

UNCLASSIFIED

EXHIBIT R-2, RDT&E Budget Item Justification							DATE:	
							February 2003	
APPROPRIATION/BUDGET ACTIVITY					R-1 ITEM NOMENCLATURE			
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-5					PE 0604300N - DD (X) Total Ship Systems Engineering			
COST (\$ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Total PE Cost	235.952	688.170	1,037.987	1,438.998	1,708.398	1,320.320	901.070	595.107
32463 / DD(X) 1 Construction	0.000	0.000	0.000	242.969	639.158	547.593	480.499	355.552
32464 / DD(X) System Design, Development and Int	133.867	588.849	845.890	1,039.714	1,022.334	725.746	372.708	190.805
32466 / Multi-Function Radar	66.210	46.300	23.047	12.393	0.000	0.000	0.000	0.000
32735 / Volume Search Radar	28.887	50.659	45.057	36.896	0.000	0.000	0.000	0.000
32880 / Power Node Control Centers (PNCC)	2.648	1.385	0.000	0.000	0.000	0.000	0.000	0.000
34009 / Advanced Gun System (AGS)	0.000	0.000	50.978	46.726	46.906	46.981	47.863	48.750
34010 / Integrated Power System (IPS)	0.000	0.000	73.015	60.300	0.000	0.000	0.000	0.000
34014 / DD(X) 2 Construction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
39062 / Reg Elec Pwr Tec Integ & Lev (REPTILE)	2.899	0.977	0.000	0.000	0.000	0.000	0.000	0.000
39063 / Aluminum Mesh Tank Liner	1.441	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Defense Emergency Response Funds (DERF) Funds: N/A								
A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:								
<p>This Program Element (PE) provides funds for development of the DD(X) Class of U. S. Navy surface combatants, advanced development R&amp;D which is integral to DD(X); and Detailed Design and Construction of the first DD(X) class ship. 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. DD(X) 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. The PNCC Congressional add pursues a technology which will support present and future surface ship and submarine platforms as a building block for increased use of electrical equipment. PNCC has the potential to integrate all of the shipboard power functions, such as switching, conversion, distribution and system operation and protection. The Congressional add for REPTILE is an initiative for the advancement of naval platform and battle-force systems through the discovery, invention, integration, leveraging and demonstration of innovative electrical technologies for naval sea and land applications. The Aluminum Mesh Congressional add is being used for explosion suppression applications to prevent destructive pressures from being generated after the explosive ignition of vapors and gases.</p>								

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>		PROGRAM ELEMENT NUMBER AND NAME PE 0604300N - DD(X) Total Ship Systems Engineering			PROJECT NUMBER AND NAME 32463 - DD(X) 1 Construction			
COST (\$ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost	0.000	0.000	0.000	242.969	639.158	547.593	480.499	355.552
RDT&E Articles Qty								

### A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This project funds the detail design and construction of the first DD(X) Class Ship using RDT&E funding. DD(X), a multi-mission surface combatant tailored for land attack and maritime dominance, will provide independent forward presence and deterrence, and operate as an integral part of joint and combined expeditionary forces. In addition, the DD(X) program will provide a baseline for spiral development of technology and engineering to support a range of future surface ships such as the future cruiser (CG(X)) and the Littoral Combat Ship (LCS), to meet the maritime requirement well into the 21st century.

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<b>B. Accomplishments/Planned Program</b>																			
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Accomplishments/Effort/Subtotal Cost	0.000	0.000	0.000	242.969															
RDT&E Articles Quantity																			
<div style="border: 1px solid black; padding: 5px; min-height: 80px;">Begin detailed production planning for first DD(X) to include: Transition design from the functional design done prior to Critical Design Review (CDR) to a 3-D Design (Zone design); Begin initial development of purchase specifications / drawings for all the significant equipment; Begin detail design of DD(X); Begin initial competition and selection of components, issue contracts and begin production of components; Begin initial material procurement of long lead equipment; Begin logistics support analysis -- develop crew training; Populate the Computer Aided Design (CAD) and Smart Product Model (SPM) with additional detail and expand standard parts libraries for use in SPM; Design fixtures and gigs to facilitate construction; Begin production design for early work packages to include work instructions, schedules, work locations, material list, tooling, facilities and manpower requirements.</div>																			
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**C. PROGRAM CHANGE SUMMARY:**

	FY 2002	FY 2003	FY 2004	FY 2005
Funding:				
Previous President's Budget: (FY 03 Pres Controls)	0.000	0.000	0.000	248.208
Current BES/President's Budget: (FY04 Pres Controls)	0.000	0.000	0.000	242.969
Total Adjustments	0.000	0.000	0.000	-5.239
Summary of Adjustments				
Congressional program reductions				
Congressional undistributed reductions				
Congressional rescissions				
SBIR/STTR Transfer				
Inflation Adjustment				-5.239
Reprogrammings				
Congressional increases				
Subtotal	0.000	0.000	0.000	-5.239

Schedule:

Not Applicable

Technical:

Not Applicable

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**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 0603513N / Shipboard Sys Component De	280.795	256.366	20.431	19.251	33.646	23.513	21.763	22.132	CONT	CONT
BLI 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:**

(U) The DD(X) acquisition strategy encompasses five contract phases: Phase I – System Concepts, Phase II – Initial System Design, Phase III – System Design, Phase IV – Detail Design and Construction, and Phase V – Engineering and Logistics Life Cycle Support. The Navy awarded section 845/804 agreements for Phases I and II for two DD(X) Industry teams. Downselection to a single DD(X) Design Agent occurred 3rd quarter FY 2002 to begin Contract Phase III. The Lead DD(X) will be competitively awarded in FY 2005.

**F. MAJOR PERFORMERS:**

**DD(X) Design Agent** - Northrop Grumman Ship Systems

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Exhibit R-3 Cost Analysis (page 1)								DATE: <b>February 2003</b>				
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>			PROGRAM ELEMENT PE 0604300N - DD(X) Total Ship Systems Engineering			PROJECT NUMBER AND NAME 32463 - DD(X) 1 Construction						
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
Product Development	Compet	TBD						242.969	3QFY05	Continuing	Continuing	
Ancillary Hardware Development											0.000	
Component Development											0.000	
Ship Integration											0.000	
Ship Suitability											0.000	
Systems Engineering											0.000	
Training Development											0.000	
Licenses											0.000	
Tooling											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal Product Development			0.000	0.000		0.000		242.969		0.000	242.969	
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:												

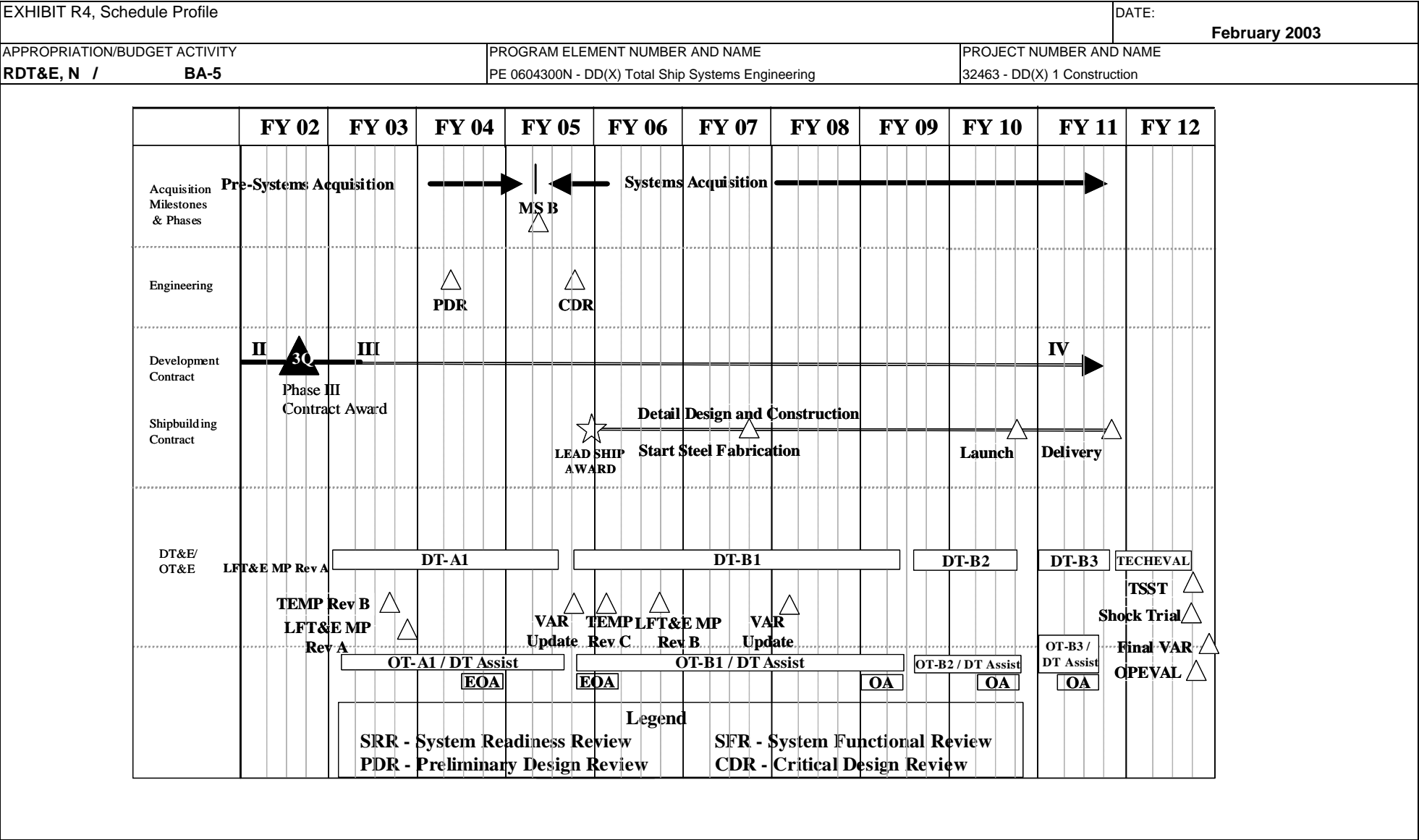
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Exhibit R-3 Cost Analysis (page 2)								DATE: February 2003				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME						
RDT&E, N / BA-5			PE 0604300N - DD(X) Total Ship Systems Engineering			32463 - DD(X) 1 Construction						
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											0.000	
Government Engineering Support											0.000	
Program Management Support											0.000	
Travel											0.000	
Labor (Research Personnel)											0.000	
SBIR Assessment											0.000	
Subtotal Management			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
Total Cost			0.000	0.000		0.000		242.969		0.000	242.969	
Remarks:												

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**Exhibit R-4a, Schedule Detail**  
(Exhibit R-4a, page 9 of 54)

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME PE 0604300N - DD(X) Total Ship Systems Engineering				PROJECT NUMBER AND NAME 32464 - DD(X) System Design, Development & Integration			
COST (\$ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost	133.867	588.849	845.890	1,039.714	1,022.334	725.746	372.708	190.805
RDT&E Articles Qty								

### A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This project encompasses efforts for the total ship system engineering development and integration of Hull, Mechanical and Electrical (HM&E), communications, electronics, command and control, combat, weapons and shipboard systems into the DD(X) class. These engineering development and integration efforts include systems engineering, analysis, software development, interface design, technical documentation, and system/subsystem testing to ensure fully functional systems integration. These efforts also include the design, development and testing (factory, land based and at-sea) of the following Engineering Development Models (EDMs): Total Ship Computing Environment, Advanced VLS, Integrated Deckhouse and Apertures, Autonomic Fire Suppression System, Infrared mock-ups, AGS magazine and Hull Form Scale Model. These systems engineering development efforts are required to ensure that DD(X) is a totally integrated ship system, delivering required warfighting technologies to the fleet within the reduced manning and cost goals. In addition, this project includes efforts to incorporate the EDMs into the overall DD(X) ship design.

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**Exhibit R-2a, RDTEN Project Justification**  
(Exhibit R-2a, page 11 of 54)

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<div style="border: 1px solid black; padding: 5px; min-height: 60px;">Continue identification and risk mitigation efforts in high risk areas such as Manning, Life Cycle Engineering and Support (LCE&amp;S), and Total Ship Computing. Continue Manning/Human Systems Integration (HSI) and LCE&amp;S Integrated Product Teams (IPTs) to address the impact of how industry-developed concepts will impact the future Navy support infrastructure in these functional areas. Monitor the industry-developed risk watch list and evaluate as a mechanism for reporting risk metrics in DD(X) Aquisition reporting documentation. Review and develop proposed policy changes as a result of DD(X) industry concepts that impact Navy manning and life cycle support structure as a result of industry proposals. Establish Executive Steering Groups to review/ monitor specific Phase III technology development focus areas: Integrated Power System (IPS) and propulsion, Radar Suite and Software.</div>																			
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Accomplishments/Effort/Subtotal Cost	0.000	0.000	0.000	0.000															
RDT&E Articles Quantity																			
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# UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: <b>February 2003</b>																																																																							
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME PE 0604300N - DD(X) Total Ship Systems Engineering	PROJECT NUMBER AND NAME 32464 - DD(X) System Design, Development & Integration																																																																								
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R-1 SHOPPING LIST - Item No. 105

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## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification								DATE: <b>February 2003</b>	
APPROPRIATION/BUDGET ACTIVITY <b>RDTE, N / BA-5</b>			PROGRAM ELEMENT NUMBER AND NAME PE 0604300N - DD(X) Total Ship Systems Engineering			PROJECT NUMBER AND NAME 32464 - DD(X) System Design, Development & Integration			

**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 0603513N / Shipboard Sys Component De	280.795	256.366	20.431	19.251	33.646	23.513	21.763	22.132	CONT	CONT
BLI 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:**

(U) The DD (X) acquisition strategy encompasses five contract phases: Phase I – System Concepts, Phase II – Initial System Design, Phase III – System Design, Phase IV – Detail Design and Construction, and Phase V – Engineering and Logistics Life Cycle Support. The Navy awarded section 845/804 agreements for Phases I and II for two DD (X) Industry teams. Downselection to a single DD (X) Design Agent occurred 3rd quarter FY 2002 to begin Contract Phase III.

**F. MAJOR PERFORMERS:**

**DD(X) Design Agent** - Northrop Grumman Ship Systems  
**Government Field Activities** - NAWC China Lake, NAWC Pt Mugu, NAWC TSD, NSWC Carderock, NSWC Crane, NSWC Dahlgren, NSWC Newport, NSWC Panama City, NSWC Port Hueneme, Naval Research Laboratory, SPAWAR Systems Center  
**Universities** - John Hopkins University / Applied Physics Laboratory and Georgia Tech Research Institute

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## CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)								DATE: <b>February 2003</b>				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME						
<b>RDT&amp;E, N / BA-5</b>			PE 0604300N - DD(X) Total Ship Systems Engineering			32464 - DD(X) System Design, Development & Integration						
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
Initial System Concepts - Phase I	OTA	DD(X) Industry Team	54.800	0.000	N/A	0.000	N/A	0.000	N/A	0.000	54.800	
Initial System Design - Phase II	OTA	DD(X) Industry Team	139.919	0.000	N/A	0.000	N/A	0.000	N/A	0.000	139.919	
Primary H/W Development- Phase III	CPAF	DD(X) Design Agent	78.000	520.776	1QFY03	730.918	1QFY04	913.780	1QFY05	Continuing	Continuing	
Ship Integration											0.000	
Ship Suitability											0.000	
Systems Engineering											0.000	
Training Development											0.000	
Licenses											0.000	
Tooling											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal Product Development			272.719	520.776		730.918		913.780		0.000	2,438.193	
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: Support costs are included in the Development contract costs.												

# UNCLASSIFIED

**CLASSIFICATION:**

Exhibit R-3 Cost Analysis (page 2)								DATE: February 2003				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME						
RDT&E, N / BA-5			PE 0604300N - DD(X) Total Ship Systems Engineering			32464 - DD(X) System Design, Development & Integration						
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
Live Fire Test & Evaluation	OTA	DD(X) Industry Teams	4.875	0.000	N/A	0.000	N/A	0.000	N/A	Continuing	Continuing	
Live Fire Test & Evaluation	CAPF	DD(X) Design Agent	0.000	4.100	12/02	0.000	N/A	0.000	N/A	Continuing	Continuing	
Live Fire Test & Evaluation	WR	NSWC CD Bethesda MD	10.262	4.550	11/02	7.921	11/03	8.921	11/04	Continuing	Continuing	
Live Fire Test & Evaluation	WR	NSWC DD Dahlgren VA	0.200	1.750	11/02	1.450	11/03	1.500	11/04	Continuing	Continuing	
Live Fire Test & Evaluation	Various	Various	5.150	3.072	11/02	16.154	11/03	18.150	11/04	Continuing	Continuing	
GFE												
Award Fees												
Subtotal T&E			20.487	13.472		25.525		28.571		0.000	88.055	
Remarks:												
Contractor Engineering Support	GSA/FFP	Anteon Arlington VA	6.800	8.817	11/02	10.320	11/03	11.820	11/04	Continuing	Continuing	
	GSA	GRCI, Falls Church VA	2.500	3.842	11/02	3.845	11/03	4.100	11/04	Continuing	Continuing	
	Misc	Various	6.100	2.565	11/02	2.668	11/03	2.890	11/04	Continuing	Continuing	
Government Engineering Support	WR	NSWC DD Dahlgren VA	41.232	11.105	11/02	25.855	11/03	27.005	11/04	Continuing	Continuing	
	WR	NSWC CD Bethesda MD	16.916	10.995	11/02	16.895	11/03	18.895	11/04	Continuing	Continuing	
	WR	NSWC CR Crane IN	3.712	1.000	11/02	2.000	11/03	2.650	11/04	Continuing	Continuing	
	WR	NSWC PHD Pt Hueneme CA	4.205	2.500	11/02	3.850	11/03	4.650	11/04	Continuing	Continuing	
	WR	SSCSD Dan Diego CA	5.657	1.204	11/02	2.604	11/03	3.404	11/04	Continuing	Continuing	
	WR	NUWC/N Newport RI	2.855	1.250	11/02	2.800	11/03	3.000	11/04	Continuing	Continuing	
	WR	NSWC/PC Panama City, FL	0.980	0.400	11/02	2.000	11/03	2.723	11/04	Continuing	Continuing	
	Various	Other Govt Activities	11.316	3.169	11/02	5.401	11/03	5.791	11/04	Continuing	Continuing	
Program Management Support	Various	Various	9.509	3.031	11/02	4.734	11/03	3.960	11/04	Continuing	Continuing	
Travel	Various	Various	1.712	1.500	Various	1.500	Various	1.500	Various	Continuing	Continuing	
Labor (Research Personnel)	CPFF	APL/JHU Laurel MD	8.357	3.223	11/02	4.975	11/03	4.975	11/04	Continuing	Continuing	
SBIR Assessment												
Subtotal Management			121.851	54.601		89.447		97.363		0.000	363.262	
Remarks:												
Total Cost			415.057	588.849		845.890		1,039.714		0.000	2,889.510	
Remarks:												

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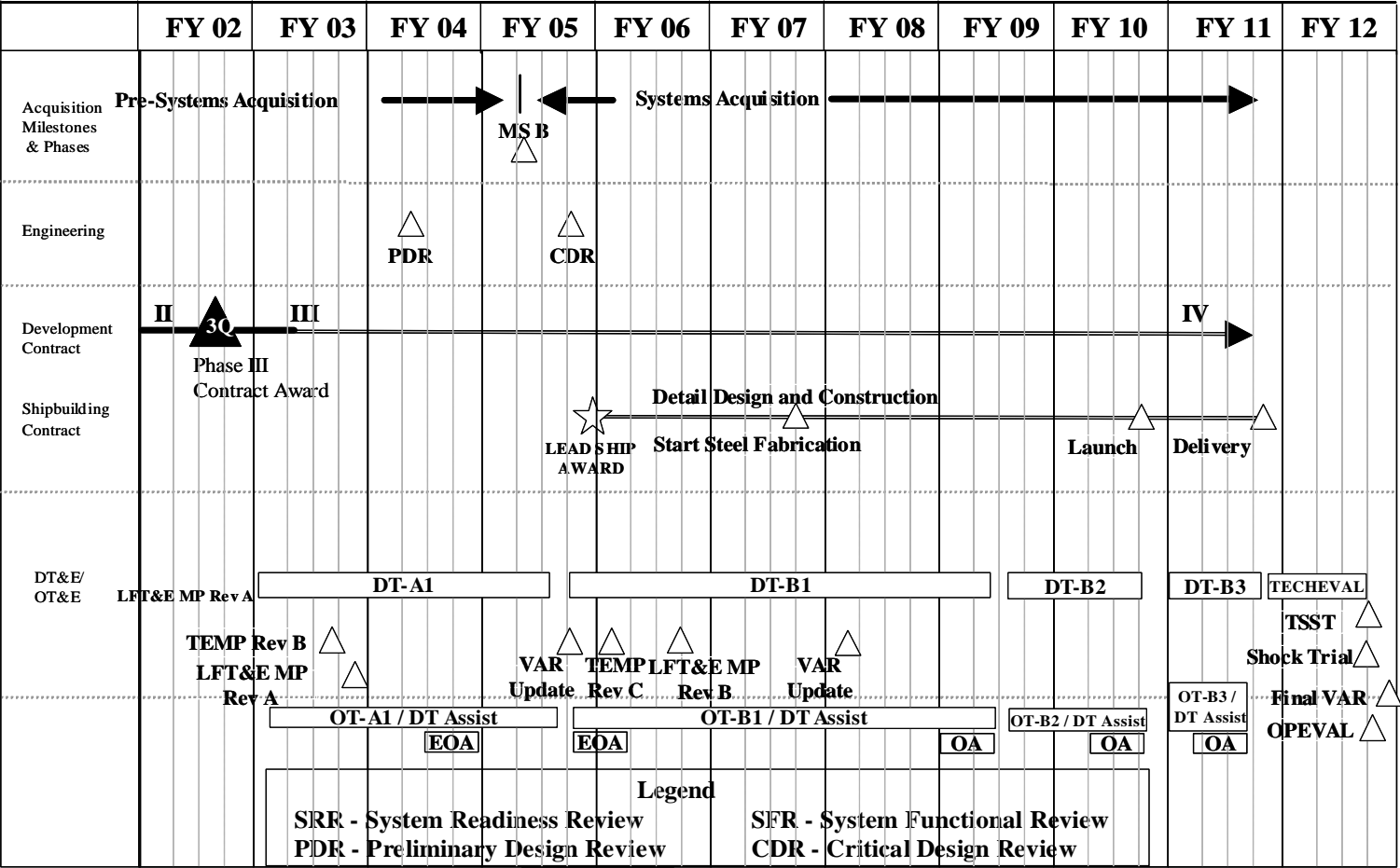
# UNCLASSIFIED

**Exhibit R-3, Project Cost Analysis**  
(Exhibit R-3, page 16 of 54)



CLASSIFICATION:

EXHIBIT R4, Schedule Profile							DATE: February 2003	
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT NUMBER AND NAME				PROJECT NUMBER AND NAME	
RDT&E, N / BA-5			PE 0604300N - DD(X) Total Ship Systems Engineering				32464 - DD(X) System Design, Development & Integration	



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**CLASSIFICATION:**

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**Exhibit R-4a, Schedule Detail**  
(Exhibit R-4a, page 18 of 54)

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## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: <b>February 2003</b>	
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME PE 0604300N - DD(X) Total Ship Systems Engineering				PROJECT NUMBER AND NAME 32466 - Multi-Function Radar (MFR)			
COST (\$ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost	66.210	46.300	23.047	12.393	0.000*	0.000	0.000	0.000
RDT&E Articles Qty		1						

**\*(1) Transferred to PE0603513N, Project 34019**

### A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This project provides funds for the development of the Multi-Function Radar (MFR) in association with DD(X) . This provides DD(X) and other applicable surface ships with an affordable, high performance radar for ship defense well into the next century. This system is based on solid state, active array radar technology and will provide search, detect, track, and weapon control functions while dramatically reducing manning and life-cycle costs associated with multiple systems that perform these functions today. The MFR will achieve a level of force protection that greatly enhances ship defense capability against all threats envisioned in the littoral environment. A Test Article will be available in FY 03 to support Developmental Test/Operational Assessment (DT/OA) land-based and at-sea testing.

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## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: <b>February 2003</b>																
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME PE 0604300N - DD(X) Total Ship Systems Engineering	PROJECT NUMBER AND NAME 32466 - Multi-Function Radar (MFR)																	
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RDT&E Articles Quantity		1																	
<div style="border: 1px solid black; padding: 5px; min-height: 60px;">Engineering and Manufacturing Development (E&amp;MD) phase of MFR hardware and software. Deliver and install Engineering Development Model (EDM) at Navy Land Based Test Site for Factory Testing in FY03. Conduct Factory Integration Testing. Provide test and integration support for land based and at-sea testing. Begin transition to production efforts.</div>																			
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RDT&E Articles Quantity																			
<div style="border: 1px solid black; padding: 5px; min-height: 60px;">Government Engineering Services and Program Management support for E&amp;MD. Perform oversight and assessment of MFR E&amp;MD efforts including factory and land-based Test and Evaluation. Begin transition to production, including the development, fabrication, documentation and engineering support associated with the following efforts: (1) high speed automated manufacturing equipment, (2) test equipment and associated test program sets, (3) systems engineering and test engineering support and (4) failure analysis, parts engineering and configuration management.</div>																			
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<div style="border: 1px solid black; padding: 5px; min-height: 60px;">Evaluation, planning, documentation, scheduling and conduct of Developmental Test / Operational Assessment. Hardware / Software updates resulting from DT/OA. Complete Navy Land Based Testing.</div>																			

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**Exhibit R-2a, RDTEN Project Justification**  
(Exhibit R-2a, page 20 of 54)

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## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: <b>February 2003</b>																																														
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME PE 0604300N - DD(X) Total Ship Systems Engineering	PROJECT NUMBER AND NAME 32466 - Multi-Function Radar (MFR)																																															
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Exhibit R-2a, RDTEN Project Justification  
(Exhibit R-2a, page 21 of 54)

# UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: <b>February 2003</b>																																																																							
APPROPRIATION/BUDGET ACTIVITY <b>RDTE, N / BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME PE 0604300N - DD(X) Total Ship Systems Engineering	PROJECT NUMBER AND NAME 32466 - Multi-Function Radar (MFR)																																																																								
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**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 0603513N / Shipboard Sys Component De	280.795	256.366	20.431	19.251	33.646	23.513	21.763	22.132	CONT	CONT
BLI 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:**

(U) In FY 1999, the Government selected a single MFR contractor (Raytheon) to begin Phase III E&MD. EDM delivery will be in FY 2003.

**F. MAJOR PERFORMERS:**

**Prime Contractor** - Raytheon

**Government Field Activities** - NSWC China Lake, NAWC Pt Mugu, NSWC Crane, NSWC, Dahlgren, NSWC Pt Hueneme, Naval Research Laboratory

**Universities** - Applied Physics Lab/John Hopkins University, Georgia Tech Research Institute

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Exhibit R-3 Cost Analysis (page 1)								DATE: <b>February 2003</b>				
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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/IF	Prime E&MD (Raytheon)	175.079	14.989	1QFY03	0.000	1QFY04	0.000	N/A	Continuing	Continuing	
	CPAF	DD(X) Design Agent	2.434	19.199	Various	4.903	N/A	0.000	N/A	Continuing	Continuing	
	CP	Various	12.414	0.000	N/A	0.000	N/A	0.000	N/A	0.000	12.414	
Ship Integration											0.000	
Ship Suitability											0.000	
Systems Engineering											0.000	
Training Development											0.000	
Licenses											0.000	
Tooling											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal Product Development			189.927	34.188		4.903		0.000		0.000	229.018	
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:												

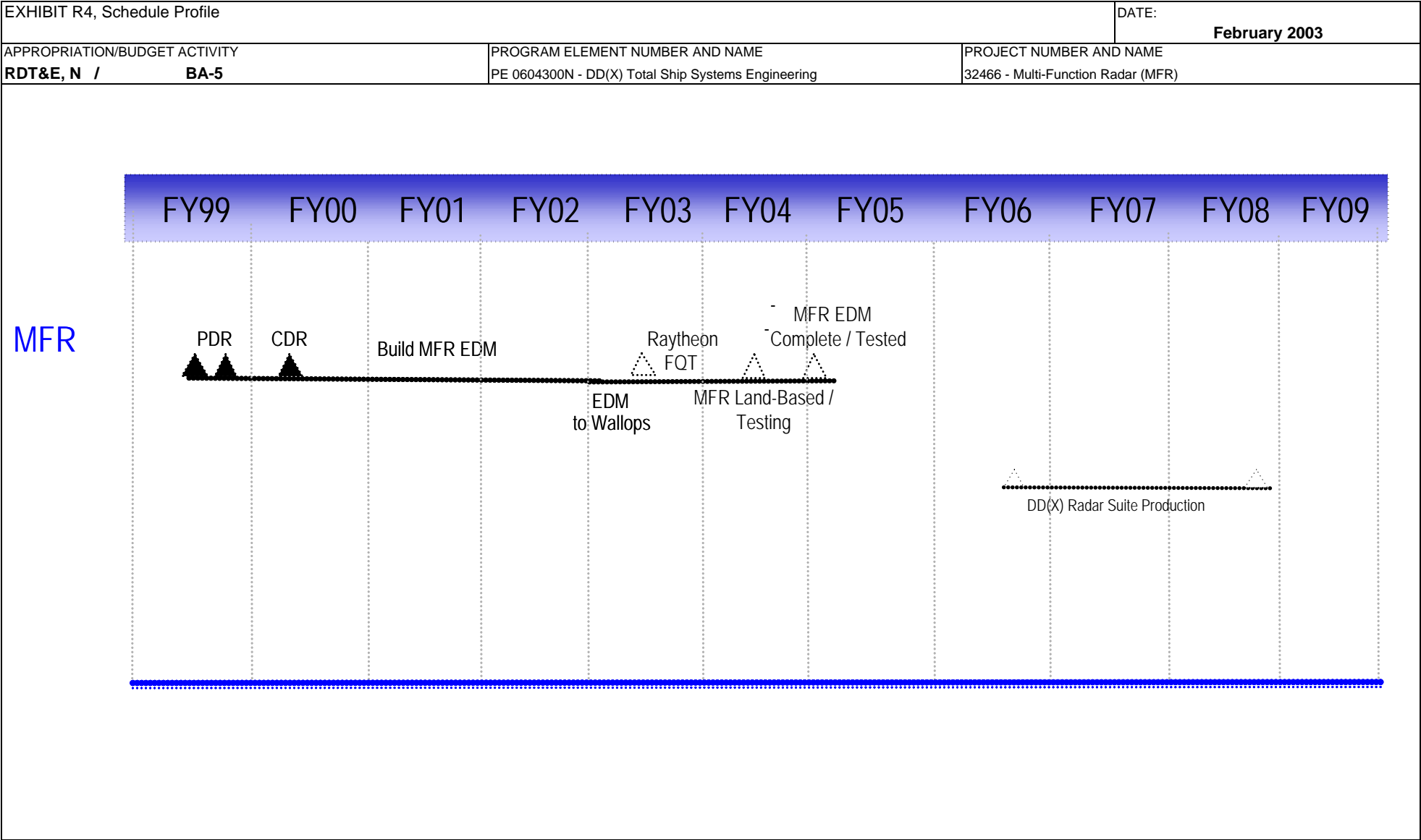


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Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	Various	Various	7.466	2.059	11/02	3.500	11/03	1.500	11/04	Continuing	Continuing	
	CPAF	SCSC Wallops Island VA	1.262	0.894	11/02	0.000	11/03	0.000	11/04	0.000	2.156	
	SS/CPFF	JHU/APL Laurel MD	1.495	0.946	11/02	1.000	11/03	0.300	11/04	Continuing	Continuing	
	WR	NSWC PHD Pt Hueneme CA	1.044	0.426	11/02	1.000	11/03	0.300	11/04	Continuing	Continuing	
	WR	NSWC DD Dahlgren VA	0.000	0.984	11/02	1.000	11/03	0.300	11/04	Continuing	Continuing	
	WR/RC	NAWC Pt Mugu CA	0.000	1.195	11/02	0.000	11/03	0.000	11/04	0.000	1.195	
Subtotal T&E			11.267	6.504		6.500		2.400		0.000	26.671	
Remarks:												
Government Engineering Support	WR	NSWC DD Dahlgren VA	5.067	0.510	11/02	2.500	11/03	1.971	11/04	Continuing	Continuing	
	WR	NSWC PHD Pt Hueneme CA	2.764	0.201	11/02	1.250	11/03	0.900	11/04	Continuing	Continuing	
	SS/CPFF	APL/JHU Laurel MD	3.220	0.264	11/02	1.200	11/03	0.700	11/04	Continuing	Continuing	
	WR	Various	4.571	3.821	11/02	4.769	11/03	4.847	11/04	Continuing	Continuing	
Government Engineering Support											0.000	
Program Management Support	C/CPFF	Various	3.995	0.812	11/02	1.925	11/03	1.575	11/04	Continuing	Continuing	
Travel												
Labor (Research Personnel)												
SBIR Assessment												
Subtotal Management			19.617	5.608		11.644		9.993		0.000	46.862	
Remarks:												
Total Cost			220.811	46.300		23.047		12.393		0.000	302.551	
Remarks:												

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**Exhibit R-4a, Schedule Detail**  
(Exhibit R-4a, page 27 of 54)

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>		PROGRAM ELEMENT NUMBER AND NAME PE 0604300N - DD(X) Total Ship Systems Engineering			PROJECT NUMBER AND NAME 32735 - Volume Search Radar (VSR)			
COST (\$ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost	28.887	50.659	45.057	36.896	0.000	0.000	0.000	0.000
RDT&E Articles Qty			1					

### A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This project provides funds for the development of the Volume Search Radar (VSR) in association with DD(X). This provides DD(X) and other applicable surface ships with an affordable, high performance air search radar. This system is based on solid state, active array radar technology and will provide search, detect, and track while dramatically reducing manning and life-cycle costs associated with multiple systems that perform these functions today. VSR provides long range above-the-horizon surveillance and timely cueing to Multi-Function Radar (MFR). A Test Article will be available in FY 04 to support Developmental Test/Operational Assessment (DT/OA) land-based and at-sea testing.

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	FY 02	FY 03	FY 04	FY 05															
Accomplishments/Effort/Subtotal Cost	26.000	39.013	40.901	35.738															
RDT&E Articles Quantity			1																
<div>Completed Phase II development efforts. In Phase III DD(X) Design Agent will finalize VSR design and procurement Engineering Development Model (EDM) hardware and will begin fabrication. Begin test and evaluation planning. In FY04, conduct VSR Factory Qualification Testing and prepare for Land Based Testing in FY05.</div>																			
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<div>Government Engineering Services and Program Management support for E&amp;MD. Perform oversight and assessment of VSR E&amp;MD efforts including Test and Evaluation. Support VSR Land Based Testing.</div>																			
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Accomplishments/Effort/Subtotal Cost	0.415	2.003	0.000	0.000															
RDT&E Articles Quantity																			
<div>Provide Program Management in support of the above milestones.</div>																			

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Exhibit R-2a, RDTEN Project Justification  
(Exhibit R-2a, page 29 of 54 )

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RDT&E Articles Quantity			0																
Began planning, document and scheduling for VSR land and at-sea testing.																			
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Funding:																																																																										
Previous President's Budget: (FY 03 Pres Controls)	28.711	51.805	46.135	37.728																																																																						
Current BES/President's Budget: (FY04 Pres Controls)	28.887	50.659	45.057	36.896																																																																						
Total Adjustments	0.176	-1.146	-1.078	-0.832																																																																						
Summary of Adjustments																																																																										
Congressional undistributed reductions returned																																																																										
Congressional undistributed reductions	-0.080	-0.596																																																																								
Congressional rescissions																																																																										
SBIR/STTR Transfer																																																																										
Miscellaneous Adjustments			-0.038	-0.036																																																																						
Reprogrammings	0.256																																																																									
Inflation Adjustments		-0.550	-1.040	-0.796																																																																						
Subtotal	0.176	-1.146	-1.078	-0.832																																																																						

R-1 SHOPPING LIST - Item No. 105

UNCLASSIFIED

# UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: <b>February 2003</b>		
APPROPRIATION/BUDGET ACTIVITY <b>RDTE, N / BA-5</b>			PROGRAM ELEMENT NUMBER AND NAME PE 0604300N - DD(X) Total Ship Systems Engineering			PROJECT NUMBER AND NAME 32735 - Volume Search Radar (VSR)			

**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 0603513N / Shipboard Sys Component De	280.795	256.366	20.431	19.251	33.646	23.513	21.763	22.132	CONT	CONT
BLI 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:**

(U) Downselection to a DD (X) Design Agent occurred 3rd quarter FY2002. The DD(X) Design Agent will initiate fabrication delivery of the VSR EDM in FY 2004. MFR/VSR Radar Suite DT/OA is anticipated in FY 2003 through FY 2005.

**F. MAJOR PERFORMERS:**

**DD(X) Design Agent** - Northrop Grumman Ship Systems

**Government Field Activities** - NAWC China Lake, NAWC Pt Mugu, NAWC TSD, NSWC Carderock, NSWC Crane, NSWC Dahlgren, NSWC Newport, NSWC Panama City, NSWC Port Hueneme, Naval Research Laboratory, SPAWAR Systems Center

**Universities** - John Hopkins University / Applied Physics Laboratory, Applied Research Labs at University of Texas, University of Washington and Penn State University, Georgia Tech Research Institute

R-1 SHOPPING LIST - Item No. 105

UNCLASSIFIED



# UNCLASSIFIED

## CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)										DATE: February 2003		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME						
RDT&E, N / BA-5			PE 0604300N - DD(X) Total Ship Systems Engineering			32735 - Volume Search Radar (VSR)						
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	OTA	DD(X) Industry Team	50.000	0.000	N/A	0.000	N/A	0.000	N/A	0.000	50.000	
	CPAF	DD(X) Design Agent	23.000	39.013	1QFY03	40.901	1QFY04	35.738	1QFY05	Continuing	Continuing	
Ship Integration											0.000	
Ship Suitability											0.000	
Systems Engineering											0.000	
Training Development											0.000	
Licenses											0.000	
Tooling											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal Product Development			73.000	39.013		40.901		35.738		0.000	188.652	
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:												

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CLASSIFICATION:

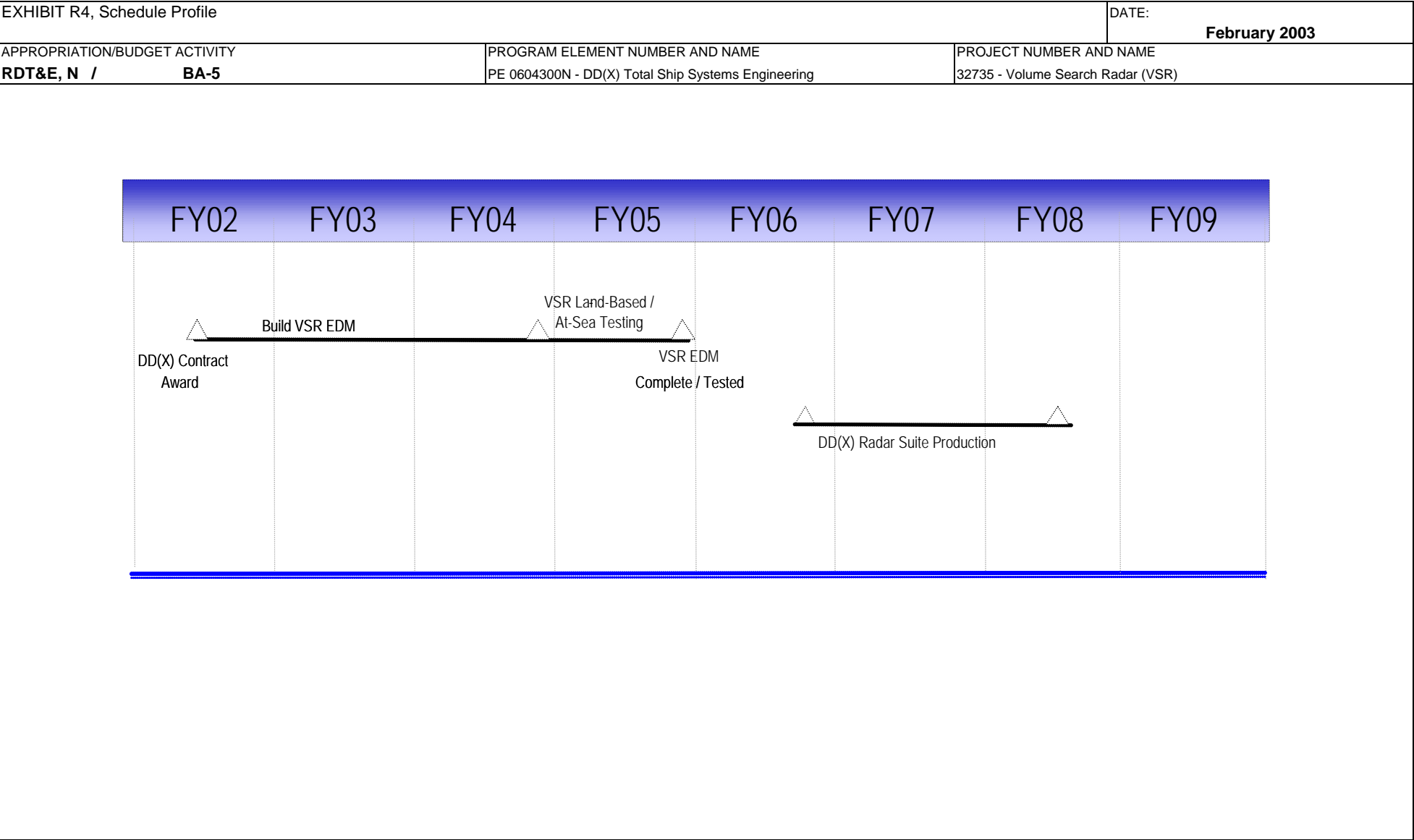
Exhibit R-3 Cost Analysis (page 2)								DATE: <b>February 2003</b>				
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>			PROGRAM ELEMENT PE 0604300N - DD(X) Total Ship Systems Engineering			PROJECT NUMBER AND NAME 32735 - Volume Search Radar (VSR)						
Cost Categories	Contract Method & Type	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	CPAF	SCSC Wallops Island VA	0.600	0.000	N/A	0.000	N/A	0.000	N/A	0.000	0.600	
	Various	Various	0.497	0.000	N/A	0.000	N/A	0.000	11/04	0.000	0.497	
											0.000	
Subtotal T&E			1.097	0.000		0.000		0.000		0.000	1.097	
Remarks:												
Government Engineering Support	WR	NSWC DD Dahlgren VA	1.646	1.860	11/02	0.000	11/03	0.000	11/04	Continuing	Continuing	
	WR	NSWC PHD Pt Hueneme CA	0.000	1.230	11/02	0.000	N/A	0.000	N/A	0.000	1.230	
	WR	Various	3.937	6.553	11/02	4.156	11/03	1.158	11/04	Continuing	Continuing	
Government Engineering Support												
Program Management Support	CPFF	Various	0.627	2.003	11/02	0.000	11/03	0.000	11/04	Continuing	Continuing	
Travel												
Labor (Research Personnel)												
SBIR Assessment												
Subtotal Management			6.210	11.646		4.156		1.158		0.000	23.170	
Remarks:												
Total Cost			80.307	50.659		45.057		36.896		0.000	212.919	
Remarks:												

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CLASSIFICATION:



**UNCLASSIFIED**

**CLASSIFICATION:**

[illegible]

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**UNCLASSIFIED**

**Exhibit R-4a, Schedule Detail**  
(Exhibit R-4a, page 36 of 54)

# UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: <b>February 2003</b>	
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>		PROGRAM ELEMENT NUMBER AND NAME PE 0604300N - DD(X) Total Ship Systems Engineering			PROJECT NUMBER AND NAME 34009 - Advanced Gun System (AGS)			
COST (\$ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost	<b>0.000</b>	<b>0.000</b>	<b>50.978*</b>	<b>46.726</b>	<b>46.906</b>	<b>46.981</b>	<b>47.863</b>	<b>48.750</b>
RDT&E Articles Qty			<b>1</b>					
<b>*Transferred from PE 0603513N, AGS Project 32467</b>								
<b>A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:</b>								
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.								

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## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: <b>February 2003</b>																
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N /</b>	PROGRAM ELEMENT NUMBER AND NAME PE 0604300N - DD(X) Total Ship Systems Engineering	PROJECT NUMBER AND NAME 34009 - Advanced Gun System (AGS)																	
<b>B. Accomplishments/Planned Program</b>																			
<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 25%;"></th><th style="width: 15%;">FY 02</th><th style="width: 15%;">FY 03</th><th style="width: 15%;">FY 04</th><th style="width: 15%;">FY 05</th></tr></thead><tbody><tr><td>Accomplishments/Effort/Subtotal Cost</td><td style="text-align: center;">0.000</td><td style="text-align: center;">0.000</td><td style="text-align: center;">13.040</td><td style="text-align: center;">0.000</td></tr><tr><td>RDT&amp;E Articles Quantity</td><td></td><td></td><td style="text-align: center;">1</td><td></td></tr></tbody></table>						FY 02	FY 03	FY 04	FY 05	Accomplishments/Effort/Subtotal Cost	0.000	0.000	13.040	0.000	RDT&E Articles Quantity			1	
	FY 02	FY 03	FY 04	FY 05															
Accomplishments/Effort/Subtotal Cost	0.000	0.000	13.040	0.000															
RDT&E Articles Quantity			1																
Fabricate Assembly and test Magazine Engineering Development Model (EDM).																			
<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 25%;"></th><th style="width: 15%;">FY 02</th><th style="width: 15%;">FY 03</th><th style="width: 15%;">FY 04</th><th style="width: 15%;">FY 05</th></tr></thead><tbody><tr><td>Accomplishments/Effort/Subtotal Cost</td><td style="text-align: center;">0.000</td><td style="text-align: center;">0.000</td><td style="text-align: center;">9.253</td><td style="text-align: center;">0.000</td></tr><tr><td>RDT&amp;E Articles Quantity</td><td></td><td></td><td></td><td></td></tr></tbody></table>						FY 02	FY 03	FY 04	FY 05	Accomplishments/Effort/Subtotal Cost	0.000	0.000	9.253	0.000	RDT&E Articles Quantity				
	FY 02	FY 03	FY 04	FY 05															
Accomplishments/Effort/Subtotal Cost	0.000	0.000	9.253	0.000															
RDT&E Articles Quantity																			
Conduct Upper Gun Mount EDM Testing																			
<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 25%;"></th><th style="width: 15%;">FY 02</th><th style="width: 15%;">FY 03</th><th style="width: 15%;">FY 04</th><th style="width: 15%;">FY 05</th></tr></thead><tbody><tr><td>Accomplishments/Effort/Subtotal Cost</td><td style="text-align: center;">0.000</td><td style="text-align: center;">0.000</td><td style="text-align: center;">7.823</td><td style="text-align: center;">0.000</td></tr><tr><td>RDT&amp;E Articles Quantity</td><td></td><td></td><td></td><td></td></tr></tbody></table>						FY 02	FY 03	FY 04	FY 05	Accomplishments/Effort/Subtotal Cost	0.000	0.000	7.823	0.000	RDT&E Articles Quantity				
	FY 02	FY 03	FY 04	FY 05															
Accomplishments/Effort/Subtotal Cost	0.000	0.000	7.823	0.000															
RDT&E Articles Quantity																			
Fabricate Assembly and Test Integration System Control (ISC).																			

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## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: <b>February 2003</b>																
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N /</b>	PROGRAM ELEMENT NUMBER AND NAME PE 0604300N - DD(X) Total Ship Systems Engineering	PROJECT NUMBER AND NAME 34009 - Advanced Gun System (AGS)																	
<b>B. Accomplishments/Planned Program</b>																			
<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 25%;"></th><th style="width: 15%;">FY 02</th><th style="width: 15%;">FY 03</th><th style="width: 15%;">FY 04</th><th style="width: 15%;">FY 05</th></tr></thead><tbody><tr><td>Accomplishments/Effort/Subtotal Cost</td><td style="text-align: center;">0.000</td><td style="text-align: center;">0.000</td><td style="text-align: center;">13.040</td><td style="text-align: center;">20.475</td></tr><tr><td>RDT&amp;E Articles Quantity</td><td></td><td></td><td></td><td></td></tr></tbody></table>						FY 02	FY 03	FY 04	FY 05	Accomplishments/Effort/Subtotal Cost	0.000	0.000	13.040	20.475	RDT&E Articles Quantity				
	FY 02	FY 03	FY 04	FY 05															
Accomplishments/Effort/Subtotal Cost	0.000	0.000	13.040	20.475															
RDT&E Articles Quantity																			
Continue LRLAP EDM development and testing.																			
<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 25%;"></th><th style="width: 15%;">FY 02</th><th style="width: 15%;">FY 03</th><th style="width: 15%;">FY 04</th><th style="width: 15%;">FY 05</th></tr></thead><tbody><tr><td>Accomplishments/Effort/Subtotal Cost</td><td style="text-align: center;">0.000</td><td style="text-align: center;">0.000</td><td style="text-align: center;">7.822</td><td style="text-align: center;">0.000</td></tr><tr><td>RDT&amp;E Articles Quantity</td><td></td><td></td><td></td><td></td></tr></tbody></table>						FY 02	FY 03	FY 04	FY 05	Accomplishments/Effort/Subtotal Cost	0.000	0.000	7.822	0.000	RDT&E Articles Quantity				
	FY 02	FY 03	FY 04	FY 05															
Accomplishments/Effort/Subtotal Cost	0.000	0.000	7.822	0.000															
RDT&E Articles Quantity																			
Support Ship Design development with Gun, Magazine, LRLAP integration efforts.																			
<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 25%;"></th><th style="width: 15%;">FY 02</th><th style="width: 15%;">FY 03</th><th style="width: 15%;">FY 04</th><th style="width: 15%;">FY 05</th></tr></thead><tbody><tr><td>Accomplishments/Effort/Subtotal Cost</td><td style="text-align: center;">0.000</td><td style="text-align: center;">0.000</td><td style="text-align: center;">0.000</td><td style="text-align: center;">19.094</td></tr><tr><td>RDT&amp;E Articles Quantity</td><td></td><td></td><td></td><td></td></tr></tbody></table>						FY 02	FY 03	FY 04	FY 05	Accomplishments/Effort/Subtotal Cost	0.000	0.000	0.000	19.094	RDT&E Articles Quantity				
	FY 02	FY 03	FY 04	FY 05															
Accomplishments/Effort/Subtotal Cost	0.000	0.000	0.000	19.094															
RDT&E Articles Quantity																			
Commence integration of Gun, Magazine, ISC EDMs.																			

R-1 SHOPPING LIST - Item No.

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# UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: <b>February 2003</b>																
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME PE 0604300N - DD(X) Total Ship Systems Engineering	PROJECT NUMBER AND NAME 34009 - Advanced Gun System (AGS)																	
<b>B. Accomplishments/Planned Program</b>																			
<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 25%;"></th><th style="width: 15%;">FY 02</th><th style="width: 15%;">FY 03</th><th style="width: 15%;">FY 04</th><th style="width: 15%;">FY 05</th></tr></thead><tbody><tr><td>Accomplishments/Effort/Subtotal Cost</td><td style="text-align: center;">0.000</td><td style="text-align: center;">0.000</td><td style="text-align: center;">0.000</td><td style="text-align: center;">7.157</td></tr><tr><td>RDT&amp;E Articles Quantity</td><td></td><td></td><td></td><td></td></tr></tbody></table>						FY 02	FY 03	FY 04	FY 05	Accomplishments/Effort/Subtotal Cost	0.000	0.000	0.000	7.157	RDT&E Articles Quantity				
	FY 02	FY 03	FY 04	FY 05															
Accomplishments/Effort/Subtotal Cost	0.000	0.000	0.000	7.157															
RDT&E Articles Quantity																			
Commence Land Based testing of AGS EDM.																			
<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 25%;"></th><th style="width: 15%;">FY 02</th><th style="width: 15%;">FY 03</th><th style="width: 15%;">FY 04</th><th style="width: 15%;">FY 05</th></tr></thead><tbody><tr><td>Accomplishments/Effort/Subtotal Cost</td><td style="text-align: center;">0.000</td><td style="text-align: center;">0.000</td><td style="text-align: center;">0.000</td><td style="text-align: center;">0.000</td></tr><tr><td>RDT&amp;E Articles Quantity</td><td></td><td></td><td></td><td></td></tr></tbody></table>						FY 02	FY 03	FY 04	FY 05	Accomplishments/Effort/Subtotal Cost	0.000	0.000	0.000	0.000	RDT&E Articles Quantity				
	FY 02	FY 03	FY 04	FY 05															
Accomplishments/Effort/Subtotal Cost	0.000	0.000	0.000	0.000															
RDT&E Articles Quantity																			
<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 25%;"></th><th style="width: 15%;">FY 02</th><th style="width: 15%;">FY 03</th><th style="width: 15%;">FY 04</th><th style="width: 15%;">FY 05</th></tr></thead><tbody><tr><td>Accomplishments/Effort/Subtotal Cost</td><td style="text-align: center;">0.000</td><td style="text-align: center;">0.000</td><td style="text-align: center;">0.000</td><td style="text-align: center;">0.000</td></tr><tr><td>RDT&amp;E Articles Quantity</td><td></td><td></td><td></td><td></td></tr></tbody></table>						FY 02	FY 03	FY 04	FY 05	Accomplishments/Effort/Subtotal Cost	0.000	0.000	0.000	0.000	RDT&E Articles Quantity				
	FY 02	FY 03	FY 04	FY 05															
Accomplishments/Effort/Subtotal Cost	0.000	0.000	0.000	0.000															
RDT&E Articles Quantity																			

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# UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: <b>February 2003</b>	
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME PE 0604300N - DD(X) Total Ship Systems Engineering	PROJECT NUMBER AND NAME 34009 - Advanced Gun System (AGS)		

**C. PROGRAM CHANGE SUMMARY:**

	FY 2002	FY 2003	FY 2004	FY 2005
Funding:				
Previous President's Budget: (FY 03 Pres Controls)	0.000	0.000	0.000	0.000
Current BES/President's Budget: (FY 04 Pres Controls)	0.000	0.000	50.978	46.726
Total Adjustments	0.000	0.000	50.978	46.726
Summary of Adjustments				
Congressional program reductions				
Congressional undistributed reductions				
Congressional rescissions				
POM-04 realignment from DD(X) BA-4 budget to BA-5			52.158	47.736
SBIR/STTR Transfer				
Inflation Adjustments			-1.177	-1.007
Miscellaneous Reductions			-0.003	-0.003
Reprogrammings				
Congressional increases				
Subtotal	0.000	0.000	50.978	46.726

Schedule:

Not Applicable

Technical:

Not Applicable

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Exhibit R-2a, RDTEEN Project Justification  
(Exhibit R-2a, page 41 of 54)

# UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification								DATE: <b>February 2003</b>	
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>			PROGRAM ELEMENT NUMBER AND NAME PE 0604300N - DD(X) Total Ship Systems Engineering			PROJECT NUMBER AND NAME 34009 - Advanced Gun System (AGS)			

**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 0603513N / Shipboard Sys Component De	280.795	256.366	20.431	19.251	33.646	23.513	21.763	22.132	CONT	CONT
BLI 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:**

(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 were conducted under section 845/804 other transaction authority. Initial phases include: Phase I – Concept Formulation, Phase II - Initial Prototype Development. Downselection to a single DD(X) Design Agent occurred in 3rd quarter FY02 to begin Phase III. The AGS EDM development will continue under this contract.

**F. MAJOR PERFORMERS:**

**Contractors** - United Defense Limited Partnership and DD(X) Design Agent - Northrop Grumman Ship Systems  
**Field Activities** - NSWC Carderock, NSWC Dahlgren, NSWC Port Hueneme, NSWC Port Hueneme Louisville detachment, NSWC Indian Head  
**Universities** - N/A

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## CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)										DATE: February 2003		
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT				PROJECT NUMBER AND NAME						
RDT&E, N / BA-5		PE 0604300N - DD(X) Total Ship Systems Engineering				34009 - Advanced Gun System (AGS)						
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				42.019	1QFY04	36.935	1QFY05	Continuing	Continuing	
											0.000	
Ship Integration											0.000	
Ship Suitability											0.000	
Systems Engineering											0.000	
Training Development											0.000	
Licenses											0.000	
Tooling											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal Product Development			0.000	0.000		42.019		36.935		0.000	78.954	
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:												

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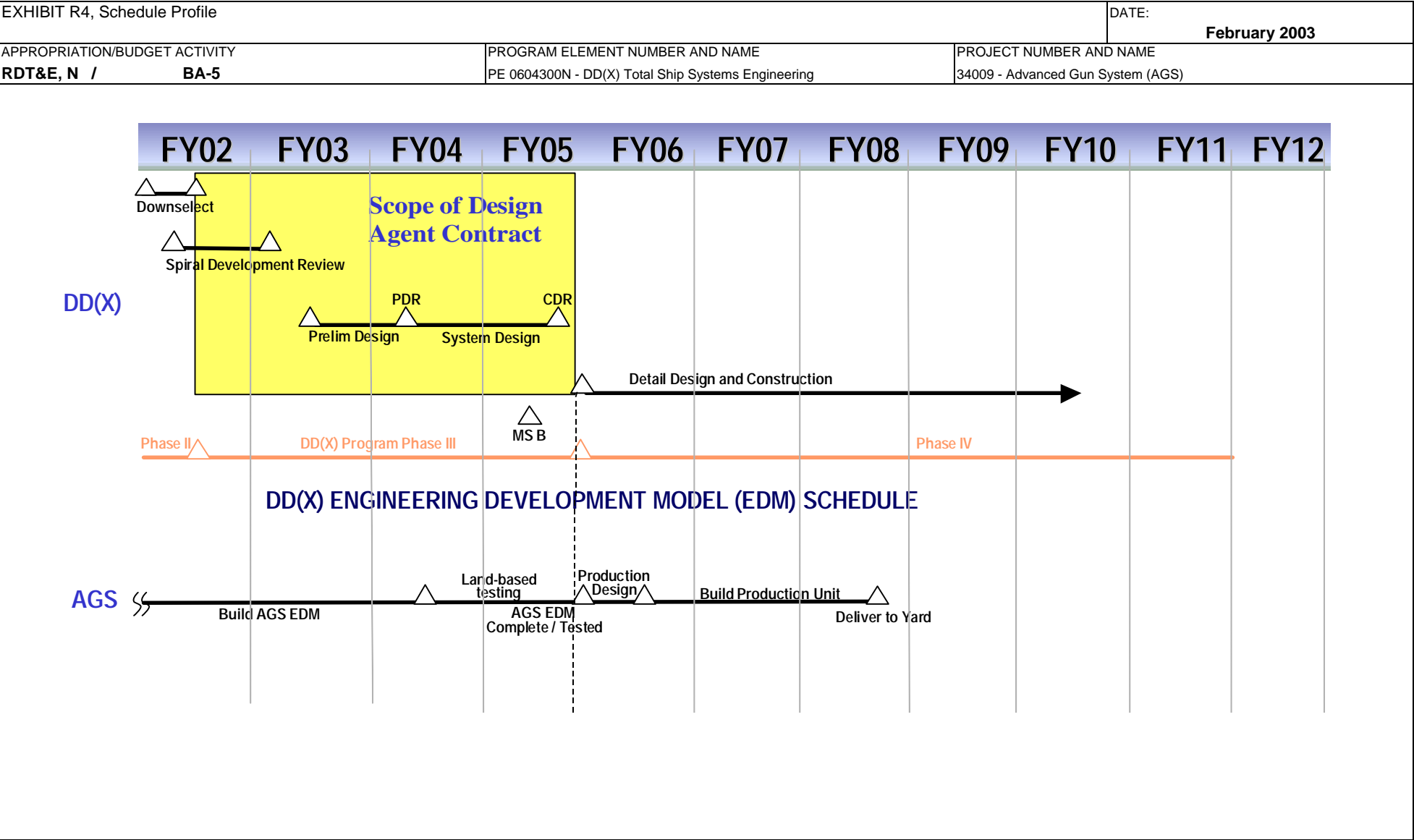
CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)							DATE: February 2003						
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT				PROJECT NUMBER AND NAME						
RDT&E, N / BA-5			PE 0604300N - DD(X) Total Ship Systems Engineering				34009 - Advanced Gun System (AGS)						
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		
											0.000		
											0.000		
Subtotal T&E			0.000	0.000		0.000		0.000		0.000	0.000		
Remarks:													
Contractor Engineering Support	GSA/CPFF	Anteon Arlington VA				2.469	10/03	2.594	10/04	Continuing	Continuing		
	Various	Other Contractors				0.825	Various	0.900	Various	Continuing	Continuing		
Government Engineering Support	WR	NSWC DD Dahlgren VA				2.465	10/03	3.000	10/04	Continuing	Continuing		
	WR	NSWC PHD Pt Hueneme CA				1.600	10/03	1.600	10/04	Continuing	Continuing		
	WR	Other Gov't Activities				1.600	Various	1.697	Various	Continuing	Continuing		
Program Management Support													
Travel													
Labor (Research Personnel)													
SBIR Assessment													
Subtotal Management			0.000	0.000		8.959		9.791		0.000	18.750		
Remarks:													
Total Cost			0.000	0.000		50.978		46.726		0.000	97.704		
Remarks:													

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CLASSIFICATION:



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**Exhibit R-4a, Schedule Detail**  
(Exhibit R-4a, page 46 of 54)

# UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE:	
							February 2003	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-5	PROGRAM ELEMENT NUMBER AND NAME 0604300N/ DD(X) Total Ship Sys Engineering				PROJECT NUMBER AND NAME 34010/Integrated Power Systems on DD(X)			
COST (\$ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost	0.000	0.000	73.015	60.300	0.000	0.000	0.000	0.000
RDT&E Articles Qty	0	0	0	0	0	0	0	0
*FY 2004 and FY 2005 IPS DD(X) funds transferred from PE 0603513N IPS Project 32471								
A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project provides funds to develop and test integrated power system Engineering Development Modules (EDMs) for DD (X) including Permanent Magnet (PM) motor and motor drive technologies . 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 provides total ship electric power, including electric propulsion, power conversion and distribution, and mission load interfaces to the electric power system. 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.								

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**Exhibit R-2a, RDTEN Project Justification**  
(Exhibit R-2a, page 47 of 54)

# UNCLASSIFIED

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: <b>February 2003</b>	
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N /BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME 0604300N/ DD(X) Total Ship Sys Engineering	PROJECT NUMBER AND NAME 34010/Integrated Power Systems on DD(X)		
<b>B. Accomplishments/Planned Program</b>				
	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.000	0.000	73.015	60.300
RDT&E Articles Quantity	0	0	0	0
<p>Platform Specific Development: FY02 &amp; 03 funds are in PE 0603513N Project 32471. Fabricate two (2) DD(X) IPS Engineering Development Models (EDMs) for land based and at-sea testing. Perform factory acceptance tests of major components. In support of DD(X) IPS EDM land based and at sea testing, complete test site preparations and prepare test plans. Deliver DD(X) IPS EDMs to land based and at sea test platforms. Install, checkout, integrate and conduct land based and at sea testing.</p>				



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## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: <b>February 2003</b>	
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME 0604300N/ DD(X) Total Ship Sys Engineering	PROJECT NUMBER AND NAME 34010/Integrated Power Systems on DD(X)		

**C. PROGRAM CHANGE SUMMARY:**

Funding:	FY 2002	FY 2003	FY 2004	FY 2005
Previous President's Budget: (FY 03 Pres Controls)	0.000	0.000	0.000	0.000
Current BES/President's Budget: (FY04/05 OSD/OMB Controls)	0.000	0.000	73.015	60.300
Total Adjustments	0.000	0.000	73.015	60.300
Summary of Adjustments				
Congressional program reductions				
Congressional undistributed reductions				
Congressional rescissions				
POM-04 realignment from DD(X) BA-4 budget to BA-5			74.700	61.600
SBIR/STTR Transfer				
Inflation Adjustments			-1.685	-1.300
Reprogrammings				
Congressional increases				
Subtotal	0.000	0.000	73.015	60.300

Schedule:

Not Applicable

Technical:

Not Applicable

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Exhibit R-2a, RD TEN Project Justification  
(Exhibit R-2a, page 49 of 54)

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## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification								DATE: <b>February 2003</b>	
APPROPRIATION/BUDGET ACTIVITY <b>RDTE, N / BA-5</b>			PROGRAM ELEMENT NUMBER AND NAME 0604300N/ DD(X) Total Ship Sys Engineering			PROJECT NUMBER AND NAME 34010/Integrated Power Systems on DD(X)			

**D. OTHER PROGRAM FUNDING SUMMARY:**

<u>Line Item No. &amp; Name</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>To Complete</u>	<u>Total Cost</u>
PE 0603513N/ Shipboard Sys Component	280.795	256.366	20.431	19.251	33.646	23.513	21.763	22.132	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:**

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

**F. MAJOR PERFORMERS:**

IPS DD(X) Design Agent, Northrop Grumman Ship Systems

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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)								DATE: February 2003				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME						
RDT&E, N / BA-5			0604300N/ DD(X) Total Ship Sys Engineering			34010/Integrated Power Systems on DD(X)						
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				73.015	10/03	60.300	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			0.000	0.000		73.015		60.300		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:												

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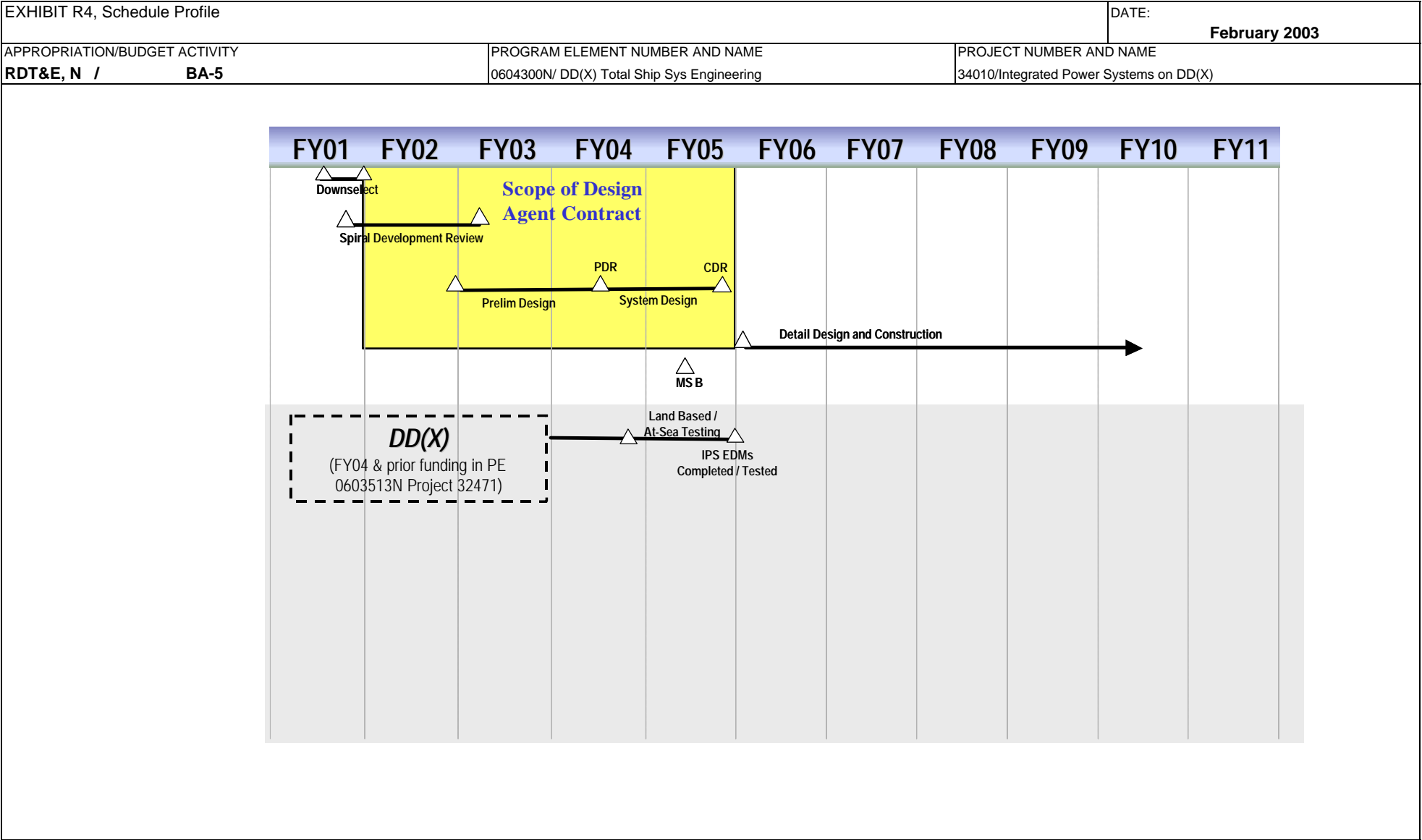
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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)								DATE: February 2003				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME						
RDT&E, N / BA-5			0604300N/ DD(X) Total Ship Sys Engineering			34010/Integrated Power Systems on DD(X)						
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												
Test Assets												
Tooling												
GFE												
Award Fees												
Subtotal T&E			0.000	0.000		0.000		0.000		CONT	CONT	
Remarks:												
Contractor Engineering Support											0.000	
Government Engineering Support											0.000	
Program Management Support											0.000	
Travel											0.000	
Labor (Research Personnel)											0.000	
SBIR Assessment											0.000	
Subtotal Management			0.000	0.000		0.000		0.000		CONT	CONT	
Remarks:												
Total Cost			0.000	0.000		73.015		60.300		CONT	CONT	
Remarks:												

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CLASSIFICATION:



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**CLASSIFICATION:**

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**Exhibit R-4a, Schedule Detail**  
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