

UNCLASSIFIED

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification						DATE: February 2004	
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-04				R-1 ITEM NOMENCLATURE 0603512N - Carrier Systems Development			
COST (\$ in Millions)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Total PE Cost	88.360	156.603	157.479	132.210	79.999	287.609	369.674
9181 - Advanced Battlestation/Decision Support System	3.428	3.560	0.000	0.000	0.000	0.000	0.000
9349 - Aviation Ship Integration Center	0.000	9.691	0.000	0.000	0.000	0.000	0.000
2208 - CVN 21	30.440	101.662	104.465	95.297	49.548	46.921	49.557
4004 - EMALS	44.679	38.660	51.094	35.083	28.634	47.318	2.539
4005 - Smart Carrier	1.942	1.860	1.843	1.830	1.817	1.804	1.799
4006 - CVN 21 Follow Ship	0.000	0.000	0.000	0.000	0.000	191.566	315.779
1723 - CV Launch and Recovery Systems	7.871	1.170	0.077	0.000	0.000	0.000	0.000
A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This Navy unique program addresses all technology areas associated with Navy/Marine Corps aircraft operations aboard ships. The program includes: - (U) (9181) - The Advanced Battlestation/Decision Support System (ABS/DSS) provides a low-risk decision support capability that has great potential for multiple Navy platforms and possible application for other services. Expected benefits include: improved situational awareness, reduced response time in a multiple threat environment, manpower reductions, and reductions in Total Ownership Costs (TOC). - (U) (9349) -- The Aviation Ship Integration Center provides an environment that supports the development and conceptualization of fully integrated future aircraft carrier advanced technology design. The Center will be used to identify, test, and integrate potential design approaches and products for the CVN 21 Warfare System that are focused on reducing costs by increasing efficiencies in air capable shipbuilding programs. The Center will mitigate CVN 21 advanced technology design risk by enabling detection and resolution of potential problems early in the development cycle, thereby maximizing the Navy's return on its non-recurring design investment and enhancing transformational initiatives necessary to support the CVN 21 Warfare System. - (U) (2208) -- Development of ship hull, mechanical, propulsion, electrical, aviation, and combat support systems, subsystems and components to significantly improve aircraft carrier affordability, manpower requirements, survivability, and operational capabilities, and to meet the requirements of existing and pending regulations and statutes critical to the operation of existing and future aircraft carriers.							

R-1 SHOPPING LIST - Item No.

38

1 of 46

UNCLASSIFIED

Exhibit R-2, RD TEN Budget Item Justification
(Exhibit R-2, page 1 of 46)

UNCLASSIFIED

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification		DATE: February 2004
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-04		R-1 ITEM NOMENCLATURE 0603512N - Carrier Systems Development
<p>- (U) (4004) - Development of an advanced technology aircraft launch system in support of the CVN 21 Class design and construction schedule. The Electro Magnetic Aircraft Launch System (EMALS) will replace the current steam catapult on CVN 21 Class ships and will also be retrofit on existing CVNs. EMALS provides better control of applied forces, both peak and transient dynamic, improved reliability and maintainability, increased operational availability and reduced operator and maintainer workload.</p> <p>- (U) (4005) - The Smart Carrier Demonstration and Validation program exploits available technologies to deliver an affordable, robust, operator-friendly automation control environment for Navy Aircraft Carrier shipboard equipment. The program provides the system architecture, requirements/specification development, technology selection, software development (including software baseline), as well as land-based and shipboard testing of new technologies to improve shipboard operations and to reduce workload, manpower requirements, and Total Ownership Costs (TOC).</p> <p>- (U) (4006) - Development of aircraft carrier specific technologies, the infusion of the ship technology base into existing and future aircraft carriers and the potential realization of subsystem design capabilities not currently feasible. This project also funds the Contract Design efforts for the CVN 21 follow ship. .</p> <p>- (U) (1723) -- Development of all systems required to provide approach and landing guidance and control, recovery, service, support and launch aircraft operating onto or from ships. Payoffs include increased safety, greater sortie generation rates, enhanced aircraft boarding rates, reduced manning, increased aircraft service life and fleet modernization.</p>		

R-1 SHOPPING LIST - Item No. 38

2 of 46

UNCLASSIFIED

Exhibit R-2, RDTEN Budget Item Justification
(Exhibit R-2, page 2 of 46)

UNCLASSIFIED

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2004
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-04	PE 0603512N - Carrier Systems Development				PROJECT NUMBER AND NAME PU 9181 - Advanced Battlestation/Decision Support System		
COST (\$ in Millions)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost	3.428	3.560	0.000	0.000	0.000	0.000	0.000
RDT&E Articles Qty							

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Advanced Battlestation/Decision Support System (ABS/DSS) provides a low-risk decision support capability that has great potential for multiple Navy platforms, and possible application for other services. Expected benefits include: improved situational awareness, reduced response time in a multiple threat environment, manpower reductions, and reductions in Total Ownership Costs (TOC).

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EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2004	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-04	PROGRAM ELEMENT NUMBER AND NAME PE 0603512N - Carrier Systems Development	PROJECT NUMBER AND NAME PU 9181 - Advanced Battlestation/Decision Support System	
B. Accomplishments/Planned Program (Cont.)			
	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	3.428	3.560	0.000
RDT&E Articles Quantity			
<p>- (U) Advanced Battlestation/Decision Support System (ABS/DSS) FY03 accomplishments include the addition of new functionality in the baseline ABS/DSS system based on inputs from USS CARL VINSON (CVN-70) staff and USS ABRAHAM LINCOLN (CVN-72) DESRON staff. Technical accomplishments also include Combat System test and certification at the Integrated Combat System Test Facility (ICSTF), San Diego, CA and approval to install in CV-67 by NAVSEASYS COM 062 and PEO Carriers. FY04 planned accomplishments include enhancing ABS/DSS capability based on Fleet operator feedback from multiple Fleet demonstrations. ABS/DSS will be fully integrated into the Aircraft Carrier Tactical Support Center (CV-TSC) and Integrated Warfare Commander Cell (IWCC). Fleet demonstrations/requirements working groups are planned for USS JOHN F. KENNEDY (CV-67) and USS ABRAHAM LINCOLN (CVN-72). Potential exercise participation includes RIMPAC '04 with CVN-74.</p>			

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APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA 04	PROGRAM ELEMENT NUMBER AND NAME PE 0603512N - Carrier Systems Development	PROJECT NUMBER AND NAME PU 9181 - Advanced Battlestation/Decision Support System

C. PROGRAM CHANGE SUMMARY:

	FY 2003	FY 2004	FY 2005
Funding:			
Previous President's Budget:	3.521	0.000	0.000
FY05 President's Budget	3.428	3.560	0.000
Total Adjustments	-0.093	3.560	0.000
Summary of Adjustments			
SBIR	-0.093		
Congressional Add		3.600	
Congressional Undistributed Adjustments		-0.040	
	-0.093	3.560	0.000

Schedule:

FY03 Contract Award Q4FY03/Q1FY04; FY04 Contract Award Q3FY04.

Technical:

Not Applicable.

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EXHIBIT R-2a, RDT&E Project Justification								DATE: February 2004	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-04		PROGRAM ELEMENT NUMBER AND NAME PE 0603512N - Carrier Systems Development			PROJECT NUMBER AND NAME PU 9181 - Advanced Battlestation/Decision Support System				
D. OTHER PROGRAM FUNDING SUMMARY:									
<u>Line Item No. & Name</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>
SCN: 200100 - Carrier Replacement Program	483.663	1,177.242	626.084	611.940	2,968.918	3,250.918	1,568.616	Cont.	Cont.
RDT&E: 0604567N - Ship Contract Design, Live Fire T&E	196.697	134.061	130.908	110.862	97.160	51.263	22.961	Cont.	Cont.
0603570N - Advanced Nuclear Power Systems	211.314	198.999	169.733	168.955	171.262	161.601	153.581	Cont.	Cont.
E. ACQUISITION STRATEGY:									
This procurement is an SBIR transition and will be awarded on a sole source basis to 21st Century Systems, Inc., Omaha, Nebraska.									
F. MAJOR PERFORMERS:									
NUWC Keyport, WA									
21st Century Systems, Inc., Omaha, NE, Development, (FY03 Award)									

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DATE:

February 2004

Remarks: Contract Award 4th Quarter FY03

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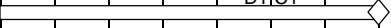
CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)										DATE: February 2004		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-04			PROGRAM ELEMENT PE 0603512N - Carrier Systems Development			PROJECT NUMBER AND NAME PU 9181 - Advanced Battlestation/Decision Support System						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation												
Operational Test & Evaluation												
Live Fire Test & Evaluation												
Test Assets												
Tooling												
GFE												
Award Fees												
Subtotal T&E			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support												
Travel												
Transportation												
SBIR Assessment												
Subtotal Management			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
Total Cost			0.000	3.428		3.560		0.000		0.000	6.988	
Remarks:												

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EXHIBIT R4, Schedule Profile																								DATE:											
APPROPRIATION/BUDGET ACTIVITY												PROGRAM ELEMENT NUMBER AND NAME												PROJECT NUMBER AND NAME											
RDT&E, N / BA-04												PE 0603512N - Carrier Systems Development												PU 9181 - Advanced Battlestation/Decision Support System											
Fiscal Year	2002				2003				2004				2005				2006				2007				2008				2009						
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4							
Acquisition Milestones																																			
ABS/DSS Development																																			
ABS/DSS Fleet Demo																																			
Follow-on Development/ Spiral I																																			
Test & Evaluation Milestones																																			
Development Test																																			
Contract Milestones																																			
Development Contract																																			
Full Funding (OPN & O&M,N)																																			

R-1 SHOPPING LIST - Item No. 38

9 of 46

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

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2004
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-04		PE 0603512N - Carrier Systems Development			PROJECT NUMBER AND NAME PU 9349 Aviation Ship Integration Center		
COST (\$ in Millions)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost	0.000	9.691	0.000	0.000	0.000	0.000	0.000
RDT&E Articles Qty							

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Aviation Ship Integration Center provides an environment that supports the development and conceptualization of fully integrated future aircraft carrier advanced technology design. The Center will be used to identify, test, and integrate potential design approaches and products for the CVN 21 Warfare System that are focused on reducing costs by increasing efficiencies in air capable shipbuilding programs. The Center will mitigate CVN 21 advanced technology design risk by enabling detection and resolution of potential problems early in the development cycle, thereby maximizing the Navy's return on its non-recurring design investment and enhancing transformational initiatives necessary to support the CVN 21 Warfare System.

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APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-04	PROGRAM ELEMENT NUMBER AND NAME PE 0603512N - Carrier Systems Development	PROJECT NUMBER AND NAME PU 9349 Aviation Ship Integration Center												
B. Accomplishments/Planned Program (Cont.) <table border="1" style="width: 100%; border-collapse: collapse; margin: 10px 0;"><thead><tr><th style="width: 30%;"></th><th style="width: 20%;">FY 03</th><th style="width: 20%;">FY 04</th><th style="width: 30%;">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;">9.691</td><td style="text-align: center;">0.000</td></tr><tr><td>RDT&E Articles Quantity</td><td></td><td></td><td></td></tr></tbody></table> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"><p>- (U) Aviation Ship Integration Center - Develop modeling and simulation capability through integration of existing M&S assets with new M&S Systems. Investigate and develop connectivity to various government and industry M&S activities. Relocate the existing M&S facility to the VASCIC Research Center. Build a support structure in the Center, procure hardware and software, and integrate various commercial and government M&S software programs. Develop and implement an Aircraft Carrier Compartment Flexibility/Modularity Program and laboratory to provide an evaluation environment for investigating, prototyping, testing and qualifying new compartment outfitting techniques and products focusing on reducing the construction cost and schedule impacts associated with the installation of electronic systems during new construction and improving fleet maintenance and modernization after delivery. Investigate existing commercial and military technologies that have the potential to simplify and accelerate the equipment installation process during ship construction and technology refresh/reconfiguration updates.</p></div>				FY 03	FY 04	FY 05	Accomplishments/Effort/Subtotal Cost	0.000	9.691	0.000	RDT&E Articles Quantity			
	FY 03	FY 04	FY 05											
Accomplishments/Effort/Subtotal Cost	0.000	9.691	0.000											
RDT&E Articles Quantity														

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APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA 04	PROGRAM ELEMENT NUMBER AND NAME PE 0603512N - Carrier Systems Development	PROJECT NUMBER AND NAME PU 9349 Aviation Ship Integration Center																																				
C. PROGRAM CHANGE SUMMARY: <table style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 40%;"></th><th style="width: 15%; text-align: right;">FY 2003</th><th style="width: 15%; text-align: right;">FY 2004</th><th style="width: 15%; text-align: right;">FY 2005</th></tr></thead><tbody><tr><td>Funding:</td><td></td><td></td><td></td></tr><tr><td>Previous President's Budget:</td><td style="text-align: right;">0.000</td><td style="text-align: right;">0.000</td><td style="text-align: right;">0.000</td></tr><tr><td>FY05 President's Budget</td><td style="text-align: right;">0.000</td><td style="text-align: right;">9.691</td><td style="text-align: right;">0.000</td></tr><tr><td>Total Adjustments</td><td style="text-align: right; border-top: 1px solid black;">0.000</td><td style="text-align: right; border-top: 1px solid black;">9.691</td><td style="text-align: right; border-top: 1px solid black;">0.000</td></tr><tr><td colspan="4" style="padding-top: 10px;">Summary of Adjustments</td></tr><tr><td> Congressional Add</td><td></td><td style="text-align: right;">9.800</td><td></td></tr><tr><td> Congressional Undistributed Adjustments</td><td></td><td style="text-align: right;">-0.109</td><td></td></tr><tr><td></td><td style="text-align: right; border-top: 3px double black;">0</td><td style="text-align: right; border-top: 3px double black;">9.691</td><td style="text-align: right; border-top: 3px double black;">0</td></tr></tbody></table> <div style="margin-top: 20px;">Schedule: Not Applicable</div> <div style="margin-top: 20px;">Technical: Not Applicable.</div>				FY 2003	FY 2004	FY 2005	Funding:				Previous President's Budget:	0.000	0.000	0.000	FY05 President's Budget	0.000	9.691	0.000	Total Adjustments	0.000	9.691	0.000	Summary of Adjustments				Congressional Add		9.800		Congressional Undistributed Adjustments		-0.109			0	9.691	0
	FY 2003	FY 2004	FY 2005																																			
Funding:																																						
Previous President's Budget:	0.000	0.000	0.000																																			
FY05 President's Budget	0.000	9.691	0.000																																			
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EXHIBIT R-2a, RDT&E Project Justification							DATE:			
							February 2004			
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT NUMBER AND NAME			PROJECT NUMBER AND NAME					
RDT&E, N / BA-04		PE 0603512N - Carrier Systems Development			PU 9349 Aviation Ship Integration Center					
D. OTHER PROGRAM FUNDING SUMMARY:										
Line Item No. & Name		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Complete	Total Cost
SCN: 200100 - Carrier Replacement Program		483.663	1,177.242	626.084	611.940	2,968.918	3,250.918	1,568.616	Cont.	Cont.
RDT&E: 0604567N - Ship Contract Design, Live Fire T&E		196.697	134.061	130.908	110.862	97.160	51.263	22.961	Cont.	Cont.
0603570N - Advanced Nuclear Power Systems		211.314	198.999	169.733	168.955	171.262	161.601	153.581	Cont.	Cont.
E. ACQUISITION STRATEGY:										
The CVN 21 will be the first ship of the new class of aircraft carriers consisting of 12 ships. Due to the length and cost of construction, each carrier will be contracted for separately. The CVN 21 will feature a new nuclear propulsion and electrical generation/distribution system, new electromagnetic aircraft launching system, advanced arresting gear system, all electric auxiliaries, warfare system improvements, survivability enhancements, improved weapons handling, and improved aircraft servicing. These design features will result in lower manpower and total ownership costs as compared to the Nimitz Class. Additionally, the following warfighting benefits will be realized: increased sortie generation rate, improved ship self defense capability, increased launch and recovery capability/flexibility, increased operational availability, and increased flexibility to support future upgrades.										
F. MAJOR PERFORMERS:										
Northrop Grumman Newport News, Newport News, VA, Design/Component Development/Construction										

R-1 SHOPPING LIST - Item No. 38

13 of 46

UNCLASSIFIED

Exhibit R-2a, RDTE Project Justification
(Exhibit R-2a, page 13 of 46)

CLASSIFICATION:

DATE:

[illegible]

	PROGRAM ELEMENT
1.	Identify the problem or issue.
2.	Analyze the problem or issue.
3.	Develop a plan of action.
4.	Implement the plan of action.
5.	Evaluate the results.
6.	Communicate the findings.
7.	Reflect on the experience.
8.	Apply the learning to future situations.

PROJECT NUMBER AND NAME

RDT&E, N / BA-04

PE 0603512N - Carrier Systems Development

<p>PU 9349 Aviation Ship Integration Center</p>
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[illegible]

Remarks: Contract Award 4th Quarter FY03

Exhibit R-3, Project Cost Analysis
(Exhibit R-3, page 14 of 46)

UNCLASSIFIED

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)								DATE: February 2004				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME						
RDT&E, N / BA-04			PE 0603512N - Carrier Systems Development			PU 9349 Aviation Ship Integration Center						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation												
Operational Test & Evaluation												
Live Fire Test & Evaluation												
Test Assets												
Tooling												
GFE												
Award Fees												
Subtotal T&E			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support												
Travel												
Transportation												
SBIR Assessment												
Subtotal Management			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
Total Cost			0.000	0.000		9.691		0.000		0.000	9.691	
Remarks:												

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

EXHIBIT R4, Schedule Profile																											DATE: February 2004								
APPROPRIATION/BUDGET ACTIVITY												PROGRAM ELEMENT NUMBER AND NAME												PROJECT NUMBER AND NAME											
RDT&E, N / BA-04												PE 0603512N - Carrier Systems Development												PU 9349 Aviation Ship Integration Center											
Fiscal Year	2002				2003				2004				2005				2006				2007				2008				2009						
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4							
Acquisition Milestones											MS B		PDR				CDR	DAB	PR																
Propulsion Plant																																			
EMALS																																			

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APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-04		PROGRAM ELEMENT NUMBER AND NAME PE 0603512N - Carrier Systems Development			PROJECT NUMBER AND NAME PU 2208 - CVN 21			
COST (\$ in Millions)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	
Project Cost	30.440	101.662	104.465	95.297	49.548	46.921	49.557	
RDT&E Articles Qty								
A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project provides for the development of aircraft carrier specific technologies, the infusion of the ship technology base into existing and future aircraft carriers, and the potential realization of subsystem design capabilities not currently feasible. This project transitions the most promising technologies from the Navy technology base, other government laboratories, and the private sector into specific advanced development efforts. All systems developed in this project have the potential to support emerging requirements and other promising systems technologies for insertion into new aircraft carrier designs. The emphasis is directed toward developing ship hull, mechanical, propulsion, electrical, aviation and combat support systems, sub-systems and components to significantly improve aircraft carrier affordability, manpower requirements, survivability, and operational capabilities and to meet the requirements of existing and pending regulations and statutes critical to the operation of future aircraft carriers.								

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APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-04	PROGRAM ELEMENT NUMBER AND NAME PE 0603512N - Carrier Systems Development	PROJECT NUMBER AND NAME PU 2208 - CVN 21													
B. Accomplishments/Planned Program															
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;"></td> <td style="width: 15%; text-align: center;">FY 03</td> <td style="width: 15%; text-align: center;">FY 04</td> <td style="width: 15%; text-align: center;">FY 05</td> </tr> <tr> <td>Accomplishments/Effort/Subtotal Cost</td> <td style="text-align: center;">20.900</td> <td style="text-align: center;">21.900</td> <td style="text-align: center;">13.400</td> </tr> <tr> <td>RDT&E Articles Quantity</td> <td></td> <td></td> <td></td> </tr> </table>					FY 03	FY 04	FY 05	Accomplishments/Effort/Subtotal Cost	20.900	21.900	13.400	RDT&E Articles Quantity			
	FY 03	FY 04	FY 05												
Accomplishments/Effort/Subtotal Cost	20.900	21.900	13.400												
RDT&E Articles Quantity															
<div style="border: 1px solid black; padding: 5px;"> <p>- (U) Non-Nuclear Propulsion Plant Development - Complete fabrication of prototype MTG and detailed design. Develop prototype qualification test plans. Initiate and complete MTG prototype qualification testing and shock test. Prepare for post-shock steam testing and prototype disassembly and inspection. Continue development of testing requirements and the identification and evaluation of testing capabilities. Continue development of inputs to the integrated product model. Continue prototyping and implementation of automated workflow for construction deliverables. Continue to integrate analysis and other required functions into product model design. Continue development of mechanical and electrical systems that interface with the propulsion plant.</p> </div>															
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;"></td> <td style="width: 15%; text-align: center;">FY 03</td> <td style="width: 15%; text-align: center;">FY 04</td> <td style="width: 15%; text-align: center;">FY 05</td> </tr> <tr> <td>Accomplishments/Effort/Subtotal Cost</td> <td style="text-align: center;">9.540</td> <td style="text-align: center;">73.002</td> <td style="text-align: center;">85.365</td> </tr> <tr> <td>RDT&E Articles Quantity</td> <td></td> <td></td> <td></td> </tr> </table>					FY 03	FY 04	FY 05	Accomplishments/Effort/Subtotal Cost	9.540	73.002	85.365	RDT&E Articles Quantity			
	FY 03	FY 04	FY 05												
Accomplishments/Effort/Subtotal Cost	9.540	73.002	85.365												
RDT&E Articles Quantity															
<div style="border: 1px solid black; padding: 5px;"> <p>- (U) CVN 21 Advanced Technology Design & Development- Commence and continue development and transition of technologies to support CVN 21 Key Performance Parameters (KPPs): increased sortie generation rate, further reductions in manpower, and further recovery of weight and stability service life margins. Continue design activities to integrate the new propulsion plant and Electromagnetic Aircraft Launch System, and expand the design build approach to include the whole ship, to optimize various systems and arrangements to meet KPPs, and to improve overall performance. Technologies and design efforts include, but are not limited to: Advanced Weapons Elevators technologies to increase throughput and improve survivability; Heavy Underway Replenishment technologies to increase individual payload limits and transfer rates per station per hour; Improved Material and Weapons Handling Arrangements and Equipment Modifications to improve the flow of material and weapons while simultaneously reducing required manpower; Improved Survivability technologies; Warfare Systems design; and an Improved/Enlarged Flight Deck to improve aircraft spotting and movement and to incorporate the Advanced Arresting Gear.</p> </div>															

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2004	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-04	PROGRAM ELEMENT NUMBER AND NAME PE 0603512N - Carrier Systems Development	PROJECT NUMBER AND NAME PU 2208 - CVN 21	
B. Accomplishments/Planned Program (Cont.)			
	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.000	6.760	5.700
RDT&E Articles Quantity			
<div><p>- (U) CVN 21 - Test & Evaluation - Determine specific developmental test requirements (DT) and related modeling and simulation and conduct actual test events including Large Test Asset. DT-A2 events will be based on CVN 21 system requirements and capabilities. Items such as test articles, instrumentation, support equipment, threat representation, test targets and other expendables, operational force test support, models, simulations, test-beds, special requirements, and funding needs will be finalized and provided in TEMP 1610 Rev B (in support of the FY07 construction contract award). Furthermore, the NGNN T&E IPT will begin to plan and execute DT-A2 events to demonstrate the CVN 21 concepts meet required capabilities.</p></div>			

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EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2004
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA 04	PROGRAM ELEMENT NUMBER AND NAME PE 0603512N - Carrier Systems Development	PROJECT NUMBER AND NAME PU 2208 - CVN 21

C. PROGRAM CHANGE SUMMARY:

Funding:	FY 2003	FY 2004	FY 2005
Previous President's Budget:	52.895	102.806	108.874
FY05 President's Budget	30.440	101.662	104.465
Total Adjustments	-22.455	-1.144	-4.409
Summary of Adjustments			
Technical Adjustment	-21.300		
Reprogrammings			-3.497
SBIR	-0.834		
Congressional Undistributed Adjustments		-1.144	
PBD 604 Inflation Adjustments			-0.338
Navy Working Capital Fund Rate Adjustments			-0.574
Miscellaneous Adjustments	-0.321		
Subtotal	-22.455	-1.144	-4.409

Schedule:

The CVN 21 Basic Construction contract will be awarded in FY07 with delivery in FY14. Funding in this R&D project supports this schedule.

Technical:

Not Applicable

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification								DATE: February 2004	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-04			PROGRAM ELEMENT NUMBER AND NAME PE 0603512N - Carrier Systems Development			PROJECT NUMBER AND NAME PU 2208 - CVN 21			
D. OTHER PROGRAM FUNDING SUMMARY:									
<u>Line Item No. & Name</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>
SCN: 200100 - Carrier Replacement Program	483.663	1,177.242	626.084	611.940	2,968.918	3,250.918	1,568.616	Cont.	Cont.
RDT&E: 0604567N - Ship Contract Design, Live Fire T&E	196.697	134.061	130.908	110.862	97.160	51.263	22.961	Cont.	Cont.
0603570N - Advanced Nuclear Power Systems	211.314	198.999	169.733	168.955	171.262	161.601	153.581	Cont.	Cont.
E. ACQUISITION STRATEGY:									
<p>The CVN 21 will be the first ship of the new class of aircraft carriers consisting of 12 ships. Due to the length and cost of construction, each carrier will be contracted for separately. The CVN 21 will feature a new nuclear propulsion and electrical generation/distribution system, new electromagnetic aircraft launching system, advanced arresting gear system, all electric auxiliaries, warfare system improvements, survivability enhancements, improved weapons handling, and improved aircraft servicing. These design features will result in lower manpower and total ownership costs as compared to the Nimitz Class. Additionally, the following warfighting benefits will be realized: increased sortie generation rate, improved ship self defense capability, increased launch and recovery capability/flexibility, increased operational availability, and increased flexibility to support future upgrades.</p>									
F. MAJOR PERFORMERS:									
Northrop Grumman Newport News, Newport News, VA, Design/Component Development/Construction									

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Exhibit R-3, Project Cost Analysis
(Exhibit R-3, page 22 of 46)

22 of 46

UNCLASSIFIED

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)								DATE: February 2004				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME						
RDT&E, N / BA-04			PE 0603512N - Carrier Systems Development			PU 2208 - CVN 21						
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												
CVN 21 Class												
	CPAF	NGNN	0.000	0.000		0.990	01/04-03/04	2.650	11/04	Continuing	Continuing	
	WX	NSWC Carderock	0.000	0.000		1.379	01/04-03/04	0.000		Continuing	Continuing	
	WX	NSWC Dahlgren	0.000	0.000		0.674	11/03	0.000		Continuing	Continuing	
	WX	NAWC AD	0.000	0.000		0.275	11/03	0.000		Continuing	Continuing	
	WX	NUWC Newport	0.000	0.000		0.934	01/04-03/04	0.000		Continuing	Continuing	
	Various	Miscellaneous	0.000	0.000		2.112	11/03-03/04	2.250	11/04	Continuing	Continuing	
Operational Test & Evaluation	WX	COMOPTEVFOR	0.000	0.000		0.396	01/04	0.800	11/04	Continuing	Continuing	
Live Fire Test & Evaluation												
Test Assets												
Tooling												
GFE												
Award Fees												
Subtotal T&E			0.000	0.000		6.760		5.700		0.000	12.460	
Remarks:												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support												
Travel												
Transportation												
SBIR Assessment												
Subtotal Management			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
Total Cost			220.299	30.440		101.662		104.465		0.000	456.866	
Remarks:												

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

R-1 SHOPPING LIST - Item No. 38 24 of 46

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2004	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-04		PROGRAM ELEMENT NUMBER AND NAME PE 0603512N - Carrier Systems Development			PROJECT NUMBER AND NAME PU 4004 - EMALS			
COST (\$ in Millions)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	
Project Cost	44.679	38.660	51.094	35.083	28.634	47.318	2.539	
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This project provides for the development of an advanced technology aircraft launch system in support of the CVN 21 design and construction schedule. The Electro Magnetic Aircraft Launch System (EMALS) will replace the current steam catapult on CVN 21 and follow-on ships of the CVN 21 Class. EMALS provides better control of applied forces, both peak and transient dynamic, improved reliability and maintainability, increased operational availability, and reduced operator and maintainer workload.

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2004	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-04	PROGRAM ELEMENT NUMBER AND NAME PE 0603512N - Carrier Systems Development	PROJECT NUMBER AND NAME PU 4004 - EMALS	
B. Accomplishments/Planned Program			
	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	44.679	38.660	51.094
RDT&E Articles Quantity			
<div>-(U) EMALS - FY-03: Continue and complete EMALS Program Definition and Risk Reduction phase. Complete prototype test facility construction. Complete full scale EMALS system manufacture, subsystem integration, and system installation at NAVAIR Lakehurst. Conduct installation checkout and commissioning tests. Conduct full scale, full power, half-length EMALS demonstration testing and technical evaluation using deadloads. Continue CVN 21 integration development. Provide management, systems engineering, test and ship integration support. FY-04: Complete full scale, full power, half-length EMALS demonstration testing and technical evaluation using deadloads. Analyze test data, proposed contractor production system configurations, and program proposals. Select contractor for and begin System Development and Demonstration phase. Conduct Systems Requirements review. Initiate production design effort. Conduct follow on development testing. Conduct Preliminary Design Review. Continue CVN 21 integration development. Provide management, systems engineering, test, and ship integration support. FY-05: Continue System Development and Demonstration phase. Complete Critical Design Reviews and initiate manufacture of production representative system for Technical Evaluation and Operational assessment. Continue CVN 21 integration development. Provide management, systems engineering, test, and ship integration support.</div>			

R-1 SHOPPING LIST - Item No. 38

26 of 46

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Exhibit R-2a, RDTEN Project Justification
(Exhibit R-2a, page 26 of 46)

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: February 2004																																																		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-04	PROGRAM ELEMENT NUMBER AND NAME PE 0603512N - Carrier Systems Development	PROJECT NUMBER AND NAME PU 4004 - EMALS																																																			
<p>C. PROGRAM CHANGE SUMMARY:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;"></th> <th style="width: 10%; text-align: right;">FY 2003</th> <th style="width: 10%; text-align: right;">FY 2004</th> <th style="width: 10%; text-align: right;">FY 2005</th> </tr> </thead> <tbody> <tr> <td>Funding:</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Previous President's Budget:</td> <td style="text-align: right;">45.366</td> <td style="text-align: right;">39.095</td> <td style="text-align: right;">51.249</td> </tr> <tr> <td>FY05 President's Budget</td> <td style="text-align: right;">44.679</td> <td style="text-align: right;">38.660</td> <td style="text-align: right;">51.094</td> </tr> <tr> <td>Total Adjustments</td> <td style="text-align: right; border-top: 1px solid black;">-0.687</td> <td style="text-align: right; border-top: 1px solid black;">-0.435</td> <td style="text-align: right; border-top: 1px solid black;">-0.155</td> </tr> <tr> <td colspan="4" style="padding-top: 10px;">Summary of Adjustments</td> </tr> <tr> <td>SBIR</td> <td style="text-align: right;">-0.988</td> <td></td> <td></td> </tr> <tr> <td>Congressional Undistributed Adjustments</td> <td></td> <td style="text-align: right;">-0.435</td> <td></td> </tr> <tr> <td>PBD 604 Inflation Adjustments</td> <td></td> <td></td> <td style="text-align: right;">-0.165</td> </tr> <tr> <td>Navy Working Capital Fund Rate Adjustments</td> <td></td> <td></td> <td style="text-align: right;">0.010</td> </tr> <tr> <td>Miscellaneous</td> <td style="text-align: right;">0.301</td> <td></td> <td></td> </tr> <tr> <td>Subtotal</td> <td style="text-align: right; border-top: 1px solid black;">-0.687</td> <td style="text-align: right; border-top: 1px solid black;">-0.435</td> <td style="text-align: right; border-top: 1px solid black;">-0.155</td> </tr> </tbody> </table> <p style="margin-top: 20px;">Remarks:</p> <p>Schedule: Not Applicable.</p> <p>Technical: Not Applicable</p>							FY 2003	FY 2004	FY 2005	Funding:				Previous President's Budget:	45.366	39.095	51.249	FY05 President's Budget	44.679	38.660	51.094	Total Adjustments	-0.687	-0.435	-0.155	Summary of Adjustments				SBIR	-0.988			Congressional Undistributed Adjustments		-0.435		PBD 604 Inflation Adjustments			-0.165	Navy Working Capital Fund Rate Adjustments			0.010	Miscellaneous	0.301			Subtotal	-0.687	-0.435	-0.155
	FY 2003	FY 2004	FY 2005																																																		
Funding:																																																					
Previous President's Budget:	45.366	39.095	51.249																																																		
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Subtotal	-0.687	-0.435	-0.155																																																		

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification								DATE: February 2004	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-04				PROGRAM ELEMENT NUMBER AND NAME PE 0603512N - Carrier Systems Development		PROJECT NUMBER AND NAME PU 4004 - EMALS			

D. OTHER PROGRAM FUNDING SUMMARY:

<u>Line Item No. & Name</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>
SCN: 200100 - Carrier Replacement Program	483.663	1,177.242	626.084	611.940	2,968.918	3,250.918	1,568.616	Cont.	Cont.
RDT&E: 0604567N - Ship Contract Design, Live Fire T&E	196.697	134.061	130.908	110.862	97.160	51.263	22.961	Cont.	Cont.
0603570N - Advanced Nuclear Power Systems	211.314	198.999	169.733	168.955	171.262	161.601	153.581	Cont.	Cont.

E. ACQUISITION STRATEGY:

The CVN 21 will be the first ship of the new class of aircraft carriers consisting of 12 ships. Due to the length and cost of construction, each carrier will be contracted for separately. The CVN 21 will feature a new nuclear propulsion and electrical generation/distribution system, new electromagnetic aircraft launching system, advanced arresting gear system, all electric auxiliaries, warfare system improvements, survivability enhancements, improved weapons handling, and improved aircraft servicing. These design features will result in lower manpower and total ownership costs as compared to the Nimitz Class. Additionally, the following warfighting benefits will be realized: increased sortie generation rate, improved ship self defense capability, increased launch and recovery capability/flexibility, increased operational availability, and increased flexibility to support future upgrades.

F. MAJOR PERFORMERS:

Northrop Grumman, Sunnyvale, CA, EMALS Design and Development
 General Atomics, La Jolla, CA, EMALS Design and Development
 NAWC, Lakehurst, NJ, EMALS Interface.

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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)								DATE:					February 2004	
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME								
RDT&E, N / BA-04			PE 0603512N - Carrier Systems Development			PU 4004 - EMALS								
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														
Aircraft Launch, Recovery & Support	CPAF	Northrop Grumman	53.306	16.900	11/02-06/03	5.549	11/03			Continuing	Continuing			
	CPAF	General Atomics	52.592	22.600	11/02-06/03	6.845	11/03			Continuing	Continuing			
	CPIF	EMALS Contractor TBD				20.000	11/03	46.485	11/04	Continuing	Continuing			
	WX	NAWC Lakehurst, NJ	8.224	2.660	11/02-06/03	3.200	11/03	2.609	11/04	Continuing	Continuing			
	CPAF	NGNN, VA	2.270								2.270			
	Various	Miscellaneous	46.715								46.715			
Subtotal Product Development			163.107	42.160		35.594		49.094		0.000	289.955			
Remarks: Prior Years were funded under PE 0603512N, PU 42208; however, prior year values have been shifted to PU 44004 in keeping with the CVN 21 Project realignment and in order to reflect program continuity on the PU 44004 Exhibit.														
Development Support														
Software Development														
Training Development														
Integrated Logistics Support														
Configuration Management														
Technical Data														
GFE														
Award Fees														
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000			
Remarks: Prior Years were funded under PE 0603512N, PU 42208; however, prior year values have been shifted to PU 44004 in keeping with the CVN 21 Project realignment and in order to reflect program continuity on the PU 44004 Exhibit.														

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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)									DATE: February 2004			
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME						
RDT&E, N / BA-04			PE 0603512N - Carrier Systems Development			PU 4004 - EMALS						
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												
Aircraft Launch, Recovery & Support	WX	Lakehurst NJ	2.519	2.519	11/02	3.066	11/03	2.000	11/04	Continuing	Continuing	
Subtotal T&E			2.519	2.519		3.066		2.000		0.000	10.104	
Remarks: Prior Years were funded under PE 0603512N, PU 42208; however, prior year values have been shifted to PU 44004 in keeping with the CVN 21 Project realignment and in order to reflect program continuity on the PU 44004 Exhibit.												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support												
Travel											0.000	
Labor (Research Personnel)												
SBIR Assessment												
Subtotal Management			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks: Prior Years were funded under PE 0603512N, PU 42208; however, prior year values have been shifted to PU 44004 in keeping with the CVN 21 Project realignment and in order to reflect program continuity on the PU 44004 Exhibit.												
Total Cost			165.626	44.679		38.660		51.094		0.000	300.059	
Remarks: FY02 and Prior Years were funded under PE 0603512N, PU 42208												

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CLASSIFICATION:

EXHIBIT R4, Schedule Profile																									DATE:							
APPROPRIATION/BUDGET ACTIVITY										PROGRAM ELEMENT NUMBER AND NAME										PROJECT NUMBER AND NAME												
RDT&E, N / BA-04										PE 0603512N - Carrier Systems Development										PU 4004 - EMALS												
Fiscal Year	2002				2003				2004				2005				2006				2007				2008				2009			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
Acquisition Milestones											MS B		PDR				CDR	DAB	PR													
Propulsion Plant																																
EMALS																																
DBR Radar Suite																																
Advanced Arresting Gear																																
Test & Evaluation Milestones																																
Development Test																																
Operational Test																																
Contract Milestones																																
IPPD Contract																																
CP Contract																																
Construction Contract																																
Full Funding (SCN)																																

R-1 SHOPPING LIST - Item No. 38

31 of 46

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

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Exhibit R-4, Schedule Profile
(Exhibit R-4, page 31 of 46)

UNCLASSIFIED

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2004	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4		PROGRAM ELEMENT NUMBER AND NAME 0603512N - Carrier Systems Development			PROJECT NUMBER AND NAME PU 4005 - Smart Carrier			
COST (\$ in Millions)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	
Project Cost	1.942	1.860	1.843	1.830	1.817	1.804	1.799	
RDT&E Articles Qty			2					
<p>A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:</p> <p>The Smart Carrier Demonstration and Validation program exploits available technologies to deliver an affordable, robust, operator-friendly automation control environment for Navy Aircraft Carrier shipboard equipment. The program provides the system architecture, requirements/specification development, technology selection, software development (including software baseline), as well as land-based and shipboard testing of new technologies to improve shipboard operations and to reduce workload, manpower requirements, and Total Ownership Costs. Initial technologies include Aviation Fuels (JP-5) Automation, the Advanced Damage Control System (ADCS), Automated Material Handling Systems, Damage Control Inventory Management and Stowage System (DCIMSS), List Control, Firemain Control, Integrated Condition Assessment System, Interior Communications/Systems Monitoring Alarm Upgrades, and the Digital Video Surveillance System. Demonstration technologies include Smart Vent, Machinery Online Monitoring, Superior Sound Technology, Flat Plane Speakers, Smart Circuit Breakers, Distilling Unit Automation, Reboiler Automation, In-line Aviation Fuels Sampling, Advanced Oil Purification System, Oil Monitoring Sensors, and Voice Interactive Display. Wireless systems, smart sensors, knowledge-based systems, automated casualty control, automated technology for workload reduction, linked smart devices, common software tools for interoperability, and self-healing network are technologies being considered for future applications. This project was previously funded under Project 42208, Future Carrier R&D.</p> <p>Remarks: Prior Years were funded under PE 0603512N, PU 42208; however, prior year values have been shifted to PU 4005 in keeping with the CVN 21 Project realignment and in order to reflect program continuity on the PU 4005 exhibit.</p>								

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2004	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N /BA-4	PROGRAM ELEMENT NUMBER AND NAME 0603512N - Carrier Systems Development	PROJECT NUMBER AND NAME PU 4005 - Smart Carrier	
B. Accomplishments/Planned Program			
	FY 03	FY 04	FY05
Accomplishments/Effort/Subtotal Cost	1.942	1.860	1.843
RDT&E Articles Quantity			
<p>- (U) Smart Carrier - In Fiscal Year 2003, completed software development for and initiated/completed test, evaluation and demonstration/validation of Aviation Fuels (JP-5) Automation and In-Line Fuel Monitoring for Smart Carrier technology insertion on USS ABRAHAM LINCOLN (CVN 72) and USS GEORGE WASHINGTON (CVN 73). Efforts continue in Fiscal Years 2004 and 2005 to identify, evaluate, demonstrate, install, test and measure the effectiveness of revised processes and selected technologies with the highest potential to meet Aircraft Carrier goals for manpower and Total Ownership Cost (TOC) reductions, such as an On-Board Training System for Aviation Fuels Operations, In-Line Fuel Monitoring, and Condition-Based Maintenance.</p>			
<p>Remarks: Prior Years were funded under PE 0603512N, PU 42208; however, prior year values have been shifted to PU 4005 in keeping with the CVN 21 Project realignment and in order to reflect program continuity on the PU 4005 exhibit.</p>			

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2004
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT NUMBER AND NAME 0603512N - Carrier Systems Development	PROJECT NUMBER AND NAME PU 4005 - Smart Carrier

C. PROGRAM CHANGE SUMMARY:

	FY 2003	FY 2004	FY 2005
Funding:			
Previous President's Budget:	1.967	1.881	1.880
FY05 President's Budget	1.942	1.860	1.843
Total Adjustments	-0.025	-0.021	-0.037
Summary of Adjustments			
BSO Adjustments	-0.005		
Congressional Undistributed Adjustments		-0.021	
PBD 604 Inflation Adjustments			-0.006
Navy Working Capital Fund Rate Adjustments			-0.031
Miscellaneous	-0.020		
Subtotal	-0.025	-0.021	-0.037

Schedule: Not Applicable

Technical: Not Applicable

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2004		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4		PROGRAM ELEMENT NUMBER AND NAME 0603512N - Carrier Systems Development			PROJECT NUMBER AND NAME PU 4005 - Smart Carrier				

D. OTHER PROGRAM FUNDING SUMMARY:

<u>Line Item No. & Name</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>
098100 Items Under \$5 million Smart Carrier	45.554	6.988	44.946	33.495	33.850	25.277	26.463	26.000	242.573

E. ACQUISITION STRATEGY:

Investigate, demonstrate, and implement available technologies to deliver a robust, operator-friendly automation control environment for Navy Aircraft Carrier shipboard equipment to reduce workload, manpower requirements, and Total Ownership Costs (TOC).

F. MAJOR PERFORMERS:

Naval Sea Systems Command - Philadelphia (formerly Naval Surface Warfare Center, Carderock Division), Philadelphia, PA and Naval Air Systems Command - Lakehurst (formerly Naval Air Warfare Center, Lakehurst), Lakehurst NJ, perform software development, test and evaluation, integration and program management to include training development and integrated logistics support development. Funds are typically issued in the first fiscal quarter.

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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)								DATE:				
APPROPRIATION/BUDGET ACTIVITY								February 2004				
RDT&E, N / BA-4			PROGRAM ELEMENT			PROJECT NUMBER AND NAME						
			0603512N - Carrier Systems Development			PU 4005 - Smart Carrier						
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												
Ancillary Hardware Development												
Component Development												
Ship Integration	WX	NAVSEA, Phil./NAVAIR Lke		0.200	12/02	0.100	11/03	0.100	11/04	0.500	0.900	
Ship Suitability												
Systems Engineering	CPAF	NGNN, VA	0.205								0.205	
	Various	Miscellaneous	7.978								7.978	
Training Development												
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development			8.183	0.200		0.100		0.100		0.500	9.083	
Remarks: Prior Years were funded under PE 0603512N, PU 2208; however, prior year values have been shifted to PU 4005 in keeping with the CVN 21 Project realignment and in order to reflect program continuity on the PU 4005 exhibit.												
Development Support											0.000	
Software Development	WX	NAVSEA, Phil./NAVAIR Lke		1.042	12/02	0.910	11/03	0.843	11/04	3.250	6.045	
Training Development	WX	NAVSEA, Phil./NAVAIR Lke		0.050	12/02	0.050	11/03	0.080	11/04	0.300	0.480	
Integrated Logistics Support	WX	NAVSEA, Phil./NAVAIR Lke		0.100	12/02	0.150	11/03	0.120	11/04	0.600	0.970	
Configuration Management											0.000	
Technical Data											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal Support			0.000	1.192		1.110		1.043		4.150	7.495	
Remarks: Prior Years were funded under PE 0603512N, PU 42208; however, prior year values have been shifted to PU 4005 in keeping with the CVN 21 Project realignment and in order to reflect program continuity on the PU 4005 exhibit.												

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Exhibit R-3 Cost Analysis (page 2)										DATE: February 2004		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4			PROGRAM ELEMENT 0603512N - Carrier Systems Development				PROJECT NUMBER AND NAME PU 4005 - Smart Carrier					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost *	FY 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WX	NAVSEA, Phil./NAVAIR Lke		0.300	12/02	0.400	11/03	0.450	11/04	1.600	2.750	
Operational Test & Evaluation												
Live Fire Test & Evaluation												
Test Assets												
Tooling												
GFE												
Award Fees												
Subtotal T&E			0.000	0.300		0.400		0.450		1.600	2.750	
Remarks: Prior Years were funded under PE 0603512N, PU 2208; however, prior year values have been shifted to PU 4005 in keeping with the CVN 21 Project realignment and in order to reflect program continuity on the PU 4005 exhibit.												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support	WX	NAVSEA, Phil./NAVAIR Lke		0.250	12/02	0.250	11/03	0.250	11/04	1.000	1.750	
Travel												
Labor (Research Personnel)												
SBIR Assessment												
Subtotal Management			0.000	0.250		0.250		0.250		1.000	1.750	
Remarks: Prior Years were funded under PE 0603512N, PU 2208; however, prior year values have been shifted to PU 4005 in keeping with the CVN 21 Project realignment and in order to reflect program continuity on the PU 4005 exhibit.												
Total Cost			8.183	1.942		1.860		1.843		7.250	21.078	

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EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2004	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4		PROGRAM ELEMENT NUMBER AND NAME 0603512N Carrier Systems Development			PROJECT NUMBER AND NAME PU 1723 CV Launch and Recovery Systems			
COST (\$ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost		7.871	1.170	0.077	0.000	0.000	0.000	0.000
RDT&E Articles Qty			2					
<p>A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:</p> <p>This project addresses the development of systems providing approach and landing guidance, recovery, service, support, and launch of aircraft operating on or from ships. Payoffs include increased safety, greater sortie generation rates, enhanced aircraft boarding rates, reduced manning, and increased aircraft service life. Specific programs include:</p> <ul style="list-style-type: none"> - (U) Advanced Recovery Control (ARC) System: The ARC system development effort will replace the existing control valve and valve actuation control system on the MK7 arresting gear, providing enhanced performance, improved reliability and maintainability, and restoring operational margins of safety. - (U) Cost Reduction Effective Improvement Initiative (CREI) Arresting Gear Fairlead Sheaves: This program seeks to replace the arresting gear fairlead drive system sheaves with a more durable product that will have a longer service life, thus decreasing system life cycle costs. <p>(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION AND VALIDATION because it develops and integrates hardware for experimental tests related to specific ship or aircraft application.</p>								

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EXHIBIT R-2a, RDT&E Project Justification			DATE: February 2004																
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT NUMBER AND NAME 0603512N Carrier Systems Development	PROJECT NUMBER AND NAME PU 1723 CV Launch and Recovery Systems																	
(U) B. Accomplishments/Planned Program																			
<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 30%;"></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></td><td style="text-align: center;">7.664</td><td style="text-align: center;">1.043</td><td></td></tr><tr><td>RDT&E Articles Quantity</td><td></td><td></td><td style="text-align: center;">2</td><td></td></tr></tbody></table>						FY 02	FY 03	FY 04	FY 05	Accomplishments/Effort/Subtotal Cost		7.664	1.043		RDT&E Articles Quantity			2	
	FY 02	FY 03	FY 04	FY 05															
Accomplishments/Effort/Subtotal Cost		7.664	1.043																
RDT&E Articles Quantity			2																
<div style="border: 1px solid black; padding: 10px; min-height: 100px;">- (U) ARC - Developed ARC System Specification, contract Statement of Work, and Request for Proposal. Conducted source selection process, completed Milestone B review and awarded development contract. Conducted testing to characterize existing Constant Run Out Valve (CROV) performance in support of ARC control system development. Completed System Requirements Review, Preliminary Design Review, Critical Design Review and fabricated/delivered two (2) test articles. Conducted developmental testing of test articles on arresting gear. Conducted development testing using deadloads at the Jet Car Track Site (JCTS) and aircraft at the Runway Arrested Landing Site (RALS). Conducted rapid cycle reliability testing and environmental testing. Complete Tech Evaluation and achieve Milestone C. Provide engineering and management support to the program.</div>																			
<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 30%;"></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></td><td style="text-align: center;">0.207</td><td style="text-align: center;">0.127</td><td style="text-align: center;">0.077</td></tr><tr><td>RDT&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		0.207	0.127	0.077	RDT&E Articles Quantity				
	FY 02	FY 03	FY 04	FY 05															
Accomplishments/Effort/Subtotal Cost		0.207	0.127	0.077															
RDT&E Articles Quantity																			
<div style="border: 1px solid black; padding: 10px; min-height: 100px;">- (U) CREI - (Arresting Gear Fairlead Sheaves) - Selected candidate materials and conducted laboratory testing on samples. Award contract, conduct design and manufacture prototype of CREI Sheaves. Conduct developmental and environmental testing of prototype sheaves. Provide engineering and management support to the program.</div>																			

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EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2004
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT NUMBER AND NAME 0603512N Carrier Systems Development	PROJECT NUMBER AND NAME PU 1723 CV Launch and Recovery Systems

(U) C. PROGRAM CHANGE SUMMARY:

	FY 2003	FY 2004	FY 2005
(U) Funding:			
Previous President's Budget:	7.646	1.183	0.077
Current President's Budget	7.871	1.170	0.077
Total Adjustments	0.225	-0.013	0.000
Summary of Adjustments			
Congressional program reductions			
Congressional undistributed reductions		-0.013	
Congressional rescissions			
SBIR/STTR Transfer	-0.110		
Economic Assumptions			
Reprogrammings	0.335		
Sponsor/FMB/NAVAIR Adjustments			
Congressional increases			
Subtotal	0.225	-0.013	0.000

(U) Schedule:

Change in ARC schedule due to additional EA-18G requirements. TECHEVAL extension from 1Q-2Q/04 to 2Q-4Q/04. TRR slips from 1Q/04 to 2Q/04; EDM delivery and Software delivery slips from 4Q/03 to 2Q/04; Milestone C slips from 3Q/04 to 4Q/04; PRR slips from 2Q/04 to 4Q/04; FRP decision slips from 3Q/04 to 4Q/04 and IOC slips from 4Q/05 to 1Q/06.

(U) Technical:

Not Applicable

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2004		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4		PROGRAM ELEMENT NUMBER AND NAME 0603512N Carrier Systems Development			PROJECT NUMBER AND NAME PU 1723 CV Launch and Recovery Systems				
(U) D. OTHER PROGRAM FUNDING SUMMARY:									
<u>Line Item No. & Name</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>
OPN Aircraft Launch & Recovery Equipment, 43SJ	0.248	0.000	3.616	5.959	6.470	9.535	7.390	5.789	39.007
 (U) E. ACQUISITION STRATEGY:									
<p>The ARC acquisition strategy calls for full and open competition leading to a single contract award for the System Development and Demonstration Phase. Production quantities are included as options to the development contract.</p> <p>CREI A/G Fairlead Sheaves: The A/G Fairlead Sheave Development effort will be competitively awarded to industry to develop sample materials and perform laboratory testing for resistance. Based on the results of the testing, one material and heat treatment process will be selected and prototype sheaves manufactured and tested on two arresting gear engines at NAVAIR Lakehurst.</p>									
(U) F. MAJOR PERFORMERS:									
<u>Major Performer</u>	<u>Location</u>	<u>Description of Work</u>	<u>FY03 Amt & Award Date</u>		<u>FY04 Amt & Award Date</u>		<u>FY05 Amt & Award Date</u>		
NAWCAD	Lakehurst, NJ	Systems Engineering and Developmental Test and Evaluation	2.402	11/02	1.170	11/03	0.077	11/04	
Northrup Grumman	Sykesville, MD	Primary H/W Development	5.469	12/02					

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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)								DATE: February 2004				
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4			PROGRAM ELEMENT 0603512N Carrier Systems Development			PROJECT NUMBER AND NAME PU 1723 CV Launch and Recovery Systems						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development (AR)	C/CPAF	Northrup Grumman,	1.970	5.469	11/02						7.439	7.439
Primary Hardware Development (AR)	WX	NAWCAD Lakehurst, NJ	3.636	0.685	11/02	0.996	11/03				5.317	
Primary Hardware Development (CR)	FFP	Advanced Dev. Mfg. Corp		0.108	12/03						0.108	
Systems Engineering (ARC)	WX	NAWCAD Lakehurst, NJ		1.125	11/02	0.005	11/03				1.130	
Systems Engineering (CREI)	WX	NAWCAD Lakehurst, NJ		0.099	11/02						0.099	
Award Fees												
Subtotal Product Development			5.606	7.486		1.001					14.093	
Remarks:												
Subtotal Support												
Remarks:												

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Exhibit R-3 Cost Analysis (page 2)										DATE: February 2004			
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT				PROJECT NUMBER AND NAME						
RDT&E, N / BA-4			0603512N Carrier Systems Development				PU 1723 CV Launch and Recovery Systems						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract	
Developmental T&E (ARC)	WX	NAWCAD Lakehurst, NJ		0.335	11/02						0.335		
Developmental T&E (CREI)	WX	NAWCAD Lakehurst, NJ				0.127	11/03	0.077	11/04		0.204		
Award Fees													
Subtotal T&E				0.335		0.127		0.077			0.539		
Remarks:													
Travel	WX	NAWCAD Lakehurst, NJ		0.050	11/02	0.042	10/03				0.092		
Subtotal Management				0.050		0.042					0.092		
Remarks:													
Total Cost			5.606	7.871		1.170		0.077			14.724		
Remarks:													

R-1 SHOPPING LIST - Item No. 38

UNCLASSIFIED

Exhibit R-3, Project Cost Analysis
(Exhibit R-3, page 44 of 46)

UNCLASSIFIED

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EXHIBIT R4, Schedule Profile																								DATE:								
APPROPRIATION/BUDGET ACTIVITY												PROGRAM ELEMENT NUMBER AND NAME												PROJECT NUMBER AND NAME								
RDT&E, N / BA-4												0603512N Carrier Systems Development												PU 1723 CV Launch and Recovery Systems								
Fiscal Year	2002				2003				2004				2005				2006				2007				2008				2009			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
ARC Acquisition Milestones			MS B ▲									MS C/FRP ▲			First Deployment ☆	IOC ☆																
Prototype Phase	Component Advance Development				System Development & Demonstration																											
System Development				SRR ▲	PDR ▲	CDR ▲	H/W-S/W					FCA/PCA ▲	PRR ▲																			
EDM Delivery of 2 units										Two EDM Units ▲																						
Software Delivery																																
ARC Test & Evaluation Milestones																																
Development Test																																
Operational Test																																
ARC Production Milestones																																
FRP																																
Deliveries																																

R-1 SHOPPING LIST - Item No. 38

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

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R-1 SHOPPING LIST - Item No. 38

46 of 46

UNCLASSIFIED

Exhibit R-4a, Schedule Detail

(Exhibit R-4a, page 46 of 46)