&E, N/BA-4	**Shipboard Sys Component Dev/0603513N**	Open Systems Architecture (OSA)/32469	

D. (U) SCHEDULE PROFILE:

PROGRAM MILESTONES	FY 2001	FY 2002	FY 2003
Survivability/Auxiliary Systems	1Q System/Subsystem Development	4Q SSFC Fuel Cell and Processor Assessments	4Q SSFC Fuel Cell Model Validations
Fuel Cell	4Q ASAP Crew Casualty/DC Model		
Salvage and Underwater Ship Husbandry	4Q SSFC Ship Impact Assessments		
TOC Initiatives			

EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2002
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER
RDT&E, N/BA-4	**Shipboard Sys Component Dev/0603513N**	Open Systems Architecture (OSA)/32469

PROGRAM MILESTONES	FY 2001	FY 2002	FY 2003
Open Systems Architeture (OSA)	2Q Complete TOSA process and strategy 2Q Complete engineering development of C4ISR Zone Open Foundations 2Q Concept for shipboard open sensor network interfaces 4Q TOSA business case and impact assessments 4Q Concept for open C4ISR Zone electric architecture and interfaces 4Q DD (X) Alliance Teams technology transfer and assessments	1Q Draft OSA Business Case templates and initial assessments 1Q Open Sensor/Network Interface demonstrator completed 2Q Open Material Condition Interface demonstrator completed 4Q Open Offboard Vehicles-Ship Interface standards developed 4Q Open C4I Zone Interface demonstrator 4Q DD (X) Industry Team partnering and assessments	1Q OSA Business Case completion and metrics development 3Q Open C4I Zone implementation 3Q Open Sensor/Network Interface risk reduction 3Q Open Material Condition Interfaces risk reduction 4Q DD (X) Industry Team interface development and assessments

Exhibit R-3 Cost Analysis (page 1)								DATE: February 2002				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N/BA-4**		PROGRAM ELEMENT **Shipboard Sys Comp Dev/0603513N**			PROJECT NAME AND NUMBER Open Systems Architecture (OSA)/32469							
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
SURVIVABILITY												
Primary Hardware Development												
Product Development	Sec845/804	DD (X) Industry Teams	14.386	8.391	10/00					0.000	22.777	
	WR	NSWC CD Bethesda, MD	7.848	2.175	Various					0.000	10.023	
	Various	Other Gov't Activities	4.743	0.244	Various					0.000	4.987	
	Various	Other Contractors	2.635	0.100	Various					0.000	2.735	
Ancillary Hardware Development												
Systems Engineering												
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Survivability			29.612	10.910		0.000		0.000		0.000	40.522	
Remarks: Funding for survivability efforts was reprogrammed to PE 0603513N, Project 32465 in FY 2002 and out.												
Open Systems Architecture (OSA)												
Engineering Dev, Demo & Eval	Sec845/804	DD (X) Industry Teams	7.111	5.439	10/00	0.000	N/A	0.000	N/A	0.000	12.550	
	CPIF	DD (X) Design Agent	0.000	0.000	N/A	0.200	3QFY02	0.200	1QFY03	CONT.	CONT.	
	Various	Other Gov't Activities	11.387	1.570	Various	2.482	Various	1.818	Various	CONT.	CONT.	
	Various	Other Contractors	3.041	0.350	Various	1.738	Various	0.914	Various	CONT.	CONT.	
Development Support Equipment												
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal ATC			21.539	7.359		4.420		2.932		CONT.	CONT.	
Remarks: Funding for DD (X) Industry Teams has been reprogrammed to DD (X) Design (PE 0604300N, Project 32464) in FY 2002 and out.												

Exhibit R-3 Cost Analysis (page 2)								DATE: February 2002				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, N/BA-4			**Shipboard Sys Comp Dev/0603513N**			Open Systems Architecture (OSA)/32469						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation												
Operational Test & Evaluation												
Tooling												
GFE												
Subtotal T&E			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
Fleet Focused Initiatives												
Contractor Engineering Support												
Gov't Eng Support	WR	NSWC CD Philadelphia, PA	0.743	0.944	Various	0.869	Various	1.297	Various	CONT.	CONT.	
	Various	Other Contractors	0.624	0.449	Various	0.267	Various	0.371	Various	CONT.	CONT.	
	Various	Other Govt Activities	12.640	1.355	Various	0.000	N/A	0.000	N/A	CONT.	CONT.	
Program Management Support												
Travel												
Labor (Research Personnel)												
Overhead												
Subtotal Auxiliary Systems			14.007	2.748		1.136		1.668		CONT.	CONT.	
Remarks: Funding for auxiliary system efforts was reprogrammed to PE 0603513N, Project 32465 in FY 2002 and out.												
Total Cost			65.158	21.017		5.556		4.600		CONT.	CONT.	
Remarks:												

EXHIBIT R-2a, RDT&E Project Justification						DATE: February 2002			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N/BA-4**	PROGRAM ELEMENT NAME AND NUMBER **Shipboard Sys Component Dev/0603513N**			PROJECT NAME AND NUMBER Integrated Topside Design (ITD)/32470					
COST ($ in Millions)	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Cost
Project Cost	**15.775**	**(1) 5.348**	**4.224**	**3.886**	**3.795**	**2.969**	**0.987**	**CONT.**	**CONT.**
RDT&E Articles Qty	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**CONT.**	**CONT.**

Note (1): (U) Funding for efforts directly related to DD (X) design and systems integration has been reprogrammed from this project to the DD (X) Design line (PE 0604300N, Project 32464) beginning in FY 2002.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project develops and integrates the necessary technologies to achieve a total integrated topside design focused on DD (X) and future surface combatant ships. Technology areas including topside signature control, sensor and antenna integration, weapon system integration, HM&E integration, related decision-making tools, and composite materials will be addressed. Other stand alone technology programs will be integrated with this effort to assure total ship systems integration for future ship design efforts. Surface combatants will need an added (stealth) layer of defense to support hardkill and softkill systems in defeating future threats. Composite materials that provide improved corrosion control and enable reduced maintenance and reduced manning will also be considered. This project also develops improved equipments that are small but critical 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. In FY 2002 and out, DD (X) design and systems integration elements of this project have been shifted to PE 0604300N, Project 32464.

1. (U) FY 2001 ACCOMPLISHMENTS:
- (U) ($3.090) Continued validation of composite material design procedures materials database. Continued development of Radar Cross Section (RCS), Infrared (IR), and Electronic Warfare (EW) prediction codes. Continued to validate and improve Electro Magnetic (EM) Engineering Tools.
- (U) ($10.238) Completed engineering efforts required for initial system design of DD (X) ITD. Began ITD system/subsystem design for DD (X).
- (U) ($0.947) Completed investigation of hydrogen fuel and other alternate shipboard power sources. Continued development of affordable HM&E machinery and architectures for existing and future fleet and create HM&E future machinery development roadmaps.
- (U) ($1.500) Complete system architecture assessments and conduct engineering assessments to address family of systems implementation alternatives for Naval Fires integration and inoperability warfighting requirements.

EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2002
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER
RDT&E, N/BA-4	**Shipboard Sys Component Dev/0603513N**	Integrated Topside Design (ITD)/32470

2. (U) FY 2002 PLAN:
-(U) ($1.045) Continue development of RCS, IR, and EW prediction codes.
-(U) ($3.636) Continue to validate and improve EM Engineering Tools. Continue validation of composite material design procedures materials database.
-(U) ($0.667) Continue development of auxiliary machinery, alternative hydrogen fuel, fuel storage, and architectures to support fleet and Strategic Studies Groups 19 and 20 initiatives.

3. (U) FY 2003 PLAN:
- (U) ($0.670) Continue development and validation of RCS, IR, and EW prediction codes for surface ships.
- (U) ($0.955) Continue development of affordable, efficient HM&E machinery and architectures for existing and future fleet.
- (U) ($2.599) Continue development and validation and improve EM Engineering tools for surface ships. Develop and validate modeling tools to support assessment of survivability characteristics of composite topside structures. Continue development and validation of composite material design database.

B. (U) OTHER PROGRAM FUNDING SUMMARY:

COST ($ in Millions)	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Complete	Total Cost
DD (X) Total Ship Systems/Engineering/0604300N	**286.444**	**235.235**	**717.397**	**923.649**	**1354.041**	**1705.084**	**1311.339**	CONT.	CONT.

C. (U) ACQUISITION STRATEGY:

EXHIBIT R-2a, RDT&E Project Justification			DATE: **February 2002**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER	
RDT&E, N/BA-4	**Shipboard Sys Component Dev/0603513N**	Integrated Topside Design (ITD)/32470	

D. (U) SCHEDULE PROFILE:

PROGRAM MILESTONES

FY 2001	FY 2002	FY 03
2Q Hydrogen assessment report	4Q-Continue Validation and Verification (V&V) of upgraded EM Engineering tools.	4Q-Continue Validation and Verification (V&V) of upgraded EM Engineering tools.
4Q RCS/IR/EW Code Updates	4Q-Continue upgrades and V&V of signature prediction tools.	4Q-Continue upgrades and V&V of signature prediction tools.
4Q Composite Design Guide Updates	4Q-Continue upgrades to topside composite survivability models and data base.	4Q-Continue upgrades to topside composite surviability models and data base.
4Q HM&E future machinery roadmap		

Exhibit R-3 Cost Analysis (page 1)								DATE: **February 2002**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N/BA-4**		PROGRAM ELEMENT **Shipboard Sys Comp Dev/0603513N**			PROJECT NAME AND NUMBER Integrated Topside Design/32470							
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	Sec845/804	DD (X) Industry Teams	14.318	10.238	10/00	0.000	N/A	0.000	N/A	0.000	24.556	
Ancillary Hardware Development												
Systems Engineering												
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development			14.318	10.238		0.000		0.000		0.000	24.556	
Remarks: Funding for DD 21 Industry Teams has been reprogrammed to DD 21 Design (PE 0604300N, Project 32464) in FY 2002 and out.												
Engineering Support	Various	Gov't Activities	14.005	3.618	Various	3.448	Various	2.627	Various	CONT.	CONT.	
	Various	Other Contractors	2.430	0.505	11/00	0.200	Various	0.200	12/02	CONT.	CONT.	
	WR	NSWC CD Bethesda	0.000	1.414	10/00	1.700	02/02	1.397	12/02	CONT.	CONT.	
Development Support Equipment												
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support			16.435	5.537		5.348		4.224		CONT.	CONT.	
Remarks:												

Exhibit R-3 Cost Analysis (page 2)								DATE: February 2002				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N/BA-4**			PROGRAM ELEMENT **Shipboard Sys Comp Dev/0603513N**			PROJECT NAME AND NUMBER Integrated Topside Design/32470						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation												
Operational Test & Evaluation												
Tooling												
GFE												
Subtotal T&E			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
Contractor Engineering Support												
Program Management Support												
Miscellaneous												
Travel												
Labor (Research Personnel)												
Overhead												
Subtotal Management			0.000	0.000		0.000		0.000		CONT.	CONT.	
Remarks:												
Total Cost			30.753	15.775		5.348		4.224		CONT.	CONT.	
Remarks:												

EXHIBIT R-2a, RDT&E Project Justification			DATE: **February 2002**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N/BA-4**	PROGRAM ELEMENT NAME AND NUMBER **Shipboard Sys Component Dev/0603513N**	PROJECT NAME AND NUMBER Integrated Power Systems (IPS)/32471	

COST ($ in Millions)	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Cost
Project Cost	**84.874**	**105.577**	**99.765**	**79.889**	**65.902**	**10.085**	**9.909**	**CONT.**	**CONT.**
RDT&E Articles Qty	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**CONT.**	**CONT.**

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. The goals of the IPS are to reduce acquisition and operating costs of naval ships and increase military effectiveness. These goals are to be accomplished by leveraging 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:

EXHIBIT R-2a, RDT&E Project Justification			DATE: February 2002
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER	
RDT&E, N/BA-4	**Shipboard Sys Component Dev/0603513N**	Integrated Power Systems (IPS)/32471	

- (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, qualify, and test integrated power system equipment for ship specific application including DD (X). This includes Permanent Magnet (PM) motor and motor drive technologies

- (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.

1. (U) FY 2001 ACCOMPLISHMENTS:

- (U) ($29.634) Systems Development: Continued 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. Conducted AD Phase III testing at NSWCCD, Philadelphia PA. Demonstrated the total system operation through various modes and the survivability and zonal isolation/fight through features of the advanced development system. Demonstrated automated system reconfiguration and start up. Continued IFTP and solid state power conversion efforts to mitigate potential risks associated with a fielded IPS system. Efforts included completing detailed design and risk reduction and begin fabrication of hardware required to populate IPS baseline configuration fight through testing. Conducted initial combat systems/survivability demonstration to show improved performance and potential to reduce combat system costs. Tested and demonstrated VSD motor controller for auxiliary applications. Continued IPS configuration development in support of JCC (X) Design Ship Study Group Phase II studies and AoA. Continued support for LH (X) studies. Initiated development/modification of IPS ship configuration documentation including CONOPS, System Level Description/Requirements, and module performance specifications as necessary to support power system requirements for JCC (X). Continued development of 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.

EXHIBIT R-2a, RDT&E Project Justification			DATE: February 2002
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER	
RDT&E, N/BA-4	**Shipboard Sys Component Dev/0603513N**	Integrated Power Systems (IPS)/32471	

- (U) ($51.690) Platform Specific Development: Completed preliminary design of competing PM motors and motor drives and incorporate preferred motor options into DD (X) IPS system designs. Began detailed design of PM motor and PM motor risk reduction. Conducted preliminary ship system design of DD (X)IPS system. DD (X) industry teams finalized proposed configurations. Continued DD (X) IPS system risk reduction.

- (U) ($3.550) At Sea Testing: Performed preliminary design of RV Triton IPS components. Began detailed design of hardware required for at sea testing. Continued development of IPS control system for use during at-sea testing.

2. (U) FY 2002 PLAN:

- (U) ($23.434) Systems Development: Continue 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. Continue to demonstrate automated system reconfiguration and start-up. Continue IFTP efforts to mitigate potential risks associated with a fielded IPS system. Efforts include continuing hardware fabrication and conducting factory acceptance testing of hardware required to populate IPS baseline configuration for fight through testing. Begin modification of 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. Continue IPS configuration development in support of JCC (X) and LH (X) ship programs. Continue to 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 LH (X) and MPF future. Continue development of 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.

- (U) ($79.293) Platform Specific Development: Begin detailed ship system design of DD (X) IPS system. Complete detailed design of PM motor. Continue PM motor and DD (X) IPS system risk reduction. Begin fabrication of full scale PM motor. Order Long Lead Material (LLM) and other material for test program. Determine representative test hardware configuration and begin modification of test site design for IPS qualification and testing at NSWCCD, Philadelphia PA. In support of DD (X) IPS system risk reduction, conduct conceptual designs of an at sea test vehicle and representative hardware configurations and perform total ship system engineering studies, models and simulations, and cost analyses/studies.

- (U) ($2.850) R/V Triton At Sea Testing: Complete detailed design and begin procurement of hardware required for at sea testing. Continue detailed development and design of the RV Triton IPS configuration for at sea testing. Continue development of IPS control system modifications for use during at-sea testing.

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2002**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER
RDT&E, N/BA-4	**Shipboard Sys Component Dev/0603513N**	Integrated Power Systems (IPS)/32471

3. (U) FY 2003 PLAN:

- (U) ($4.818) Systems Development: Continue 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. Continue IFTP efforts to mitigate potential risks associated with a fielded IPS system. Efforts include completing hardware fabrication and factory acceptance testing, and taking delivery of hardware required to populate IPS baseline configuration for fight through testing. Complete modification of test site design for IPS integrated fight through power and begin testing at NSWCCD, Philadelphia PA. Continue to evaluate emerging technologies for ship applications to determine future feasibility and development requirements. Emerging technologies include technologies such as fuel cells and power electronics. Continue IPS configuration development in support of LH(X) and MPF Future ship programs. Continue to develop/modify IPS ship configuration documentation including CONOPS, System Level Description/Requirements, and module performance specifications as necessary to support power system requirements for LH(X) and MPF Future. Continue development of 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.

- (U) ($82.000) Platform Specific Development: Continue detailed ship system design of DD (X) IPS system. Continue PM motor and DD (X) IPS system risk reduction. Take delivery of full scale PM motor. Continue ordering other material for test. Determine test hardware configuration and complete modification of test site design for IPS qualification and testing at NSWCCD, Philadelphia PA. In support of DD (X) IPS system risk reduction, conduct preliminary and detailed design of at sea test vehicle and hardware configuration.

- (U) ($12.947) RV Triton At Sea Testing: Continue procurement of hardware required for at sea testing. Complete detailed development and design of the RV Triton IPS configuration for at sea testing and begin risk reduction efforts and ship modifications. Continue development of IPS control system modifications for use during at-sea testing.

B. (U) OTHER PROGRAM FUNDING SUMMARY:

COST ($ in Millions)	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Complete	Total Cost
DD (X) Total Ship Systems/Engineering/0604300N	**286.444**	**235.235**	**717.397**	**923.649**	**1354.041**	**1705.084**	**1311.339**	CONT.	CONT.

C. (U) ACQUISITION STRATEGY:

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

EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2002
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N/BA-4**	PROGRAM ELEMENT NAME AND NUMBER **Shipboard Sys Component Dev/0603513N**	PROJECT NAME AND NUMBER Integrated Power Systems (IPS)/32471

D. (U) SCHEDULE PROFILE:

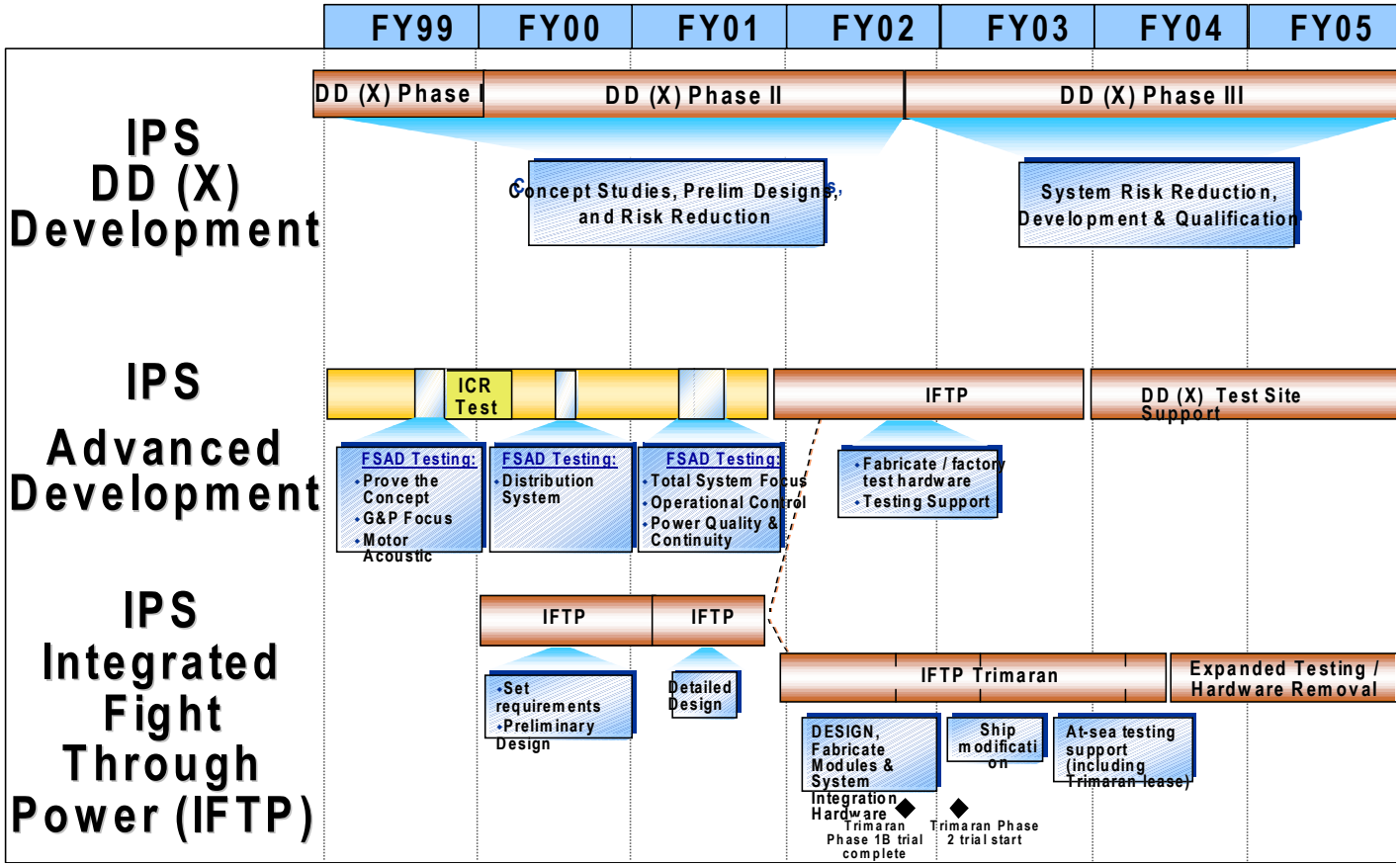

Exhibit R-3 Cost Analysis (page 1)										DATE: February 2002		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N/BA-4**			PROGRAM ELEMENT **Shipboard Sys Comp Dev/0603513N**			PROJECT NAME AND NUMBER Integrated Power System/32471						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/CPAF	Lockheed M Syracuse, NY	22.072	2.500	02/01	0.000	N/A	0.000	N/A	0.000	24.572	
	Sec845/804	DD (X) Industry Teams	14.971	51.690	07/01	0.000	Various	0.000	N/A	0.000	66.661	
	CPIF	DD (X) Design Agent	0.000	0.000	N/A	72.500	3QFY02	82.000	1QFY03	CONT.	CONT.	
	Sec845/804	IFTP Teams	3.448	18.804	12/00	21.564	02/02	15.065	10/02	CONT.	CONT.	
	US/UK MOU	DERA, UK	0.000	1.350	06/01	0.000	N/A	0.000	N/A	CONT.	CONT.	
	WR	NSWCCD Philadelphia, PA	11.799	6.115	12/00	4.827	02/02	1.050	10/02	CONT.	CONT.	
	WR	NSWCCD Dahlgren, Va.	0.000	0.000	N//A	2.806	02/02	0.000	N/A	CONT.	CONT.	
	Various	Other Contractors	5.723	1.565	12/00	2.212	03/02	0.450	12/02	CONT.	CONT.	
	Various	Other Govt Activities	1.025	0.302	12/00	0.568	02/02	0.100	10/02	CONT.	CONT.	
Ancillary Hardware Development												
Systems Engineering												
Licenses												
Tooling												
GFE												
Subtotal Product Development			59.038	82.326		104.477		98.665		CONT.	CONT.	
Remarks:												
Development Support Equipment												
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												

Exhibit R-3 Cost Analysis (page 2)									DATE: February 2002		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N/BA-4**		PROGRAM ELEMENT **Shipboard Sys Comp Dev/0603513N**			PROJECT NAME AND NUMBER Integrated Power System/32471						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NSWC CD Philadelphia, PA	13.138	2.438	12/00	1.000	02/02	1.000	10/02	CONT.	CONT.	
Operational Test & Evaluation												
Tooling												
GFE												
Subtotal T&E			13.138	2.438		1.000		1.000		0.000	CONT.	
Remarks:												
Contractor Engineering Support												
Program Management Support												
Miscellaneous												
Travel	Various	Various	0.314	0.110	12/00	0.100	04/02	0.100	10/02	CONT.	CONT.	
Labor (Research Personnel)												
Overhead												
Subtotal Management			0.314	0.110		0.100		0.100		CONT.	CONT.	
Remarks:												
Total Cost			72.490	84.874		105.577		99.765		CONT.	CONT.	
Remarks:												