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Exhibit R-2, RDT&E Budget Item Justification: PB 2014 Navy **DATE:** April 2013

APPROPRIATION/BUDGET ACTIVITY					R-1 ITEM NOMENCLATURE							
1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>					PE 0603512N: <i>Carrier Systems Development</i>							
COST (\$ in Millions)	All Prior Years	FY 2012	FY 2013[#]	FY 2014 Base	FY 2014 OCO^{##}	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
Total Program Element	1,525.990	61.909	108.871	83.902	-	83.902	49.195	50.881	47.344	46.022	Continuing	Continuing
2208: <i>CVN 21</i>	800.971	27.168	36.673	31.638	-	31.638	37.297	40.833	40.650	39.234	Continuing	Continuing
3216.: <i>Tactical Support Center-Integration</i>	14.338	2.060	9.600	4.546	-	4.546	4.660	4.724	4.831	4.901	Continuing	Continuing
4004: <i>EMALS</i>	694.848	30.995	60.861	43.003	-	43.003	2.443	2.507	0.000	0.000	0.000	834.657
4005: <i>In-Service Carrier Systems Development</i>	15.833	1.686	1.737	4.715	-	4.715	4.795	2.817	1.863	1.887	Continuing	Continuing

MDAP/MAIS Code(s): 223

[#] FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

^{##} The FY 2014 OCO Request will be submitted at a later date

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:

- (2208) - Development of ship hull, mechanical, propulsion, electrical, aviation, and combat support systems, subsystems and components to significantly improve aircraft carrier affordability, manpower requirements, survivability, and operational capabilities, and to meet the requirements of existing and pending regulations and statutes critical to the operation of existing and future aircraft carriers.

- (3216) - Development of block upgrades to the MH-60R sensor suite into the AN/SQQ-34 Aircraft Carrier Tactical Support Center (CV-TSC). The CV-TSC provides increased situational awareness to the Carrier Strike Group (CSG) in support of force protection, primarily in the area of Anti Submarine Warfare (ASW). Through the integration of off-board sensors and signal, data and display processors, the AN/SQQ-34 is utilized in detecting, classifying, and localizing threats. An integrated element of the Carrier Combat System, the AN/SQQ-34 supports the tactical deployment of embarked ASW and Surface Warfare (SUW) assets (S-3B until retirement, SH-60F helicopter). This project provides the development and engineering foundation to refresh legacy AN/SQQ-34 systems on all Carriers and shore sites in support of Fleet introduction and shipboard integration of the MH-60R Multi Mission Helicopter. Upgrades to legacy systems enable the exchange of sensor, tactical and imagery data with the MH-60R initially, followed by incremental upgrades to support CVN air integration efforts.

- (4004) - Development of an advanced technology aircraft launch system in support of the CVN 78 Class design and construction schedule. The Electro Magnetic Aircraft Launch System (EMALS) will replace the current steam catapult on CVN 78 Class ships. EMALS provides better control of applied forces, both peak and transient dynamic, improved reliability and maintainability, increased operational availability and reduced operator and maintainer workload.

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APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>
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- (4005) - The In-Service Carrier Systems Development Demonstration and Validation program exploits available technologies to deliver an affordable, robust, operator-friendly automation control environment for Navy Aircraft Carrier shipboard equipment. The program provides the system architecture, requirements/specification development, technology selection, software development (including software baseline), as well as land-based and shipboard testing of new technologies to improve shipboard operations and to reduce workload, manpower requirements, and Total Ownership Costs (TOC). A portion of this effort is classified with details available at a higher classification level.

B. Program Change Summary (\$ in Millions)	FY 2012	FY 2013	FY 2014 Base	FY 2014 OCO	FY 2014 Total
Previous President's Budget	54.072	108.871	67.139	-	67.139
Current President's Budget	61.909	108.871	83.902	-	83.902
Total Adjustments	7.837	0.000	16.763	-	16.763
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	9.100	0.000			
• SBIR/STTR Transfer	-1.263	0.000			
• Program Adjustments	0.000	0.000	17.486	-	17.486
• Rate/Misc Adjustments	0.000	0.000	-0.723	-	-0.723

Change Summary Explanation

Cost: Added funding in FY 12 and FY 14 to properly price the EMALS effort. Added FY 14 funds to project 4005 (details available at higher classification level). The FY 14 program for project 2208 was adjusted to properly phase program requirements with expenditures.

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Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy **DATE:** April 2013

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>	PROJECT 2208: <i>CVN 21</i>
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COST (\$ in Millions)	All Prior Years	FY 2012	FY 2013 [#]	FY 2014 Base	FY 2014 OCO ^{##}	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
2208: <i>CVN 21</i>	800.971	27.168	36.673	31.638	-	31.638	37.297	40.833	40.650	39.234	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0		0	0	0	0	0		

[#] FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012
^{##} The FY 2014 OCO Request will be submitted at a later date

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 support CVN 78 procurement, including, but not limited to engineering support, programmatic and program support, logistics support, modeling and simulation, test and evaluation, manpower and program related studies, and design support systems, such as the Integrated Digital Environment (IDE).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2012	FY 2013	FY 2014
Title: CVN 78 Class Advanced Technology Design & Development	22.954	31.673	21.333
Articles:	0	0	0
Description: - CVN 78 Class Advanced Technology Design & Development: Continue development and transition of technologies to support CVN 78 Class Key Performance Parameters (KPPs): maintain sortie generation rate, reductions in manpower, and further recovery of weight and stability service life margins. Continue design activities to integrate the new technologies, such as the new propulsion plant and Electromagnetic Aircraft Launch System into the ship.			
FY 2012 Accomplishments: Continued design, development and transition of key technologies to support CVN 21 (CVN 78 Class) Key Performance Parameters (KPPs) which include sortie generation rate, reductions in manpower, and further recovery of weight and stability service life margins. Continued design activities to integrate new technologies, such as the new propulsion plant and Electromagnetic Aircraft Launch System into the ship.			
Performed special studies and program management in support of warfare system integration and design. Identified risk mitigation options for a post-delivery installation of warfare systems. Provided an analysis on the changes required to incorporate			

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2012	FY 2013	FY 2014
<p>new systems in the CVN 78 design. Provided structural assessments for possible relocations of antennas which currently have interference issues with the Dual Band Radar (DBR) arrays. Identified options to resolve DBR high power issues. Modified the switchboard hardware design and software to provide the required ship signal interface. Located and provided impact for an Information Assurance solution within existing design parameters. Tested common display within flexible infrastructure design allowing for a single universal mounting option. Developed a Weapons System Explosive Safety Review Board (WSESRB) strategy and path forward, in collaboration with NAVSEA to include completion of a weapon system safety gap analysis to baseline the efforts and to identify shortfalls.</p> <p>FY 2013 Plans: Continue design, development and transition of key technologies to support CVN 21 (CVN 78 Class) Key Performance Parameters (KPPs) which include sortie generation rate, reductions in manpower, and further recovery of weight and stability service life margins. Continue design activities to integrate new technologies, such as the new propulsion plant and Electromagnetic Aircraft Launch System into the ship. Continue existing studies and commence new studies required for integrated warfare system and C4I design, integration, test and validation efforts. Develop and review Pre-Planned Product Improvement (P3I) Technical Data Packages. Continue engineering and technical support of aircraft launch and recovery systems. Develop ship integration side studies to support NAVSEA documented class baseline changes. Continue shipbuilder system and cost engineering support to assess ship impacts from selected Engineering Change Requests (ECRs) and changes to the GFE/CFE equipment split.</p> <p>FY 2014 Plans: Continue design, development and transition of key technologies to support CVN 21 (CVN 78 Class) Key Performance Parameters (KPPs) which include sortie generation rate, reductions in manpower, and further recovery of weight and stability service life margins. Continue design activities to integrate new technologies, such as the new propulsion plant and Electromagnetic Aircraft Launch System into the ship. Continue existing studies and commence new studies required for integrated warfare system and C4I design, integration, test and validation efforts. Develop and review Pre-Planned Product Improvement (P3I) Technical Data Packages. Continue engineering and technical support of aircraft launch and recovery systems. Develop ship integration side studies to support NAVSEA documented class baseline changes. Continue shipbuilder system and cost engineering support to assess ship impacts from selected Engineering Change Requests (ECRs) and changes to the GFE/CFE equipment split.</p>				
Title: CVN 21 - Test & Evaluation (T&E)		4.214	5.000	10.305
		Articles: 0	0	0
Description: - CVN 21 - Test & Evaluation (T&E)				
FY 2012 Accomplishments:				

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)				
Continued to develop the Test and Evaluation Master Plan (TEMP) 1610, Rev C. Continued to collaboratively develop the Commander, Operational Test and Evaluation (COTF) Integrated Evaluation Framework (IEF). Continued to map requirements from the IEF to the test events in the TEMP 1610, Rev C. Continued to update and maintain the Overall Platform Integrated Test Schedule (OP-ITS). Continued to co-chair the Integrated Coordination Team (ICT) efforts to optimize the pre- and post-delivery tests & trials schedule, while identifying and mitigating testing risks. Continued to develop a Full Ship Shock Trial (FSST) Alternative process, concentrating on the analysis of the LPD 19 Model and the comparison of its results with the LPD 19 FSST data. Successfully completed the navigation system risk mitigation testing. Continued to execute Integrated Test-Phase 1 (IT-1), which included: planning the IT-1 Operational Assessment (OA) 1 (formerly OT-B3); conducting the IT-1 OA1 Test Readiness Review (TRR); completing sortie generation rate assessment (SGRA) 11; and setting up for land-based testing at the PEO C4I Test Integration Facility (TIF), the NAVAIR Production Integration Facility (PIF) and the HII-NNS Platform Integration Center (PIC). Continued the spiral development of the Virtual Carrier (VCVN) Model to increase operational fidelity that will support the validation of the SGR key performance parameter (KPP) during Initial Operational Test & Evaluation (IOT&E). Commenced development of the Test and Certification Plan (TCP), which will document the required pre- and post-delivery special tests and certifications, the applicable references and the supporting activities.				
FY 2013 Plans: Complete development of the TEMP 1610, Rev C and route for signature. Complete development of the TCP. Continue updating and maintaining the OP-ITS. Continue to co-chair the ICT, focusing on pre- and post-launch activities. Continue the FSST Alternative process development. Complete IT-1, which includes completing the IT-1 OA 1 (formerly OT-B3) and producing the IT-1 OA Report (IT-1 OAR1). Commence IT-Phase 2, which includes: (1) completing the IT-1 Developmental Test Report (IT-1 DT RPT); PEO C4I TIF testing; and SGRA 12; (2) continuing NAVAIR PIF testing; HII-NNS PIC testing; and spiral development of the VCVN Model to increase operational fidelity that will support the validation of the SGR KPP during IOT&E; and (3) commencing Dual Band Radar (DBR) land-based testing; SGRA 13; and Information Assurance (IA) testing on Contractor-Furnished Equipment (CFE) during PIC testing.				
FY 2014 Plans: Continue updating and maintaining the OP-ITS. Continue to co-chair the ICT, focusing on post-launch activities. Complete the FSST Alternative process development and conduct the FSST Alternative Process Gate Review to gain acceptance of the Process as a technically-feasible and cost-effective alternative to a traditional FSST. Continue IT-Phase 2, which includes: (1) completing IT-2 OA 1; IT-2 OA Report (IT-2 OAR1); SGRA 13; and NAVAIR PIF testing; (2) continuing DBR land-based testing; HII-NNS PIC testing; IA testing on CFE during PIC testing; and spiral development of the VCVN Model to increase operational fidelity that will support the validation of the SGR KPP during IOT&E; and (3) commencing the Radiation Hazard (RADHAZ) assessment; and the Steering Gear industrial testing.				
Accomplishments/Planned Programs Subtotals				
				27.168
				36.673
				31.638

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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u> <u>Base</u>	<u>FY 2014</u> <u>OCO</u>	<u>FY 2014</u> <u>Total</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• RDTEN/0604567N: <i>Project Units 3179, 4007</i>	20.325	13.862	15.572		15.572	20.365	21.315	22.885	20.140	Continuing	Continuing
• RDTEN/0603570N: <i>Propulsion Plant Development (PU 2692)</i>	65.808	62.020	57.499		57.499	56.693	0.000	0.000	0.000	0.000	1,526.874
• SCN/2001: <i>Carrier Replacement Program</i>	554.798	608.195	944.866		944.866	1,834.072	1,918.441	2,539.826	2,954.419	Continuing	Continuing
• SCN/5300: <i>Completion of Prior Year Shipbuilding Programs</i>	0.000	0.000	588.100		588.100	729.000	0.000	0.000	0.000	0.000	1,317.100

Remarks

D. Acquisition Strategy

The CVN 78 is the first ship of the CVN 78 Class of aircraft carriers designed to replace USS ENTERPRISE and the ships of the NIMITZ Class. The CVN 78 will feature a new nuclear propulsion and electrical generation/distribution system, EMALS, advanced arresting gear (AAG) 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 war fighting 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.

E. Performance Metrics

Successfully complete development of TEMP 1610, Rev C and route for signature. Successfully complete all PEO C4I TIF testing. Successfully execute SGRA 12 and SGRA 13. Gain acceptance of the FSST Alternative Process as a technically-feasible and cost-effective alternative to the traditional FSST. Successfully complete the NAVAIR PIF testing and the Consolidated Afloat Networks and Enterprise Services (CANES) testing. Successfully conduct and support feasibility and tradeoff studies and data packages on new and modified shipboard systems, technologies and proposed modification. Data packages shall include information to support program decisions to integrate these efforts into the whole ship design efforts. Successfully conduct IDC shock testing and reporting in order to finalize IDC R&D efforts. Successfully complete Advanced Weapons Elevator Shock and Electromagnetic Interference (EMI) Test qualifications. Successfully complete Plasma Arc Waste Destruction System (PAWDS) Land-Based Test. Successfully create and deliver 21 Decision Memorandums (DM) for Bents/Bays 1-21 on the 03 Level (Gallery Deck) with Layer 31 information. Successfully develop the baseline Technical Data Packages for 39 systems and mature packages in preparation for final GFI arrival.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy **DATE:** April 2013

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Product Development (\$ in Millions)				FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Propulsion Plant Development	SS/CPFF	Bettis:PA	71.627	0.000		0.000		0.000		-		0.000	0.000	71.627	
Propulsion Plant Development	C/CPFF	HII:VA	164.409	0.000		0.000		0.000		-		0.000	0.000	164.409	
Propulsion Plant Development	Various	Miscellaneous:Various	10.562	0.000		0.000		0.000		-		0.000	0.000	10.562	
Propulsion Plant Development	WR	NSWC Carderock:MD	0.050	0.000		0.000		0.000		-		0.000	0.000	0.050	
Advanced Design & Development	C/CPAF	HII:VA	155.748	0.378	Oct 2011	15.041	Nov 2012	7.080	Nov 2013	-		7.080	Continuing	Continuing	Continuing
Advanced Design & Development	WR	NSWC Carderock:MD	73.446	5.012	Oct 2011	4.989	Nov 2012	4.796	Nov 2013	-		4.796	Continuing	Continuing	Continuing
Advanced Design & Development	C/CPFF	SAIC:NM	49.488	0.085	Nov 2011	0.188	Dec 2012	0.196	Dec 2013	-		0.196	Continuing	Continuing	Continuing
Advanced Design & Development	WR	NAWCAD Patuxent River:MD	50.428	3.598	Oct 2011	2.355	Nov 2012	2.099	Nov 2013	-		2.099	Continuing	Continuing	Continuing
Advanced Design & Development	WR	NAWC Lakehurst:NJ	8.249	0.200	Dec 2011	0.000		0.000		-		0.000	0.000	8.449	
Advanced Design & Development	WR	NSWC Dahlgren:VA	26.555	1.938	Oct 2011	1.741	Nov 2012	1.630	Nov 2013	-		1.630	Continuing	Continuing	Continuing
Advanced Design & Development	C/CPAF	Raytheon:VA	33.365	3.229	Oct 2011	3.351	Dec 2012	2.874	Dec 2013	-		2.874	Continuing	Continuing	Continuing
Advanced Design & Development	WR	NSWC Port Hueneme:CA	6.000	0.077	Oct 2011	0.000		0.000		-		0.000	0.000	6.077	
Advanced Design & Development	WR	SPAWAR:CA	10.668	0.622	Oct 2011	0.635	Nov 2012	0.270	Nov 2013	-		0.270	Continuing	Continuing	Continuing
Advanced Design & Development	C/CPFF	NAVSEA Seaport:DC	37.375	4.838	Dec 2011	3.006	Dec 2012	2.030	Dec 2013	-		2.030	Continuing	Continuing	Continuing
Advanced Design & Development	WR	SSC Atlantic:SC	0.122	0.264	Nov 2011	0.000		0.000		-		0.000	0.000	0.386	
Advanced Design & Development	Various	Miscellaneous:Various	39.949	2.713	Oct 2011	0.367	Dec 2012	0.358	Dec 2013	-		0.358	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy **DATE:** April 2013

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Product Development (\$ in Millions)				FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			738.041	22.954		31.673		21.333		0.000		21.333			

Test and Evaluation (\$ in Millions)				FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Developmental Test & Evaluation	C/CPAF	HII:VA	9.821	0.000	Dec 2011	0.341	Nov 2012	1.497	Nov 2013	-		1.497	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	NAWCAD Patuxent River:MD	16.975	1.689	Nov 2011	0.000	Nov 2012	2.405	Nov 2013	-		2.405	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	NSWC Dahlgren:VA	4.147	1.044	Nov 2011	0.000	Nov 2012	0.842	Nov 2013	-		0.842	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	NSWC Carderock:MD	11.028	0.000	Nov 2011	3.321	Nov 2012	1.964	Nov 2013	-		1.964	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	SPAWAR:CA	3.291	0.000	Nov 2011	0.000	Nov 2012	0.517	Nov 2013	-		0.517	Continuing	Continuing	Continuing
Developmental Test & Evaluation	C/CPFF	NAVSEA SeaPort:DC	0.143	0.075	Mar 2012	0.000		0.000		-		0.000	0.000	0.218	
Developmental Test & Evaluation	C/CPAF	Raytheon:VA	2.174	0.499	Dec 2011	0.341	Dec 2012	0.374	Dec 2013	-		0.374	Continuing	Continuing	Continuing
Developmental Test & Evaluation	Various	Miscellaneous:Various	10.328	0.120	Nov 2011	0.000	Dec 2012	0.678	Dec 2013	-		0.678	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	SSC Atlantic:SC	0.319	0.060	Nov 2011	0.000	Nov 2012	0.109	Nov 2013	-		0.109	Continuing	Continuing	Continuing
Operational Test & Evaluation	WR	COMOPTEVFOR:VA	4.429	0.727	Nov 2011	0.997	Dec 2012	1.919	Dec 2013	-		1.919	Continuing	Continuing	Continuing
Subtotal			62.655	4.214		5.000		10.305		0.000		10.305			

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Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy **DATE:** April 2013

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Fiscal Year	2012				2013				2014				2015				2016				2017				2018							
	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								CVN 79 DAB PR ▽																▽								CVN 80 DAB PR MS C ▽
Propulsion Plant																																
EMALS																SDD Complete △																
Advanced Arresting Gear																																
Test & Evaluation Milestones																																
Integrated Test Phases																																
IOT&E Phase C1 (HM&E Systems)																																
IOT&E Phase C2 (Aviation Systems)																																
IOT&E Phase C3 (Warfare Systems)																																
Contract Milestones																																
Construction Contract																																
Full Funding (SCN)																																
Full Funding (SCN)																																

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Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>	PROJECT 2208: <i>CVN 21</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2208				
CVN 79 DAB PR	4	2013	4	2013
CVN 80 DAB PR	4	2017	4	2017
Milestone C	4	2018	4	2018
Propulsion Plant	1	2012	4	2015
EMALS SDD Complete	2	2015	2	2015
AAG TRR 2 (IT)	2	2012	2	2012
Integrated Tests 1 (IT-1)	1	2012	1	2013
Integrated Tests 2 (IT-2)	1	2013	3	2016
Integrated Tests 3 (IT-3)	3	2016	2	2017
Integrated Tests 4 (IT-4)	2	2017	4	2018
Initial Operational Test & Evaluation - Phase 1 (OT-C1)	1	2017	3	2018
Initial Operational Test & Evaluation - Phase 2 (OT-C2)	4	2017	4	2018
Initial Operational Test & Evaluation - Phase C3 (OT-C3)	3	2018	4	2018
CVN 78 Ship Launch	4	2013	4	2013
CVN 78 Ship Delivery	4	2015	4	2015
CVN 78 Initial Operational Capability (IOC)	2	2017	2	2017
CVN 79 Construction Contract Award	4	2013	4	2013
CVN 80 GFE LLTM Contract Award	1	2016	1	2016
CVN 80 Construction Contract Award	1	2018	1	2018
CVN 79 SCN Full Funding	1	2013	4	2018
CVN 80 SCN Full Funding	1	2018	4	2018

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Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy										DATE: April 2013		
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>					R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>				PROJECT 3216.: <i>Tactical Support Center-Integration</i>			
COST (\$ in Millions)	All Prior Years	FY 2012	FY 2013[#]	FY 2014 Base	FY 2014 OCO ^{##}	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
3216.: <i>Tactical Support Center-Integration</i>	14.338	2.060	9.600	4.546	-	4.546	4.660	4.724	4.831	4.901	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0		0	0	0	0	0		

[#] FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

^{##} The FY 2014 OCO Request will be submitted at a later date

A. Mission Description and Budget Item Justification

The CV-TSC program provides increased situational awareness to the Carrier Strike Group (CSG) in support of force protection, primarily in the area of Anti-Submarine Warfare (ASW). Through the integration of off-board sensors with shipboard systems, including data processing and displays, the AN/SQQ-34 is utilized in detecting, classifying, and localizing threats. An integrated element of the Carrier Combat System, the AN/SQQ-34 supports the tactical deployment of embarked ASW and Surface Warfare (SUW) assets (SH-60F and MH-60R helicopters). This project provides the design, development and engineering foundation to refresh legacy AN/SQQ-34 systems on all Carriers and shore sites in support of Fleet introduction and shipboard integration of the MH-60R Multi-Mission Helicopter. Upgrades to legacy systems enable the exchange of sensor, tactical and imagery data with the MH-60R initially, followed by incremental upgrades to support CVN ASW improvements and air integration and efforts.

Additionally, this project will mature the development of low-cost multi-beam Ku-Band planar phased arrays and associated integrated radio systems, and addresses the major cost drivers of planar arrays and their associated radios. This effort will be the first spiral of a major cost reduction effort for multi-beam arrays, with a goal of showing a path to a production cost of less than one third the cost of existing array technologies. This development will produce key integrated components needed to reduce the cost of arrays and will provide prototype multi-beam Ku-Band receiving and transmitting arrays/radios using these components. The effort will also emphasize advances in technologies associated with multi-path interference, scan angle losses and networking waveforms.

(Speed to Fleet) The CV-TSC program provides increased situational awareness to the Carrier Strike Group (CSG) in support of force protection, primarily in the area of Anti-Submarine Warfare (ASW). A portion of this program will focus on maturing low-cost multi-beam Ku-Band planar phased arrays and associated integrated radio systems that will be used to support data links to multiple MH-60Rs. This specific effort will address the need for low cost communications security (COMSEC) devices that are compatible with phased array systems, and that are needed to secure these data links.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

Title: MH-60R Integration Development for CV-TSC	FY 2012	FY 2013	FY 2014
	2.060	7.605	3.570
Articles:	0	0	0
FY 2012 Accomplishments:			
- Completed development of software version 7.0 to include new capabilities: additional MH-60R data exchange support, remote control of MH-60R shipboard data-link, automated acoustic analysis aids, improved Directional Command Active Sonobouy			

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Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy		DATE: April 2013		
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>		R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>		PROJECT 3216.: <i>Tactical Support Center-Integration</i>
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2012	FY 2013	FY 2014
<p>System (DICASS) acoustic processing techniques, transition to Linux operating system, and coordinated replay of tactical and sensor data.</p> <ul style="list-style-type: none"> - Completed interface testing with the MH-60R, Common Data Link System (CDLS), Ship Self-Defense System (SSDS), and Integrated Shipboard Network System (ISNS)/ Global Command and Control System (GCCS). - Completed notional definition of capabilities for software version 8.0. - Obtained Platform Information Technology (PIT) Platform Risk Assessment (PRA) for software version 8.0, providing authority to operate in shipboard environment. - Completed update of Navy Training System Plan (NTSP) and established new Navy Enlisted Classification (NEC) codes for operator and maintainer training of the new variants of the system. <p>FY 2013 Plans:</p> <ul style="list-style-type: none"> - Begin development on software version 8.0 to include: integration of Periscope Detection Radar (PDR) data, common Anti-Submarine Warfare (ASW) air control decision aids, sensor performance prediction tools for MH-60R acoustic sensors, required changes for interoperability with SSDS and CDL, transitioning Science and Technology (S&T) efforts for embedded training and automate sensor analysis aids. - Conduct incremental requirements, design, and test reviews. - Complete Technology Transition Agreement (TTA) between the Office of Naval Research (ONR), OPNAV N980C, and PEO IWS5 for low cost planar arrays to support multiple MH-60R datalinks. <p>FY 2014 Plans:</p> <ul style="list-style-type: none"> - Continue development on software version 8.0 to include: integration of PDR data, common ASW air control decision aids, sensor performance prediction tools for MH-60R acoustic sensors, required changes for interoperability with SSDS and CDL, transitioning S&T efforts for embedded training and automate sensor analysis aids. - Conduct incremental requirements, design, and test reviews. - Complete software and prepare for combat system certification testing. - Define capabilities definition and decompose requirements for software version 9.0. 				
Title: Phased Array COMSEC		0.000	1.995	0.976
			0	0
<p>Description: The CV-TSC program provides increased situational awareness to the Carrier Strike Group (CSG) in support of force protection, primarily in the area of Anti-Submarine Warfare (ASW). A portion of this program will focus on maturing low-cost multi-beam Ku-Band planar phased arrays and associated integrated radio systems that will be used to support data links to multiple MH-60Rs. This specific effort will address the need for low cost communications security (COMSEC) devices that are compatible with phased array systems, and that are needed to secure these data links.</p>				

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Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>	PROJECT 3216.: <i>Tactical Support Center-Integration</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2012	FY 2013	FY 2014
<i>FY 2013 Plans:</i> - Develop low cost COMSEC suitable for use with phased array-based Ku-band data links to MH-60R.			
<i>FY 2014 Plans:</i> - Complete development of low cost COMSEC suitable for use with phased array-based Ku-band data links to MH-60R. - Initiate and complete testing and certification activities associated with COMSEC end units.			
Accomplishments/Planned Programs Subtotals	2.060	9.600	4.546

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u> <u>Base</u>	<u>FY 2014</u> <u>OCO</u>	<u>FY 2014</u> <u>Total</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPN/2176: <i>Undersea Support Equipment (CV-TSC/CDL portion)</i>	15.740	8.348	0.342		0.342	0.361	0.399	0.408	0.415	Continuing	Continuing

Remarks

D. Acquisition Strategy

The CV-TSC acquisition strategy utilizes an incremental development approach that aims to deliver required capability updates on two-year intervals to the fleet. This approach allows required capability to be delivered in a timely manner and provides frequent opportunities to ensure interoperability is synchronized with the Ship Self Defense System (SSDS) Advanced Capability Builds (ACBs). The acquisition strategy places heavy emphasis on the use of open architecture best practices to ensure ease of upgrades and make developed products available to other platforms.

In support of MH-60R, COMSEC development and certification will be conducted under the auspices of the Naval Center for High Assurance Computer Systems at the Naval Research Laboratory (NRL).

E. Performance Metrics

- Successfully complete Preliminary Design Review (PDR) and Critical Design Review (CDR) for MH-60R system upgrade.
 - Successfully field system that supports integration of the MH-60R on the CVN.
 - Utilize Commercial Off-The-Shelf (COTS) based Common Processor/Common Display Systems (CPS/CDS) to minimize Total Ownership Costs (TOC).
- Successfully complete Certification requirements for COMSEC being developed.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy **DATE:** April 2013

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>	PROJECT 3216.: <i>Tactical Support Center-Integration</i>
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Product Development (\$ in Millions)				FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering / H/W & S/W Devel / Integration	WR	NAWC/Pax River:MD	0.000	0.000		0.669	Apr 2013	0.359	Nov 2013	-		0.359	0.000	1.028	
Engineering / H/W & S/W Devel / Integration	WR	NRL:DC	0.000	0.000		0.500	Apr 2013	0.000		-		0.000	0.000	0.500	
Engineering / H/W & S/W Devel / Integration	WR	NSWC/ Carderock:MD	0.000	0.000		0.795	Dec 2012	0.000		-		0.000	0.000	0.795	
Engineering / H/W & S/W Devel / Integration	WR	NSWC/Dahlgren:VA	0.000	0.000		0.500	Apr 2013	0.000		-		0.000	0.000	0.500	
Engineering / H/W & S/W Devel / Integration	WR	NUWC/Keyport:WA	9.583	1.515	Dec 2011	3.090	Nov 2012	2.214	Nov 2013	-		2.214	Continuing	Continuing	Continuing
Engineering / H/W & S/W Devel / Integration	WR	NUWC/Newport:RI	0.000	0.000		0.266	Apr 2013	0.179	Nov 2013	-		0.179	0.000	0.445	
System Eng / S/W Development	C/CPFF	Adaptive Methods:VA	0.300	0.000		0.775	Feb 2013	0.538	Dec 2013	-		0.538	0.000	1.613	
System Eng / S/W Development	C/CPFF	JHU/APL:MD	0.250	0.000		0.000		0.000		-		0.000	0.000	0.250	
System Eng / S/W Development	WR	SPAWAR:CA	3.610	0.000		0.200	Nov 2012	0.000		-		0.000	0.000	3.810	
Engineering / H/W & S/W Development	C/CPFF	VAR*:VAR*	0.000	0.000		0.520	Apr 2013	0.000		-		0.000	0.000	0.520	
Advanced Design & Development	WR	NRL:DC	0.000	0.000		1.995	Nov 2012	0.000		-		0.000	0.000	1.995	
Subtotal			13.743	1.515		9.310		3.290		0.000		3.290			

Remarks
Engineering/H/W & S/W Development/Integration

Test and Evaluation (\$ in Millions)				FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test and Certification	WR	NUWC//Keyport:WA	0.500	0.470	Dec 2011	0.235	Nov 2012	0.225	Nov 2013	-		0.225	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy **DATE:** April 2013

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>	PROJECT 3216.: <i>Tactical Support Center-Integration</i>
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Test and Evaluation (\$ in Millions)				FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Functional and Certification Testing	WR	NRL:DC	0.000	0.000		0.000		0.976	Oct 2013	-		0.976	0.000	0.976	
Subtotal			0.500	0.470		0.235		1.201		0.000		1.201			

Remarks
Testing and Certification

Management Services (\$ in Millions)				FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management Support	C/CPAF	BAE Systems:MD	0.095	0.075	Feb 2012	0.055	Apr 2013	0.055	Dec 2013	-		0.055	Continuing	Continuing	Continuing
Subtotal			0.095	0.075		0.055		0.055		0.000		0.055			

Remarks
N/A

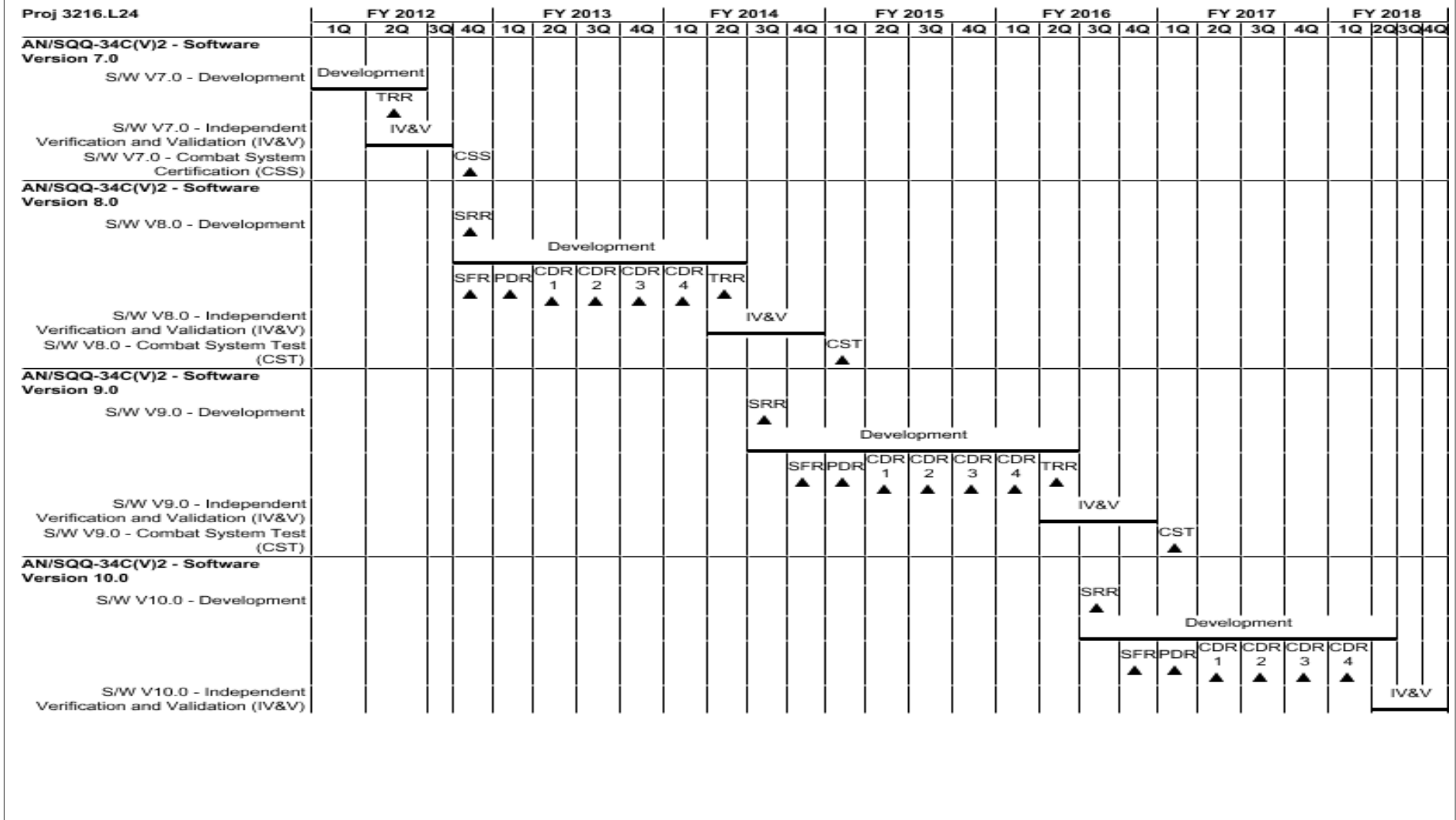
	All Prior Years	FY 2012	FY 2013	FY 2014 Base	FY 2014 OCO	FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	14.338	2.060	9.600	4.546	0.000	4.546			

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy **DATE:** April 2013

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>	PROJECT 3216.: <i>Tactical Support Center-Integration</i>
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Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>	PROJECT 3216.: <i>Tactical Support Center-Integration</i>

2014PB - 0603512N - 3216.L24

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Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy **DATE:** April 2013

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>	PROJECT 3216.: <i>Tactical Support Center-Integration</i>
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Speed to Fleet: COMSEC	FY 2012				FY 2013				FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	
COMSEC Requirement																													
Identify COMSEC Requirement					Requirement																								
COMSEC Design & Development																													
COMSEC Initial Design					Prelim Design																								
COMSEC Detailed Design									Final Design																				
COMSEC Hardware/Software										HW/SW																			
COMSEC Testing																													
COMSEC Functional Testing											HW/SW Functional Test																		
COMSEC Certification Testing													Certification																
COMSEC Reviews																													
COMSEC Initial Design																													
COMSEC Final Design																													

2014PB - 0603512N - 3216.S14

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Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>	PROJECT 3216.: <i>Tactical Support Center-Integration</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3216.L24				
AN/SQQ-34C(V)2 - Software Version 7.0: S/W V7.0 - Development: S/W V7.0 - Development	1	2012	2	2012
AN/SQQ-34C(V)2 - Software Version 7.0: S/W V7.0 - Development: S/W V7.0 - Test Readiness Review (TRR)	2	2012	2	2012
AN/SQQ-34C(V)2 - Software Version 7.0: S/W V7.0 - Independent Verification and Validation (IV&V): IV&V	2	2012	3	2012
AN/SQQ-34C(V)2 - Software Version 7.0: S/W V7.0 - Combat System Certification (CSS): CSS	4	2012	4	2012
AN/SQQ-34C(V)2 - Software Version 8.0: S/W V8.0 - Development: S/W V8.0 - System Requirements Review (SRR)	4	2012	4	2012
AN/SQQ-34C(V)2 - Software Version 8.0: S/W V8.0 - Development: S/W V8.0 - Development	4	2012	2	2014
AN/SQQ-34C(V)2 - Software Version 8.0: S/W V8.0 - Development: S/W V8.0 - System Functional Review (SFR)	4	2012	4	2012
AN/SQQ-34C(V)2 - Software Version 8.0: S/W V8.0 - Development: S/W V8.0 - Preliminary Design Review (PDR)	1	2013	1	2013
AN/SQQ-34C(V)2 - Software Version 8.0: S/W V8.0 - Development: S/W V8.0 - Critical Design Review (CDR) 1	2	2013	2	2013
AN/SQQ-34C(V)2 - Software Version 8.0: S/W V8.0 - Development: S/W V8.0 - Critical Design Review (CDR) 2	3	2013	3	2013
AN/SQQ-34C(V)2 - Software Version 8.0: S/W V8.0 - Development: S/W V8.0 - Critical Design Review (CDR) 3	4	2013	4	2013
AN/SQQ-34C(V)2 - Software Version 8.0: S/W V8.0 - Development: S/W V8.0 - Critical Design Review (CDR) 4	1	2014	1	2014

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Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy **DATE:** April 2013

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>	PROJECT 3216.: <i>Tactical Support Center-Integration</i>
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
AN/SQQ-34C(V)2 - Software Version 8.0: S/W V8.0 - Development: S/W V8.0 - Test Readiness Review (TRR)	2	2014	2	2014
AN/SQQ-34C(V)2 - Software Version 8.0: S/W V8.0 - Independent Verification and Validation (IV&V): IV&V	2	2014	4	2014
AN/SQQ-34C(V)2 - Software Version 8.0: S/W V8.0 - Combat System Test (CST): CST	1	2015	1	2015
AN/SQQ-34C(V)2 - Software Version 9.0: S/W V9.0 - Development: S/W V9.0 - System Requirements Review (SRR)	3	2014	3	2014
AN/SQQ-34C(V)2 - Software Version 9.0: S/W V9.0 - Development: S/W V9.0 - Development	3	2014	2	2016
AN/SQQ-34C(V)2 - Software Version 9.0: S/W V9.0 - Development: S/W V9.0 - System Functional Review (SFR)	4	2014	4	2014
AN/SQQ-34C(V)2 - Software Version 9.0: S/W V9.0 - Development: S/W V9.0 - Preliminary Design Review (PDR)	1	2015	1	2015
AN/SQQ-34C(V)2 - Software Version 9.0: S/W V9.0 - Development: S/W V9.0 - Critical Design Review (CDR) 1	2	2015	2	2015
AN/SQQ-34C(V)2 - Software Version 9.0: S/W V9.0 - Development: S/W V9.0 - Critical Design Review (CDR) 2	3	2015	3	2015
AN/SQQ-34C(V)2 - Software Version 9.0: S/W V9.0 - Development: S/W V9.0 - Critical Design Review (CDR) 3	4	2015	4	2015
AN/SQQ-34C(V)2 - Software Version 9.0: S/W V9.0 - Development: S/W V9.0 - Critical Design Review (CDR) 4	1	2016	1	2016
AN/SQQ-34C(V)2 - Software Version 9.0: S/W V9.0 - Development: S/W V9.0 - Test Readiness Review (TRR)	2	2016	2	2016
AN/SQQ-34C(V)2 - Software Version 9.0: S/W V9.0 - Independent Verification and Validation (IV&V): IV&V	2	2016	4	2016
AN/SQQ-34C(V)2 - Software Version 9.0: S/W V9.0 - Combat System Test (CST): CST	1	2017	1	2017

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Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy			DATE: April 2013		
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>		R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>		PROJECT 3216.: <i>Tactical Support Center-Integration</i>	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
AN/SQQ-34C(V)2 - Software Version 10.0: S/W V10.0 - Development: S/W V10.0 - System Requirements Review (SRR)		3	2016	3	2016
AN/SQQ-34C(V)2 - Software Version 10.0: S/W V10.0 - Development: S/W V10.0 - Development		3	2016	2	2018
AN/SQQ-34C(V)2 - Software Version 10.0: S/W V10.0 - Development: S/W V10.0 - System Functional Review (SFR)		4	2016	4	2016
AN/SQQ-34C(V)2 - Software Version 10.0: S/W V10.0 - Development: S/W V10.0 - Preliminary Design Review (PDR)		1	2017	1	2017
AN/SQQ-34C(V)2 - Software Version 10.0: S/W V10.0 - Development: S/W V10.0 - Critical Design Review (CDR) 1		2	2017	2	2017
AN/SQQ-34C(V)2 - Software Version 10.0: S/W V10.0 - Development: S/W V10.0 - Critical Design Review (CDR) 2		3	2017	3	2017
AN/SQQ-34C(V)2 - Software Version 10.0: S/W V10.0 - Development: S/W V10.0 - Critical Design Review (CDR) 3		4	2017	4	2017
AN/SQQ-34C(V)2 - Software Version 10.0: S/W V10.0 - Development: S/W V10.0 - Critical Design Review (CDR) 4		1	2018	1	2018
AN/SQQ-34C(V)2 - Software Version 10.0: S/W V10.0 - Independent Verification and Validation (IV&V): IV&V		2	2018	4	2018
Speed to Fleet: COMSEC					
COMSEC Requirement: Identify COMSEC Requirement: COMSEC Requirement		1	2013	1	2013
COMSEC Design & Development: COMSEC Initial Design: Preliminary Design		1	2013	2	2013
COMSEC Design & Development: COMSEC Detailed Design: Final Design		2	2013	3	2013
COMSEC Design & Development: COMSEC Hardware/Software: Hardware/Software Completion		3	2013	4	2013
COMSEC Testing: COMSEC Functional Testing: Hardware/Software Functional Testing		1	2014	1	2014
COMSEC Testing: COMSEC Certification Testing: Formal Certification Testing		2	2014	4	2014
COMSEC Reviews: COMSEC Initial Design: Initial Design Review		1	2013	1	2013

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Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy **DATE:** April 2013

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>	PROJECT 3216.: <i>Tactical Support Center-Integration</i>
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
COMSEC Reviews: COMSEC Final Design: Final Design Review	2	2013	2	2013

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Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy **DATE:** April 2013

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>	PROJECT 4004: <i>EMALS</i>
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COST (\$ in Millions)	All Prior Years	FY 2012	FY 2013 [#]	FY 2014 Base	FY 2014 OCO ^{##}	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
4004: <i>EMALS</i>	694.848	30.995	60.861	43.003	-	43.003	2.443	2.507	0.000	0.000	0.000	834.657
Quantity of RDT&E Articles	0	0	0	0		0	0	0	0	0		

[#] FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012
^{##} The FY 2014 OCO Request will be submitted at a later date

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, as well as Engineering and Life Cycle System (E&LCS) design. The Electromagnetic Aircraft Launch System (EMALS) will be the aircraft catapult for CVN 78 Class ships. 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.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2012	FY 2013	FY 2014
Title: EMALS	30.995	60.861	43.003
Articles:	0	0	0
Description: EMALS			
FY 2012 Accomplishments:			
(1) EMALS System Development and Demonstration (SDD) Phase - Transition to Test and Evaluation phase. Continued shipboard representative system development, testing and risk mitigation efforts including: 1) Highly Accelerated Life Testing (HALT) of trough components; 2) High Cycle Testing (HCT) of power equipment; 3) Full Scale Catapult System Functional Demonstration (SFD); 4) Aircraft Compatibility Testing (ACT) Phase I; 5) Site re-configuration to support further risk mitigation testing for shared Energy Storage Subsystem (ESS) and Shared Inverter Testing; 6) Electromagnetic Interference (EMI) tests; 7) Shock and Vibration of the EMALS Control and Instrumentation Unit, Cable Disconnect Unit and Large Capacity Deck Simulation Fixture; 8) Humidity, Harmonics and Thermal Performance Testing of the Transformer/Rectifier and General Environment Testing of various other EMALS components. Continued and completed EMALS Integrated Logistics Support (ILS) Development tasks under the SDD contract.			
(2) EMALS ILS Development Order against the EMALS Basic Ordering Agreement (BOA) with General Atomics - Developed and released the Request for Proposal, conducted Technical and Cost Evaluations against contractor proposals, entered formal negotiations for a 4Q FY12 Award.			
FY 2013 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy		DATE: April 2013		
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>		R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>		PROJECT 4004: <i>EMALS</i>
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)				FY 2012
<p>EMALS SDD - Conduct and complete Shared ESS Testing, Shared Inverter Testing and ACT Phase 2 at the SFD site and perform shipboard risk mitigation testing prior to conducting multiple ESS motor generators feeding multiple launchers onboard ship. The shared Inverter testing will execute no load and deadload launches with Inverters in a shipboard master/two slave configuration vice the SFD master/one slave configuration that has already been demonstrated. Complete ACT Phase 2 requirements verification testing at SFD requiring aircraft launches as well as development of the aircraft launch bulletins for shipboard operations. Continue Environmental Qualification Testing of EMALS components including the completion of General Environment Tests and EMI Susceptibility Tests.</p> <p>(2) EMALS BOA ILS Order - Continue the execution of the EMALS ILS Development Program. Conduct annual Logistics Reviews, Training In Process Reviews (IPRs) and Organizational and Intermediate (O & I) Technical Manual IPRs. Develop or update Failure Mode Effectiveness and Criticality Analyses (FMECA), the Logistics Management Information (LMI) Database, Reliability-Centered Maintenance (RCM) Analyses, Calibration Analysis, Calibration/Measurements Requirements Summary / Instrument Calibration Procedures (CMRS/ICP), Manpower Analyses, O&I Maintenance Plans, Task Analyses/Narratives, Provisioning Documentation, Post Production Support Planning/ Diminishing Manufacturing Sources & Material Shortages (PPSP/ DMSMS) Screening and Analyses, and Support Equipment Identification and Technical Data. Continue to develop and complete O&I Level Interactive Electronic Technical Manuals for both the Operators and Maintainers. Continue to develop Training Documents and the Navy Formal Training Course. Develop the Maintenance Demonstration (M-Demo) Plan, Shipboard Facility Requirements Document (FRD) and the Training FRD.</p> <p>FY 2014 Plans: EMALS SDD - Conduct full system and risk mitigation testing at the SFD site by completing Repeated Cycles with Deadload Testing and Gap Variation Tests. Run multiple Cycles with Deadloads to bring the EMALS system up to 4000 deadload launches as part of the reliability growth Program. Perform Gap Variation Tests to simulate shipboard variations in the Launch Motor Subsystem gap at the SFD site as a shipboard risk mitigation.</p> <p>(2) EMALS BOA ILS Order - Continue the execution of the EMALS ILS Development Program. Conduct annual Logistics Reviews, Training IPR and O & I Level Technical Manual IPRs. Based on the development and availability of Engineering source data for each of the six EMALS subsystems and allocated resources, develop or update FMECAs, LMI Database, CMRS/ ICP, Manpower Analyses, O&I Maintenance Plans, Provisioning Documentation, PPSP/DMSMS Screening and Analyses, and Support Equipment Identification and Technical Data. Continue to develop Training Documents, the Navy Formal Training Course and conduct Pre-Commissioning Unit Training. Conduct the M-Demo at the SFD facility. Complete the Shipboard FRD and the Training FRD.</p>				FY 2013
				FY 2014
Accomplishments/Planned Programs Subtotals				30.995
				60.861
				43.003

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Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy **DATE:** April 2013

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>	PROJECT 4004: <i>EMALS</i>
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u> <u>Base</u>	<u>FY 2014</u> <u>OCO</u>	<u>FY 2014</u> <u>Total</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• RDTEN/0604567N: <i>Project Units 3179, 4007</i>	20.325	13.862	15.572		15.572	20.365	21.315	22.885	20.140	Continuing	Continuing
• RDTEN/0603570N: <i>Propulsion Plant Development (PU 2692)</i>	65.808	62.020	57.499		57.499	56.693	0.000	0.000	0.000	0.000	1,526.874
• SCN/2001: <i>Carrier Replacement Program</i>	554.798	608.195	944.866		944.866	1,834.072	1,918.441	2,539.826	2,954.419	Continuing	Continuing
• SCN/5300: <i>Completion of Prior Year Shipbuilding Programs</i>	0.000	0.000	588.100		588.100	729.000	0.000	0.000	0.000	0.000	1,317.100

Remarks

D. Acquisition Strategy

The CVN 78 is the first ship of the CVN 78 Class of aircraft carriers designed to replace USS ENTERPRISE and the ships of the NIMITZ Class. The CVN 78 will feature a new nuclear propulsion and electrical generation/distribution system, new electromagnetic aircraft launching system (EMALS), advanced arresting gear (AAG) 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 war fighting 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.

E. Performance Metrics

Successfully complete Highly Accelerated Life Test (HALT) Phase II. Successfully complete System Functional Demonstration (SFD) testing. Successfully complete Environmental Qualification Testing (EQT). Successfully complete Shipset Controls Lab testing.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy **DATE:** April 2013

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>	PROJECT 4004: <i>EMALS</i>
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Product Development (\$ in Millions)				FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Aircraft Launch, Recovery & Support	C/CPAF	Northrop Grumman:VA	86.673	0.000		0.000		0.000		-		0.000	0.000	86.673	
Aircraft Launch, Recovery & Support	C/CPAF	General Atomics (PDRR):CA	82.719	0.000		0.000		0.000		-		0.000	0.000	82.719	
Aircraft Launch, Recovery & Support	C/CPAF	General Atomics (SDD):CA	390.728	16.698	Dec 2011	23.861	Dec 2012	22.203	Dec 2013	-		22.203	0.000	453.490	408.301
Aircraft Launch, Recovery & Support	C/CPFF	General Atomics (BOA):CA	0.000	4.000	Aug 2012	21.300	Nov 2012	15.000	Nov 2013	-		15.000	0.000	40.300	
Aircraft Launch, Recovery & Support	WR	NAWC Lakehurst:NJ	44.704	0.000		0.000		0.000		-		0.000	0.000	44.704	
Aircraft Launch, Recovery & Support	C/CPAF	HIINC:VA	3.126	0.000		0.000		0.000		-		0.000	0.000	3.126	
Aircraft Launch, Recovery & Support	C/CPAF	General Atomics (SDD) - Award Fee:CA	14.253	0.000		0.000		0.000		-		0.000	0.000	14.253	14.253
Subtotal			622.203	20.698		45.161		37.203		0.000		37.203	0.000	725.265	

Test and Evaluation (\$ in Millions)				FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Aircraft Launch, Recovery & Support	WR	NAWC Lakehurst:NJ	72.346	10.297	Dec 2011	15.700	Dec 2012	5.800	Dec 2013	-		5.800	0.000	104.143	
Subtotal			72.346	10.297		15.700		5.800		0.000		5.800	0.000	104.143	

Management Services (\$ in Millions)				FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Defense Acquisition Workforce	Various	Not Specified:Not Specified	0.299	0.000		0.000		0.000		-		0.000	0.000	0.299	

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Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy **DATE:** April 2013

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>	PROJECT 4004: <i>EMALS</i>
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Fiscal Year	2012				2013				2014				2015				2016				2017				2018			
	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								CVN 79 DAB PR ▽																▽				CVN 80 DAB PR MS C ▽
Propulsion Plant																												
EMALS															SDD Complete △													
Advanced Arresting Gear		TRR 2 △																										
Test & Evaluation Milestones																												
Integrated Test Phases			IT-1								IT-2									IT-3							IT-4	
IOT&E Phase C1 (HM&E Systems)																												
IOT&E Phase C2 (Aviation Systems)																												
IOT&E Phase C3 (Warfare Systems)																												
Contract Milestones																												
Construction Contract																												
Full Funding (SCN)																												
Full Funding (SCN)																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>	PROJECT 4004: <i>EMALS</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 4004				
CVN 79 DAB PR	4	2013	4	2013
CVN 80 DAB PR	4	2017	4	2017
Milestone C	4	2018	4	2018
Propulsion Plant	1	2012	4	2015
EMALS SDD Complete	2	2015	2	2015
AAG TRR 2 (IT)	2	2012	2	2012
Integrated Tests 1 (IT-1)	1	2012	1	2013
Integrated Tests 2 (IT-2)	1	2013	3	2016
Integrated Tests 3 (IT-3)	3	2016	2	2017
Integrated Tests 4 (IT-4)	2	2017	4	2018
Initial Operational Test & Evaluation - Phase 1 (OT-C1)	1	2017	3	2018
Initial Operational Test & Evaluation - Phase 2 (OT-C2)	4	2017	4	2018
Initial Operational Test & Evaluation - Phase 3 (OT-C3)	3	2018	4	2018
CVN 78 Ship Launch	4	2013	4	2013
CVN 78 Ship Delivery	4	2015	4	2015
CVN 78 Ship Initial Operational Capability (IOC)	2	2017	2	2017
CVN 79 Construction Contract Award	4	2013	4	2013
CVN 80 GFE LLTM Contract Award	1	2016	1	2016
CVN 80 Construction Contract Award	1	2018	1	2018
CVN 79 SCN Full Funding	1	2013	4	2018
CVN 80 SCN Full Funding	1	2018	4	2018

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Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy **DATE:** April 2013

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>	PROJECT 4005: <i>In-Service Carrier Systems Development</i>
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COST (\$ in Millions)	All Prior Years	FY 2012	FY 2013 [#]	FY 2014 Base	FY 2014 OCO ^{##}	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
4005: <i>In-Service Carrier Systems Development</i>	15.833	1.686	1.737	4.715	-	4.715	4.795	2.817	1.863	1.887	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0		0	0	0	0	0		

[#] FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

^{##} The FY 2014 OCO Request will be submitted at a later date

Note

A portion of this effort in FY 2014 (\$3.0 million) is classified. Details are available at a higher classification level.

A. Mission Description and Budget Item Justification

The In-Service Carrier Systems 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 the Ship Control System Governor Software Development, Tank Preservation, Uninterruptible Power Supply (UPS) Replacements, Advanced Damage Control System (ADCS), Weapons Elevator Control Accumulator Replacement, and the Integrated Condition Assessment System. Demonstration technologies include Advanced Damage Control System (ADCS) software improvements, A/C Plant Model, Input/Output Controller (IOC) Replacement, Fleet Wireless Personal digital Assistant (PDA), Weapons Elevator Laser Positioning System, Legacy Steering Interface upgrades, CVN Integrated Topside Design (ITD) location option evaluation tools, Antenna to Antenna coupling analysis tools. Wireless systems, smart sensors, lighting systems, 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 including the following: Integrated Bridge control Data Logger, C4I Network Performance Modeling and Analysis, NCDS Packet Filtering Device, Network Data Logger Device, Portable Communication System (PCS) proof of concept, Ship Control System (SCS) Onboard trainer, Universal Portable Command and Control Unit (PCCU). Additionally there is a classified project starting in FY14.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2012	FY 2013	FY 2014
Title: In-Service Carrier Systems Development	1.686	1.737	1.715
Articles:	0	0	0
FY 2012 Accomplishments: Continued support to technologies with modifications, upgrades and development of systems and software support of In-Service aircraft carrier modernization initiatives.			
FY 2013 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy		DATE: April 2013		
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>		R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>		PROJECT 4005: <i>In-Service Carrier Systems Development</i>
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2012	FY 2013	FY 2014
Continue support to technologies with modifications, upgrades and development of systems and software support of In-Service aircraft carrier modernization initiatives. FY 2014 Plans: Continue support to technologies with modifications, upgrades and development of systems and software support of In-Service aircraft carrier modernization initiatives.				
Title: Classified Effort		0.000	0.000	3.000
FY 2014 Plans: N/A		Articles:		0
Accomplishments/Planned Programs Subtotals		1.686	1.737	4.715
C. Other Program Funding Summary (\$ in Millions) N/A				
Remarks				
D. Acquisition Strategy Investigate, demonstrate, and implement available technologies to deliver a robust, operator-friendly automation control environment for Navy Aircraft Carrier shipboard equipment to reduce workload, manpower requirements, and Total Ownership Costs (TOC).				
E. Performance Metrics Successfully complete Ship Control System Governor Software Development, AC Plant Model Capacity Optimization, Uninterruptible Power Supply (UPS) Replacements, Advanced Damage Control System (ADCS) Software Improvements, Automatic Fire Sensing and Suppression System/Flooding and Casualty Control Software (AFSSS/FCCS) Software Development Test, Input/Output Controller (IOC) replacement demonstration, Tank Preservation models, Weapons Elevator Laser Positioning demonstration, Legacy Steering Interface Upgrades, CVN Integrated Topside Design (ITD) location option evaluation tool development, Antenna to Antenna coupling analysis tool development, Universal Portable Command and Control Unit (PCCU) development, Ship Control System (SCS) Trainer, Integrated Bridge Control Data Logger, Weapons Elevator Control Accumulator Replacement, and C4I Network Performance Requirements Modeling and Analysis.				

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy **DATE:** April 2013

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>	PROJECT 4005: <i>In-Service Carrier Systems Development</i>
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Product Development (\$ in Millions)				FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Ship Integration	WR	NAVSEA:Phil	1.112	0.115	Nov 2011	0.187	Nov 2012	0.245	Nov 2013	-		0.245	0.000	1.659	
Ship Integration	WR	NAVSEA:Dahlgren	0.060	0.090	Nov 2011	0.031	Nov 2012	0.000		-		0.000	0.000	0.181	
Classified effort	WR	Classified:Classified	0.000	0.000		0.000		1.500	Nov 2013	-		1.500	0.000	1.500	
Subtotal			1.172	0.205		0.218		1.745		0.000		1.745	0.000	3.340	

Support (\$ in Millions)				FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Software Development	WR	NAVSEA:Phil	6.616	0.240	Nov 2011	0.341	Nov 2012	0.413	Nov 2013	-		0.413	0.000	7.610	
Program Management Support	WR	NAVSEA:Phil	2.218	0.188	Nov 2011	0.221	Nov 2012	0.225	Nov 2013	-		0.225	0.000	2.852	
Training Development	WR	NAVSEA:Phil	0.652	0.093	Nov 2011	0.166	Nov 2012	0.174	Nov 2013	-		0.174	0.000	1.085	
Integrated Logistics Support	WR	NAVSEA:Phil	1.160	0.068	Nov 2011	0.102	Nov 2012	0.109	Nov 2013	-		0.109	0.000	1.439	
Software Development	WR	NAVSEA:Dahlgren	0.115	0.140	Nov 2011	0.068	Nov 2012	0.000		-		0.000	0.000	0.323	
Program Management Support	WR	NAVSEA:Dahlgren	0.150	0.120	Nov 2011	0.047	Nov 2012	0.000		-		0.000	0.000	0.317	
Subtotal			10.911	0.849		0.945		0.921		0.000		0.921	0.000	13.626	

Test and Evaluation (\$ in Millions)				FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Developmental Test & Evaluation	WR	SPAWAR:Atlantic	0.000	0.214	Dec 2011	0.200	Nov 2012	0.061	Nov 2013	-		0.061	0.000	0.475	
Classified effort	WR	Classified:Classified	0.000	0.000		0.000		1.500	Nov 2013	-		1.500	0.000	1.500	
Developmental Test & Evaluation	WR	NAVSEA:Phil	3.692	0.268	Nov 2011	0.343	Nov 2012	0.488	Nov 2013	-		0.488	Continuing	Continuing	Continuing

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Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy **DATE:** April 2013

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>	PROJECT 4005: <i>In-Service Carrier Systems Development</i>
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FY 2012				FY 2013				FY 2014				FY 2015				FY 2016				FY 2017				FY 2018			
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

	FY 2012				FY 2013				FY 2014				FY 2015				FY 2016				FY 2017				FY 2018			
Proj 4005																												
IOC Replacement: IOC Replacement																												
Tank Preservation: Tank Preservation																												
UPS Replacements: UPS Replacements																												
Legacy Steering Interface Upgrade: Legacy Steering Interface Upgrade																												
CVN Integrated Topside Design location option evaluation tool: CVN Integrated Topside Design location option evaluation tool																												
Antenna to Antenna coupling analysis tool: Antenna to Antenna coupling analysis tool																												
Integrated Bridge Control Data Logger: Integrated Bridge Control Data Logger																												
Weapons Elevator control accumulator replacement: Weapons Elevator control accumulator replacement																												
C4I Networks performance requirements modeling and analysis: C4I Networks performance requirements modeling and analysis																												
NCDS Packet Filtering Device: NCDS Packet Filtering Device																												
Network Data Logger Device: Network Data Logger Device																												
PCS proof of concept: PCS proof of concept																												
Universal PCCU: Universal PCCU																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy **DATE:** April 2013

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>	PROJECT 4005: <i>In-Service Carrier Systems Development</i>
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	FY 2012				FY 2013				FY 2014				FY 2015				FY 2016				FY 2017				FY 2018			
	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
SCS Onboard trainer: SCS Onboard trainer																												
Integrated Condition Assessment System SE Improvements: Integrated Condition Assessment System SE Improvements																												
Classified Item: Classified Item																												
Chlorinator/Dechlorinator Reliability Improvements: Chlorinator/Dechlorinator Reliability Improvements																												
Portable Navigation/Ship Control Data Analyzer: Portable Navigation/Ship Control Data Analyzer																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>	PROJECT 4005: <i>In-Service Carrier Systems Development</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 4005				
IOC Replacement: IOC Replacement	1	2012	4	2013
Tank Preservation: Tank Preservation	1	2012	2	2013
UPS Replacements: UPS Replacements	1	2012	1	2012
Legacy Steering Interface Upgrade: Legacy Steering Interface Upgrade	1	2012	2	2015
CVN Integrated Topside Design location option evaluation tool: CVN Integrated Topside Design location option evaluation tool	1	2012	4	2013
Antenna to Antenna coupling analysis tool: Antenna to Antenna coupling analysis tool	1	2012	4	2013
Integrated Bridge Control Data Logger: Integrated Bridge Control Data Logger	2	2012	3	2014
Weapons Elevator control accumulator replacement: Weapons Elevator control accumulator replacement	1	2012	2	2013
C4I Networks performance requirements modeling and analysis: C4I Networks performance requirements modeling and analysis	1	2012	4	2014
NCDS Packet Filtering Device: NCDS Packet Filtering Device	2	2013	3	2015
Network Data Logger Device: Network Data Logger Device	2	2013	3	2015
PCS proof of concept: PCS proof of concept	2	2013	4	2015
Universal PCCU: Universal PCCU	1	2012	4	2014
SCS Onboard trainer: SCS Onboard trainer	1	2012	4	2014
Integrated Condition Assessment System SE Improvements: Integrated Condition Assessment System SE Improvements	3	2014	2	2017
Classified Item: Classified Item	1	2014	4	2017
Chlorinator/Dechlorinator Reliability Improvements: Chlorinator/Dechlorinator Reliability Improvements	1	2016	2	2018

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Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy **DATE:** April 2013

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603512N: <i>Carrier Systems Development</i>	PROJECT 4005: <i>In-Service Carrier Systems Development</i>
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Portable Navigation/Ship Control Data Analyzer: Portable Navigation/Ship Control Data Analyzer	2	2016	4	2018