CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification						DATE:		
							February 2005	
APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMEN	-			
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY /	BA-04	T	1	0603512N - Carrie	er Systems Devel	opment		ı
COST (\$ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE Cost	150.169	162.007	167.823	198.395	160.688	155.120	146.126	85.451
9181 - Advanced Battlestation/Decision Support System	3.458	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9349 - Aviation Ship Integration Center	9.425	3.665	0.000	0.000	0.000	0.000	0.000	0.000
9515 - Sentinel Net	0.000	1.091	0.000	0.000	0.000	0.000	0.000	0.000
9516 - Surface Ship Composite Moisture Separators	0.000	2.377	0.000	0.000	0.000	0.000	0.000	0.000
2208 - CVN 21	93.598	102.372	109.362	59.090	49.698	56.873	58.736	42.821
4004 - EMALS	37.173	50.600	56.630	58.538	26.312	13.455	0.000	0.000
4005 - Smart Carrier	1.836	1.825	1.831	1.820	1.828	1.823	1.863	1.903
4006 - CVN 21 Follow Ship	0.000	0.000	0.000	78.947	82.850	82.969	85.527	40.727
1723 - CV Launch & Recovery Systems	4.679	0.077	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) (9181) The Advanced Battlestation/Decision Support System (ABS/DSS) provides a low-risk decision support capability that has great potential for multiple Navy platforms and possible application for other services. Expected benefits include: improved situational awareness, reduced response time in a multiple threat environment, manpower reductions, and reductions in Total Ownership Costs (TOC).
- (U) (9349) The Aviation Ship Integration Center provides an environment that supports the development and conceptualization of fully integrated future aircraft carrier advanced technology design. The Center will be used to identify, test, and integrate potential design approaches and products for the CVN 21 Warfare System that are focused on reducing costs by increasing efficiencies in air capable shipbuilding programs. The Center will mitigate CVN 21 advanced technology design risk by enabling detection and resolution of potential problems early in the development cycle, thereby maximizing the Navy's return on its non-recurring design investment and enhancing transformational initiatives necessary to support the CVN 21 Warfare System.
- (U) (9515) Sentinel Net provides a low-risk sensor processing method that builds on the Aircraft Carrier's Tactical Support Center's (CV-TSC) Command and Control (C2) Suite to yield a harbor defense or force protection C2 capability aboard the Carriers.

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification			DATE:
			February 2005
APPROPRIATION/BUDGET ACTIVITY		R-1 ITEM NOMENCLATURE	
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY /	BA-04	0603512N - Carrier Systems	s Development
 (U) (9516) -Development of Composite Moisture Separators and a related manufacture. Class Aircraft Carrier ventilation systems. The ventilation system has intake air inlets of entrained moisture in the air before it gets into the ventilation ducts, thus reducing the accomposite moisture separator, topside weight will be reduced. Reducing topside weight 	on the shell of the ship. At these inlets the amount of corrosion of the ventilation du	ere currently are baffled stainle cts. These stainless steel moi	ess steel moisture separators that reduce the amount of sture separators are heavy, and by converting them to a
- (U) (2208) - Development of ship hull, mechanical, propulsion, electrical, aviation, and requirements, survivability, and operational capabilities, and to meet the requirements			
 (U) (4004) - Development of an advanced technology aircraft launch system in support current steam catapult on CVN 21 Class ships and could also be retrofit on existing CV increased operational availability and reduced operator and maintainer workload. 	•		, , , ,
 (U) (4005) - The Smart Carrier Demonstration and Validation program exploits availal shipboard equipment. The program provides the system architecture, requirements/sp shipboard testing of new technologies to improve shipboard operations and to reduce v 	pecification development, technology sele	ection, software development ((including software baseline), as well as land-based and
 (U) (4006) - Development of aircraft carrier specific technologies, the infusion of the scurrently feasible. This project also funds the Contract Design efforts for the CVN 79. 	ship technology base into existing and fu	ture aircraft carriers and the po	otential realization of subsystem design capabilities not
- (U) (1723) Development of all systems required to provide approach and landing greater sortie generation rates, enhanced aircraft boarding rates, reduced manning, inc	•	• •	erating onto or from ships. Payoffs include increased safety,

R-1 SHOPPING LIST - Item No.

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification	n						DATE:	
							Februa	ry 2005
APPROPRIATION/BUDGET ACTIVITY					PROJECT NUMB	ER AND NAME		
RDT&E, N / BA-04	PE 0603512N - Ca	rrier Systems Deve	lopment		PU 9181 - Advan	ed Battlestation/I	Decision Support S	System
COST (\$ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Project Cost	3.458	0.000	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, reduced response time in a multiple threat environment, manpower reductions, and reductions in Total Ownership Costs (TOC).

CLASSIFICATION:

	fication		DATE:	
				bruary 2005
PPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND N	AME	
RDT&E, N / BA-04	PE 0603512N - Carrier Systems Developme	ent PU 9181 - Advanced Battle	station/Decision Support	System
		•		
. Accomplishments/Planned Program (Cor	ıt.)			
	FY(04 FY 05	FY 06	FY 07
Advanced Battlestation/Decision Support S			0.000	0.000
RDT&E Articles Quantity				
	f the Combat System. Fleet demonstrations/requirements		Y HAWK (CV-63), USS EN	TERPRISE (CVN-65), USS

CLASSIFICATION:

XHIBIT R-2a, R	RDT&E Project Justification					DATE:	February 2005
PROPRIATION/E	BUDGET ACTIVITY	PROGRAM ELEMENT NUMBE	R AND NAME		PROJECT NUMI	BER AND NAME	February 2005
DT&E, N /	BA 04	PE 0603512N - Carrier System	ns Development		PU 9181 - Advai	nced Battlestation/[Decision Support System
C. PROGRAM	I CHANGE SUMMARY:						
Funding:			FY 2004	FY 2005	FY 2006	FY 2007	
	President's Budget		3.560	0.000	0.000	0.000	
FY2006 F	President's Budget		3.458	0.000	0.000	0.000	
Total Adju	ustments		-0.102	0.000	0.000	0.000	
Sur	mmary of Adjustments						
Cui	Inflation Savings		-0.003				
	SBIR Tax Assessment		-0.099				
	Total Adjustments		-0.102	0.000	0.000	0.000	
Schedule	ı:						
	act Award Q2FY05.						
00	aot / thata a _t 1001						
Technical	l:						
Not A	Applicable.						

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Proje	ect Justification			DATE:
				February 2005
APPROPRIATION/BUDGET ACTI		PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND	NAME
RDT&E, N /	BA-04	PE 0603512N - Carrier Systems Development	PU 9181 - Advanced Bat	tlestation/Decision Support System
D. OTHER PROGRAM FU	NDING SUMMARY:			
E. ACQUISITION STRATEGY This procurement is an		source basis to 21st Century Systems, Inc., Omaha, I	Nebraska.	
F. MAJOR PERFORMERS: NUWC Keyport, WA 21st Century Systems,	Inc., Omaha, NE, Development.			

CLASSIFICATION:

								DATE:						
Exhibit R-3 Cost Analysis (pa	ge 1)										Februa	ry 2005		
APPROPRIATION/BUDGET ACTIV	/ITY		/ ELEMENT			PROJECT N						-		
RDT&E, N / BA-04		PE 06035	2N - Carrier Syst	tems Develo _l	oment	PU 9181 - A	dvanced Bat	tlestation/Decis		System				
Cost Categories		Performing	Total		FY 04		FY 05		FY 06		FY 07		L.	L
	Method & Type	Activity & Location	PY s Cost	FY 04 Cost	Award Date	FY 05 Cost	Award Date	FY 06 Cost	Award Date	FY 07 Cost	Award Date	Cost to Complete	Total Cost	Target Value of Contract
D. I. (D. I.)	& Type	Location	Cost	Cost	Date	Cost	Date	Cost	Date	Cost	Date	Complete	Cost	or Contract
Product Development Advanced	+													
Battlestation/Decision														
Support System	C/CPFF	21st Century	3.384	3.164	01/05								6.548	3
		NUWC Keyport, WA	0.000	0.254	06/04								0.254	1
	Various	Miscellaneous	0.044	0.040									0.084	1
														1
	1			1		-								-
														1
														+
	-													-
				<u> </u>										
														1
														1
														1
					-	-								
			_	 	-	-					_	_		+
Subtotal Product Development			3.428	3.458		0.000		0.000					6.886	3
Remarks: Contract Award 4th Qua	rter EV03		1 0.120	000		0.000	1	0.000	ı			L.	0.000	~1
Tomano. Somiati Awaii 4tii Qua	100													

CLASSIFICATION:

Exhibit R-3 Cost Analysis (p	age 2)								DATE:			Februa	ary 2005			
APPROPRIATION/BUDGET ACT	VITY		PROGRAM EL	LEMENT			PROJECT	NUMBER AND	NAME			1 CDI GC	ary 2000			
RDT&E, N / BA-04			PE 0603512N	- Carrier Sys	tems Develop	oment	PU 9181 -	Advanced Bat	tlestation/Dec	ision Suppor	System					
Cost Categories	Contract Method & Type	Performing Activity & Location		Total PY s Cost	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Ta of	rget Value Contract
Developmental Test & Evaluation	71															
Operational Test & Evaluation																
ive Fire Test & Evaluation																
est Assets																
ooling																
GFE																
ward Fees																
Subtotal T&E				0.000	0.00	0	0.0	00	0.0	000	0.00	0	0.00	0	0.000	
Remarks:		T	Ţ	T								T				
Remarks: Contractor Engineering Support						<u> </u>		<u> </u>						T		
Contractor Engineering Support Government Engineering Support																
Contractor Engineering Support																
Contractor Engineering Support Government Engineering Support Program Management Support Travel																
Contractor Engineering Support Government Engineering Support Program Management Support Travel Transportation																
Contractor Engineering Support Government Engineering Support Program Management Support Travel Transportation SBIR Assessment																
Contractor Engineering Support Government Engineering Support Program Management Support Travel Transportation				0.000	0.00	0	0.0	000	0.0	000			0.00	0	0.000	
Contractor Engineering Support Government Engineering Support Program Management Support Travel Transportation SBIR Assessment				0.000	0.00	0	0.0	000	0.0	000			0.00	0	0.000	
Contractor Engineering Support Government Engineering Support Program Management Support Travel Transportation SBIR Assessment Subtotal Management				0.000			0.0		0.0				0.000		0.000	
Contractor Engineering Support Government Engineering Support Program Management Support Travel Transportation SBIR Assessment Subtotal Management Remarks:																

CLASSIFICATION:

EXHIBIT R4, Schedu	e Profile																								DATE	:	Fe	ebrua	ry 20	05		
APPROPRIATION/BUDG	ET ACTIVIT	Υ							PROG	RAM	ELEM	ENT N	IUMBE	R AND	NAM (E					PROJ	ECT N	UMBE	R ANI	D NAM	ΙE						
RDT&E, N /	BA-04	4							PE 06	03512	N - Ca	arrier S	Systen	ns Dev	elopm	ent					PU 91	81 - A	dvanc	ed Ba	ttlesta	tion/D	ecisio	1 Supp	ort Sy	stem		
Fiscal Year		20	04			200)5			20	06			20	07			20	08			20	09			20	10			201	11	
	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	1	2	3	4
Acquisition Milestones																																
ABS/DSS Development			PDR					IOC																								
ABS/DSS Fleet Demo									CVN-76 CV-63	VN-65	CVN-6	69																				
Follow-on Development/ Spiral I		[
Test & Evaluation Milestones Development Test	DT C1								DT	C2																						
Contract Milestones Development Contract	Contrac	ct Aw	ard	Cor	itract A	ward																										

CLASSIFICATION:

Exhibit R-4a, Schedule Detail						DATE:	February 20	05
APPROPRIATION/BUDGET ACTIVITY	PROGRAM EI	EMENT			PROJECT NU	MBER AND NA	AME	
RDT&E, N / BA-04	PE 0603512N	- Carrier Syste	ms Developme	ent	PU 9181 - Adv	vanced Battlest	ation/Decision	Support System
Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Phase I Passive Display Development	1Q							
Phase I Passive Display Integration Testing	2Q-3Q							
System Qualification Test (SQT)	3Q-4Q							
Phase I CSIT (As required)	3Q-4Q							
Phase I Field Change Kit Development	4Q							
Phase I Initial Installation (CVN-72)	4Q							
Phase I Initial Installation (CVN-76)		1Q						
Phase I Initial Installation (CVN-65)		1Q						
Phase I Initial Installation (CV-63)		1Q-2Q						
Phase I Initial Installation (CVN-69)		1Q-3Q						
Phase II Active Interface Development		1Q-4Q	1Q					
Phase II CSIT		3Q-4Q						
Fleet Requirements Working Group (Phase I feedback)		4Q						
								1
								1
								1
								1

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification	on						DATE:	
							Febru	ıary 2005
APPROPRIATION/BUDGET ACTIVITY					PROJECT NUMB	ER AND NAME		
RDT&E, N / BA-04	PE 0603512N - Ca	rrier Systems Deve	elopment		PU 9515 - Sentir	el Net for Anti-Te	rrorism and Force I	Protection
COST (\$ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Project Cost	0.000	1.091	0.000	0.000	0.000	0.000	0.000	0.000
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Sentinel Net provides a low-risk sensor processing method that builds on the Aircraft Carrier's Tactical Support Center's (CV-TSC) Command and Control (C2) Suite to yield a harbor defense or force protection C2 capability aboard the Carriers.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justific	cation			DATE:		
					bruary 2005	
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAI	ME	PROJECT NUMBER AND NA	ME		
RDT&E, N / BA-04	PE 0603512N - Carrier Systems Develop	ment	PU 9515 - Sentinel Net for A	Anti-Terrorism and Force	Protection	
D. Assemblishments/Dismost Dusmiss. (Cont.						
B. Accomplishments/Planned Program (Cont.	-)					
	F	Y 04	FY 05	FY 06	FY 07	
Advanced Battlestation/Decision Support Sy	vstem (ABS/DSS) 0.	.000	1.091	0.000	0.000	
RDT&E Articles Quantity						
- (II) Sentinal Nat. EV05 plans are to develo	op the first version of Sentinel Net for deployment in F	V06 Heina	lessons learned from a proof of co	ncent unit in Falluiah (fund	ed by LISMC during August -	October
2004), Sentinel Net development will be great	op the first version of Sentine Net for deployment in F	Tub. Using	lessons learned from a proof of co	ncept unit in Fallujan (tunu	ed by OSINC during August -	October
2004), Sentinei Net development will be grea	ally accelerated.					
	•					

CLASSIFICATION:

					Fobruary 2005
PROGRAM ELEMENT NUMBE	ER AND NAME		PROJECT NUME	 BER AND NAM	February 2005
PE 0603512N - Carrier Syster	ns Development		PU 9515 - Senti	nel Net for An	nti-Terrorism and Force Protection
		1			
				= 1	
	0.000	1.091	0.000	0.000	
		4.400			
	0.000	1.091	0.000	0.000	
-		FY 2004 0.000 0.000 0.000 0.000	FY 2004 FY 2005 0.000 0.000 0.000 1.091 0.000 1.091 1.100 -0.009	FY 2004 FY 2005 FY 2006 0.000 0.000 0.000 0.000 1.091 0.000 0.000 1.091 0.000 1.100 -0.009 0.000 1.091 0.000	FY 2004 FY 2005 FY 2006 FY 2007 0.000 0.000 0.000 0.000 0.000 1.091 0.000 0.000 0.000 1.091 0.000 0.000 1.100 -0.009

CLASSIFICATION:

EXHIBIT R-2a, RDT&E	Project Justification			DATE:
				February 2005
APPROPRIATION/BUDGE	T ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND	NAME
RDT&E, N /	BA-04	PE 0603512N - Carrier Systems Developmen	t PU 9515 - Sentinel Net f	or Anti-Terrorism and Force Protection
D. OTHER PROGRA	AM FUNDING SUMMARY:			
E. ACQUISITION STR	ATEGY:			
This procuremen	nt is an SBIR transition and will be awar	rded on a sole source basis to 21st Century Systems, Inc., Oma	ha, Nebraska.	
F. MAJOR PERFORM Johns Hopkins I	IERS: Jniversity Applied Physics Laboratory (J	JHU/APL), MD.		
	stems, Inc., Omaha, NE, Development			

CLASSIFICATION:

									DATE:						
Exhibit R-3 Cost Analyst APPROPRIATION/BUDGET	sis (page 1)											Februa	ry 2005		
APPROPRIATION/BUDGET			PROGRAM ELEM				PROJECT N	UMBER AND	NAME						
RDT&E, N / B/	A-04		PE 0603512N - C	Carrier Syste	ems Develop	ment	PU 9515 - S	entinel Net fo	r Anti-Terror	ism and Force	Protection				
Cost Categories	Contract Method	Performing Activity &		otal Y s	FY 04	FY 04 Award	FY 05	FY 05 Award	FY 06	FY 06 Award	FY 07	FY 07 Award	Cost to	Total	Target Value
	& Type	Location			Cost	Date	Cost	Date	Cost	Date	Cost	Date	Complete	Cost	of Contract
Product Development	e , jp e								1				- Compress		
1 Todact Development						1									
Sentinel Net	C/CPFF	21st Century					1.000	01/05						1.000)
Sentinel Net	C/CPFF	JHU/APL, MI)				0.091	02/05						0.091	
						Ì									
								1							
									-						
							+	+	+			+			
									+						
							_		+						
									-						
						1									
						1									
							+	+	+			+			
									+						
									-						
						-		+							1
						 		+	+						
		1				 	+	+			+				1
						1									
Subtotal Product Developm	nent			0	0.000		1.091		0.000					1.091	
Remarks: Contract Award 2	2nd Quarter FY05														

CLASSIFICATION:

5 1 11 11 D 0 0 . (A . 1 . 1 . 1	0)							DATE:				0005		
Exhibit R-3 Cost Analysis (pa			DDOODAM ELEMENT			DDO IFOT	NII IMPED AND				Februa	ary 2005		
APPROPRIATION/BUDGET ACTI RDT&E, N / BA-04	/11 Y		PROGRAM ELEMENT PE 0603512N - Carrier S	tama Barral			NUMBER AND) NAME for Anti-Terro		- Destantion				
Cost Categories	Contract	Performing	Total	ystems bever	FY 04	PU 9515 -	FY 05	IOI Anti-Terro	FY 06	e Protection	FY 07	<u> </u>	1	ı
Sost Categories	Method	Activity &	PY s	FY 04	Award	FY 05	Award	FY 06	Award	FY 07	Award	Cost to	Total	Target Value
	& Type	Location	Cost	Cost	Date	Cost	Date	Cost	Date	Cost	Date	Complete	Cost	of Contract
Developmental Test & Evaluation												·		
Operational Test & Evaluation														
Live Fire Test & Evaluation														
Test Assets														
Γooling														
GFE														
Award Fees														
Subtotal T&E			0.0	0.0	000	0.	000	0.0	000	0.000)	0.000	0.000)
Contractor Engineering Support Sovernment Engineering Support														
Program Management Support														
Travel									+		1			
Transportation														
SBIR Assessment														
Subtotal Management			0.0	0.0	100	0.	000	0.0	000			0.000	0.00)
Remarks:														
Total Cost			0.0	00 0.0	000	1.0)91	0.0	000			0.000	1.09	1
Remarks:														

CLASSIFICATION:

EXHIBIT R4, Schedule	Profile																								DATE	:	Fe	brua	rv 20	05		
APPROPRIATION/BUDGE														R AND							PROJ											
RDT&E, N /	BA-0)4			1				PE 06	03512	N - Ca	arrier S	Systen	ns Dev	elopm	ent					PU 95	15 - S	entine	el Net	for An	ti-Terr	orism	and Fo	orce P	rotect	ion	
Fiscal Year		20	004			20	05			20	06			20	07			20	08			200	09			20	10			201	11	
	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	1	2	3	4
Acquisition Milestones																																
Sentinel Net Devel. Spiral 1										IOC																						
Sentinel Net Fleet Demo																																
Follow-on Development/ Spiral 2																																
Test & Evaluation Milestones Development Test									DT 〈	C1		DT	C2																			
Contract Milestones Development Contract				Coi	tract A	ward																										

CLASSIFICATION:

Exhibit R-4a, Schedule Detail						DATE:		
							February 20	005
APPROPRIATION/BUDGET ACTIVITY	PROGRAM EI	EMENT			PROJECT NU	MBER AND N	AME	
RDT&E, N / BA-04	PE 0603512N	- Carrier Syste	ms Developme	ent	PU 9515 - Se	ntinel Net for A	nti-Terrorism a	nd Force Protect
Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Spiral 1 Development		2Q-4Q	1Q-2Q					
Fleet Demo			1Q					
Spiral 2 Development			1Q-4Q					
				-				
				<u> </u>				
								<u> </u>

CLASSIFICATION:

E 0603512N - Carr				PROJECT NUMBE				
F 0603512N - Carr				L LOTE OF MONIDE	EK AND NAME			
E 0000001ER Our	rier Systems Deve	elopment	1	PU 9349 Aviation	Ship Integration	Center		1
FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY2010	FY2011	_
9.425	3.665	0.000	0.000	0.000	0.000	0.000	0.000	

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

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

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justific	eation		DATE:
			February 2005
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND N	NAME
RDT&E, N / BA-04	PE 0603512N - Carrier Systems Development	PU 9349 Aviation Ship Inte	gration Center
D. A (Cont.)			

B. Accomplishments/Planned Program (Cont.)

	FY 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost	9.425	3.665	0.000	0.000
RDT&E Articles Quantity				

- (U) Aviation Ship Integration Center - Develop modeling and simulation capability through integration of existing M&S assets with new M&S Systems. Investigate and develop connectivity to various government and industry M&S activities. Relocate the existing M&S facility to the VASCIC Research Center. Build a support structure in the Center, procure hardware and software, and integrate various commercial and government M&S software programs. Develop and implement an Aircraft Carrier Compartment Flexibility/Modularity Program and laboratory to provide an evaluation environment for investigating, prototyping, testing and qualifying new compartment outfitting techniques and products focusing on reducing the construction cost and schedule impacts associated with the installation of electronic systems during new construction and improving fleet maintenance and modernization after delivery. Investigate existing commercial and military technologies that have the potential to simplify and accelerate the equipment installation process during ship construction and technology refresh/reconfiguration updates. Develop a prototype test bed to: examine the use of advanced materials to improve cost/performance of existing modular deck tile and reduce weight; examine the adaptation of aircraft technology clamping devices to reduce outfitting durations; examine alternative methods of modular deck installation to decrease installation times; and aid in the development of simulations and models to analyze the shock and vibration characteristics of modular decking. Continue the application of Modeling and Simulation to aid in the CVN 21 ship design. Develop a facility in the VASCIC to investigate and develop connectivity to various government and industry M&S activities, and develop a M&S laboratory within the VASCIC to support the ship design and sortie generation rate analysis and to facilitate CVN 21 participation in future battle-space experiments.

CLASSIFICATION:

KHIBIT R-2a, RL	T&E Project Justification					DA	ATE: February 2005
PROPRIATION/BU	IDGET ACTIVITY	PROGRAM ELEMENT NUM	BER AND NAME		PROJECT NUME	BER AND NAM	
DT&E, N /	BA 04	PE 0603512N - Carrier Syst			PU 9349 Aviatio		
	CHANGE SUMMARY:	,	·	"			
Funding:			FY 2004	FY 2005	FY 2006	FY 2007	
	dent's Budget		9.691	0.000	0.000	0.000	
	dent's Budget		9.425	3.665	0.000	0.000	
Total Adjus			-0.266	3.665	0.000	0.000	
Sumi	mary of Adjustments		0.000				
	Inflation Savings		-0.009				
	SBIR		-0.257	2.700			
	Congressional Add			3.700			
	Recissions Other Adjustments			-0.034 -0.001			
	Other Adjustments		0.000				
	Total Adjustments		-0.266	3.665	0	0	
Schedule: The CV	N 78 Basic Construction contrac	t will be awarded in FY08 with deliver	y in FY15.				
Technical: Not Ap	plicable.						

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification								DATE:		
									February 20	005
APPROPRIATION/BUDGET ACTIVITY		PROGRAM E	LEMENT NUMBER	R AND NAM	E	PROJECT N	JMBER AND	NAME		
RDT&E, N / BA-04		PE 0603512N	- Carrier Systems	s Developm	ent	PU 9349 Avia	ation Ship In	egration Center		
D. OTHER PROGRAM FUNDING SUMMARY:										
Line Item No. & Name	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Complete	Total <u>Cost</u>
SCN: 200100 - Carrier Replacement Program	1,162.905	623.551	564.913	795.994	3,689.413	3,730.407	1,657.362	539.680	Cont.	Cont.
RDT&E: 0604567N - Ship Contract Design, Live Fire T&E 0603570N - Advanced Nuclear Power Systems	112.730 198.814	136.516 168.080	55.672 168.373	86.506 170.980	83.826 160.992		40.082 133.951	87.499 105.975	Cont. Cont.	Cont. Cont.

E. ACQUISITION STRATEGY:

The CVN 78 will be the first ship of the CVN 21 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 78 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

CLASSIFICATION:

									DATE:						
xhibit R-3 Cost Analysis (pa	age 1)											Februai	y 2005		
PPROPRIATION/BUDGET ACTI	VITY		PROGRAM E	ELEMENT			PROJECT N	IUMBER AND NA	ME						
RDT&E, N / BA-04			PE 0603512N	N - Carrier System	ems Devel	opment	PU 9349 Av	iation Ship Integi	ration Center						
Cost Categories	Method	Performing Activity &			FY 04	FY 04 Award	FY 05	FY 05 Award	FY 06	FY 06 Award		FY 07 Award	Cost to	Total	Target Valu
	& Type	Location		Cost	Cost	Date	Cost	Date					Complete	Cost	of Contract
roduct Development															
viation Ship Integration Center	CPAF	NGNN, VA		0.000	9.425	01/04	3.547	02/05						12.972	
	Various	Other		0.000			0.118	08/05						0.118	
						+									
								-							
								+							
Subtotal Product Development				0	9.425		3.665		0.000	1	0.000	1		13.090	1

CLASSIFICATION:

												DATE:		
Exhibit R-3 Cost Analysis (page	ne 2)												February 2	005
Exhibit R-3 Cost Analysis (paga APPROPRIATION/BUDGET ACTIV	ITY		PROGRAM ELEMENT							PROJECT NU	IMBER AND	NAME		
RDT&E, N / BA-04			PE 0603512N - Carrier S	ystems Develop	ment					PU 9349 Avia	tion Ship Int	egration Center		
Cost Categories		Performing Activity & Location	Total PY s Cost	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation													0.000	
Operational Test & Evaluation														
Live Fire Test & Evaluation														
Test Assets														
Tooling														
GFE														
Award Fees														
Subtotal T&E			0.	0.00	0	0.000)	0.000		0.000		0.000	0.000	
Contractor Engineering Support													0.000	
Government Engineering Support														
Program Management Support														
Travel										1				
Transportation														
SBIR Assessment										1				
Subtotal Management			0.	0.00	0	0.000)	0.000		0.000		0.000	0.000	
Remarks:														
Total Cost			0.	000 9.42	5	3.665	5	0.000		0.000		0.000	13.090	
Remarks:														

CLASSIFICATION:

EXHIBIT R4, Schedule I	Profile																								DATE	:			ıry 20	ne.		
APPROPRIATION/BUDGET RDT&E, N /	ACTIVI BA-(R AND											l D NAM ntegra			ebrua	iry 20	ບວ		
Fiscal Year		20	004			20	05			20				200				20	08			20	09			20	10			201	11	
	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	1	2	3	4
Acquisition Milestones		MS B	SRR				SFR		PDR				CDR	DAB	PR																	
Propulsion Plant																																
EMALS		SDD /	WARI		SRR	SFR	PDI	R С	DR 1	CD	R 2	TRR	1		TR	R 2				LRIP												
DBR Radar Suite		P[DR		CDR																											
Advanced Arresting Gear	SRR			PDR	мѕ в			CDR-1	-2				TRI	R 1						TF	R 2				мѕс							
Test & Evaluation Milestones						DT	A2						_			DT	B1								DT	B2			/	DT	В3	
Development Test Operational Test					<	ОТ	B1	}				(\ \	ОТ	B2	\Rightarrow	>	ОТ	В3		\rightleftharpoons	ОТ	B4		,				\Leftrightarrow	ОТ	B5	\longrightarrow
Contract Milestones IPPD Contract CP Contract Construction Contract	C	Contrac	et Awar	d												Cor	ntract A	lward														
Full Funding (SCN)																	х															

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

CLASSIFICATION:

								DATE:	
Exhibit R-4a, Schedule Detail									uary 2005
APPROPRIATION/BUDGET ACTIVITY	DA 04	PROGRAM					UMBER AND I		
RDT&E, N /	BA-04		N - Carrier Sys					egration Cente	_
Schedule Profile		FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11
Developmental Tests DT A-2		1-4Q							
Advanced Arresting Gear SRR		1Q							_
EMALS SDD Phase Initiate		2Q							
Dual Band Radar PDR		2Q							
CVN 21 Milestone B		3Q							
CVN 21 SRR		3Q							
Construction Preparation Contract Award		3Q							
Advanced Arresting Gear PDR		4Q							
EMALS SRR			1Q						
Developmental Tests DT A-2			1-4Q						
Dual Band Radar CDR			1Q						
Advanced Arresting Gear Milestone B			1Q						
Operational Tests OT-B1			2-3Q						
EMALS SFR			2Q						
CVN 21 SFR			3Q						
EMALSP PDR			3Q						
EMALS CDR 1			4Q						
Advanced Arresting Gear CDR 1			4Q						
CVN 21 PDR				1Q					
Developmental Tests DT A-2				1-4Q					
AAG CDR 2				1Q					
EMALS CDR 2				2Q					
EMALS TRR 1(HALT/HCT)				4Q					
CVN 21 CDR					1Q				
Developmental Tests DT-B1					1-4Q				
Operational Tests OT-B2					1-4Q				
CVN 21 DAB PR					2Q				
AAG TRR 1 (DT/OA)					2Q				
EMALS TRR 2 (DT/OA)					4Q				
CVN 21 Construction Contract Award						1Q			
CVN 21 SCN Full Funding						1Q			
Developmental Tests DT-B1						1-4Q			1
Operational Tests OT-B3						1-4Q	1		
EMALS LRIP					1	4Q	1		
AAG TRR 2 (DT/OA)					1		1Q		
Developmental Tests DT-B1			1				1Q		
Operational Tests OT-B4						1	1-4Q		-
Developmental Tests DT-B2						1	3-4Q		-
Developmental Tests DT-B2			1		1	1	3 704	1-4Q	+
AAG LRIP			1			1		1 702	10
Operational Tests OT-B5			1		1	1	†		1-4
Developmental Tests DT-B3			+				+		2-4
2010/04/HOHIGH 100/0 D1-D0				+	+				

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification									DATE:
ADDDODDIATION (DUDOET A OTIVITY)					IDD O IFOT ALLIAND				February 2005
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-04	PE 0603512N - Car	rier Systems Deve	lopment	_	PROJECT NUMBE PU 9516 Surface		oisture Separator	s	
COST (\$ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY2010	FY2011	
Project Cost	0.000	2.377	0.000	0.000	0.000	0.000	0.000	0.000	
RDT&E Articles Qty									

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This item funds design and development of Composite Moisture Separators and a related manufacturing process for the CVN 21 Class Aircraft Carrier to replace the stainless steel moisture separators currently in use in NIMITZ Class Aircraft Carrier ventilation systems. The ventilation system has intake air inlets on the shell of the ship. At these inlets there currently are baffled stainless steel moisture separators that reduce the amount of entrained moisture in the air before it gets into the ventilation ducts, thus reducing the amount of corrosion of the ventilation ducts. These stainless steel moisture separators are heavy, and by converting them to a composite moisture separator, topside weight will be reduced. Reducing topside weight supports the CVN 21 Class Key Performance Parameters for Weight and Stability.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE:
			February 2005
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND N	NAME
RDT&E, N / BA-04	PE 0603512N - Carrier Systems Development	PU 9516 Surface Ship Com	posite Moisture Separators

B. Accomplishments/Planned Program (Cont.)

	FY 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost	0.000	2.377	0.000	0.000
RDT&E Articles Quantity				

- (U) Surface Ship Composite Moisture Separators - Perform a ship design analysis of moisture separator sizes, locations and quantities in the ship. Work with vendor to choose a representative size for which to develop a prototype. Select and prove out the manufacturing process, materials and the design for the vanes and frame system, ensuring quality and producibility. As part of the component design process, perform pressure drop analysis, as well as airflow and moisture separation analysis at both the sub-element and full scale level. Produce one prototype unit. Develop an acquisition and life cycle cost analysis and a plan of action and milestone for testing, qualifying and installation of the prototype unit on a ship for evaluation.

R-1 SHOPPING LIST - Item No.

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CLASSIFICATION:

∧півії к-∠а, К	DT&E Project Justification						DATE: February 2005
PROPRIATION/B	UDGET ACTIVITY	PROGRAM ELEMENT NUMBE	R AND NAME		PROJECT NUME	BER AND NA	
DT&E, N /	BA 04	PE 0603512N - Carrier System	ns Development		PU 9516 Surface	e Ship Com	posite Moisture Separators
	CHANGE SUMMARY:	,	•			•	·
F dia a.			FY 2004	EV 2005	EV 2006	EV 2007	
Funding:	sident's Budget		0.000	FY 2005 0.000		FY 2007 0.000	
	sident's Budget		0.000	2.377		0.000	
Total Adju			0.000	2.377	0.000	0.000	
Total Auju	istinents		0.000	2.511	0.000	0.000	
Sum	nmary of Adjustments						
	Congressional Add			2.400			
	Recissions			-0.022			
	Other adjustments			-0.001			
	Tatal Adimeter and			0.077	0.000	0.000	:
	Total Adjustments		0	2.377	0.000	0.000	
Schedule:	:						
		vill be awarded in FY08 with delivery in	EV15				
THE	VIV 70 Dasic Construction contract w	mil be awarded in 1 100 with delivery in	11 113.				
Technical	:						
	pplicable.						
NOL A	ррпоавіс.						
		R-1 SHOP			38		

CLASSIFICATION:

APPROPRIATION/BUDGET ACTIVITY										
APPROPRIATION/BUDGET ACTIVITY									February 200	5
		PROGRAM EL	EMENT NUMBER	R AND NAMI		PROJECT NU	JMBER AND	NAME		
RDT&E, N / BA-04		PE 0603512N	- Carrier Systems	s Developm	ent	PU 9516 Surf	ace Ship Co	mposite Moisture	e Separators	
D. OTHER RECORAM FUNDING CHIMMARY.										
D. OTHER PROGRAM FUNDING SUMMARY:										Total
Line Item No. & Name FY	2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Complete	Cost
SCN: 200100 - Carrier Replacement Program 1,16.	2.905	623.551	564.913	795.994	3,689.413	3,730.407	1,657.362	539.680	Cont.	Cont.
RDT&E:										
0604567N - Ship Contract Design, Live Fire T&E	2.730	136.516	55.672	86.506	83.826	59.393	40.082	87.499	Cont.	Cont.
0603570N - Advanced Nuclear Power Systems 19	8.814	168.080	168.373	170.980	160.992	152.814	133.951	105.975	Cont.	Cont.

^{*}Note: Only a portion of the funding in PE 0603570N is included in the CVN 21 Program

E. ACQUISITION STRATEGY:

The CVN 78 will be the first ship of the CVN 21 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 78 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

CLASSIFICATION:

xhibit R-3 Cost Analysis (pag PPROPRIATION/BUDGET ACTIV	je 1) ⊤∨		PROGRAM ELEI	MENIT			DDO IECT	NUMBER AND	NAME			Febru	ary 2005		
DT&E, N / BA-04	111		PE 0603512N - C		ems Develor	ment		urface Ship C		oistura Sar	narators				
ost Categories	Contract Method	Performing Activity &	To	tal	FY 04	FY 04 Award	FY 05	FY 05 Award	FY 06	FY 06 Award	FY 07	FY 07 Award	Cost to	Total	Target Value
	& Type	Location	Co		Cost	Date	Cost	Date					Complete	Cost	of Contract
oduct Development															
urface Ship Composite Moisture Se	CPAF	NGNN, VA		0.000			2.301	02/05						2.301	
	Various	Other		0.000			0.076	08/05						0.076	
								+							
Viktotal Draduat Development				0	0.000		2.377		0.000		0.000			2.377	
Subtotal Product Development				0	0.000		2.377		0.000		0.000			2.377	

CLASSIFICATION:

													DATE:		
Exhibit R-3 Cost Analysis (page	ge 2)													February 20	005
APPROPRIATION/BUDGET ACTIV	ΊΤΥ		PROGRAM ELEMENT								PROJECT NU				
RDT&E, N / BA-04			PE 0603512N - Carrier	Syster	ms Developi						PU 9516 Surf		posite Moistur	e Separators	
Cost Categories	Contract Method	Performing Activity &	Total PY s	_	FY 04	FY 04 Award	FY 05	FY 05 Award	FY 06	FY 06 Award	FY 07	FY 07 Award	Cost to	Total	Target Value
	& Type	Location	Cost		Cost	Date	Cost	Date	Cost	Date	Cost	Date	Cost to	Cost	of Contract
Developmental Test & Evaluation	,												· ·	0.000	
Operational Test & Evaluation															
Live Fire Test & Evaluation															
Test Assets															
Tooling															
GFE															
Award Fees															
Subtotal T&E				0.000	0.000	D	0.000)	0.000	D	0.000		0.000	0.000	
Contractor Engineering Survey	1			1						1			1	0.000	ı
Contractor Engineering Support Government Engineering Support				-			+							0.000	
Program Management Support															
Travel															
Transportation															
SBIR Assessment															
Subtotal Management				0.000	0.000)	0.000		0.000)	0.000		0.000	0.000	
Remarks:															
Total Cost				0.000	0.000	D	2.37	,	0.000	D	0.000		0.000	2.377	
Remarks:										•					

CLASSIFICATION:

EXHIBIT R4, Schedule	e Profile																								DATE	:	F	hrua	ry 20	05		
APPROPRIATION/BUDGE	T ACTIVI													R AND											O NAM Ompo:							
Fiscal Year		20	004			20	05			20				200				20	800			20				20		-		20	11	
	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	1	2	3	4
Acquisition Milestones		MS B	SRR				SFR		PDR				CDR	DAB	PR																	
Propulsion Plant																																
EMALS		SDD /	WARI		SRR	SFR	PDI	R CI	DR 1	CD	R 2	TRR	1		TR	R 2				LRIP												
DBR Radar Suite		PE	OR		CDR																											
Advanced Arresting Gear	SRR			PDR	мѕ в			CDR-1	-2				TRI	R 1						TF	R 2				мѕс							
Test & Evaluation Milestones						DT	A2						<u></u>			DT	B1								DT	B2			,	DT	В3	
Development Test Operational Test					<	ОТ	B1					(\ \	ОТ	B2	\Rightarrow	>	ОТ	B3) ОТ	B4		,				\rightleftharpoons	ОТ	B5	\Rightarrow
Contract Milestones IPPD Contract CP Contract Construction Contract	C	Contrac	t Awar	d												Cor	itract A	lward														
Full Funding (SCN)														DDIN			х															<u></u> _

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

CLASSIFICATION:

								DATE:	
Exhibit R-4a, Schedule Detail									ary 2005
APPROPRIATION/BUDGET ACTIV		PROGRAM					UMBER AND I		
RDT&E, N /	BA-04		N - Carrier Sys					mposite Moist	
Schedule Profile		FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11
Developmental Tests DT A-2		1-4Q							
Advanced Arresting Gear SRR		1Q							
EMALS SDD Phase Initiate		2Q							
Dual Band Radar PDR		2Q							
CVN 21 Milestone B		3Q							
CVN 21 SRR		3Q							
Construction Preparation Contract A	ward	3Q							
Advanced Arresting Gear PDR		4Q							
EMALS SRR			1Q						
Developmental Tests DT A-2			1-4Q						
Dual Band Radar CDR			1Q						
Advanced Arresting Gear Milestone	9 B		1Q						
Operational Tests OT-B1			2-3Q						
EMALS SFR			2Q						
CVN 21 SFR			3Q						
EMALSP PDR			3Q						
EMALS CDR 1			4Q						
Advanced Arresting Gear CDR 1			4Q						
CVN 21 PDR				1Q					
Developmental Tests DT A-2				1-4Q					
AAG CDR 2				1Q					
EMALS CDR 2				2Q					
EMALS TRR 1(HALT/HCT)				4Q					
CVN 21 CDR					1Q				
Developmental Tests DT-B1					1-4Q				
Operational Tests OT-B2					1-4Q				
CVN 21 DAB PR					2Q				
AAG TRR 1 (DT/OA)					2Q				
EMALS TRR 2 (DT/OA)					4Q				
CVN 21 Construction Contract Awar	rd.				100	1Q			
CVN 21 SCN Full Funding	u .		+			1Q			1
Developmental Tests DT-B1						1-4Q			
Operational Tests OT-B3			+			1-4Q	†		
EMALS LRIP						1-4Q 4Q	+		
AAG TRR 2 (DT/OA)				+		40	1Q	+	1
Developmental Tests DT-B1			+	+			1Q 1Q		
Operational Tests OT-B4			+			+	1-4Q		
Developmental Tests DT-B2			+			+	1-4Q 3-4Q		
-			+			+	3-4Q	4.40	
Developmental Tests DT-B2			+			+	+	1-4Q	10
AAG LRIP				-			-		1Q
Operational Tests OT-B5			+			+	+		1-4Q
Developmental Tests DT-B3			+	-		+	+		2-4Q

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE:		
									February 2005
APPROPRIATION/BUDGET ACTIVITY PROGRAM ELEMENT NUMBER AND NAME PROJECT NUMBER AND NAME									
RDT&E, N / BA-04	PE 0603512N - Ca	PE 0603512N - Carrier Systems Development PU 2208 - CVN 21				1			
COST (\$ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	
Project Cost	93.598	102.372	109.362	59.090	49.698	56.873	58.736	42.821	
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, warfare systems, 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. This project also encompasses those tasks required to develop the contract data package necessary to support CVN 78 procurement, including, but not limited to engineering support, programmatic and program support, logistics support, modeling and simulation, manpower and program related studies, and design support systems, such as the Integrated Digital Environment.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE:	
				February 2005
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND N	AME	
RDT&E, N / BA-04	PE 0603512N - Carrier Systems Development	PU 2208 - CVN 21		

B. Accomplishments/Planned Program

	FY 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost	21.089	13.400	3.600	0.000
RDT&E Articles Quantity				

- (U) Non-Nuclear Propulsion Plant Development - Complete fabrication of prototype Main Turbine Generator (MTG) and detailed design. Develop prototype qualification test plans. Initiate and complete MTG prototype qualification testing and shock test. Prepare for post-shock steam testing and prototype disassembly and inspection. Continue development of testing requirements and the identification and evaluation of testing capabilities. Continue development of inputs to the integrated product model. Continue prototyping and implementation of automated workflow for construction deliverables. Continue to integrate analysis and other required functions into product model design. Continue development of mechanical and electrical systems that interface with the propulsion plant.

	FY 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost	66.153	78.582	99.595	54.930
RDT&E Articles Quantity				

- (U) CVN 21 Advanced Technology Design & Development- Commence and continue development and transition of technologies to support CVN 21 Key Performance Parameters (KPPs): increased sortie generation rate, further reductions in manpower, and further recovery of weight and stability service life margins. Continue design activities to integrate the new propulsion plant and Electromagnetic Aircraft Launch System, and expand the design build approach to include the whole ship, to optimize various systems and arrangements to meet KPPs, and to improve overall performance. Technologies and design efforts include, but are not limited to: Advanced Weapons Elevators technologies to increase throughput and improve survivability; Heavy Underway Replenishment technologies to increase individual payload limits and transfer rates per station per hour; Improved Material and Weapons Handling Arrangements and Equipment Modifications to improve the flow of material and weapons while simultaneously reducing required manpower; Improved Survivability technologies; Combat/Warfare Systems design/integration; and an Improved/Enlarged Flight Deck to improve aircraft spotting and movement and to incorporate the Advanced Arresting Gear.

CLASSIFICATION:

T&E, N / BA-04 ccomplishments/Planned Program (Cont.) Accomplishments/Effort/Subtotal Cost RDT&E Articles Quantity c (U) CVN 21 - Test & Evaluation - Determine specifiest events including tests on a Large Test Asset. DT-		FY 05 10.390	PROJECT NUMBER AND N PU 2208 - CVN 21 FY 06 6.167	February 2005 NAME FY 07 4.160
	FY 04 6.356	FY 05 10.390	PU 2208 - CVN 21 FY 06 6.167	FY 07
Accomplishments/Planned Program (Cont.) Accomplishments/Effort/Subtotal Cost RDT&E Articles Quantity - (U) CVN 21 - Test & Evaluation - Determine specifitest events including tests on a Large Test Asset. DT-	FY 04 6.356 ic developmental test require	FY 05 10.390	FY 06 6.167	
Accomplishments/Effort/Subtotal Cost RDT&E Articles Quantity - (U) CVN 21 - Test & Evaluation - Determine specif test events including tests on a Large Test Asset. DT-	6.356 ic developmental test require	10.390	6.167	
- (U) CVN 21 - Test & Evaluation - Determine specifitest events including tests on a Large Test Asset. DT-	6.356 ic developmental test require	10.390	6.167	
- (U) CVN 21 - Test & Evaluation - Determine specifitest events including tests on a Large Test Asset. DT-	ic developmental test require			4.160
- (U) CVN 21 - Test & Evaluation - Determine specifitest events including tests on a Large Test Asset. DT-		ements (DT), related mod		
test events including tests on a Large Test Asset. DT-		ements (DT), related mod		
capabilities.				

CLASSIFICATION:

HIBIT R-2a, R	DT&E Project Justification					DATE:	February 2005
PROPRIATION/B	BUDGET ACTIVITY	PROGRAM ELEMENT NUMB	ER AND NAME		PROJECT NUME	I BER AND NAME	i ebidaiy 2003
DT&E, N /	BA 04	PE 0603512N - Carrier Syste	ms Development		PU 2208 - CVN 2	21	
	CHANGE SUMMARY:	,	·	!			
Funding:			FY 2004	FY 2005	FY 2006	FY 2007	
FY05 Pre	sident's Budget		102.806	104.465	95.297	49.548	
	sident's Budget		93.598	102.372	109.362	59.090	
Total Adju			-9.208	-2.093	14.065	9.542	
C	nmary of Adjustments						
Sur	Congressional Recissions		-1.144	-1.072			
	SBIR		-1.144 -1.952	-1.072			
	Inflation Savings		-0.094				
	Technical & Miscellaneous Adjustr	nents	-6.018	-0.021	14.065	9.542	
	Reprogramming		0.010	-1.000	1 1.000	5.0 IE	
	Subtotal		-9.208	-2.093	14.065	9.542	
Schedule							
The C	VN 78 Basic Construction contract wi	I be awarded in FY08 with delivery	in FY15.				
Technical	l:						
Not A	applicable						
	• •						

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE:		
								February	<i>y</i> 2005
APPROPRIATION/BUDGET ACTIVITY	PROGRAM EL	EMENT NUN	MBER AND NA	ME	PROJECT N	UMBER AND	NAME		
RDT&E, N / BA-04	PE 0603512N	- Carrier Sys	stems Develop	ment	PU 2208 - C	VN 21			
D. OTHER PROGRAM ELINIDING CHMMARY.									
D. OTHER PROGRAM FUNDING SUMMARY:									Total
Line Item No. & Name FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Complete	Cost
SCN: 200100 - Carrier Replacement Program 1,162.905	623.551	564.913	795.994	3,689.413	3,730.407	1,657.362	539.680	Cont.	Cont.
RDT&E: 0604567N - Ship Contract Design, Live Fire T&E 112.730 0603570N - Advanced Nuclear Power Systems 198.814		55.672 168.373	86.506 170.980	83.826 160.992		40.082 133.951	87.499 105.975	Cont. Cont.	Cont. Cont.

^{*}Note: Only a portion of the funding in PE 0603570N is included in the CVN 21 Program

E. ACQUISITION STRATEGY:

The CVN 78 will be the first ship of the CVN 21 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 78 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

CLASSIFICATION:

								DATE:						
Exhibit R-3 Cost Analysis (pa	ge 1)										February:	2005		
PPROPRIATION/BUDGET ACTIV	ITY	PROC	GRAM ELEMENT			PROJECT N	JMBER AND N	AME						
RDT&E, N / BA-04			03512N - Carrier Syst	ems Develop		PU 2208 - CV								
cost Categories		Performing Activity &	Total PY s	FY 04	FY 04 Award	FY 05	FY 05 Award	FY 06	FY 06 Award	FY 07	FY 07 Award	Cost to	Total	Target Value
	& Type	Location	Cost	Cost	Date	Cost	Date	Cost	Date	Cost	Date	Complete	Cost	of Contract
roduct Development														
ropulsion Plant Development	SS,CPFF	BETTIS, PA	71.627										71.627	71.627
	CPFF	NGNN, VA	120.347	20.547	11/03	12.700	11/04	3.322	11/05				156.916	156.91
	Various	Miscellaneous	9.062	0.542	11/03	0.700	11/04	0.278	11/05				10.582	
dvanced Design & Development	CPAF	NGNN	13.126	29.783	11/03	33.250	11/04	19.000	11/05	26.273	11/06	Continuing	Continuing	
	WX	NSWC Carderock	18.301	21.212	11/03	31.347	11/04-2/05	31.580	11/05	5.790	11/06	Continuing	Continuing	
	WX	NAVAIR	0.000	2.929	11/03	2.000	11/04	3.200	11/05	4.540	11/06			
	WX	NAWC Lakehurst	1.500	0.966	11/03	2.705	11/04	15.125	11/05	4.470	11/06	Continuing	Continuing	
	WX	NSWC Dahlgren	1.938	1.305	11/03	0.850	11/04	5.250	11/05	7.370	11/06	Continuing	Continuing	
	WX	NSWC P. H.	0.000	4.000	11/03	1.000	11/04	1.000	11/05				6.000	
	PD	SPAWAR	0.715	1.780	11/03	0.700	11/04	2.580	11/05	1.840	11/06	Continuing	Continuing	
	PR	NAVSEA SEAPORT						7.248	12/05					
	Various	Miscellaneous	14.123	4.178	11/03	6.730	11/04	14.612	11/05	4.647	11/06	Continuing	Continuing	
									1					
			2525-	07.045		04.005		100.10-		54.00				
Subtotal Product Development			250.739	87.242		91.982		103.195		54.930		Continuing	Continuing	

CLASSIFICATION:

								DATE:						
xhibit R-3 Cost Analysis (pag											February 2	2005		
PPROPRIATION/BUDGET ACTIV	ITY		AM ELEMENT			PROJECT NU		NAME						
RDT&E, N / BA-04	lo		512N - Carrier Syst	ems Developn		PU 2208 - CV		1	E) / 00	1	In. on	Т	1	1
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	e , jp e											- Compress		
CVN 21 Class														
	CPAF	NGNN	0.000	1.233	01/04-03/04	0.500	11/04	0.942	11/05	0.925	11/06	Continuing	Continuing	
	WX	NAWC AD	0.000	1	11/03	6.995							9.296	
	WX	NSWC Dahlgren	0.000		11/03	0.322		0.525	11/05	0.675	11/06	Continuing	Continuing	1
	Various	PARMS	0.000		,			1.000	11/05	0.725	11/06	Continuing		
	Various	Miscellaneous	0.000		11/03-03/04	1.973	11/04	3.100	11/05	1.035	11/06	Continuing		
												+		
Operational Test & Evaluation	wx	COMOPTEVFOR	0.000	0.448	01/04	0.600	11/04	0.600	11/05	0.800	11/06	Continuing	Continuing	
ive Fire Test & Evaluation														
est Assets														
ooling														
GFE .														
Award Fees														
Subtotal T&E			0.000	6.356		10.390		6.167	,	4.160)	Continuing	Continuing	
Remarks:														
Contractor Engineering Support														
Sovernment Engineering Support	<u> </u>							+		-				
Program Management Support	-							1		-				
ravel	-							1		1		-		
ransportation	-					1		+		+		-		
SBIR Assessment	<u> </u>									1				
Subtotal Management			0.000	0.000		0.000		0.000)	0.000)	Continuing	Continuing	
Remarks:														
			250.739	93.598		102.372		109.362	,	59.090	\	Continuing	Continuing	

CLASSIFICATION:

EXHIBIT R4, Schedule	Profile																								DATE	:	F	ebrua	ry 20	05		
APPROPRIATION/BUDGET RDT&E, N /	ACTIVI BA-(R AND s Deve							PROJ			R ANI	D NAM	E						
Fiscal Year		20	004			20	05			20	06			200)7			20	08			20	09			20	10			201	11	
	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	1	2	3	4
Acquisition Milestones		MS B ∠	SRR	7			SFR		PDR				CDR	DAB	PR																	
Propulsion Plant																																
EMALS		SDD /	WARI		SRR	SFR	PDI	R C	DR 1	CD	R 2	TRR	1		TR	R 2				LRIP												
DBR Radar Suite		PE /	OR.		CDR																											
Advanced Arresting Gear	SRR			PDR	мѕ в			CDR-1	-2				TRI	R 1						TF	R 2				мѕс							
Test & Evaluation Milestones						DT	A2						<u></u>			DT	B1					/			DT	B2				DT	В3	
Development Test Operational Test					<	ОТ	B1					(\\ \	ОТ	B2		>	ОТ	В3			ОТ	B4		>					ОТ	B5	
Contract Milestones IPPD Contract CP Contract Construction Contract	C	ontrad	ct Awar	d												Cor	itract A	ward														
Full Funding (SCN)																	х															[

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

CLASSIFICATION:

Exhibit R-4a, Schedule Detail							DATE:	uary 2005
APPROPRIATION/BUDGET ACTIVITY	PROGRAM	ELEMENT			PROJECT N	NUMBER AND N		adi y 2003
RDT&E, N / BA-04		N - Carrier Sy	stems Develo	pment	PU 2208 - C			
Schedule Profile	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11
Developmental Tests DT A-2	1-4Q							
Advanced Arresting Gear SRR	1Q							
EMALS SDD Phase Initiate	2Q							
Dual Band Radar PDR	2Q							
CVN 21 Milestone B	3Q							
CVN 21 SRR	3Q							
Construction Preparation Contract Award	3Q							
Advanced Arresting Gear PDR	4Q							
EMALS SRR		1Q						
Developmental Tests DT A-2		1-4Q						
Dual Band Radar CDR		1Q						
Advanced Arresting Gear Milestone B		1Q						
Operational Tests OT-B1		2-3Q						
EMALS SFR		2Q						
CVN 21 SFR		3Q						
EMALSP PDR		3Q						
EMALS CDR 1		4Q						
Advanced Arresting Gear CDR 1		4Q						
CVN 21 PDR			1Q					
Developmental Tests DT A-2			1-4Q					
AAG CDR 2			1Q					
EMALS CDR 2			2Q					
EMALS TRR 1(HALT/HCT)			4Q					
CVN 21 CDR				1Q				
Developmental Tests DT-B1				1-4Q				
Operational Tests OT-B2				1-4Q				
CVN 21 DAB PR				2Q				
AAG TRR 1 (DT/OA)				2Q				
EMALS TRR 2 (DT/OA)				4Q				
CVN 21 Construction Contract Award					1Q			
CVN 21 SCN Full Funding					1Q			
Developmental Tests DT-B1					1-4Q			
Operational Tests OT-B3					1-4Q			
EMALS LRIP					4Q			
AAG TRR 2 (DT/OA)						1Q		
Developmental Tests DT-B1						1Q		
Operational Tests OT-B4						1-4Q		
Developmental Tests DT-B2						3-4Q		
Developmental Tests DT-B2							1-4Q	
AAG LRIP								1Q
Operational Tests OT-B5								1-40
Developmental Tests DT-B3			1					2-40

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification									DATE: February 2005
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEM	ENT NUMBER AN	D NAME		PROJECT NUMBE	ER AND NAME			,
RDT&E, N / BA-04	PE 0603512N - Ca	rrier Systems De	velopment		PU 4004 - EMALS			1	
COST (\$ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	
Project Cost	37.173	50.600	56.630	58.538	26.312	13.455	0.000	0.000	
RDT&E Articles Qty			1						

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This project provides for the development of an advanced technology aircraft launch system in support of the CVN 78 design and construction schedule. The Electro Magnetic Aircraft Launch System (EMALS) will replace the current steam catapult on CVN 78 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.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE:	
				February 2005
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND N	AME	
RDT&E, N / BA-04	PE 0603512N - Carrier Systems Development	PU 4004 - EMALS		
· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·			

B. Accomplishments/Planned Program

	FY 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost	37.173	50.600	56.630	58.538
RDT&E Articles Quantity			1	

-(U) EMALS -

FY-04: Complete full scale, full power, half-length EMALS demonstration testing and technical evaluation using deadloads. Analyze test data, proposed contractor production system configurations, and program proposals. Select contractor for and begin System Development and Demonstration phase. Conduct comprehensive development risk assessments and develop detailed integrated program baseline. Initiate production design effort. Conduct follow on development testing. Continue CVN 78 integration development. Provide management, systems, engineering, test and ship integration support.

FY-05: Continue System Development and Demonstration phase. Conduct Functional and Systems Requirements reviews. Conduct Preliminary Design and Critical Design Reviews and initiate manufacture of production representative system for Development Testing and Operational Assessment. Initiate procurement of dead load test articles and instrumentation in support of land based testing. Conduct follow on development testing on Program Definition and Risk Reduction phase system. Continue CVN 78 integration development. Provide management, systems engineering, test, and ship integration support.

FY-06: Continue System Development and Demonstration phase. Continue production system development effort. Complete Critical design reviews. Continue manufacture of production representative system and procurement of dead load test articles and instrumentation. Initiate installation in the EMALS land based test facility. Continue CVN 78 integration development. Provide management, systems engineering, test, and ship integration support.

FY-07: Continue System Development and Demonstration phase. Continue production system development effort. Conduct environmental, high cycle and highly accelerated life testing. Complete installation of the production representative EMALS system in the land based test facility. Initiate system integration and Integrated System Performance Development Testing and Operational Assessment. Continue CVN 78 integration development. Provide management, systems engineering, test, and ship integration support.

CLASSIFICATION:

N	BIT R-2a, RDT&E Project Justification					DATE:	
N	-						February 2005
### PROGRAM CHANGE SUMMARY: Funding:	ROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND	NAME		PROJECT NUME	BER AND NAME	-
### PROGRAM CHANGE SUMMARY: Funding:	&E, N / BA-04	PE 0603512N - Carrier Systems Dev	elopment		PU 4004 - EMAL	.s	
Funding: FY 2004 FY 2005 FY 2006 FY 2007 FY05 President's Budget 39.095 51.094 35.083 28.634 35.085 28.634 35.085 28.634 37.173 50.600 56.630 58.538 28.634 27.0484 27.547 29.904 27.547							
FY05 President's Budget 39.095 51.094 35.083 28.634 FY06 President's Budget 37.173 50.800 56.630 58.538 Total Adjustments -1.922 -0.494 21.547 29.904	C. PROGRAM CHANGE SUMMARY:						
FY06 President's Budget Total Adjustments -1.922 -0.494 21.547 29.904 Summary of Adjustments Congressional Recissions SBIR Congressional Recissions -0.435 -0.484 SBIR -0.977 Inflation Savings -0.036 Technical & Miscellaneous Adjustments -0.1922 -0.494 21.547 29.904 Subtotal -1.922 -0.494 21.547 29.904 Permarks: Schedule: The CVN 78 Basic Construction contract will be awarded in FY08 with delivery in FY15.	Funding:	F	FY 2004	FY 2005	FY 2006	FY 2007	
Total Adjustments Summary of Adjustments Congressional Recissions SBIR Inflation Savings Technical & Miscellaneous Adjustments Subtotal Subtotal -0.435 -0.484 SBIR -0.977 Inflation Savings Technical & Miscellaneous Adjustments -0.474 -0.010 21.547 29.904 29.904 21.547 29.904 Subtotal Technical: Technical:			39.095	51.094	35.083	28.634	
Summary of Adjustments Congressional Recissions SBIR Inflation Savings Technical & Miscellaneous Adjustments Subtotal Congressional Recissions -0.474 -0.0977 -0.010 -0.1547 -0.010 -0.15	FY06 President's Budget		37.173	50.600	56.630	58.538	
Congressional Recissions SBIR -0.977 Inflation Savings Technical & Miscellaneous Adjustments Subtotal Schedule: The CVN 78 Basic Construction contract will be awarded in FY08 with delivery in FY15.	Total Adjustments		-1.922	-0.494	21.547	29.904	
Congressional Recissions SBIR -0.977 Inflation Savings Technical & Miscellaneous Adjustments Subtotal Schedule: The CVN 78 Basic Construction contract will be awarded in FY08 with delivery in FY15.	Summary of Adjustments						
SBIR Inflation Savings Technical & Miscellaneous Adjustments Subtotal Subtotal Schedule: The CVN 78 Basic Construction contract will be awarded in FY08 with delivery in FY15.		3	-0.435	-0.484			
Inflation Savings Technical & Miscellaneous Adjustments Subtotal Subtotal Subtotal -0.036 -0.474 -0.010 21.547 29.904 -1.922 -0.494 21.547 29.904 PMARKS: Schedule: The CVN 78 Basic Construction contract will be awarded in FY08 with delivery in FY15.							
Technical & Miscellaneous Adjustments Subtotal -0.474 -0.010 21.547 29.904 -1.922 -0.494 21.547 29.904							
Subtotal -1.922 -0.494 21.547 29.904 Permarks: Schedule: The CVN 78 Basic Construction contract will be awarded in FY08 with delivery in FY15. Technical:	Technical & Miscellaneou	s Adjustments	-0.474	-0.010	21.547	29.904	
Schedule: The CVN 78 Basic Construction contract will be awarded in FY08 with delivery in FY15. Technical:		<u> </u>	-1.922	-0.494	21.547		
The CVN 78 Basic Construction contract will be awarded in FY08 with delivery in FY15. Technical:	Remarks:						
Technical:	Schedule:						
Technical:	The CVN 78 Basic Construction co	ontract will be awarded in FY08 with delivery in FY15.					
Not Applicable	Technical:						
	Not Applicable						

R-1 SHOPPING LIST - Item No.

36

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification								DATE:		
									February	y 2005
APPROPRIATION/BUDGET ACTIVITY		PROGRAM E	LEMENT NU	MBER AND	NAME	PROJECT N	UMBER AN	D NAME		
RDT&E, N / BA-04		PE 0603512N -	Carrier Syste	ms Developm	ent	PU 4004 - E	MALS			
D. OTHER PROCESS STATEMENTS CHIMMARY										
D. OTHER PROGRAM FUNDING SUMMARY:										Total
Line Item No. & Name	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Complete	Cost
SCN: 200100 - Carrier Replacement Program	1,162.905	623.551	564.913	795.994	3,689.413	3,730.407	1,657.362	539.680	Cont.	Cont.
RDT&E:										
0604567N - Ship Contract Design, Live Fire T&E	112.730		55.672	86.506	83.826		40.082	87.499	Cont.	Cont.
0603570N - Advanced Nuclear Power Systems	198.814	168.080	168.373	170.980	160.992	152.814	133.951	105.975	Cont.	Cont.

^{*}Note: Only a portion of the funding in PE 0603570N is included in the CVN 21 Program

E. ACQUISITION STRATEGY:

The CVN 78 will be the first ship of the CVN 21 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 78 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:

General Atomics, San Diego, CA, EMALS Design and Development Naval Air Warfare Center, Aircraft Division, Lakehurst, NJ: EMALS Development and Test.

R-1 SHOPPING LIST - Item No.

38

CLASSIFICATION:

								DATE:						
Exhibit R-3 Cost Analysis (page	1)										February	2005		
PPROPRIATION/BUDGET ACTIVITY	, '	PROGRAM E	LEMENT			PROJECT N	UMBER AND N	AME						
RDT&E, N / BA-04		PE 0603512	N - Carrier Sys	stems Develop	oment	PU 4004 - EI	MALS							
Cost Categories	Contract	Performing	Total		FY 04		FY 05		FY 06		FY 07			
	Method	Activity &	PY s	FY 04	Award	FY 05	Award	FY 06	Award	FY 07	Award	Cost to	Total	Target Value
	& Type	Location	Cost	Cost	Date	Cost	Date	Cost	Date	Cost	Date	Complete	Cost	of Contract
roduct Development														
ircraft Launch, Recovery & Support	CPAF	Northrop Grumman	75.215	8.137	11/03	0.266	11/04					Continuing	Continuing	Continuing
	CPAF	General Atomics (PDRR)	76.028	6.691	11/03							Continuing	Continuing	Continuing
	CPIF	General Atomics (SDD)		16.924	04/04	41.234	11/04-8/05	39.178	11/05	36.340	11/06	Continuing	Continuing	Continuing
	WX	NAWC Lakehurst, NJ	10.884	4.028	11/03	5.207	11/04	5.521	11/05	5.631	11/06	Continuing	Continuing	Continuing
	CPAF	NGNN, VA	2.270									Continuing	Continuing	Continuing
	Various	Miscellaneous	0.000			1.614	11/04	3.952	11/05	4.098	11/06	Continuing	Continuing	Continuino
Subtotal Product Development			164.397	35.780	1	48.321		48.651		46.069	1	Continuing	Continuing	Continuing

Remarks: Prior Years were funded under PE 0603512N, PU 42208; however, prior year values have been shifted to PU 44004 in keeping with the CVN 21 Project realignment and in order to reflect program continuity on the PU 44004 Exhibit.

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

Remarks: Prior Years were funded under PE 0603512N, PU 42208; however, prior year values have been shifted to PU 44004 in keeping with the CVN 21 Project realignment and in order to reflect program continuity on the PU 44004 Exhibit.

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2 PPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-04	۷)											February:	2005		
RDT&E, N / BA-04			PROGRAM ELEME	MENT			IPROJECT NI	JMBER AND N	I JAME			rebruary.	2005		
			PE 0603512N - Car		ems Developr	ment	PU 4004 - EN		O WILL						
	Contract Method & Type	Performing Activity & Location	Total PY s Cost	al s	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	- / '														
	WX	Lakehurst NJ		5.038	1.393	11/03	2.279	11/04	7.979	11/05	12.469	11/06	Continuing	Continuing	
Subtotal T&E				5.038	1.393		2.279		7.979		12.469		Continuing	Continuing	
Remarks: Prior Years were funded u	under PE (0603512N, PU 4	12208; however, pr	orior year v	alues have be	een snifted to	PU 44004 IN F	keeping with t	ne CVN 21 Pro	oject realignin	ient and in ord	der to renect p	rogram comm	and on the re	TTOOT EXIII
	under PE (0603512N, PU 4	12208; however, pr	orior year v	values have be	een snitted to	PU 44004 in F	Reeping with t	ne CVN 21 Pro	oject realignii	ent and in ord	der to reflect p	logram commi	1	T
ontractor Engineering Support	under PE (0603512N, PU 4	12208; however, pr	orior year v	values have be	een snifted to	PU 44004 in F	Reeping with t	ne CVN 21 Pro	oject realignii	ent and in ord	der to reliect p			L L
ontractor Engineering Support overnment Engineering Support	under PE (0603512N, PU 4	12208; however, pr	orior year v	values have be	een snifted to	PU 44004 in F	leeping with t	ne CVN 21 Pro	oject realignii	ent and in ord	der to reliect p	logram commi		Land Called
ontractor Engineering Support overnment Engineering Support rogram Management Support	under PE (0603512N, PU 4	12208; however, pr	orior year v	values have be	een snifted to	PU 44004 in F	eeping with t	ne CVN 21 Pro	Dect realignin	ent and in ord	der to reliect p	I I I I I I I I I I I I I I I I I I I		- TOOT EARING
ontractor Engineering Support iovernment Engineering Support rogram Management Support ravel	under PE (0603512N, PU 4	12208; however, pr	orior year v	values have be	een sniited to	PU 44004 in F	Reeping with t	ne CVN 21 Pri	oject realignii	ent and in ord	aer to renect p	Togram commi		
ontractor Engineering Support overnment Engineering Support rogram Management Support ravel abor (Research Personnel)	under PE (0603512N, PU 4	12208; however, pr	orior year v	values have be	een sniited to	PU 44004 in F	Reeping with t	NO CVN 21 Pro	oject realignii	ent and in ord	aer to renect p	Togram commi		
contractor Engineering Support covernment Engineering Support rogram Management Support ravel abor (Research Personnel) BIR Assessment Subtotal Management	under PE (0603512N, PU 4		0.000	0.000	een sniited to	0.000	Reeping with t	0.000	oject realignii	0.000	aer to renect p	0.000	0.000	
Contractor Engineering Support Covernment Engineering Support Program Management Support Pravel Abor (Research Personnel) BIR Assessment				0.000	0.000		0.000		0.000		0.000		0.000	0.000	

CLASSIFICATION:

EXHIBIT R4, Schedule																									DATE		Fe	ebrua	ry 20	05		
APPROPRIATION/BUDGE RDT&E, N /	FACTIVI BA- (PROG PE 06		ELEMI N - Ca												IUMBE Mals		D NAM	E			•			
Fiscal Year		20	04			20	05			20	06			200	07			20	08			20	09			20	10			20	11	
	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	1	2	3	4
Acquisition Milestones		MS B	SRR				SFR		PDR				CDR	DAB	PR																	
Propulsion Plant																																
EMALS		SDD A	WARI	•	SRR	SFR	PD	R C	DR 1	CD	R 2	TRR	1		TR	R 2				LRIP												
DBR Radar Suite		PE /	DR		CDR																											
Advanced Arresting Gear	SRR			PDR	мѕ в			CDR-1	-2				TRI	R 1						TF	R 2				мѕс							
Test & Evaluation Milestones						DT	A2					^				DT	B1								DT	B2			/	DT	В3	
Development Test Operational Test					<	ОТ	B1	\ \ \					\\ \=	ОТ	B2	\Rightarrow		ОТ	В3			ОТ	B4		,				\Leftrightarrow	ОТ	B5	
Contract Milestones IPPD Contract CP Contract Construction Contract	C	Contrac	t Awar	d												Cor	itract A	ward														
Full Funding (SCN)																	х															

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

CLASSIFICATION:

Exhibit R-4a, Schedule Detail							DATE:	uary 2005
APPROPRIATION/BUDGET ACTIVITY	PROGRAM	FLEMENT			PROJECT N	NUMBER AND N		uai y 2003
RDT&E, N / BA-04		N - Carrier Sy	stems Develo	pment	PU 4004 - E			
Schedule Profile	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11
Developmental Tests DT A-2	1-4Q							
Advanced Arresting Gear SRR	1Q							
EMALS SDD Phase Initiate	2Q							
Dual Band Radar PDR	2Q							
CVN 21 Milestone B	3Q							
CVN 21 SRR	3Q							
Construction Preparation Contract Award	3Q							
Advanced Arresting Gear PDR	4Q							
EMALS SRR		1Q						
Developmental Tests DT A-2		1-4Q						
Dual Band Radar CDR		1Q						
Advanced Arresting Gear Milestone B		1Q						
Operational Tests OT-B1		2-3Q						
EMALS SFR		2Q						
CVN 21 SFR		3Q						
EMALSP PDR		3Q						
EMALS CDR 1		4Q						
Advanced Arresting Gear CDR 1		4Q						
CVN 21 PDR			1Q					
Developmental Tests DT A-2			1-4Q					
AAG CDR 2			1Q					
EMALS CDR 2			2Q					
EMALS TRR 1(HALT/HCT)			4Q					
CVN 21 CDR				1Q				
Developmental Tests DT-B1				1-4Q				
Operational Tests OT-B2				1-4Q				
CVN 21 DAB PR				2Q				
AAG TRR 1 (DT/OA)				2Q				
EMALS TRR 2 (DT/OA)				4Q				
CVN 21 Construction Contract Award					1Q			
CVN 21 SCN Full Funding					1Q			
Developmental Tests DT-B1					1-4Q			
Operational Tests OT-B3					1-4Q			
EMALS LRIP					4Q			
AAG TRR 2 (DT/OA)						1Q		
Developmental Tests DT-B1						1Q		
Operational Tests OT-B4						1-4Q		
Developmental Tests DT-B2						3-4Q		
Developmental Tests DT-B2							1-4Q	
AAG LRIP								1Q
Operational Tests OT-B5								1-40
Developmental Tests DT-B3		1			1			2-40

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE:	
							Februa	ry 2005
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEM	ENT NUMBER ANI	O NAME		PROJECT NUMBI	ER AND NAME		
RDT&E, N / BA-4	0603512N - Carrie	r Systems Develo	pment		PU 4005 - Smart	Carrier		
COST (\$ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Project Cost	1.836	1.825	1.831	1.820	1.828	1.823	1.863	1.903
RDT&E Articles Qty		2	1	1				

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 Aviation Fuels On-Board Training (OBT) System, 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.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justifica	ation			DATE:	
					February 2005
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUM	IBER AND NAME	PROJECT NUMBER AND N	İAME	-
RDT&E, N /BA-4	0603512N - Carrier System	s Development	PU 4005 - Smart Carrier		
B. Accomplishments/Planned Program	FY 04	EV 05	EV 06	FV 07	
		FY 05	FY 06	FY 07	
Accomplishments/Effort/Subtotal Cost	1.836	1.825	1.831	1.820	
RDT&E Articles Quantity		2	1	1	

- (U) Smart Carrier - Fiscal Year 2004 and 2005 efforts continue to develop, evaluate, demonstrate, install, test and measure the effectiveness of revised processes and selected technologies with the highest potential to meet Aircraft Carrier goals for manpower and Total Ownership Cost (TOC) reductions, such as HN&E LAN survivability modifications, an On-Board Training capability for Aviation Fuels Operations, In-Line Fuel Monitoring, Condition-Based Maintenance, and Automated Systems Logs. Fiscal Year 2006 and 2007 efforts include software development, land-based testing, shipboard start-up and shipboard demonstration of ADCS software improvements and Electronic Valve Operator automation. Future efforts include Superior Sound Technology (5MC), vibration monitoring/rotating machinery diagnostic tools, and expanded condition-based maintenance using the existing Smart Carrier hardware and software suite.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification				DATE:	
					February 2005
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME		PROJECT NUME	BER AND NAME	
RDT&E, N / BA-4	0603512N - Carrier Systems Development		PU 4005 - Smart	Carrier	
C. PROGRAM CHANGE SUMMARY:					
Funding:	FY 2004	FY 2005	FY 2006	FY 2007	
FY05 President's Budget:	1.881	1.843		1.817	
FY06 President's Budget	1.836	1.825		1.820	
Total Adjustments	-0.045	-0.018		0.003	
Summary of Adjustments					
Congressional Recissions	-0.021	-0.018	}		
Technical & Miscellaneous Adjustments			0.001	0.003	
Subtotal	-0.045	-0.018	0.001	0.003	
Schedule: Not Applicable					
Concadio. Not Applicable					
Technical: Not Applicable					
		NI-	20		

CLASSIFICATION:

	· ,									Februa	ry 2005	
APPROPRIATION/BUDGET	ACTIVITY		PROGRAM E	LEMENT NUM	BER AND NAM	1E	PROJECT NU	MBER AND N	AME			
RDT&E, N /	BA-4		0603512N - C	arrier System	s Developmen	t	PU 4005 - Sm	art Carrier				
D. OTHER PROGRAM	I FUNDING SUMMARY:									T -	Takal	
Line Item No. & Nan	<u>ne</u>	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	To <u>Complete</u>	Total <u>Cost</u>	

9.133

10.286

8.056

E. ACQUISITION STRATEGY:

EXHIBIT R-2a, RDT&E Project Justification

098100 Items Under \$5 million

Smart Carrier (LT 140)

6.988

44.638

20.923

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).

22.954

F. MAJOR PERFORMERS:

Naval Sea Systems Command - Philadelphia (formerly Naval Surface Warfare Center, Carderock Division), Philadelphia, PA and Naval Air Systems Command - Lakehurst (formerly Naval Air Warfare Center, Lakehurst), Lakehurst NJ, perform software development, test and evaluation, integration and program management to include training development and integrated logistics support development.

R-1 SHOPPING LIST - Item No.

DATE:

3.329

Cont.

126.307

CLASSIFICATION:

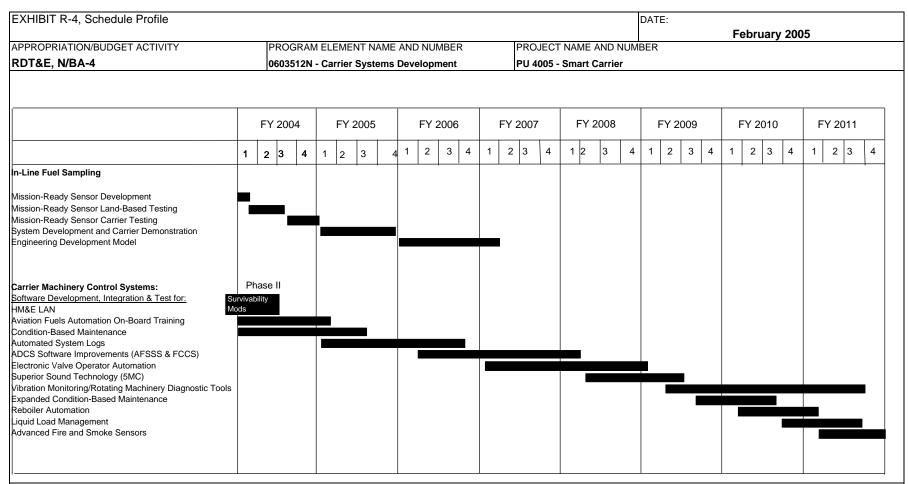
Exhibit R-3 Cost Analysis (pa										DATE:				
												February 200)5	
APPROPRIATION/BUDGET ACTIV	/ITY	PROGRAM E						PROJECT NU		NAME				
RDT&E, N / BA-4	10		arrier Systems	s Developmen			EV 05	PU 4005 - Sm		1	IDV 07		Γ	1
Cost Categories	Contract Method	Performing Activity &	Total PY s	FY 04	FY 04 Award		FY 05 Award	FY 06	FY 06 Award	FY 07	FY 07 Award	Cost to	Total	Target Value
	& Type	Location	Cost	Cost	Date	Cost	Date	Cost	Date	Cost	Date	Complete	Cost	of Contract
Primary Hardware Development	71													
Ancillary Hardware Development														
Component Development														
Ship Integration	WX	NAVSEA, Phil./NAVAIR Lke	0.200	0.100	11/03	0.100	11/04	0.100	11/05	0.100	11/06	Continuing	Continuing	
Ship Suitability														
Systems Engineering	CPAF	NGNN, VA	0.205										0.205	1
	Various	Miscellaneous	7.978										7.978	3
Training Development														
Licenses														
Tooling														
Tooling GFE														
-														
GFE			8.383	0.100		0.100		0.100		0.100		0.000	8.783	
GFE Award Fees			8.383	0.100		0.100		0.100		0.100		0.000	8.783	
GFE Award Fees Subtotal Product Development			8.383	0.100		0.100		0.100		0.100		0.000	8.783	
GFE Award Fees Subtotal Product Development Development Support	wx	NAVSEA, Phil./NAVAIR Lke	8.383			0.100		0.100	11/05	0.100	11/06	0.000 Continuing		
GFE Award Fees Subtotal Product Development Development Support Software Development	wx	NAVSEA, Phil./NAVAIR Lke NAVSEA, Phil./NAVAIR Lke	1.042						11/05 11/05				0.000	
GFE Award Fees	_		1.042 0.050	0.886	11/03	0.825	11/04 11/04	0.881	11/05	0.820	11/06	Continuing	0.000 Continuing	
GFE Award Fees Subtotal Product Development Development Support Software Development Training Development Integrated Logistics Support	wx	NAVSEA, Phil./NAVAIR Lke	1.042 0.050	0.886 0.050	11/03 11/03	0.825 0.080	11/04 11/04	0.881 0.050	11/05	0.820 0.080	11/06 11/06	Continuing Continuing	0.000 Continuing Continuing	
GFE Award Fees Subtotal Product Development Development Support Software Development Training Development Integrated Logistics Support	wx	NAVSEA, Phil./NAVAIR Lke	1.042 0.050	0.886 0.050	11/03 11/03	0.825 0.080	11/04 11/04	0.881 0.050	11/05	0.820 0.080	11/06 11/06	Continuing Continuing	0.000 Continuing Continuing Continuing	
GFE Award Fees Subtotal Product Development Development Support Software Development Training Development Integrated Logistics Support Configuration Management	wx	NAVSEA, Phil./NAVAIR Lke	1.042 0.050	0.886 0.050	11/03 11/03	0.825 0.080	11/04 11/04	0.881 0.050	11/05	0.820 0.080	11/06 11/06	Continuing Continuing	0.000 Continuing Continuing Continuing Continuing	
GFE Award Fees Subtotal Product Development Development Support Software Development Training Development Integrated Logistics Support Configuration Management Technical Data	wx	NAVSEA, Phil./NAVAIR Lke	1.042 0.050	0.886 0.050	11/03 11/03	0.825 0.080	11/04 11/04	0.881 0.050	11/05	0.820 0.080	11/06 11/06	Continuing Continuing	0.000 Continuing Continuing Continuing 0.000	

CLASSIFICATION:

Exhibit R-3 Cost Analysis (pa	ngo 2)									DATE:		February 200	05	
APPROPRIATION/BUDGET ACTIV		PROGRAM EI 0603512N - C		s Davelonmer	n+			PROJECT NU		NAME		1 ebitally 200	03	
Cost Categories	Contract Method & Type	Performing Activity &	Total PY s Cost *	FY 04 Cost	FY 04 Award Date		FY 05 Award Date	FY 06	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WX	NAVSEA, Phil./NAVAIR Lke	0.300	0.400	11/03	0.450	11/04	0.400	11/05	0.450	11/06	Continuing	Continuing	
Operational Test & Evaluation														
Live Fire Test & Evaluation														
Test Assets														
Tooling														
GFE														
Award Fees														
Subtotal T&E			0.300	0.400		0.450		0.400		0.450		0.000	2.000	
Contractor Engineering Support		T	I	I	I						Ι		I	T
Contractor Engineering Support Government Engineering Support														
	wx	NAVSEA, Phil./NAVAIR Lke	0.250	0.250	11/03	0.250	11/04	0.250	11/05	0.250	11/06	Continuing	Continuing	
Government Engineering Support	wx	NAVSEA, Phil./NAVAIR Lke	0.250	0.250	11/03	0.250	11/04	0.250	11/05	0.250	11/06	Continuing	Continuing	
Government Engineering Support Program Management Support	wx	NAVSEA, Phil./NAVAIR Lke	0.250	0.250	11/03	0.250	11/04	0.250	11/05	0.250	11/06	Continuing	Continuing	
Government Engineering Support Program Management Support Travel	wx	NAVSEA, Phil./NAVAIR Lke	0.250	0.250	11/03	0.250	11/04	0.250	11/05	0.250	11/06	Continuing	Continuing	
Government Engineering Support Program Management Support Travel Labor (Research Personnel)	wx	NAVSEA, Phil./NAVAIR Lke	0.250			0.250		0.250		0.250		Continuing		
Government Engineering Support Program Management Support Travel Labor (Research Personnel) SBIR Assessment	wx	NAVSEA, Phil./NAVAIR Lke												
Government Engineering Support Program Management Support Travel Labor (Research Personnel) SBIR Assessment	wx	NAVSEA, Phil./NAVAIR Lke		0.250									1.250	

CLASSIFICATION:

UNCLASSIFIED



R-1 SHOPPING LIST - Item No. 38

Exhibit R-4, Schedule Profile (Exhibit R-4, Page 38 of 46)

UNCLASSIFIED

CLASSIFICATION:

Exhibit R-4a, Schedule Detail							DATE: Februa	ry 2005
APPROPRIATION/BUDGET ACTIVITY	PROGRAM E	LEMENT			PROJECT NU	MBER AND N		
RDT&BA-04	PE 0603512N	- Carrier Syste	ems Developm	ent	PU 4005 - Sm	art Carrier		
Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
n-Line Fuel Sampling								
Mission Ready Sensor Development Testing	1Q							
Mission Ready Sensor Land-Based Testing	1-3Q							
Mission Ready Sensor Carrier Testing (single sensor, during deployment)	3-4Q	1Q						1
System Development and Carrier Demonstration (Multi-Sensor System)		1-4Q						
Sensor Group Development - Six Sensors (HW & SW)		1-2Q						
Group Development Test		3-4Q						1
Engineering Development Model			1-4Q	1Q				
Sensor System Development (HW & SW)			1-3Q					1
System Development Test			4Q	1Q				
								1
Carrier Machinery Control Systems								
HM&E Local Area Network Survivability Mods - Phase II Development and Test	1-3Q							
Aviation Fuels On-Board Training Software Development	1-3Q							
Aviation Fuels On-Board Training Software Development Test	4Q	1Q						
Condition-Based Maintenance Software Development	1-4Q							
Condition-Based Maintenance Software Development Test		1-3Q						
Automated System Logs Software Development		1-4Q						
Automated System Logs Software Development Test			1-3Q					
ADCS Software Improvements (AFSSS/FCCS) Software Development			2-4Q	1Q				
ADCS Software Improvements (AFSSS/FCCS) Software Development Test				2-4Q	1Q			
Electronic Valve Operator Automation Software Development				1-4Q	10			
Electronic Valve Operator Automation Software Development Test					2-4Q			
Superior Sound Technology (5MC) Development/Integration					2-4Q	1-3Q		
Vibration Monitoring/Rotating Machinery Diagnostic Tools SW Development						2-4Q	1-2Q	
Vibration Monitoring/Rotating Machinery Diagnostic Tools SW Dev. Test							3-4Q	1-3Q
Expanded Condition-Based Maintenance - Rotating Machinery						3-4Q	1-3Q	
Reboiler Automation SW/HW Development							2-4Q	
Reboiler Automation SW/HW Development Test						1		1Q
Liquid Load Management SW Development/Test						1	3-4Q	1-3Q
Advanced Fire and Smoke Sensor System Development						1		2-3Q
Advanced Fire and Smoke Sensor System Development Testing						1		4Q
							<u> </u>	· ~

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification	on								DATE:
									February 2005
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEM	ENT NUMBER AN	ID NAME		PROJECT NUMBI	ER AND NAME			
RDT&E, N / BA-04	PE 0603512N - Ca	arrier Systems De	velopment	T	PU 4006 - CVN 21	Follow Ship	1	T	
COST (\$ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	
Project Cost	0.000	0.000	0.000	78.947	82.850	82.969	85.527	40.727	
RDT&E Articles Qty									

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Development and related testing 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 79. 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, warfare systems, and combat support 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. This project also encompasses those tasks required to develop the contract data package necessary to support CVN 79 procurement, including, but not limited to engineering support, programmatic and program support, logistics support, modeling and simulation, manpower and program related studies, and design support systems, such as the Integrated Digital Environment.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justifica	ation			DATE:	
				Fe	bruary 2005
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUME	BER AND NAME	PROJECT NUMBER AND N	AME	
RDT&E, N / BA-04	PE 0603512N - Carrier Syste	ems Development	PU 4006 - CVN 21 Follow S	Ship	
B. Accomplishments/Planned Program					_
	FY 04	FY 05	FY 06	FY 07	
Accomplishments/Effort/Subtotal Cost	0.000	0.000	0.000	43.060	
RDT&E Articles Quantity					

- (U) CVN 21 Follow Ship Advanced Technology Design & Development: Commence development and transition of technologies to support continued improvements in CVN 21 Key Performance Parameters (KPPs) and efforts supporting achievement of CVN 21 Class Operational Requirements Document (ORD) Objectives: increased sortie generation rate, manpower reduction, and recovery of weight and stability service life margins. Commence design activities to integrate and optimize systems and arrangements to improve KPPs and to improve overall performance towards ORD objectives. Technologies and design efforts include, but are not limited to: Enhanced Weapons / Material Movement to further reduce manpower and increase sortie generation rates; Advanced Materials development and integration to reduce total weight and improve stability while reducing shipboard maintenance; Consolidated Electrical Energy Storage and Advanced Electrical Load Management to improve power density, reduce weight, and support advanced electrical loads; Improved Survivability technologies; and Advanced Ship Self Defense technologies.

	FY 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost	0.000	0.000	0.000	3.850
RDT&E Articles Quantity				

- (U) CVN 21 Follow Ship Testing: Initiate efforts to determine specific developmental test and related modeling and simulation requirements. Assess the CVN 79 hull design survivability in terms of susceptibility, vulnerability and recoverability. Initiate planning of UNDEX, AIREX, Damage Control/Fire Fighting and Recoverability modeling and simulation and plan surrogate testing for model validation. Commence CVN 79 susceptibility assessment. Commence UNDEX, AIREX, Damage Control/Fire Fighting and Recoverability modeling and simulation. Commence surrogate testing of models. Continue CVN 79 susceptibility assessment and continue initiating and validating any additional modeling deemed necessary.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE:	
				February 2005
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND N	AME	
RDT&E, N / BA-04	PE 0603512N - Carrier Systems Development	PU 4006 - CVN 21 Follow S	Ship	

B. Accomplishments/Planned Program

	FY 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost	0.000	0.000	0.000	32.037
RDT&E Articles Quantity				

- (U) CVN 21 Follow Ship Total Ship Integration: The CVN 79 will incorporate advanced technologies including, but not limited to: Enhanced Weapons / Material Movement to further reduce manpower and increase sortie generation rates; Advanced Materials development and integration to reduce total weight and improve stability while reducing shipboard maintenance; Consolidated Electrical Energy Storage and Advanced Electrical Load Management to improve power density, reduce weight, and support advanced electrical loads; Improved Survivability technologies; and Advanced Ship Self Defense technologies. These technologies support continued improvement in CVN 21 class Key Performance Parameters (KPPs) and efforts supporting achievement of CVN 21 class Operational Requirements Document (ORD) Objectives: increased sortie generation rate, manpower reduction, and recovery of weight and stability service life margins.

CVN 79 Total Ship Integration (TSI) will be accomplished through an IPPD contract with Northop Grumman Newport News to incorporate technology advancements into the CVN 21 baseline design. TSI efforts are focused on continued design activities that integrate and optimize systems arrangements to improve KPPs and overall performance towards ORD objectives. CVN 79 design efforts will resolve issues related to incorporation of new technologies, the development of the CVN 79 contract data package, including design drawings and specifications, and will provide required program management and logistics support.

CLASSIFICATION:

Not Applicable

XHIBIT R-2a, RDT&E Project Justification				DATE:	February 2005
PPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAM	 E	PROJECT NUM	BER AND NAME	rebluary 2005
DT&E, N / BA-04	PE 0603512N - Carrier Systems Developm		PU 4006 - CVN		
C. PROGRAM CHANGE SUMMARY:				•	
Funding:	FY 200	94 FY 2005	5 FY 2006	FY 2007	
FY05 President's Budget	0.00			0.000	
FY06 President's Budget	0.00			78.947	
Total Adjustments	0.00			78.947	
rotal Adjustifiertis	0.00	0.000	0.000	70.547	
Summary of Adjustments					
Programmatic Adjustment				79.601	
Other Adjustments				-0.654	
College		0.000	0.000	70.047	
Subtotal	0.00	0.000	0.000	78.947	
Remarks:					
Schedule:					
The CVN 78 Basic Construction contract	will be awarded in FY08 with delivery in FY15. The	CVN 79 Basic (Construction contra	act will be awarded in FY1	12.
Technical:					

R-1 SHOPPING LIST - Item No.

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CLASSIFICATION:

KHIBIT R-2a, RDT&E Project Justification							ı	DATE:		
									Februar	y 2005
PROPRIATION/BUDGET ACTIVITY		PROGRAM E	LEMENT NU	MBER AND	NAME	PROJECT N	UMBER ANI	D NAME		
DT&E, N / BA-04		PE 0603512N -	Carrier System	ems Developr	ment	PU 4006 - C	VN 21 Follo	w Ship		
D. OTHER RECORAM FUNDING CHAMARY.										
D. OTHER PROGRAM FUNDING SUMMARY:										Total
Line Item No. & Name	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Complete	Cost
SCN: 200100 - Carrier Replacement Program	1,162.905	623.551	564.913	795.994	3,689.413	3,730.407	1,657.362	539.680	Cont.	Cont.
RDT&E:										
0604567N - Ship Contract Design, Live Fire T&E	112.730	136.516	55.672	86.506	83.826	59.393	40.082	87.499	Cont.	Cont.
0603570N - Advanced Nuclear Power Systems	198.814	168.080	168.373	170.980	160.992	152.814	133.951	105.975	Cont.	Cont.

^{*}Note: Only a portion of the funding in PE 0603570N is included in the CVN 21 Program

E. ACQUISITION STRATEGY:

The CVN 78 will be the first ship of the CVN 21 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 78 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 Naval Surface Warfare Center, Carderock, MD, Technology Design & Development Naval Surface Warfare Center, Dahlgren, Virginia, Technology Design & Development

CLASSIFICATION:

									DATE:					
xhibit R-3 Cost Analysis (pa											Fel	oruary 2005		
PPROPRIATION/BUDGET ACTIV	ITY	PROGRA	M ELEMENT				PROJECT	NUMBER AND	O NAME					
RDT&E, N / BA-04			512N - Carrier Sys	tems Develo	•			CVN 21 Follow						
Cost Categories		Performing	Total PY s	FY 04	FY 04	FY 05	FY 05	FY 06	FY 06	FY 07	FY 07	0	Tatal	T+ \/-!
	& Type	Activity & Location	Cost	FY 04	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost to Complete	Total Cost	Target Value of Contract
Product Development	71													
Advanced Design and Development	CPAF	NGNN, VA	0.000							16.723	11/06	Continuing	Continuing	
	WX	NSWC Carderock	0.000							10.702	11/06	Continuing	Continuing	
	WX	NAWC Lakehurst	0.000							5.868	11/06	Continuing	Continuing	
	WX	NSWC Dahlgren	0.000							2.275	11/06	Continuing	Continuing	
	WX	NRL	0.000							3.392	11/06	Continuing	Continuing	
	Various	Miscellaneous	0.000							4.100	11/06	Continuing	Continuing	
Fotal Ship Integration	CPAF	NGNN, VA	0.000							19.115	11/06	Continuing	Continuing	
	WX	NSWC Carderock	0.000							2.372	11/06	Continuing	Continuing	
	WX	NSWC Dahlgren	0.000							2.419	11/06	Continuing	Continuing	
	WX	NAVAIR	0.000							2.405	11/06	Continuing	Continuing	
	Various	Miscellaneous	0.000							5.726	11/06	Continuing	Continuing	
	-													
	1				+									
												_		
Subtotal Product Development			0.000	0.000		0.000		0.000		75.097		Continuing	Continuing	
Oubtotal Froduct Development	1	l	0.000	0.000		0.000		0.000		13.091		Continuing	Continuing	1

CLASSIFICATION:

						- 		DATE:						
Exhibit R-3 Cost Analysis (pa	age 2)										February 2	2005		
APPROPRIATION/BUDGET ACT	VITY		AM ELEMENT			PROJECT N								
RDT&E, N / BA-04			512N - Carrier Sys	tems Develo		PU 4006 - C		Ship						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	а туре	Location	Cost	COSI	Date	Cost	Date	Cost	Date	Cost	Date	Complete	Cost	Of Contract
CVN 21 Follow Ship	CPAF	NGNN, VA	0.000							0.300	11/06	Continuing	Continuing	
SVIV 21 1 Ollow Grilp	Various	Miscellaneous	0.000							0.299	11/06	Continuing	Continuing	
	various	IVIISCEIIAITEOUS	0.000							0.299	11/00	Continuing	Continuing	
Operational Test & Evaluation														
CVN Follow Ship														
Live Fire Test & Evaluation														
CVN 21 Follow Ship	CPAF	NGNN, VA	0.000							0.486	11/06	Continuing	Continuing	
·	WX	NSWC Carderock	0.000							1.026	11/06	Continuing	Continuing	
Test Assets	Various	Miscellaneous	0.000							1.739	11/06	Continuing	Continuing	
Tooling												Ĭ		
GFE														
Award Fees														
Subtotal T&E			0.000	0.000		0.000		0.000		3.850		Continuing	Continuing	
Remarks:														
Contractor Engineering Support														
Government Engineering Support							1							
Program Management Support														
Travel														
Transportation														<u> </u>
SBIR Assessment				1			1							
Subtotal Management			0.000	0.000		0.000		0.000		0.000		Continuing	Continuing	ı
Remarks:														
Total Cost			0.000	0.000		0.000		0.000		78.947		Continuing	Continuing	1
Remarks:														
			D 4 CUO	DDING LIG	Γ - Item No.	38								

CLASSIFICATION:

EXHIBIT R4, Schedule I	Profile																								DATE	:	_					
APPROPRIATION/BUDGET RDT&E, N /	ACTIVI BA- (R AND											 D NAM w Ship		Fe	ebrua	ry 20	05		
Fiscal Year			004			20	05			20				20				20	08			20				20	10			201	11	
	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	1	2	3	4
Acquisition Milestones		MS B	SRR				SFR		PDR				CDR	DAB	PR																	
Propulsion Plant																																
EMALS		SDD A	WARI		SRR	SFR	PDI	R С	DR 1	CD	R 2	TRR	1		TR	R 2				LRIP												
DBR Radar Suite		PE	JR		CDR																											
Advanced Arresting Gear	SRR			PDR	мѕ в			CDR-1	-2				TRI	R 1						TF	R 2				мѕс							
Test & Evaluation Milestones						DT	A2						_			DT	B1								DT	B2			,	DT	В3	
Development Test Operational Test					<	ОТ	B1	}						ОТ	B2	\Rightarrow	\	ОТ	В3			ОТ ОТ	B4		,				\rightleftharpoons	ОТ	B5	\longrightarrow
Contract Milestones IPPD Contract CP Contract Construction Contract	C	Contrac	t Awar	d												Cor	ntract A	lward														
Full Funding (SCN)																	х															

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

CLASSIFICATION:

							DATE:	
Exhibit R-4a, Schedule Detail								ary 2005
APPROPRIATION/BUDGET ACTIVITY	PROGRAM					NUMBER AND I		
RDT&E, N / BA-04		N - Carrier Sy				VN 21 Follow		
Schedule Profile	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11
Developmental Tests DT A-2	1-4Q							
Advanced Arresting Gear SRR	1Q							
EMALS SDD Phase Initiate	2Q							
Dual Band Radar PDR	2Q							
CVN 21 Milestone B	3Q							
CVN 21 SRR	3Q							
Construction Preparation Contract Award	3Q							
Advanced Arresting Gear PDR	4Q							
EMALS SRR		1Q						
Developmental Tests DT A-2		1-4Q						
Dual Band Radar CDR		1Q						
Advanced Arresting Gear Milestone B		1Q						
Operational Tests OT-B1		2-3Q						
EMALS SFR		2Q						
CVN 21 SFR		3Q						
EMALSP PDR		3Q						
EMALS CDR 1		4Q						
Advanced Arresting Gear CDR 1		4Q						
CVN 21 PDR			1Q					
Developmental Tests DT A-2			1-4Q					
AAG CDR 2			1Q					
EMALS CDR 2			2Q					
EMALS TRR 1(HALT/HCT)			4Q					
CVN 21 CDR				1Q				
Developmental Tests DT-B1				1-4Q				
Operational Tests OT-B2				1-4Q				
CVN 21 DAB PR				2Q				
AAG TRR 1 (DT/OA)				2Q				
EMALS TRR 2 (DT/OA)				4Q				
CVN 21 Construction Contract Award					1Q			
CVN 21 SCN Full Funding					1Q			
Developmental Tests DT-B1					1-4Q			
Operational Tests OT-B3					1-4Q	1		
EMALS LRIP					4Q	1		
AAG TRR 2 (DT/OA)					70	1Q		
Developmental Tests DT-B1					+	1Q		
Derational Tests OT-B4						1-4Q		
		+			+	3-4Q		
Developmental Tests DT-B2 Developmental Tests DT-B2						3-4Q	1-4Q	
					+	+	1-4Q	10
AAG LRIP					+	+		10
Operational Tests OT-B5								1-40
Developmental Tests DT-B3					1			2-40

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE:	
							Februa	ry 2005
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEM	ENT NUMBER ANI	O NAME		PROJECT NUMBE	ER AND NAME		
RDT&E, N / BA-4	0603512N Carrie	er Systems Develo	pment		1723 CV Launch	and Recovery Sy	stems	
COST (\$ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Project Cost	4.679	0.077	0.000	0.000	0.000	0.000	0.000	0.000
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 Recovey 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.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justificat	DATE:		
		February 2005	
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDT&E, N / BA-4	0603512N Carrier Systems Development	1723 CV Launch and Recovery Systems	
(II) R. Accomplishments/Planned Program			•

(U) B. Accompilsnments/Planned Program

	FY 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost	4.552			
RDT&E Articles Quantity	2			

- (U) ARC -

Developed ARC System Specification, contract Statement of Work, and Request for Proposal. Conducted source selection process, completed Milestone B review and awarded development contract. Conducted testing to characterize existing Constant Run Out Valve (CROV) performance in support of ARC control system development. Completed System Requirements Review, Preliminary Design Review, Critical Design Review and fabricated/delivered two (2) test articles. Conducted developmental testing of test articles on arresting gear. Conducted development testing using deadloads at the Jet Car Track Site (JCTS) and aircraft at the Runway Arrested Landing Site (RALS). Conducted rapid cycle reliability testing and environmental testing. Complete Tech Evaluation and achieve Milestone C. Provide engineering and management support to the program. Purchased two production representative ARC test articles to support developmental testing.

	FY 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost	0.127	0.077		
RDT&E Articles Quantity				

- (U) CREI -

(Arresting Gear Fairlead Sheaves) - Selected candidate materials and conducted laboratory testing on samples. Award contract, conduct design and manufacture prototype of CREI Sheaves. Conduct developmental and environmental testing of protoype sheaves. Provide engineering and management support to the program.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification					DA	
						February 2005
PPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER	R AND NAME		PROJECT NUME	BER AND NAME	E
RDT&E, N / BA-4	0603512N Carrier Systems D		PU 1723 CV Lau	unch and Recov	overy Systems	
(U) C. PROGRAM CHANGE SUMMARY:						
(U) Funding:		FY 2004	FY 2005	FY 2006	FY 2007	
FY05 President's Budget		1.170	0.077			
FY06 President's Budget	_	4.679	0.077			
Total Adjustments		3.509	0.000	0.000	0.000	
Summary of Adjustments						
Reprogrammings		3.509				
Subtotal	-	3.509	0.000	0.000	0.000	
(U) Schedule:						
(U) Technical:						
Not Applicable						

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification								DATE:	DATE:			
										Februa	ry 2005	
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT NUMBER AND NAME				PROJECT NUMBER AND NAME					
RDT&E, N /	0603512N Carrier Systems Development PU 1723 CV Launch and Re				Recovery Sys	Recovery Systems						
(U) D. OTHER PROGRAM	FUNDING SUMMARY:									То	Total	
Line Item No. & Name: 42	<u>16</u>	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	<u>Complete</u>	<u>Cost</u>	
OPN BLI: 421600- Aircraft L Equipment	aunch & Recovery	0.000	4.295	4.424	7.489	8.690	9.093	9.133	9.253	2.500	Cont	

(U) E. ACQUISITION STRATEGY:

The ARC acquisition strategy calls for full and open competition leading to a single contract award for the System Development and Demonstration Phase. Production quantities are included as options to the development contract.

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 registance

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