

CLASSIFICATION:

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EXHIBIT R-2, RDT&E Budget Item Justification							DATE: February 2003	
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-04					R-1 ITEM NOMENCLATURE 0603512N - Carrier Systems Development			
COST (\$ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Total PE Cost	157.969	111.395	144.965	162.080	143.495	94.065	292.109	372.591
29181 - Advanced Battlestation/Decision Support System	0.000	3.521	0.000	0.000	0.000	0.000	0.000	0.000
42208 - CVN 21	119.643	52.895	102.806	108.874	106.429	63.479	51.130	52.580
42693 - Ship System Definition	31.987	0.000	0.000	0.000	0.000	0.000	0.000	0.000
44004 - EMALS	0.000	45.366	39.095	51.249	35.185	28.709	47.373	2.550
44005 - Smart Carrier	0.000	1.967	1.881	1.880	1.881	1.877	1.866	1.862
44006 - CVNX 2	0.000	0.000	0.000	0.000	0.000	0.000	191.740	315.599
S1722 - CV WPNS Elevator Improvements	0.540	0.000	0.000	0.000	0.000	0.000	0.000	0.000
W1723 - CV Launch & Recovery Systems	3.936	7.646	1.183	0.077	0.000	0.000	0.000	0.000
W2269 - EAF Matting	1.863	0.000	0.000	0.000	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) (29181) -- 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, manpower reductions, and reductions in Total Operating Costs (TOC). An ABS/DSS demonstration is scheduled aboard USS John C. Stennis (CVN 74) in February, 2003. This effort will be the first time the system is demonstrated with a live tactical data feed and with ship's force system operators. - (U) (42208) -- Development of ship hull, mechanical, propulsion, electrical, aviation and combat support systems, subsystems and components to significantly improve aircraft carrier affordability, manpower requirements, survivability, operational capabilities, and to meet the requirements of existing and pending regulations and statutes critical to the operation of existing and future aircraft carriers. - (U) (42693) - Support of post Milestone I ship system technical definition and refinement of cost estimates through engineering efforts. These efforts will support ORD level requirements definition and assessments for industrial capability, risk, Integrated Logistics Support (ILS), schedule development and tracking to ensure a coordinated acquisition effort. Continue Total Ship Integration efforts to develop ship requirements and definition at the total systems level.								

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APPROPRIATION/BUDGET ACTIVITY		R-1 ITEM NOMENCLATURE
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY /	BA-04	0603512N - Carrier Systems Development
<p>- (U) (44004) - 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) (44005) - 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) (44006) - 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-on ship. .</p> <p>- (U) (S1722) -- Development of standardized, supportable and maintainable aircraft carrier weapons elevators components.</p> <p>- (U) (W1723) -- 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> <p>- (U) (W2269) -- Development of Lightweight Mat and Expeditionary Arresting Gear for use at Marine Corps Expeditionary Airfields (EAF).</p>		

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EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2003	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-04	PROGRAM ELEMENT NUMBER AND NAME PE 0603512N - Carrier Systems Development				PROJECT NUMBER AND NAME PU 29181 - Advanced Battlestation/DSS			
COST (\$ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost	0.000	3.521	0.000	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, manpower reductions, and reductions in Total Operating Costs (TOC). An ABS/DSS demonstration is scheduled aboard USS John C. Stennis (CVN 74) in February, 2003. This effort will be the first time the system is demonstrated with a live tactical data feed and with ship's force system operators.

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B. Accomplishments/Planned Program (Cont.)																			
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<p>C. PROGRAM CHANGE SUMMARY:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 35%;"></th> <th style="text-align: right; width: 15%;">FY 2002</th> <th style="text-align: right; width: 15%;">FY 2003</th> <th style="text-align: right; width: 15%;">FY 2004</th> <th style="text-align: right; width: 15%;">FY 2005</th> </tr> </thead> <tbody> <tr> <td>Funding:</td> <td></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> <td style="text-align: right;">0.000</td> </tr> <tr> <td>Current BES/President's Budget:</td> <td style="text-align: right;">0.000</td> <td style="text-align: right;">3.521</td> <td style="text-align: right;">0.000</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;">3.521</td> <td style="text-align: right; border-top: 1px solid black;">0.000</td> <td style="text-align: right; border-top: 1px solid black;">0.000</td> </tr> <tr> <td colspan="5" style="padding-top: 10px;">Summary of Adjustments</td> </tr> <tr> <td style="padding-left: 20px;">Congressional Add</td> <td></td> <td style="text-align: right;">3.600</td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">Congressional undistributed reductions</td> <td></td> <td style="text-align: right;">-0.041</td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">Economic Assumptions</td> <td></td> <td style="text-align: right;">-0.038</td> <td></td> <td></td> </tr> <tr> <td></td> <td style="text-align: right; border-top: 1px solid black; border-bottom: 1px solid black;">0.000</td> <td style="text-align: right; border-top: 1px solid black; border-bottom: 1px solid black;">3.521</td> <td style="text-align: right; border-top: 1px solid black; border-bottom: 1px solid black;">0.000</td> <td style="text-align: right; border-top: 1px solid black; border-bottom: 1px solid black;">0.000</td> </tr> </tbody> </table> <p style="margin-top: 20px;">Schedule:</p> <p style="margin-left: 20px;">An ABS/DSS demonstration is scheduled aboard USS John C. Stennis (CVN 74) in February, 2003. This effort will be the first time the system is demonstrated with a live tactical data feed and with ship's force system operators.</p> <p style="margin-top: 20px;">Technical:</p> <p style="margin-left: 20px;">Not Applicable.</p>						FY 2002	FY 2003	FY 2004	FY 2005	Funding:					Previous President's Budget:	0.000	0.000	0.000	0.000	Current BES/President's Budget:	0.000	3.521	0.000	0.000	Total Adjustments	0.000	3.521	0.000	0.000	Summary of Adjustments					Congressional Add		3.600			Congressional undistributed reductions		-0.041			Economic Assumptions		-0.038				0.000	3.521	0.000	0.000
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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 29181 - Advanced Battlestation/DSS				

D. OTHER PROGRAM FUNDING SUMMARY:

<u>Line Item No. & 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>
SCN: 200100 - Carrier Replacement Program	135.341	395.493	1,186.564	626.010	611.771	2,983.870	3,811.809	3,074.351	Cont.	Cont.
RDT&E: 0604567N - Ship Contract Design, Live Fire T&E	122.405	181.098	138.017	140.018	115.004	91.371	50.352	27.038	Cont.	Cont.
0603570N - Advanced Nuclear Power Systems	170.706	211.314	201.239	174.239	178.357	182.055	172.532	164.732	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:

21st Century Systems, Inc., Omaha, NE, Development, (FY03 Award)

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Exhibit R-3 Cost Analysis (page 1)

[illegible]

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-04			PE 0603512N - Carrier Systems Development			PU 29181 - Advanced Battlestation/DSS						
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	
Transportation											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	3.521		0.000		0.000		0.000	3.521	
Remarks:												

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COST (\$ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost	119.643	52.895	102.806	108.874	106.429	63.479	51.130	52.580
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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B. Accomplishments/Planned Program

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	55.799	42.200	21.900	13.400
RDT&E Articles Quantity				

-(U) Non-Nuclear Propulsion Plant Development - Begin and 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. Complete preliminary design of the main propulsion unit and develop MPU detailed design. 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.

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	4.900	6.613	2.043	1.720
RDT&E Articles Quantity				

-(U) Large Capacity Reverse Osmosis Desalination Plant - Develop the Large Capacity Reverse Osmosis Desalination Plant, to include the non-deployable prototype unit, based on system design requirements developed by non-nuclear propulsion plant efforts. Start construction of the non-deployable prototype unit.

	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	46.964	0.000	0.000	0.000
RDT&E Articles Quantity				

-(U) Aircraft Launch, Recovery & Support – Continue Electromagnetic Aircraft Launch System Program definition and Risk Reduction phase. Initiate prototype test facility design and construction. Initiate manufacture, integration and acceptance testing of prototype launch systems. Initiate CVNX-1 integration development. Provide management, system engineering, and ship integration support for all aviation related systems

Remarks: This effort was transferred to PE 0603512N, PU 44004, EMALS, effective FY03.

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<div style="border: 1px solid black; padding: 5px;"> <p>- (U) Battle Damage Prevention & Recovery - Continue battle damage prevention and recovery assessments and design improvements development. Continue acoustic and non-acoustic signatures design support efforts. Expand modeling and simulation and scaled testing efforts for advanced protection systems development to address Underwater Protection, Weapons Damage and Residual Strength and Dynamic Armor Protection system that are applicable to Nimitz and modified Nimitz hull forms. Continue and expand advanced damage control systems and improved magazines/shipboard fire protection systems technologies development.</p> </div>																			
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<div style="border: 1px solid black; padding: 5px;"> <p>- (U) CVNX Class Technologies - Commence development of long term technology features for integration into the CVNX Class ship design to fulfill operational requirements and to meet ship construction schedule. Items for which initial technology investment will be made include survivability features such as dynamic protection and development of items to address deficiencies in service life allowance for weight and stability requirements (KG), as well as meeting sortie generation rate requirements.</p> </div>																			
<p>Remarks: This effort was transferred to PE 0603512N, PU 44006, CVNX 2, effective FY03.</p>																			
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<div style="border: 1px solid black; padding: 5px;"> <p>- (U) Systems Development - Continue total ship design integration. Continue design, engineering and interoperability analyses to support overall CVNX Design Development. Perform TOC reductions/analyses, survivability analyses, systems readiness reviews gap analyses, Advanced Launch & Recovery analyses, trade studies and Lethality Studies. Continue development of manpower and material support alternatives which will achieve manpower reductions and total ownership cost savings. Provide acquisition planning support.</p> </div>																			

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RDT&E Articles Quantity																			
<div style="border: 1px solid black; padding: 5px;"><p>- (U) Smart Carrier - Continue the Smart Carrier initiative involving the introduction of technology insertions and process improvements with the goal of reducing total workload, lowering total ownership cost (TOC). Continue research, evaluation and integration of new technologies and process engineering efforts in support of potential workload reductions. New technologies to be evaluated and/or demonstrated are listed, but not limited to the following: Integrated Workload Reduction System, Lattice Block Material, Laser Induced Surface Improvement.</p><p>Remark: This effort was transferred to PE 0603512N, PU 44005, Smart Carrier, effective FY03.</p></div>																			
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RDT&E Articles Quantity																			
<div style="border: 1px solid black; padding: 5px;"><p>- (U) CVN 21 Integrated Warfare System - Perform system engineering efforts for Warfare System baseline design refinement. Conduct Warfare System Technical reviews. Monitor improvements targeted at increasing system capabilities, reducing the operational and support costs of the ship's Warfare Systems. Coordinate radar development efforts with the DD-X program regarding integration of MFR and VSR. Refine Warfare Systems Integration design and integrate into the CVN 21 ship design.</p></div>																			

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EXHIBIT R-2a, RDT&E Project Justification			DATE: February 2003																															
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-04	PROGRAM ELEMENT NUMBER AND NAME PE 0603512N - Carrier Systems Development	PROJECT NUMBER AND NAME PU 42208 - CVN 21																																
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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification									DATE: February 2003	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-04			PROGRAM ELEMENT NUMBER AND NAME PE 0603512N - Carrier Systems Development			PROJECT NUMBER AND NAME PU 42208 - CVN 21				

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
SCN: 200100 - Carrier Replacement Program	135.341	395.493	1,186.564	626.010	611.771	2,983.870	3,811.809	3,074.351	Cont.	Cont.
RDT&E: 0604567N - Ship Contract Design, Live Fire T&E	122.405	181.098	138.017	140.018	115.004	91.371	50.352	27.038	Cont.	Cont.
0603570N - Advanced Nuclear Power Systems	170.706	211.314	201.239	174.239	178.357	182.055	172.532	164.732	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, (FY00 Award); (FY01 Award).

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Exhibit R-2a, RDTEN Project Justification
(Exhibit R-2a, page 15 of 42)

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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-04			PE 0603512N - Carrier Systems Development			PU 42208 - CVN 21						
Cost Categories	Contract Method	Performing Activity &	Total PY s	FY 03	FY 03 Award	FY 04	FY 04 Award	FY 05	FY 05 Award	Cost to	Total	Target Value
	& Type	Location	Cost	Cost	Date	Cost	Date	Cost	Date	Complete	Cost	of Contract
Product Development											0.000	
Aircraft Launch, Recovery & Support	CPAF	Northrop Grumman	53.306								53.306	
	CPAF	General Atomics	52.592								52.592	
	WR	NAWC Lakehurst, NJ	8.224								8.224	
	CPAF	NGNN, VA	2.270								2.270	
	Various	Miscellaneous	46.715								46.715	
Battle Damage & Recovery	WR	NSWC/CD, MD	9.429								9.429	
	CPAF	NGNN, VA	2.272								2.272	
	Various	Miscellaneous	2.008								2.008	
Propulsion Plant Development	SS,CPFF	BETTIS, PA	71.627								71.627	71.627
	CPFF	NGNN, VA	101.547	40.512	11/02	21.024	11/03	12.864	11/04		175.947	175.947
	Various	Miscellaneous	6.962	1.688	11/02	0.876	11/03	0.536	11/04	Continuing	Continuing	9.918
Reverse Osmosis Desalination Plant	CPAF	NGNN, VA	4.096	2.909	11/02	1.480	11/03	1.516	11/04	Continuing	Continuing	
	WR	NSWC/CD, MD	0.000	0.793	11/02	0.379	11/03				1.172	
	Various	Miscellaneous	0.804	2.911	11/02	0.184	11/03	0.204	11/04	Continuing	Continuing	
Manpower & Material Support	WR	NSWC/CD, MD	0.320								0.320	
	Various	Miscellaneous	2.518								2.518	
	C	Boeing, CA	0.800								0.800	
Systems Development	CPAF	NGNN, VA	4.906								4.906	
	WR	NSWC/CD, MD	3.528								3.528	
	WR	NAWC Lakehurst, NJ	0.610								0.610	
	WR	NSWC/DD	0.250								0.250	
	WR	SUPSHIPS	0.435								0.435	
	Various	Miscellaneous	6.977								6.977	
Combat & Intelligence Systems	C	NGNN, VA	9.261								9.261	
	C	Bath Iron Works	10.417								10.417	
ASW Tactical Decision Aids	C	Progeny, VA	1.5								1.500	
	WR	NUWC KP	0.256								0.256	
Smart Carrier	CPAF	NGNN, VA	0.205								0.205	
	Various	Miscellaneous	7.978								7.978	
CVNX Class Technologies	Various	Miscellaneous	0.464								0.464	
	WR	NSWC/CD, MD	2.884								2.884	
	CPFF	NGNN, VA	0.443								0.443	
Subtotal Product Development			415.604	48.813		23.943		15.120			503.480	
Remarks:												

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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-??			PE 0603512N - Carrier Systems Development			PU 42208 - 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
Product Development, Cont.											0.000	
Integrated Warfare System	CP Type	N G Newport News	0.000								0.000	
	SPD	SPAWAR	0.000	0.270	11/02	0.270	11/03	0.270	11/04	Continuing	Continuing	
	WX	NAVAIR	0.000	0.936	11/02	0.650	11/03	0.650	11/04	Continuing	Continuing	
	WR	NSWC Dahlgren	0.000	1.323	11/02	1.080	11/03	1.080	11/04	Continuing	Continuing	
	WR	NSWC Dam Neck	0.000	0.165	11/02	0.000	11/03	0.000	11/04	Continuing	Continuing	
	Various	Miscellaneous	0.000	0.888	11/02	0.000		0.000		Continuing	Continuing	
CVN 21 Design & Development	CP Type	NGNN	0.000			45.103	11/03	50.054	11/04	Continuing	Continuing	
	PD	ONR	0.000			10.000	11/03	15.000	11/04	Continuing	Continuing	
	WR	NSWC Carderock	0.000			8.000	11/03	10.000	11/04	Continuing	Continuing	
	PD	NAVSUP	0.000			3.000	11/03	5.000	11/04	Continuing	Continuing	
	WX	NAVAIR	0.000			3.000	11/03	5.000	11/04	Continuing	Continuing	
	WR	NSWC Dahlgren				1.000	11/03	1.000	11/04			
Subtotal Product Development			0.000	3.582		72.103		88.054		0.000	163.739	
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-04			PE 0603512N - Carrier Systems Development			PU 42208 - 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												
Aircraft Launch Recovery & Support	CPAF	Miscellaneous	2.519								2.519	
CVN 21 Class	PD	SUPSHIP Newport News	0.000	0.500	11/02					Continuing	Continuing	
	CP Type	NGNN	0.000			2.750	11/03	2.250	11/04	Continuing	Continuing	
	SPD	SPAWAR	0.000			1.165	11/03	0.785	11/04	Continuing	Continuing	
	WX	NAVAIR	0.000			0.300	11/03	0.300	11/04	Continuing	Continuing	
	WR	NSWC Corona	0.000			0.450	11/03	0.425	11/04	Continuing	Continuing	
	WR	NSWC Dahlgren	0.000			0.465	11/03	0.465	11/04	Continuing	Continuing	
	Various	Miscellaneous	0.000			0.930	11/03	0.775	11/04	Continuing	Continuing	
Operational Test & Evaluation	WR	COMOPTVFOR	0.000			0.700	11/03	0.700	11/04	Continuing	Continuing	
Live Fire Test & Evaluation										Continuing	Continuing	
Test Assets										Continuing	Continuing	
Tooling											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal T&E			2.519	0.500		6.760		5.700		0.000	15.479	
Remarks:												
Contractor Engineering Support											0.000	
Government Engineering Support											0.000	
Program Management Support											0.000	
Travel											0.000	
Transportation											0.000	
SBIR Assessment											0.000	
Subtotal Management			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
Total Cost			418.123	52.895		102.806		108.874		0.000	682.698	
Remarks:												

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Exhibit R-3, Project Cost Analysis
(Exhibit R-3, page 18 of 42)

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EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2003	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-04		PROGRAM ELEMENT NUMBER AND NAME PE 0603512N - Carrier Systems Development			PROJECT NUMBER AND NAME PU 44004 - EMALS			
COST (\$ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost	0.000	45.366	39.095	51.249	35.185	28.709	47.373	2.550
RDT&E Articles Qty								
<p>A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:</p> <p>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.</p> <p>Remarks: FY02 and Prior Years were funded under PE 0603512N, PU 42208</p>								

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Exhibit R-2a, RD TEN Project Justification
(Exhibit R-2a, page 19 of 42)

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: February 2003	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-04	PROGRAM ELEMENT NUMBER AND NAME PE 0603512N - Carrier Systems Development	PROJECT NUMBER AND NAME PU 44004 - EMALS		
B. Accomplishments/Planned Program				
	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.000	45.366	39.095	51.249
RDT&E Articles Quantity				
<p>EMALS - Continue and complete EMALS Program Definition and Risk Reduction phase. (FY03) 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. (FY04) 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 Engineering and Manufacturing Development phase. Conduct Systems Requirements review. Initiate production design effort. Conduct Preliminary Design Review. Continue CVN 21 integration development. Provide management, systems engineering, test and ship integration support. (FY05) Continue Engineering and Manufacturing development 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.</p>				

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Exhibit R-2a, RDTEN Project Justification
(Exhibit R-2a, page 20 of 42)

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EXHIBIT R-2a, RDT&E Project Justification			DATE: February 2003																																																								
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME																																																									
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<p>C. PROGRAM CHANGE SUMMARY:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 40%;"></th> <th style="text-align: right; width: 10%;">FY 2002</th> <th style="text-align: right; width: 10%;">FY 2003</th> <th style="text-align: right; width: 10%;">FY 2004</th> <th style="text-align: right; width: 10%;">FY 2005</th> </tr> </thead> <tbody> <tr> <td>Funding:</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Previous President's Budget: (FY 03 Pres Controls)</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> <td style="text-align: right;">0.000</td> </tr> <tr> <td>Current BES/President's Budget: (FY04/05 OSD/OMB Controls)</td> <td style="text-align: right;">0.000</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>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;">45.366</td> <td style="text-align: right; border-top: 1px solid black;">39.095</td> <td style="text-align: right; border-top: 1px solid black;">51.249</td> </tr> <tr> <td colspan="5" style="padding-top: 10px;">Summary of Adjustments</td> </tr> <tr> <td>Transfer from PU42208</td> <td></td> <td style="text-align: right;">46.127</td> <td style="text-align: right;">40.000</td> <td style="text-align: right;">52.351</td> </tr> <tr> <td>Congressional rescissions</td> <td></td> <td style="text-align: right;">-0.269</td> <td></td> <td></td> </tr> <tr> <td>Inflation</td> <td></td> <td style="text-align: right;">-0.492</td> <td style="text-align: right;">-0.902</td> <td style="text-align: right;">-1.105</td> </tr> <tr> <td>Misc. Adjustments</td> <td></td> <td style="text-align: right;">-0.003</td> <td style="text-align: right;">0.003</td> <td></td> </tr> <tr> <td>Subtotal</td> <td style="text-align: right; border-top: 1px solid black; border-bottom: 1px solid black;">0.000</td> <td style="text-align: right; border-top: 1px solid black; border-bottom: 1px solid black;">45.366</td> <td style="text-align: right; border-top: 1px solid black; border-bottom: 1px solid black;">39.095</td> <td style="text-align: right; border-top: 1px solid black; border-bottom: 1px solid black;">51.249</td> </tr> </tbody> </table> <p style="margin-top: 20px;">Remarks: FY02 and Prior Years were funded under PE 0603512N, PU 42208</p> <p>Schedule:</p> <p style="margin-left: 20px;">Not Applicable.</p> <p style="margin-top: 20px;">Technical:</p> <p style="margin-left: 20px;">Not Applicable</p>						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: (FY04/05 OSD/OMB Controls)	0.000	45.366	39.095	51.249	Total Adjustments	0.000	45.366	39.095	51.249	Summary of Adjustments					Transfer from PU42208		46.127	40.000	52.351	Congressional rescissions		-0.269			Inflation		-0.492	-0.902	-1.105	Misc. Adjustments		-0.003	0.003		Subtotal	0.000	45.366	39.095	51.249
	FY 2002	FY 2003	FY 2004	FY 2005																																																							
Funding:																																																											
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EXHIBIT R-2a, RDT&E Project Justification								DATE: February 2003	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-04				PROGRAM ELEMENT NUMBER AND NAME PE 0603512N - Carrier Systems Development			PROJECT NUMBER AND NAME PU 44004 - EMALS		

D. OTHER PROGRAM FUNDING SUMMARY:

<u>Line Item No. & 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>
SCN: 200100 - Carrier Replacement Program	135.341	395.493	1,186.564	626.010	611.771	2,983.870	3,811.809	3,074.351	Cont.	Cont.
RDT&E: 0604567N - Ship Contract Design, Live Fire T&E	122.405	181.098	138.017	140.018	115.004	91.371	50.352	27.038	Cont.	Cont.
0603570N - Advanced Nuclear Power Systems	170.706	211.314	201.239	174.239	178.357	182.055	172.532	164.732	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, (FY00 Award)
 General Atomics, La Jolla, CA, EMALS Design and Development, (FY00 Award)
 NAWC, Lakehurst, NJ, EMALS Interface.

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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-04			PE 0603512N - Carrier Systems Development			PU 44004 - 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		14.000	11/02	4.150	11/03			Continuing	Continuing	Continuing
	CPAF	General Atomics		22.500	11/02	6.840	11/03			Continuing	Continuing	Continuing
	CPIF	EMALS Contractor TBD				23.509	11/03	47.578	11/04	Continuing	Continuing	Continuing
	WR	NAWC Lakehurst, NJ		2.566	11/02	2.546	11/03	2.621	11/04	Continuing	Continuing	Continuing
	CPAF	NNS, VA		1.000	11/02	1.000	11/03	1.000	11/04	Continuing	Continuing	Continuing
	Various	Miscellaneous		0.250	11/02					Continuing	Continuing	Continuing
											0.000	
											0.000	
											0.000	
											0.000	
Subtotal Product Development			0.000	40.316		38.045		51.199		0.000	129.560	
Remarks: FY02 and Prior Years were funded under PE 0603512N, PU 42208												
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: FY02 and Prior Years were funded under PE 0603512N, PU 42208												

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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)										DATE: February 2003		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-04			PROGRAM ELEMENT PE 0603512N - Carrier Systems Development			PROJECT NUMBER AND NAME PU 44004 - 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	WR	Lakehurst NJ		5.000	11/02	1.000	11/03			Continuing	Continuing	Cont.
											0.000	
											0.000	
											0.000	
											0.000	
											0.000	
Subtotal T&E			0.000	5.000		1.000		0.000		0.000	6.000	
Remarks: FY02 and Prior Years were funded under PE 0603512N, PU 42208												
Contractor Engineering Support											0.000	
Government Engineering Support											0.000	
Program Management Support											0.000	
Travel				0.050		0.050		0.050			0.150	
Labor (Research Personnel)											0.000	
SBIR Assessment											0.000	
Subtotal Management			0.000	0.050		0.050		0.050		0.000	0.150	
Remarks: FY02 and Prior Years were funded under PE 0603512N, PU 42208												
Total Cost			0.000	45.366		39.095		51.249		0.000	135.710	
Remarks: FY02 and Prior Years were funded under PE 0603512N, PU 42208												

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EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2003	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT NUMBER AND NAME 0603512N - Carrier Systems Development				PROJECT NUMBER AND NAME 44005 - Smart Carrier			
COST (\$ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost		1.967	1.881	1.880	1.881	1.877	1.866	1.862
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

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.

Remarks: FY02 and Prior Years were funded under PE 0603512N, PU 42208

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EXHIBIT R-2a, RDT&E Project Justification			DATE: February 2003	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N /BA-4	PROGRAM ELEMENT NUMBER AND NAME 0603512N - Carrier Systems Development	PROJECT NUMBER AND NAME 44005 - Smart Carrier		
B. Accomplishments/Planned Program				
	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost		1.967	1.881	1.880
RDT&E Articles Quantity				
<p>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.</p> <p>Remarks: FY02 and Prior Years were funded under PE 0603512N, PU 42208</p>				

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Exhibit R-2a, RDTEN Project Justification
(Exhibit R-2a, page 26 of 42)

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT NUMBER AND NAME 0603512N - Carrier Systems Development	PROJECT NUMBER AND NAME 44005 - Smart Carrier

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	1.967	1.881	1.880
Total Adjustments	0.000	1.967	1.881	1.880
Summary of Adjustments				
Transfer from PU 42208		2.000	2.000	2.000
Congressional Recissions		-0.012		
Inflation		-0.021	-0.043	-0.041
Misc. Adjustments			-0.076	-0.079
Subtotal	0.000	1.967	1.881	1.880

Remarks: FY02 and Prior Years were funded under PE 0603512N, PU 42208

Schedule: Not Applicable

Technical: Not Applicable

R-1 SHOPPING LIST - Item No. 43

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Exhibit R-2a, RD TEN Project Justification
(Exhibit R-2a, page 27 of 42)

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification									DATE: February 2003		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4			PROGRAM ELEMENT NUMBER AND NAME 0603512N - Carrier Systems Development			PROJECT NUMBER AND NAME 44005 - Smart Carrier					
D. OTHER PROGRAM FUNDING SUMMARY:											
<u>Line Item No. & 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>	
098100 Items Under \$5 million Smart Carrier	33.860	46.653	7.317	36.696	24.244	27.266	21.806	24.146	56.500	278.488	
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 Surface Warfare Center, Carderock Division, Philadelphia, PA performs 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: February 2003				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME						
RDT&E, N / BA-4			0603512N - Carrier Systems Development			44005 - 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											0.000	
Ancillary Hardware Development											0.000	
Component Development											0.000	
Ship Integration	WR	NSWCCD, Philadelphia, PA		0.200	11/02	0.100	11/03	0.100	11/04	0.500	0.900	
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	0.200		0.100		0.100		0.500	0.900	
Remarks: FY02 and Prior Years were funded under PE 0603512N, PU 42208												
Development Support											0.000	
Software Development	WR	NSWCCD, Philadelphia, PA		1.067	11/02	0.931	11/03	0.880	11/04	3.486	6.364	
Training Development	WR	NSWCCD, Philadelphia, PA		0.050	11/02	0.050	11/03	0.080	11/04	0.300	0.480	
Integrated Logistics Support	WR	NSWCCD, Philadelphia, PA		0.100	11/02	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	1.217		1.131		1.080		4.386	7.814	
Remarks: FY02 and Prior Years were funded under PE 0603512N, PU 42208												

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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)										DATE: February 2003		
APPROPRIATION/BUDGET ACTIVITY RDTE, N / BA-4			PROGRAM ELEMENT 0603512N - Carrier Systems Development				PROJECT NUMBER AND NAME 44005 - 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	WR	NSWCCD, Philadelphia, PA		0.300	11/02	0.400	11/03	0.450	11/04	1.600	2.750	
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	0.300		0.400		0.450		1.600	2.750	
Remarks: FY02 and Prior Years were funded under PE 0603512N, PU 42208												
Contractor Engineering Support											0.000	
Government Engineering Support											0.000	
Program Management Support	WR	NSWCCD, Philadelphia, PA		0.250	11/02	0.250	11/03	0.250	11/04	1.000	1.750	
Travel											0.000	
Labor (Research Personnel)											0.000	
SBIR Assessment											0.000	
Subtotal Management			0.000	0.250		0.250		0.250		1.000	1.750	
Remarks: FY02 and Prior Years were funded under PE 0603512N, PU 42208												
Total Cost			0.000	1.967		1.881		1.880		7.486	13.214	
Remarks: FY02 and Prior Years were funded under PE 0603512N, PU 42208												

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EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2003	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4		PROGRAM ELEMENT NUMBER AND NAME 0603512N Carrier Systems Development			PROJECT NUMBER AND NAME W1723 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	3.936	7.646	1.183	0.077				
RDT&E Articles Qty		2						

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

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:

- (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.

(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.

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: February 2003																															
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT NUMBER AND NAME 0603512N Carrier Systems Development	PROJECT NUMBER AND NAME W1723 CV Launch and Recovery Systems																																
(U) B. Accomplishments/Planned Program																																		
<table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <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> <tr> <td>Accomplishments/Effort/Subtotal Cost</td> <td style="text-align: center;">3.936</td> <td style="text-align: center;">7.439</td> <td style="text-align: center;">1.056</td> <td></td> </tr> <tr> <td>RDT&E Articles Quantity</td> <td></td> <td style="text-align: center;">2</td> <td></td> <td></td> </tr> </table> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>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 and Preliminary Design Review. Provided engineering and management support. Complete Preliminary Design Review and Critical Design Review and fabricate/deliver two (2) test articles. Conduct developmental testing of test articles on arresting gear. Conduct development testing using deadloads at the Jet Car Track Site (JCTS) and aircraft at the Runway Arrested Landing Site (RALS). Conduct rapid cycle reliability testing and environmental testing. Complete Tech Evaluation and achieve Milestone C.</p> </div> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <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> <tr> <td>Accomplishments/Effort/Subtotal Cost</td> <td style="text-align: center;">0.000</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> </table> <div style="border: 1px solid black; padding: 5px;"> <p>CREI (Arresting Gear Fairlead Sheaves) - Select candidate materials and samples and conduct laboratory testing. Conduct design and manufacture prototype of CREI Sheaves. Conduct rapid cycle wear testing, dead load testing at the JCTS and aircraft testing at RALS, and environmental testing of developmental sheaves. Provide engineering and management support to the program.</p> </div>						FY 02	FY 03	FY 04	FY 05	Accomplishments/Effort/Subtotal Cost	3.936	7.439	1.056		RDT&E Articles Quantity		2				FY 02	FY 03	FY 04	FY 05	Accomplishments/Effort/Subtotal Cost	0.000	0.207	0.127	0.077	RDT&E Articles Quantity				
	FY 02	FY 03	FY 04	FY 05																														
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Exhibit R-2a, RDTEN Project Justification
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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: February 2003																																																																												
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT NUMBER AND NAME 0603512N Carrier Systems Development	PROJECT NUMBER AND NAME W1723 CV Launch and Recovery Systems																																																																													
<p>(U) C. PROGRAM CHANGE SUMMARY:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 35%;">(U) Funding:</th> <th style="text-align: right; width: 15%;">FY 2002</th> <th style="text-align: right; width: 15%;">FY 2003</th> <th style="text-align: right; width: 15%;">FY 2004</th> <th style="text-align: right; width: 15%;">FY 2005</th> </tr> </thead> <tbody> <tr> <td>Previous President's Budget:</td> <td style="text-align: right;">5.344</td> <td style="text-align: right;">7.818</td> <td style="text-align: right;">1.221</td> <td style="text-align: right;">0.080</td> </tr> <tr> <td>Current BES/President's Budget</td> <td style="text-align: right;">3.936</td> <td style="text-align: right;">7.646</td> <td style="text-align: right;">1.183</td> <td style="text-align: right;">0.077</td> </tr> <tr> <td>Total Adjustments</td> <td style="text-align: right; border-top: 1px solid black;">-1.408</td> <td style="text-align: right; border-top: 1px solid black;">-0.172</td> <td style="text-align: right; border-top: 1px solid black;">-0.038</td> <td style="text-align: right; border-top: 1px solid black;">-0.003</td> </tr> <tr> <td colspan="5" style="padding-top: 10px;">Summary of Adjustments</td> </tr> <tr> <td> Congressional program reductions</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> Congressional undistributed reductions</td> <td></td> <td style="text-align: right;">-0.045</td> <td></td> <td></td> </tr> <tr> <td> Congressional rescissions</td> <td style="text-align: right;">-0.011</td> <td></td> <td></td> <td></td> </tr> <tr> <td> SBIR/STTR Transfer</td> <td style="text-align: right;">-0.011</td> <td></td> <td></td> <td></td> </tr> <tr> <td> Economic Assumptions</td> <td style="text-align: right;">-0.011</td> <td style="text-align: right;">-0.044</td> <td style="text-align: right;">-0.029</td> <td style="text-align: right;">-0.002</td> </tr> <tr> <td> Management Reform Initiative</td> <td style="text-align: right;">-0.047</td> <td></td> <td></td> <td></td> </tr> <tr> <td> Reprogrammings</td> <td style="text-align: right;">-1.330</td> <td></td> <td></td> <td></td> </tr> <tr> <td> Sponsor/FMB/NAVAIR Adjustments</td> <td style="text-align: right;">0.002</td> <td style="text-align: right;">-0.083</td> <td style="text-align: right;">-0.009</td> <td style="text-align: right;">-0.001</td> </tr> <tr> <td> Congressional increases</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> Subtotal</td> <td style="text-align: right; border-top: 1px solid black;">-1.408</td> <td style="text-align: right; border-top: 1px solid black;">-0.172</td> <td style="text-align: right; border-top: 1px solid black;">-0.038</td> <td style="text-align: right; border-top: 1px solid black;">-0.003</td> </tr> </tbody> </table> <p style="margin-top: 20px;">(U) Schedule:</p> <p>Deferral of the ARC System program contract award from 1Q/02 to 3Q/02 was due to a decision to pursue ARC as an ACAT IVM program. This change has caused the following delays in the ARC System program: CDR has moved from 1Q/03 to 3Q/03 and DT has moved from 2Q/03 to 1Q/04. ARC PDR is scheduled for 1Q/03 and ARC MS C is scheduled for 3Q/04.</p> <p style="margin-top: 20px;">(U) Technical:</p> <p>Not Applicable</p>					(U) Funding:	FY 2002	FY 2003	FY 2004	FY 2005	Previous President's Budget:	5.344	7.818	1.221	0.080	Current BES/President's Budget	3.936	7.646	1.183	0.077	Total Adjustments	-1.408	-0.172	-0.038	-0.003	Summary of Adjustments					Congressional program reductions					Congressional undistributed reductions		-0.045			Congressional rescissions	-0.011				SBIR/STTR Transfer	-0.011				Economic Assumptions	-0.011	-0.044	-0.029	-0.002	Management Reform Initiative	-0.047				Reprogrammings	-1.330				Sponsor/FMB/NAVAIR Adjustments	0.002	-0.083	-0.009	-0.001	Congressional increases					Subtotal	-1.408	-0.172	-0.038	-0.003
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Exhibit R-2a, RD TEN Project Justification
(Exhibit R-2a, page 33 of 42)

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification								DATE: February 2003	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4			PROGRAM ELEMENT NUMBER AND NAME 0603512N Carrier Systems Development			PROJECT NUMBER AND NAME W1723 CV Launch and Recovery Systems			

(U) D. OTHER PROGRAM FUNDING SUMMARY:

<u>Line Item No. & 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>	To <u>Complete</u>	Total <u>Cost</u>
OPN Aircraft Launch & Recovery Equipment, 43SJ	26.835	18.949	20.277	21.319	31.883	33.077	33.714	34.323	Continuing	Continuing

(U) E. ACQUISITION STRATEGY:

ARC System: The Navy is preparing a performance specification, for the valve actuation and control system and a build to print data package for the CROV valve. NAWCAD LKE will serve as the prime contractor and competitively award contracts for the development, manufacture, and production of the ARC components.

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 wear 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.

(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	2.777	11/02	0.883	11/03	0.077	11/04
Northrup Grumman	Sykesville, MD	Primary H/W Development	4.869	12/02	0.300	11/03		

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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)								DATE: February 2003				
APPROPRIATION/BUDGET ACTIVITY RDTE&E, N / BA-4			PROGRAM ELEMENT 0603512N Carrier Systems Development			PROJECT NUMBER AND NAME W1723 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	C/CPAF	Northrup Grumman,	3.942	4.869	11/02	0.300	11/03				9.111	8.603
Primary Hardware Development	WX	NAWCAD Lakehurst, NJ		0.685	11/02						0.685	
Systems Engineering	WX	NAWCAD Lakehurst, NJ	24.460	1.627	11/02	0.637	11/03				26.724	
Award Fees												
Subtotal Product Development			28.402	7.181		0.937					36.520	
Remarks:												
Subtotal Support												
Remarks:												

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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)										DATE: February 2003		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4			PROGRAM ELEMENT 0603512N Carrier Systems Development				PROJECT NUMBER AND NAME W1723 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	0.104	11/03				0.439	
Developmental T&E (CREI)	WX	NAWCAD Lakehurst, NJ		0.080	11/02	0.127	11/03	0.077	11/04		0.284	
Award Fees												
Subtotal T&E				0.415		0.231		0.077			0.723	
Remarks:												
Travel	WX	NAWCAD Lakehurst, NJ		0.050		0.015					0.065	
Subtotal Management				0.050		0.015					0.065	
Remarks:												
Total Cost			28.402	7.646		1.183		0.077			37.308	
Remarks:												

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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-4												0603512N Carrier Systems Development												W1723 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 △			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																																			

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

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Exhibit R-4, Schedule Profile
(Exhibit R-4, page 37 of 42)

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CLASSIFICATION:

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Exhibit R-4a, Schedule Detail

(Exhibit R-4a, page 38 of 42)

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2003	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-5	PROGRAM ELEMENT NUMBER AND NAME 0603512N Carrier Systems Development				PROJECT NUMBER AND NAME W2269 EAF Matting			
COST (\$ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost	1.863							
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This project addresses the Program Definition and Risk Reduction (PDRR) phase of the lightweight airfield mat and expeditionary arresting gear to meet naval aviation unique Expeditionary Airfield (EAF) operational requirements, including transportability requirements on Maritime Prepositioning Ships (MPS).

(U) The currently deployed EAF mat (AM-2) was developed for heavy fighter (such as the F-4) operations and is cumbersome to deploy. Lightweight (1/2 the weight of AM-2), less voluminous (1/2 the volume of AM-2), and easier to install (five days vice fifteen days to install a complete airfield) mat material may be technically feasible and commercially available, but must be evaluated for use with current type/model/series Naval and Air Mobility Command (AMC) aircraft at conventional and Vertical and Short Take-off and Landing (V/STOL) airfields ashore. Candidate mat materials under consideration include reinforced synthetic composite materials and polyvinyl fiberglass. These mat materials will be configured and evaluated under Marine Corps operational scenarios.

(U) The expeditionary arresting gear program will provide the Marine Corps with the capability to conduct short span arrestments of designated Navy and Marine Corps tail hook equipped aircraft in the expeditionary environment. The current arresting gear (M-21) cannot be adapted to operate on short span (100 feet or less) surfaces and is incapable of arresting the current inventory under casualty (no flaps or half flap) conditions. The M-21 has inadequate reliability and several replacement components are no longer produced. The replacement gear, M-31, will provide air transportability, rapid setup, full inventory operational compatibility under all arrestment conditions, and adequate operational reliability. Two M-31 prototype systems will be built under this project.

(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 applications.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: February 2003	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-5	PROGRAM ELEMENT NUMBER AND NAME 0603512N Carrier Systems Development	PROJECT NUMBER AND NAME W2269 EAF Matting		
(U) B. Accomplishments/Planned Program				
	FY 02	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	1.863			
RDT&E Articles Quantity				
<div>M-31 Demonstrated compatability and performance thresholds with deadloads and aircraft. Completed developmental testing (DT) and achieved Milestone III. Provided engineering and management support to the program.</div>				

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: February 2003	
APPROPRIATION/BUDGET ACTIVITY RDTE, N / BA-5	PROGRAM ELEMENT NUMBER AND NAME 0603512N Carrier Systems Development	PROJECT NUMBER AND NAME W2269 EAF Matting		

(U) C. PROGRAM CHANGE SUMMARY:

	FY 2002	FY 2003	FY 2004	FY 2005
(U) Funding:				
Previous President's Budget:	0.851			
Current BES/President's Budget	1.863			
Total Adjustments	1.012	0.000	0.000	0.000
Summary of Adjustments				
Congressional program reductions				
Congressional undistributed reductions				
Congressional rescissions				
SBIR/STTR Transfer	-0.002			
Economic Assumptions	-0.005			
Management Reform Initiative	-0.008			
Reprogrammings	1.027			
Sponsor/FMB/NAVAIR Adjustments				
Congressional increases				
Subtotal	1.012	0.000	0.000	0.000

(U) Schedule:

The delay in delivery of prototype caused Final DT to move from 1Q-4Q/01 to 2Q/02. Required additional aircraft testing and validation of reliability and maintainability efforts caused the M31 MS III approval move from 2Q/02 TO 3Q/02.

(U) Technical:

Not applicable

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Exhibit R-2a, RDTE Project Justification
(Exhibit R-2a, page 41 of 42)

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification						DATE: February 2003	
APPROPRIATION/BUDGET ACTIVITY RDTE&E, N / BA-5			PROGRAM ELEMENT NUMBER AND NAME 0603512N Carrier Systems Development		PROJECT NUMBER AND NAME W2269 EAF Matting		

(U) 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 Continuing	Total Cost
OPN (Expeditionary Airfields 43SE)										

(U) E. ACQUISITION STRATEGY:

The advanced lightweight mat acquisition strategy envisioned the solicitation of candidate material panels from commercial sources for evaluation in the laboratory and in the operational environment. Upon qualification of a viable material, limited production quantities will be procured for full scale environmental, performance, and operational testing. Production quantities will be procured from the commercial source in accordance with Marine Corps priorities.

The M-31 arresting gear acquisition strategy is predicated on the creation of a fully integrated team consisting of Navy and contractor personnel. Initial technology development and system design effort will be shared between the partners. The commercial partner will take the lead in the prototype manufacturing effort; the Navy partner will lead the test effort; and the commercial partner will ultimately be tasked with system production.

(U) F. MAJOR PERFORMERS: Not Applicable

Major Performer	Location	Description of Work	FY03 Amt & Award Date	FY04 Amt & Award Date	FY05 Amt & Award Date

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