

CLASSIFICATION:

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EXHIBIT R-2, RDT&E Budget Item Justification								DATE: June 2001		
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA 4					R-1 ITEM NOMENCLATURE Carrier Systems Development - 0603512N					
COST (\$ in Millions)	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Cost
Total PE Cost	134.194	149.549	165.150						Cont.	Cont.
S1722 CV Weapons Elevator Improvements	0.993	1.043	1.049						Cont.	Cont.
42208 Future CV R & D	104.240	123.378	124.469						Cont.	Cont.
42693 Carrier Systems Definition	23.815	14.230	33.435						Cont.	Cont.
W1723 CV Launch & Recovery Systems	1.338	6.731	5.346						Cont.	Cont.
W2269 EAF Matting	3.808	4.167	0.851						0.000	18.716
Quantity of RDT&E Articles										

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) (S1722) -- Development of standardized, supportable and maintainable aircraft carrier weapons elevators components.
- (U) (42208) -- Development of ship hull, mechanical, propulsion, electrical, aviation and combat support systems, subsystems and components to significantly improve aircraft carrier affordability, 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) - Supports 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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		June 2001																					
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATURE																						
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA 4	Carrier Systems Development - 0603512N																						
<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> <p>B. <u>Program Change Summary</u></p> <table border="0"> <thead> <tr> <th></th> <th>FY 2000</th> <th>FY 2001</th> <th>FY 2002</th> </tr> </thead> <tbody> <tr> <td>(U) FY 2001 President's Budget:</td> <td>141.957</td> <td>148.952</td> <td>156.631</td> </tr> <tr> <td>(U) Appropriated Value:</td> <td>142.783</td> <td>150.952</td> <td></td> </tr> <tr> <td>(U) Adjustments to FY 2000/2001 Appropriated Value/ FY 2001 President's Budget:</td> <td>-8.589</td> <td>0.597</td> <td>8.517</td> </tr> <tr> <td>(U) FY 2002 PRES Budget Submit:</td> <td>134.194</td> <td>149.549</td> <td>165.148</td> </tr> </tbody> </table> <p>Funding:</p> <p>FY00 change (-\$8.859) (-\$3.215) SBIR reductions, (-\$3.500) Naval Fires Network Transfer, (-\$1.365) Congressional undistributed reductions, (-\$0.417) program adjustments, and (-\$.092) minor pricing adjustments.</p> <p>FY01 change (+\$0.597) (+\$.2000) ASW Tactical Decision Aids, (-\$1.385) Congressional undistributed reductions, and (-\$.018) minor pricing adjustments.</p> <p>FY02 change (+\$8.517) (-\$9.300) moved from 42208 into PE 0604567N/42301 to support LFT&E requirements, (+\$5.000) CVNX Class Technology, (+\$20.300) CVNX1 Total Ship Integration, (-\$7.688) moved from W1723 into PE 0604512N to reflect program as an Engineering and Manufacturing Development effort instead of a Demonstration and Validation effort, and (+\$0.205) minor pricing adjustments.</p> <p>Schedule: (U) W1723 -- The deferral of the VISUAL program Milestone II from 2Q FY00 to 3Q FY00 was due to delays in developing, coordinating, and finalizing program documentation. Final evaluation of the VISUAL "centerline camera" components was delayed in FY00 due to funding constraints associated with the award of the VISUAL electro-optic EDM contract.</p> <p>Technical: Not applicable.</p>					FY 2000	FY 2001	FY 2002	(U) FY 2001 President's Budget:	141.957	148.952	156.631	(U) Appropriated Value:	142.783	150.952		(U) Adjustments to FY 2000/2001 Appropriated Value/ FY 2001 President's Budget:	-8.589	0.597	8.517	(U) FY 2002 PRES Budget Submit:	134.194	149.549	165.148
	FY 2000	FY 2001	FY 2002																				
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EXHIBIT R-2a, RDT&E Project Justification						DATE: June 2001				
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER				PROJECT NAME AND NUMBER					
RDT&E, N / BA 4	Carrier Systems Development - 0603512N				CV Weapons Elevator Improvements S1722					
COST (\$ in Millions)	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Cost
Project Cost	0.993	1.043	1.049						Cont.	Cont.
RDT&E Articles Qty										
<p>A. Mission Description and Budget Item Justification This project provides for advanced development, fabrication, test, evaluation and documentation of standardized aircraft carrier weapons elevators components such as control systems, hoist machinery, doors and hatches. Emphasis is placed on the reduction of total ownership cost, improvement of safety, reliability, maintainability and watertight integrity and weight reduction.</p> <p>- (U) PROGRAM ACCOMPLISHMENTS AND PLANS:</p> <p>FY 2000 ACCOMPLISHMENTS: (U)(\$.200) – Completed linear actuator tests. (U)(\$.075) – Completed alternative governor research. (U)(\$.072) – Completed platform landing load analysis. (U)(\$.306) – Developed intelligent controls for multiple car systems. (U)(\$.340) – Completed linear drive ropeless elevator research.</p> <p>FY 2001 PLAN: (U)(\$.233) – Complete design for model ropeless elevator safety system. (U)(\$.200) – Develop simulation model for multiple cars in non-traditional trunk. (U)(\$.160) – Investigate feasibility of available smart sensor networks for condition sensing. (U)(\$.100) – Test magnetostrictive actuator for use on elevator closure systems. (U)(\$.150) - Develop intelligent networked controls for existing elevator systems. (U)(\$.100) - Complete alternate overspeed governor tests. (U)(\$.100) - Investigate use of embedded force sensing pins.</p>										

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EXHIBIT R-2a, RDT&E Project Justification		DATE:
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER
RDT&E, N / BA 4	Carrier Systems Development - 0603512N	Future Carrier R&D - S1722
FY 2002 PLAN:		
<p>(U)(\$.200) – Develop design for non-traditional trunk installation at LBES. (U)(\$.179) – Develop electrical power simulation model for linear electric drive. (U)(\$.200) – Test one-tenth scale model to validate design model and safety feature concepts. (U)(\$.200) – Test one tenth scale model to validate electrical power model. (U)(\$.100) – Test wireless sensor for effectiveness on LBES elevator platforms. (U)(\$.170) – Develop PC based control for linear electric drives in multiple car systems.</p>		

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EXHIBIT R-2a, RDT&E Project Justification		DATE: June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA 4	PROGRAM ELEMENT NAME AND NUMBER Carrier Systems Development - 0603512N	PROJECT NAME AND NUMBER CV Weapons Elevator Improvements S1722	
B. Other Program Funding Summary: Not applicable			
C. Acquisition Strategy: Not applicable			
D. Schedule Profile	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
Program Milestones	2Q Completed Alternative governor research 4Q Completed linear drive ropeless elevator research	3Q Complete design for ropeless elevator	4Q Develop PC based control for linear electric drives in multiple car systems
Engineering Milestones	3Q Developed intelligent multiple car controls	4Q Develop simulation model for multiple cars 2Q Investigate feasibility of available SMART sensor networks for condition sensing. 4Q Develop intelligent networked controls for existing elevator systems 4Q Investigate embedded force sensing pins	4Q Develop design for non-traditional trunk at LBES 2Q Develop electrical power simulation model for linear electric drive
T&E Milestones	4Q Completed linear actuator tests	4Q Test magnetostrictive actuator for use on elevator closures 2Q Complete alternate governor testing	3Q Test scale model to validate design model & safety features 4Q Test scale model to validate electrical power model 2Q Test wireless sensor for effectiveness on LBES
Contract Milestones			

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Exhibit R-3 Cost Analysis (page 1)								DATE: June 2001				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, N / BA 4			Carrier Systems Development - 0603512N			CV Weapons Elevator Improvements S1722						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NSWC Philadelphia	0.540	0.678	12/99	0.850	12/00	0.549	12/01	Cont.	Cont.	Cont.
Ancillary Hardware Development		Misc	0.821									
Systems Engineering												
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development			1.361	0.678		0.850		0.549		Cont.	Cont.	Cont.
Remarks:												
Development Support Equipment											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	
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												

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Exhibit R-3 Cost Analysis (page 2)										DATE: June 2001		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, N / BA 4			Carrier Systems Development - 0603512N			CV Weapons Elevator Improvements S1722						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NSWC Philadelphia	0.210	0.315	12/99	0.193	12/00	0.500	12/01	Cont.	Cont.	Cont.
Operational Test & Evaluation											0.000	
Tooling											0.000	
GFE											0.000	
Subtotal T&E			0.210	0.315		0.193		0.500		Cont.	Cont.	Cont.
Remarks:												
Contractor Engineering Support											0.000	
Government Engineering Support											0.000	
Program Management Support											0.000	
Travel											0.000	
Labor (Research Personnel)											0.000	
Overhead											0.000	
Subtotal Management			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
Total Cost			1.571	0.993		1.043		1.049		Cont.	Cont.	
Remarks:												

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EXHIBIT R-2a, RDT&E Project Justification							DATE: June 2001				
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA 4		PROGRAM ELEMENT NAME AND NUMBER Carrier Systems Development - 0603512N			PROJECT NAME AND NUMBER Future Carrier R&D - 42208						
COST (\$ in Millions)		FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Cost
Project Cost		104.240	123.378	124.469						Cont.	Cont.
RDT&E Articles Qty											

A. (U) 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, survivability, and operational capabilities and to meet the requirements of existing and pending regulations and statutes critical to the operation of future aircraft carriers.

- (U) PROGRAM ACCOMPLISHMENTS AND PLANS:

FY 2000 ACCOMPLISHMENTS:

-(U) (\$43.888)-Non-Nuclear Propulsion Plant Development

- (U) (\$15.404) Began preliminary design of the main propulsion unit (MPU). Completed preliminary main turbine generator (MTG) design, developed testing requirements and identified required testing capabilities for a prototype unit. Produced MTG schematic diagrams identifying all ship and system connections.

- (U) (\$5.619) Integrated Non-Propulsion equipment into the Steam and Electric Equipment layouts. Determined major system requirements and performance criteria and provided information for the integrated product model. Established non-propulsion systems interface requirements with propulsion plant and power distribution systems.

- (U) (\$6.782) Continued developing enhancements to the product data management software and prototype automated workflow for construction deliverables. Developed design analysis features required for propulsion plan design development.

- (U) (\$16.083) Began developing conceptual designs for optimized mechanical and electrical systems that interface with the propulsion plant. Established interface controls between propulsion and non-propulsion equipment. Developed optimal volume and weight requirements for these mechanical and electrical systems. Established layout of doors, ladders, passageways, hatches, and escape trunks integrated with the optimal propulsion plant.

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APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER
RDT&E, N / BA 4	Carrier Systems Development - 0603512N	Future Carrier R&D - 42208
<p>- (U) (\$31.659) –Aircraft Launch, Recovery & Support - Electromagnetic Aircraft Launch System (EMALS) (formerly Advanced Tehcnology Launcher) Program Definition and Risk Reduction Phase. Awarded two competitive contracts for full size, full power, fully integrated, reduced length prototype launcher systems. Initiated system engineering, technology assessment and risk mitigation efforts. Completed Systems Requirements Review, trade studies, and initial Preliminary Design Review for both contracts. Completed baseline ship system designs and initiated sub-scale test bed development and critical component testing. Developed initial ship integration plans for CVNX-1/CVNX-2 and identified preliminary hull, mechanical and electrical support requirements. Provided management, system engineering, and ship integration support.</p> <p>- (U) (\$4.423) – Battle Damage Prevention & Recovery - Initiated signatures support and integration in battle damage prevention efforts. This includes acoustic and non-acoustic signatures reduction design support efforts addressing performance, cost and ship impacts assessment. Continued evaluation and development of Upgraded Armor Protection System - Littoral (UAPS - Littoral), Dynamic Armor Protection System (DAPS), Underwater Protection System (UWPS), and Weapons Damage and Residual Strength design concepts to meet threats and design goals. Developed preliminary system designs and determined installation feasibility within ship concept designs. Developed plans for procurement and development of scaled test components. Prepared test facilities for small scale testing. Commenced refinement of analytical capabilities for underwater protection systems, to include the Torpedo/Mine Side Protection System (T/MSPS). Defined design, producibility and material property goals for General Protective Plate. Commenced fire vulnerability study in support of initiatives targeted at improving performance, and reducing operation and support costs of related systems. Commenced development of enhanced damage control and firefighting concepts.</p> <p>- (U) (\$1.340) – Manpower and Material Support – Initiated development of manpower and material support alternatives to achieve manpower reductions and total ownership cost savings. Included will be the development of advanced robotics for ship systems and components operation, maintenance and material handling in the areas of combat and intelligence, logistics and Hull Mechanical & Electrical (HM&E). A standardized open system architecture approach will be incorporated into system and component development.</p> <p>- (U) (\$19.678) - Combat and Intelligence Systems – Completed Phase II competitive solicitation for Combat Systems Integration concepts and design process. Continued monitoring improvements targeted at reducing the operational and support costs of the ship's war fighting systems. Initiatives remain focused on reducing the number of systems through the use of "multi-function" radars and flat planar antenna arrays, data exchange across operational areas, data fusion, and integrated displays for operators. Completed trade studies, including those that result in cost reductions without degrading operational performance into the design development. Evaluated and completed competitive Combat Systems Integration design development and integrated into the ship contract data package. Commenced Phase III Design Refinement. Refined Combat Systems Integration design and integrated into the ship design.</p> <p>- (U) (\$3.252) – Systems Development – Supported CVNX Engineering Team for design, engineering and interoperability analysis to support Milestone I. Also supported the Requirements and AOA Teams for TOC reductions/analysis, survivability analysis and CVNX Advanced Launch & Recovery, and trade studies and Lethality Studies (ORD Specific). Provided acquisition planning support.</p>		

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APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA 4	PROGRAM ELEMENT NAME AND NUMBER Carrier Systems Development - 0603512N	June 2001
FY 2001 PLAN: - (U) (\$50.411) Non-Nuclear Propulsion Plant Development - (U) (\$18.003) Begin detailed design of the main turbine generator (MTG) prototype, development of MTG prototype testing requirements and plans. Continue preliminary design of the main propulsion unit. - (U) (\$6.226) Determine changes to and complete layout of major electric plant equipment such as load centers outside of propulsion plant spaces. Continue development of inputs to the integrated product model database. Refine interface requirements for the non-propulsion systems with the propulsion and power distribution systems. - (U) (\$7.785) Continue prototyping and implementation of automated workflow for construction deliverables. Continue to integrate analysis and other required function into the product model design and continue adding design data to the database. - (U) (\$18.397) Complete preliminary designs and continue development of mechanical and electrical systems that interface with the propulsion plant. Finalize overall layout of non-propulsion plant mechanical and electrical systems and assess preliminary volume and weight data. - (U) (\$43.738) – Aircraft Launch, Recovery & Support – Continue Electromagnetic Aircraft Launch System Program Definition and Risk Reduction (PDRR) phase. Initiate prototype system long-lead time material procurements. Conduct component and subsystem development testing. Conduct incremental Preliminary and Contract Design Reviews. Begin PDRR system manufacture and integration. Continue CVNX-1/CVNX-2 arrangement studies, system integration and support requirements development. Develop hull, mechanical and electrical system requirements. Provide management, system engineering, and ship integration support for all aviation related systems. - (U) (\$4.668) – Battle Damage Prevention & Recovery - Continue battle prevention and ship survivability ship design assessments with limited small scale testing and analyses for UWPS, Weapons Damage and Residual Strength and T/MSPS protection systems. Commence design of DAPS components and small scale testing of DAPS concepts. Commence Live Fire Test & Evaluation efforts to support development of documentation required for MS II approval, including commencing of surrogate testing.		

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APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER
RDT&E, N / BA 4	Carrier Systems Development - 0603512N	Future Carrier R&D - 42208
<p>- (U) (\$12.052) – Systems Development– Commence total ship design integration. Commence 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. Perform acquisition planning, system readiness reviews (SRR), and documentation to support MS II.</p> <p>- (U) (\$7.560) - Smart Carrier - The Smart Carrier Program is a PEO Carriers' initiative involving the introduction of information technology, automation and controls, and process improvements with the goal of reducing total workload, lowering total ownership (TOC), and enhancing quality of life. The following technologies will be actively installed on a demonstration basis: Advanced Damage Control, Remote Shaft Alley Monitoring, Integrated Condition Assessment System, Rechargeable Battle Lanterns, Battery-powered Tools and Bulkhead Surface Coating.</p> <p>- (U) (\$1.938) - ASW Tactical Decision Aids - Integrate tactical decision aid technology from the Advanced Undersea Warfare Concept into future aircraft carrier combat systems, an initial step in fulfilling a larger vision of Network - Centric Undersea Warfare Theater Combat System. Develop a prototype system in the aircraft carrier tactical Support Center Integrated Warfare Commander Cell.</p> <p>- (U) (\$3.011) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.</p> <p>FY 2002 PLAN:</p> <p>-(U) (\$55.799) Non-Nuclear Propulsion Plant Development</p> <p>- (U) (\$26.500) Begin fabrication of prototype MTG and complete detailed design. Complete preliminary design of the main propulsion unit. Continue development of testing requirements and the identification and evaluation of testing capabilities.</p> <p>- (U) (\$8.900) Continue development of inputs to the integrated product model.</p> <p>- (U) (\$6.149) Continue prototyping and implementation of automated workflow for construction deliverables. Continue to integrate analysis and other required functions into product model design.</p> <p>- (U) (\$14.250) Continue development of mechanical and electrical systems that interface with the propulsion plant.</p> <p>- (U) (\$4.900) - Commence development of the Large Capacity Reverse Osmosis Desalination Plant based on system design requirements developed by non-nuclear propulsion plant efforts.</p> <p>- (U) (\$47.683) – Aircraft Launch, Recovery & Support – Continue Electromagnetic Aircraft Launch System Program definition and Risk Reduction phase. Complete prototype test facility design and construction. Complete manufacture, integration and acceptance testing of prototype launch systems. Begin installation of prototype systems in test facilities. Initiate CVNX-1 integration development. Provide management, system engineering, and ship integration support for all aviation related systems.</p>		

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APPROPRIATION/BUDGET ACTIVITY						June 2001				
PROGRAM ELEMENT NAME AND NUMBER		PROJECT NAME AND NUMBER								
RDT&E, N / BA 4		Carrier Systems Development - 0603512N								
		Future Carrier R&D - 42208								
<p>- (U) (\$5.000) – 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 modified and new configuration hull forms. Continue and expand advanced damage control systems and improved magazines/shipboard fire protection systems technologies development.</p> <p>- (U) (\$5.000) - 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 armor protection and development of items to address deficiencies in service life allowance for weight and stability requirements (KG).</p> <p>- (U) (\$4.087) - Systems Development - Continue total ship design integration. Commence 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> <p>- (U) (\$2.000) - Smart Carrier - The Smart Carrier Program is a PEO Carriers' 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: Autonomous Launch Bar Seating Check, In-Line Fuel Sampling and Single Cost-Coat Systems for Tank & Void Preservation.</p>										
B. Other Program Funding Summary										
Related RDT&E:	<u>FY 2000</u>	<u>FY 2001</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>Complete</u>	<u>Total Cost</u>
0604567N/42301 CV Contract Design										
CVN-77	33.806	45.887	35.457						0	115.15
CVNX	0	0	9.324						Cont.	Cont.
0603570N/S2692 Advance Nuclear Power System										
	68.418	98.302	106.101						449.989	722.810
Related SCN:										
200100 Carrier Replacement Program	747.503	4038.105	147.890						Cont.	Cont.

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EXHIBIT R-2a, RDT&E Project Justification		DATE: June 2001
APPROPRIATION/BUDGET ACTIVITY RDTE&E, N / BA 4	PROGRAM ELEMENT NAME AND NUMBER Carrier Systems Development - 0603512N	PROJECT NAME AND NUMBER Future Carrier R&D - 42208
<p>C. <u>Acquisition Strategy</u>. The Carrier acquisition strategy for CVNX will utilize a phased design and technology insertion or "evolutionary" strategy. This strategy will focus on combat system redesign (topside) on CVN77, new propulsion plant and Electro-Magnetic Aircraft Launching System (EMALS) on CVNX-1 and improvements in the area of aviation, survivability, service life restoration and Total Ownership Costs (TOC) reduction on the CVNX-2. On each hull, core capabilities will be maintained and TOC will be reduced in accordance with Carrier goals. As with previous NIMITZ class carriers, the CVN77 was awarded as a sole source Fixed Price Incentive Fee (FPIF) contract to Newport News Shipbuilding. For CVNX-1 and future hulls, early IPPD design efforts will be cost type contracts with construction contracts anticipated to be FPIF similar to CVN 77.</p>		
D. Schedule Profile:	<u>FY 2000</u>	<u>FY 2001</u> <u>FY 2002</u>
Program Milestones	CVNX: 2Q MS1	CVNX: 3Q MS2
Engineering Milestones	EMALS: 2Q SRR EMALS: 4Q PDR	EMALS: 3Q CDR EMALS: 4Q Initiate Sys Instl @ LKE
T&E Milestones		
Contract Milestones	EMALS: 1Q PDRR Phase	

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Exhibit R-2a, RDT&E Project Justification
(Exhibit R-2a, page 13 of 30)

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Exhibit R-3 Cost Analysis (page 1)										DATE: June 2001		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, N / BA 4			Carrier Systems Development - 0603512N			Future Carrier R&D - 42208						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Product Development												
Aircraft Launch, Recovery & Support	CPAF	Northrop Gumman		13.727	12/99	16.513	N/A	23.263	11/01	Cont.	Cont.	Cont.
	CPAF	General Atomics		14.000	12/99	16.513	N/A	18.700	11/01	Cont.	Cont.	Cont.
	WR	NAWC Lakehurst, NJ	2.711	3.219	11/99	3.120	11/00	2.920	11/01	Cont.	Cont.	Cont.
	CPAF	NNS, Va			11/99	2.270	11/00	2.000	11/01	Cont.	Cont.	Cont.
		Miscellaneous				4.122						
Battle Damage & Recovery	WR	NSWC/CD, MD	1.000	2.831	11/99	3.408	12/00	0.750	11/01	Cont.	Cont.	Cont.
	WR	APG, MD		0.000	N/A	0.000	11/00	3.250	11/01	Cont.	Cont.	Cont.
	CPAF	NNS, Va		1.592	11/99	0.680	03/01	0.500	11/01	Cont.	Cont.	Cont.
	Various	Miscellaneous	1.511	0.000	N/A	0.580	11/00	0.500	11/01	Cont.	Cont.	Cont.
Propulsion Plant Development	SS,CPFP	BETTIS, PA	27.739	43.888	11/99	0.000	N/A			0.000	71.627	71.627
	C	NNS, Va				48.399	11/00	53.567	11/01	57.200	159.166	159.166
	Various	Miscellaneous	2.299	0.000	N/A	2.012	11/00	2.232				
Reverse Osmosis Desalination Plant	CPAF	NNS, Va						4.400	11/01	Cont.	Cont.	Cont.
	Various	Miscellaneous						0.500	11/01			
Manpower & Material Support	WR	NSWC/CD, MD		0.320	11/99						0.320	0.320
	Various	Miscellaneous	2.298	0.220	11/99						2.518	2.518
	C	Boeing, CA		0.800	11/99						0.800	0.800
Systems Development	CPAF	NNS, Va				4.906						
	WR	NSWC/CD, MD				3.528	12/00	3.325	11/01	Cont.	Cont.	
	Various	Miscellaneous		3.252	11/99	3.243		0.587				
Combat & Intelligence Systems	C	NNS, Va		9.261	11/99	0.000	N/A			Cont.	Cont.	Cont.
		Bath Iron Works		10.417	01/00	0.000	N/A			Cont.	Cont.	Cont.
ASW Tactical Decision Aids		Progeny, VA				1.500	03/01					
		NUWC KP				0.272						
	Various	Miscellaneous				0.166						
Smart Carrier	C	NNS, Va				0.205	12/00			Cont.	Cont.	Cont.
	Various	Miscellaneous				6.814	11/00	1.259	11/01	Cont.	Cont.	Cont.
CVNX Class Technologies	Various	Miscellaneous						5.000	11/01			
SBIR		Miscellaneous				3.011						
Subtotal Product Development			37.558	103.527		121.262		122.753		Cont.	Cont.	Cont.
Remarks:												
Development Support Equipment											0.000	
GFE											0.000	
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												

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Exhibit R-3, Project Cost Analysis
(Exhibit R-3, page 14 of 30)

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Exhibit R-3 Cost Analysis (page 2)										DATE: June 2001		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, N / BA 4			Carrier Systems Development - 0603512N			Future Carrier R&D - 42208						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation												
Aircraft Launch, Recovery & Support	CPAF	Miscellaneous		0.713	11/99	1.200	11/00	0.800	11/01	Cont.	Cont.	Cont.
Operational Test & Evaluation												
Aircraft Launch, Recovery & Support												
Subtotal T&E			0.000	0.713		1.200		0.800		Cont.	Cont.	Cont.
Remarks:												
Contractor Engineering Support												
Aircraft Launch, Recovery & Support												
Program Management Support	CSS	TBD			11/99					Cont.	Cont.	Cont.
Systems Development	TBD					0.100	11/00	0.100	11/01			
Smart Carrier	TBD					0.541	11/00	0.541	11/01			
Travel						0.275	11/00	0.275	11/01			
Labor (Research Personnel)												
Overhead												
Subtotal Management			0.000	0.000		0.916		0.916		Cont.	Cont.	Cont.
Remarks:												
Total Cost			37.558	104.240		123.378		124.469		Cont.	Cont.	Cont.
Remarks:												

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EXHIBIT R-2a, RDT&E Project Justification						DATE: June 2001				
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER				PROJECT NAME AND NUMBER					
RDT&E, N / BA 4	Carrier Systems Development - 0603512N				Carrier Systems Definition - 42693					
COST (\$ in Millions)	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Cost
Project Cost	23.815	14.230	33.435						Cont.	Cont.
RDT&E Articles Qty										
<p>A. (U) <u>Mission Description and Budget Item Justification</u>: This project performs the Ship Feasibility Studies required after Milestone 0 (MS 0) to address a specific Mission Needs Statement (MNS) and support the Analysis of Alternatives (AOA) for the Future Carrier (CVNX) Program; performs impact studies of aircraft/air wing composition, propulsion, hull alternatives, combat systems, machinery and electrical subsystems, and cost on CVNX designs, supports the development of the Operational Requirements Document (ORD) and other documentation required at Milestone I. Completion of this phase allows review and approval, at Milestone I, to transfer a ship program to the Contract Design Program Element 0604567N. Ship Feasibility Study products include a description of the alternative ships' principal character and mission critical subsystems, weight estimates, general arrangement sketches, technical risk assessments, and Class F cost estimates.</p> <p>- (U) PROGRAM ACCOMPLISHMENTS AND PLANS:</p> <p>FY 2000 ACOMPLISHMENTS:</p> <p>- (U) (\$12.505) Conducted ORD level requirements definition, industrial capability assessments, risk assessment and management, schedule development and tracking, and threat assessments necessary to insure a coordinated acquisition effort. Developed an Integrated Master Plan. Developed the Test and Evaluation Master Plan. Developed logistics requirements including integrated logistics assessments, maintenance planning, supportability analysis, logistics process improvements, computer resource requirements analysis, and manpower/workload assessments. Developed cost model and baseline cost estimates.</p> <p>- (U) (\$11.310) Conducted engineering efforts associated with the CVNX Ship Development phase to develop ship requirements and definition at the total system level. Conducted trade studies to support total ship definition including baseline design/build budget and baseline cost estimate. Further developed Integrated Product Process Development (IPPD).</p>										

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Exhibit R-2a, RDT&E Project Justification
 (Exhibit R-2a, page 16 of 30)

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EXHIBIT R-2a, RDT&E Project Justification		DATE:																																																																													
APPROPRIATION/BUDGET ACTIVITY		June 2001																																																																													
RDT&E, N / BA 4	PROGRAM ELEMENT NAME AND NUMBER Carrier Systems Development - 0603512N	PROJECT NAME AND NUMBER Carrier Systems Definition -- 42693																																																																													
<p>FY 2001 PLAN:</p> <p>- (U) (\$0.855) Continue to conduct ORD level requirements definition, industrial capability assessments, risk assessment and management, schedule development and tracking, and threat assessments necessary to insure a coordinated acquisition effort. Continue to develop an Integrated Master Plan and the Test and Evaluation Master Plan. Continue development of logistics requirements including integrated logistics assessments, maintenance planning, supportability analysis, logistics process improvements, computer resource requirements analysis, and manpower/workload assessments. Continue to develop cost model and baseline cost estimate.</p> <p>- (U) (\$12.999) Continue to conduct engineering effort associated with the CVNX Ship Development phase to develop ship requirements and definition at the total system level. Continue trade studies to support total ship definition including baseline design/build budget and baseline cost estimate. Further develop IPPD.</p> <p>- (U) (\$0.376) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.</p> <p>FY 2002 PLAN:</p> <p>-(U) (\$33.435) Continue to conduct engineering effort associated with the CVNX Ship Development phase. Continue ship design definition to meet ORD Key Performance Parameters such as Service Life Allowance and Sortie Generation Rate. Conduct Total Ship Integration of the design changes required to the legacy baseline design to develop ship requirements and definition at the total system level. Further develop IPPD in support of Milestone II.</p> <p>B. Other Program Funding Summary</p> <table border="1"> <thead> <tr> <th>Related RDT&E:</th> <th>FY 2000</th> <th>FY 2001</th> <th>FY 2002</th> <th>FY 2003</th> <th>FY 2004</th> <th>FY 2005</th> <th>FY 2006</th> <th>FY 2007</th> <th>Complete</th> <th>Total Cost</th> </tr> </thead> <tbody> <tr> <td>0604567N/42301 CV Contract Design</td> <td></td> </tr> <tr> <td> CVN-77</td> <td>33.806</td> <td>45.887</td> <td>35.457</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>115.15</td> </tr> <tr> <td> CVNX</td> <td>0</td> <td>0</td> <td>9.324</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Cont.</td> </tr> <tr> <td>0603570N/S2692 Advance Nuclear Power System</td> <td>68.418</td> <td>98.302</td> <td>106.101</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>272.821</td> </tr> <tr> <td>Related SCN:</td> <td></td> </tr> <tr> <td>200100 Carrier Replacement Program</td> <td>747.503</td> <td>4038.105</td> <td>147.890</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Cont.</td> </tr> </tbody> </table>			Related RDT&E:	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Complete	Total Cost	0604567N/42301 CV Contract Design											CVN-77	33.806	45.887	35.457							115.15	CVNX	0	0	9.324							Cont.	0603570N/S2692 Advance Nuclear Power System	68.418	98.302	106.101							272.821	Related SCN:											200100 Carrier Replacement Program	747.503	4038.105	147.890							Cont.
Related RDT&E:	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Complete	Total Cost																																																																					
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200100 Carrier Replacement Program	747.503	4038.105	147.890							Cont.																																																																					

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Exhibit R-2a, RDT&E Project Justification
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EXHIBIT R-2a, RDT&E Project Justification		DATE:	June 2001
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER	
RDT&E, N / BA 4	Carrier Systems Development - 0603512N	Carrier Systems Definition - 42693	
<p>C. <u>Acquisition Strategy</u>. The Carrier acquisition strategy for CVNX will utilize a phased design and technology insertion or "evolutionary" strategy. This strategy will focus on combat system redesign (topside) on CVN77, new propulsion plant and Electro-Magnetic Aircraft Launching System (EMALS) on CVNX-1 and improvements in the area of aviation, survivability, service life restoration and Total Ownership Costs (TOC) reduction on the CVNX-2. On each hull, core capabilities will be maintained and TOC will be reduced in accordance with Carrier goals. As with previous NIMITZ class carriers, the CVN77 was awarded as a sole source Fixed Price Incentive Fee (FPIF) contract to Newport News Shipbuilding. For CVNX-1 and future hulls, early IPPD design efforts will be cost type contracts with construction contracts anticipated to be FPIF similar to CVN 77.</p>			
D. Schedule Profile:	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
Program Milestones	CVNX: 2Q MS1		CVNX: 3Q MS2
Engineering Milestones	EMALS: 2Q SRR EMALS: 4Q PDR	EMALS: 3Q CDR	EMALS: 4Q Sys Instll @ LKE
T&E Milestones			
Contract Milestones	EMALS: 1Q PDRR Phase		

R-1 SHOPPING LIST - Item No. 51-18 of 51-30

Exhibit R-2a, RDT&E Project Justification
(Exhibit R-2a, page 18 of 30)

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Exhibit R-3 Cost Analysis (page 1)							DATE: June 2001					
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, N / BA 4			Carrier Systems Development - 0603512N			Carrier Systems Definition - 42693						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Product Development	SS, CPFF	BETTIS, PA	35.372	0.000	N/A						35.372	35.372
		AME, VA	6.851	0.000							6.851	6.851
	C, CPFF	JJMA, VA	6.200	0.000							6.200	6.200
	C, CPFF	NSWC/CD, MD	3.000	2.083	11/99			2.300	11/01		7.383	7.383
	WR	NSWC/DD, VA	1.500	0.170	11/99						1.670	1.670
	WR	Miscellaneous	11.127	1.202	11/99			2.325	11/01		14.654	14.654
	Various	Miscellaneous	1.311	2.690	11/99	0.855	11/00	3.335	11/01		8.191	8.191
	C	NNS		16.530	11/99	12.999	10/00	20.675	11/01		50.204	50.204
	WR	NAWC Lakehurst, NJ		1.140							1.140	1.140
	FP	Anteon, VA						4.800	11/01		4.800	4.800
SBIR		SBIR				0.376					0.376	
Subtotal Product Development			65.361	23.815		14.230		33.435			136.841	136.841
Remarks:												
Development Support Equipment											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	
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												

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Exhibit R-3 Cost Analysis (page 2)										DATE: June 2001		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, N / BA 4			Carrier Systems Development - 0603512N			Carrier Systems Definition - 42693						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation												
Operational Test & Evaluation												
Tooling												
GFE												
Subtotal T&E			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support												
Travel												
Labor (Research Personnel)												
Overhead												
Subtotal Management			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
Total Cost			65.361	23.815		14.230		33.435		0.000	136.841	136.841
Remarks:												

R-1 SHOPPING LIST - Item No. 51-20 of 51-30

Exhibit R-3, Project Cost Analysis
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EXHIBIT R-2a, RDT&E Project Justification							DATE: June 2001				
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA 4		PROGRAM ELEMENT NAME AND NUMBER Carrier Systems Development - 0603512N			PROJECT NAME AND NUMBER CV Launch & Recovery Systems - W1723						
COST (\$ in Millions)		FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Cost
Project Cost		1.338	6.731	5.344						Cont.	Cont.
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) Virtual Imaging System for Approach and Landing (VISUAL): VISUAL will provide the Landing Signal Officer (LSO) and other command personnel with enhanced images of the aircraft and ship in low visibility and night conditions during launch and recovery operations.
- (U) Constant Run-Out Valve (CROV): The CROV development effort will replace the existing control and retract valves on the MK7 arresting gear, providing enhanced performance and restoring margins of safety. This program addresses the CV(N) OAG's Number 11 priority item (arresting gear improvements).
- (U) Advanced Arresting Gear Engine (AAGE): The AAGE replaces the MK7 arresting gear engine, which has reached the limits of its operating capability. This program represents the long term solution to the CV(N) OAG's Number 11 priority item (arresting gear improvements).
- (U) Cost Reduction Effective Improvement Initiative (CREI) Arresting Gear Fairlead Sheaves: This program seeks to replace the unique hydraulic fluid used on the arresting gear system sheaves with a more durable product that will have a longer service life thus decreasing system life cycle costs.

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.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

FY 2000 ACCOMPLISHMENTS:

(U) (\$.300) Developed CROV acquisition strategy, performance specification, milestone and contracting documentation, and source selection criteria. Developed performance requirements and Statement of Objectives and released CROV RFP.

(U) (\$ 1.038) Released VISUAL electro-optical sensor and display EDM phase solicitation. Reviewed responses and selected VISUAL electro-optical sensor and display EDM contractor. Received Milestone II decision to proceed to the EMD phase. Provided engineering and management support to the program, particularly for the transition from the PD&RR phase to the EMD phase of the program.

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EXHIBIT R-2a, RDT&E Project Justification		DATE:
APPROPRIATION/BUDGET ACTIVITY RDT&E, N	PROGRAM ELEMENT NAME AND NUMBER Carrier Systems Development - 0603512N	June 2001 PROJECT NAME AND NUMBER CV Launch & Recovery Systems - W1723
<p>2. FY 2001 PLANS</p> <p>- (U) (\$2.870) Conduct CROV proposal review and select EDM contractor. Award contract for design, analysis, computer simulation, and prototype manufacture of two (2) CROV and control systems test articles. Conduct Preliminary Design Review (PDR) and perform initial test planning and test facility modifications.</p> <p>- (U) (\$3.363) Develop AAGE system specification. Solicit industry participation and evaluate potential technologies capable of achieving system objectives. Prepare solicitation and milestone documentation. Release Request for Proposals. Provide engineering and management support to the program. **</p> <p>- (U) (\$0.342) Complete evaluation of VISUAL "centerline camera" sensor candidates. Conduct laboratory evaluations and select sensor configuration for incorporation in VISUAL EMD program. Select best candidates for installation of prototype system in CVN flight deck and evaluate under controlled operational conditions.</p> <p>- (U) (\$0.156) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.</p> <p>3. FY 2002 PLAN:</p> <p>- (U) (\$5.346) Conduct CROV Critical Design Review (CDR) and deliver two (2) EMD test articles and initiate developmental testing.</p> <p>**Continued funding for this program was transferred to Program Element 604512N, Project Unit W2232.</p>		

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Exhibit R-2a, RDT&E Project Justification
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EXHIBIT R-2a, RDT&E Project Justification		DATE: June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N	PROGRAM ELEMENT NAME AND NUMBER Carrier Systems Development - 0603512N	PROJECT NAME AND NUMBER CV Launch & Recovery Systems - W1723	
<p>B. Other Program Funding Summary: N/A</p> <p><u>Related RDT&E</u></p> <p>P.E. 0602122N (Aircraft Technology) P.E. 0604512N (Shipboard Aviation Systems)</p> <p>C. Acquisition Strategy: VISUAL: The Navy is conducting system integration and risk reduction efforts at NAWCADLKE, including sensor and subsystem development and integration. Based on these efforts, a full system performance specification will be prepared and a cost plus award fee EDM contract will be competitively awarded.</p> <p>CROV: The Navy is preparing a performance specification and will competitively award up to two cost plus award fee contracts to develop prototypes for evaluation at the NAWCADLKE Runway Arrested Landing Site.</p>			
Schedule Profile:	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u> <u>TO COMPLETE</u>
Program Milestones	VISUAL: 3Q 00 MS II		
Engineering Milestones	CROV: 3Q 01 PDR AAGE: 3Q 01 System Spec	CROV: 2Q 02 CDR	CREI: 1Q/03 Design Prototype CREI: 2Q/03 CDR
T&E Milestones		CROV: 2Q-4Q 02 DT	CREI: 2Q-3Q/03 DT CROV: 1Q/03 DT
Contract Milestones	VISUAL: 3Q 00 EDM Awd CROV: 4Q 00 RFP	CROV: 2Q 01 EDM Award AAGE: 3Q 01 RFP	

R-1 SHOPPING LIST - Item No. 51-23 of 51-30

Exhibit R-2a, RDT&E Project Justification
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Exhibit R-3 Cost Analysis (page 1)								DATE: June 2001				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, N			Carrier Systems Development - 0603512N			CV Launch & Recovery Systems - W1723						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WX	NAWCAD, LKE	20.829	1.338	11/99	1.720	11/00			Cont.	Cont.	
CROV Primary Hardware Dev.	TBD	TBD				1.150	02/01	0.450	11/01		1.600	1.600
AAGE Systems Engineering	WX	NAWCADLKE				3.363	11/00			Cont.	Cont.	
VISUAL Design, Manufacturing	C/FP	FIIR Systems			11/99	0.342	01/01				0.342	0.342
Subtotal Product Development			20.829	1.338		6.575		0.450		Cont.	Cont.	
Remarks:												
Development Support Equipment												
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												

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Exhibit R-3, Project Cost Analysis
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Exhibit R-3 Cost Analysis (page 2)								DATE: June 2001				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, N			Carrier Systems Development - 0603512N			CV Launch & Recovery Systems - W1723						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	Cost to Complete	Total Cost	Target Value of Contract
CROV Developmental/Reliability test	WX	NAWCAD, Lakehurst						4.894	11/01		4.894	
Subtotal T&E			0.000	0.000		0.000		4.894		0.000	Cont.	
Remarks:												
SBIR Assessment						0.156						
Subtotal Management			0.000	0.000		0.156		0.000		0.000	Cont.	
Remarks:												
Total Cost			20.829	1.338		6.731		5.346		Cont.	Cont.	Cont.
Remarks:												

R-1 SHOPPING LIST - Item No. 51-25 of 51-30

Exhibit R-3, Project Cost Analysis
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EXHIBIT R-2a, RDT&E Project Justification						DATE: June 2001				
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER				PROJECT NAME AND NUMBER					
RDT&E, N / BA 4	Carrier Systems Development - 0603512N				EAF Matting W2269					
COST (\$ in Millions)	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Cost
Project Cost	3.808	4.167	0.851						0.000	18.716
RDT&E Articles Qty	2									
<p>(U) 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).</p> <p>(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.</p> <p>(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.</p> <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> <p>(U) PROGRAM ACCOMPLISHMENTS AND PLANS:</p> <p>FY 2000 ACCOMPLISHMENTS:</p> <p>(U) (\$3.808) Completed fabrication of two prototype M-31 systems and initiated performance testing with deadloads.</p>										

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Exhibit R-2a, RDT&E Project Justification
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EXHIBIT R-2a, RDT&E Project Justification			DATE:	June 2001										
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER												
RDT&E, N / BA 4	Carrier Systems Development - 0603512N	EAF Matting W2269												
<p>FY 2001 PLANS:</p> <p>(U) (\$4.122) Complete M-31 performance testing with deadloads. Initiate developmental testing (DT). Demonstrate compatibility and performance thresholds with aircraft. Provide engineering and management support to the program.</p> <p>(U) (\$0.045) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.</p> <p>FY 2002 PLANS:</p> <p>(U) (\$.851) Provide engineering and management support to the program. Complete developmental testing (DT) and achieve Milestone III.</p> <p>B. Other Program Funding Summary</p> <p>EAF OPN (PE 0206139M)</p> <table> <thead> <tr> <th></th> <th><u>FY 2000</u></th> <th><u>FY 2001</u></th> <th><u>FY 2002</u></th> <th><u>To Comp.</u></th> </tr> </thead> <tbody> <tr> <td></td> <td>0.062</td> <td>3.247</td> <td>7.551</td> <td>Cont.</td> </tr> </tbody> </table> <p>Related RDT&E: N/A</p>						<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>To Comp.</u>		0.062	3.247	7.551	Cont.
	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>To Comp.</u>										
	0.062	3.247	7.551	Cont.										

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EXHIBIT R-2a, RDT&E Project Justification		DATE: June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA 4	PROGRAM ELEMENT NAME AND NUMBER Carrier Systems Development - 0603512N	PROJECT NAME AND NUMBER EAF Matting W2269
<p>C. Acquisition Strategy: The advanced lightweight mat acquisition strategy envisions 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 priority.</p> <p>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.</p>		
D. Schedule Profile	<u>FY 2000</u>	<u>FY 2001</u> <u>FY 2002</u>
Program Milestones		MS III 2Q 02
Engineering Milestones	Arresting Gear 2 Proto 4Q 00	
T&E Milestones	Arresting Gear DT 1Q-4Q 01	Final DT 1Q 02
Contract Milestones		

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Exhibit R-3 Cost Analysis (page 1)								DATE: June 2001				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, N / BA 4			Carrier Systems Development - 0603512N			EAF Matting W2269						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	CPAF	ESCO	4.955	2.826	06/98	1.340	06/98	0.519	06/98		9.640	9.961
Ancillary Hardware Development	WX	NAWCAD LKE	4.935	0.982	10/99						5.917	
Award Fees	CPAF	ESCO						0.045			0.045	
Non-Add BTR for M-31 A/G												
Subtotal Product Development			9.890	3.808		1.340		0.564		0.000	15.602	
Remarks: None												
Development Support Equipment												
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks: None												

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Exhibit R-3, Project Cost Analysis
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Exhibit R-3 Cost Analysis (page 2)										DATE: June 2001		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, N / BA 4			Carrier Systems Development - 0603512N			EAF Matting W2269						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WX	NAWCAD, Lakehurst				2.782		0.287			3.069	
Subtotal T&E			0.000	0.000		2.782		0.287		0.000	3.069	
Remarks: N/A												
SBIR Assessment						0.045					0.045	
Subtotal Management			0.000	0.000		0.045		0.000		0.000	0.045	
Remarks: N/A												
Total Cost			9.890	3.808		4.167		0.851		0.000	18.716	
Remarks: N/A												

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