

**UNCLASSIFIED**

**Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy** **DATE:** February 2010

<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>
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COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
Total Program Element	178.095	175.823	93.830	0.000	93.830	65.502	52.306	50.878	52.513	Continuing	Continuing
2208: <i>CVN 21</i>	61.701	57.303	33.278	0.000	33.278	38.383	40.777	41.764	42.660	6,869.600	7,992.261
3216: <i>Tactical Support Center-Integration</i>	0.000	5.133	8.583	0.000	8.583	2.349	5.067	4.002	5.199	Continuing	Continuing
3217: <i>KU-Band Common Data Link</i>	0.000	14.502	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.502
4004: <i>EMALS</i>	87.284	94.143	50.341	0.000	50.341	22.999	4.670	3.274	2.775	Continuing	Continuing
4005: <i>Smart Carrier</i>	1.585	1.794	1.628	0.000	1.628	1.771	1.792	1.838	1.879	Continuing	Continuing
9999: <i>Congressional Adds</i>	27.525	2.948	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	39.731

**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)(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.
  
- (U)(3216) - Development of block upgrades of 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 will enable exchange of sensor, tactical and imagery data with the MH-60R initially and eventually with P-8 and Broad Area Maritime Surveillance (BAMS) aircraft.

**UNCLASSIFIED**

R-1 Line Item #34

Page 1 of 42

**UNCLASSIFIED**

<b>Exhibit R-2, RDT&amp;E Budget Item Justification: PB 2011 Navy</b>		<b>DATE:</b> February 2010
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	
<p>- (U)(3217) - Development of multi-mission shipboard high data rate Ku-Band data link between the embarked air assets and the Carrier combat system, enabling exchange of sensor, tactical and imagery data initially with the MH-60R Multi Mission Helicopter. It also provides capability for on-the-deck mission synchronization with MH-60R. Eventually, the KU-band data link will support other Ku-Band equipped aircraft, including the P-8 and Broad Area Maritime Surveillance (BAMS). This effort will provide the Carrier with the capability to support multiple aircraft simultaneously on different missions, and completing the Kill Chain by linking sensor platform to sensor controllers and the ASW/SUW warfare commanders.</p> <p>- (U)(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.</p> <p>- (U)(4005) - The Smart Carrier Demonstration and Validation program exploits available technologies to deliver an affordable, robust, operator-friendly automation control environment for Navy Aircraft Carrier shipboard equipment. The program provides the system architecture, requirements/specification development, technology selection, software development (including software baseline), as well as land-based and shipboard testing of new technologies to improve shipboard operations and to reduce workload, manpower requirements, and Total Ownership Costs (TOC).</p> <p>- (U)(9B58A) - Funding will be used to continue ongoing corrosion testing at Ocean City Research Testing facility in NJ. Various coupons and coatings have been exposed up to 7 months now and will continue to be evaluated over the next three years of exposure under simulated flight deck conditions. The funding will also be used to initiate phase 2 study into the development of a corrosion inhibitor addition to the armature cooling to extend the armatures life. Phase one identified several candidates which look promising. The remainder of the funds will be utilized to interrogate and document the material properties of the alloys selected for use on EMALS. Fatigue and fracture data will be compiled under the unique conditions of the EMALS for the in-service support of the EMALS system.</p> <p>- (U) (9D23A) - Funds will be used to incorporate National Sensors data into a fusion engine in order to provide a complete and accurate Common Tactical Picture (CTP) of the surface and subsurface threat environment to the at-sea Warfare Commanders. The National Sensor Fusion Configuration Item (NSFCI), as an integral part of the Undersea Warfare</p>		

**UNCLASSIFIED**

R-1 Line Item #34

Page 2 of 42

**UNCLASSIFIED**

**Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy** **DATE:** February 2010

<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>
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Decision Support System (USW-DSS - AN/UYQ-100), has demonstrated the capability to collect and integrate a wide variety of disparate geospatial and sensor data, to fuse the available data sources into real time vessel tracks and to provide military commanders with the CTP they need to support critical battle-space decisions. The NSF for Puget Sound Port Security (PSPS) is being developed as an application within the Service Oriented Architecture (SOA) of USW-DSS.

- (U) (9D24A) - 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.

- (U) 10C098 - Develop and validate a full scale composite aircraft carrier topside structure, providing a lightweight fragmentation/structural/fire integrated technology solution that can meet/exceed current performance requirements while reducing costs.

**B. Program Change Summary (\$ in Millions)**

	<b><u>FY 2009</u></b>	<b><u>FY 2010</u></b>	<b><u>FY 2011 Base</u></b>	<b><u>FY 2011 OCO</u></b>	<b><u>FY 2011 Total</u></b>
Previous President's Budget	147.205	173.594	0.000	0.000	0.000
Current President's Budget	178.095	175.823	93.830	0.000	93.830
Total Adjustments	30.890	2.229	93.830	0.000	93.830
• Congressional General Reductions		-0.731			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		2.960			
• Congressional Directed Transfers		0.000			
• Reprogrammings	33.629	0.000			
• SBIR/STTR Transfer	-2.739	0.000			
• Program Adjustments	0.000	0.000	93.830	0.000	93.830

**Congressional Add Details (\$ in Millions, and Includes General Reductions)**

**Project:** 9999: *Congressional Adds*

Congressional Add: *Composite Mast for CVNs*

Congressional Add: *IMPROVED CORROSION PROTECTION FOR ELECTROMAGNETIC*

Congressional Add: *National Sensor Fusion Support for Puget Sound Por*

	<b><u>FY 2009</u></b>	<b><u>FY 2010</u></b>
	0.000	2.948
	1.995	0.000
	1.596	0.000

**UNCLASSIFIED**

R-1 Line Item #34

Page 3 of 42

**UNCLASSIFIED**

**Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy** **DATE:** February 2010

**APPROPRIATION/BUDGET ACTIVITY**  
 1319: *Research, Development, Test & Evaluation, Navy*  
 BA 4: *Advanced Component Development & Prototypes (ACD&P)*

**R-1 ITEM NOMENCLATURE**  
 PE 0603512N: *Carrier Systems Development*

**Congressional Add Details (\$ in Millions, and Includes General Reductions)**

Congressional Add: *EMALS*

Congressional Add Subtotals for Project: 9999

Congressional Add Totals for all Projects

FY 2009	FY 2010
23.934	0.000
27.525	2.948
27.525	2.948

**Change Summary Explanation**

Technical: Not applicable.

Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

**UNCLASSIFIED**

**UNCLASSIFIED**

**Exhibit R-2A, RDT&E Project Justification:** PB 2011 Navy **DATE:** February 2010

<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	<b>PROJECT</b> 2208: <i>CVN 21</i>
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COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2208: <i>CVN 21</i>	61.701	57.303	33.278	0.000	33.278	38.383	40.777	41.764	42.660	6,869.600	7,992.261
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

**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, manpower and program related studies, and design support systems, such as the Integrated Digital Environment (IDE).

**B. Accomplishments/Planned Program (\$ in Millions)**

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
CVN 21 Advanced Technology Design & Development - (U) CVN 21 Advanced Technology Design & Development: Continue development and transition of technologies to support CVN 21 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.	46.528	49.271	24.403	0.000	24.403

**UNCLASSIFIED**

R-1 Line Item #34

Page 5 of 42





**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2011 Navy							<b>DATE:</b> February 2010				
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>			<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>			<b>PROJECT</b> 2208: <i>CVN 21</i>					
<b>B. Accomplishments/Planned Program (\$ in Millions)</b>											
							<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011 Base</b>	<b>FY 2011 OCO</b>	<b>FY 2011 Total</b>
for DT-B2i Net-Ready / Interoperability event. Finalize WS TE&C Plan for signature. Finalize Dynamic System Mechanics Advanced Simulation (DYSMAS) accreditation. Conduct WIPT meetings.  <i>FY 2011 Base Plans:</i> Complete OT-B3 and continue DT-B2 T&E planning efforts. Plan / execute alternative to fulfill the requirements of the FSST. Continue planning for and execute DT-B2i Net-Ready / Interoperability event. Commence DT on NAVAIR and C4I equipment and sensors to define and implement interoperability testing to support JITC certification. Continue collaboration with the various working groups, COMOPTEVFOR, and DOT&E to ensure requirements are met for planning of PDT&T. Continue planning / execution of SGR M&S improvements to the VCVN Model to ensure COMOPTEVFOR IOT&E requirements are met. Continue Topside E3 risk evaluation and testing.											
Defense Acquisition Workforce Fund (DAWF)  <i>FY 2009 Accomplishments:</i> Funded Defense Acquisition Workforce Fund							0.275	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals							61.701	57.303	33.278	0.000	33.278
<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011 Base</b>	<b>FY 2011 OCO</b>	<b>FY 2011 Total</b>	<b>FY 2012</b>	<b>FY 2013</b>	<b>FY 2014</b>	<b>FY 2015</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• BLI 200100: <i>Carrier Replacement Program</i>	3,915.642	1,219.927	2,639.569	0.000	2,639.569	494.823	2,418.293	3,386.556	2,284.498	Continuing	Continuing
<b>D. Acquisition Strategy</b>											
The CVN 78 will be 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, advanced arresting gear system, all electric auxiliaries,											

**UNCLASSIFIED**

**UNCLASSIFIED**

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<p>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.</p> <p><b>E. Performance Metrics</b></p> <p>Successfully complete Developmental Test - B2 (DT-B2) Net Ready / Interoperability Event. Successfully complete Operational Test - B3 (OT-B3). Successfully complete Operational Test (OT) Report. Successfully complete Operational Test Readiness Review (OTRR). 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. Successful conduct IDC shock testing and reporting in order to finalize IDC R&amp;D efforts. Successfully complete Advanced Weapons Elevator Shock and EMI Test qualifications. Successfully complete PLASMA ARC Waste Destruction System 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. This effort includes comment and adjudication for each ODWG delivered DM. Successfully develop the baseline Technical Data Packages for 39 systems and mature packages in preparation for final GFI arrival.</p>		

**UNCLASSIFIED**

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2011 Navy</b>										<b>DATE: February 2010</b>			
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>				<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>				<b>PROJECT</b> 2208: <i>CVN 21</i>					

**Product Development (\$ in Millions)**

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Propulsion Plant Development	SS/CPFF	Bettis PA	71.627	0.000		0.000		0.000		0.000	0.000	71.627	Continuing
Propulsion Plant Development	C/CPFF	NGSB-NN VA	164.409	0.000		0.000		0.000		0.000	0.000	164.409	Continuing
Propulsion Plant Development	Various/ Various	Miscellaneous Various	10.562	0.000		0.000		0.000		0.000	0.000	10.562	Continuing
Propulsion Plant Development	WR	NSWC Carderock MD	0.050	0.000		0.000		0.000		0.000	0.000	0.050	Continuing
Advanced Design & Development	C/CPAF	NGSB-NN VA	138.814	16.066	Nov 2009	6.494	Oct 2010	0.000		6.494	0.000	161.374	Continuing
Advanced Design & Development	WR	NSWC Carderock MD	71.598	0.290	Oct 2009	0.045	Oct 2010	0.000		0.045	0.000	71.933	Continuing
Advanced Design & Development	C/CPFF	SAIC Not Specified	49.070	0.000		0.000		0.000		0.000	0.000	49.070	Continuing
Advanced Design & Development	WR	NAWCAD Patuxent River MD	37.311	8.046	Oct 2009	1.495	Oct 2010	0.000		1.495	0.000	46.852	Continuing
Advanced Design & Development	WR	NAWC Lakehurst NJ	8.189	0.000		0.000		0.000		0.000	0.000	8.189	Continuing
Advanced Design & Development	WR	NSWC Dahlgren VA	18.934	4.711	Oct 2009	3.928	Oct 2010	0.000		3.928	0.000	27.573	Continuing
Advanced Design & Development	C/CPAF	Raytheon Not Specified	20.653	5.505	Dec 2009	4.107	Dec 2010	0.000		4.107	0.000	30.265	Continuing
Advanced Design & Development	WR	NSWC Port Hueneme CA	5.643	0.297		0.068	Oct 2010	0.000		0.068	0.000	6.008	Continuing

**UNCLASSIFIED**

R-1 Line Item #34

Page 10 of 42

**UNCLASSIFIED**

<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2011 Navy</b>										<b>DATE:</b> February 2010			
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>				<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>				<b>PROJECT</b> 2208: <i>CVN 21</i>					

**Product Development (\$ in Millions)**

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Advanced Design & Development	WR	SPAWAR CA	8.682	1.812	Oct 2009	0.550	Oct 2010	0.000		0.550	0.000	11.044	Continuing
Advanced Design & Development	C/CPFF	NAVSEA Seaport Not Specified	23.982	5.051	Dec 2009	2.259	Dec 2010	0.000		2.259	0.000	31.292	Continuing
Advanced Design & Development	Various/ Various	Miscellaneous Various	39.807	7.493	Dec 2009	5.456	Oct 2010	0.000		5.456	0.000	52.756	Continuing
<b>Subtotal</b>			669.331	49.271		24.402		0.000		24.402	0.000	743.004	

**Remarks**

**Test and Evaluation (\$ in Millions)**

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Developmental Test & Evaluation	C/CPAF	NGSB-NN VA	7.134	1.354	Nov 2009	2.923	Nov 2010	0.000		2.923	0.000	11.411	Continuing
Developmental Test & Evaluation	WR	NAWCAD Patuxent River MD	11.997	1.754	Oct 2009	1.794	Oct 2020	0.000		1.794	0.000	15.545	Continuing
Developmental Test & Evaluation	WR	NSWC Dahlgren VA	3.206	0.474	Oct 2009	0.182	Oct 2010	0.000		0.182	0.000	3.862	Continuing
Developmental Test & Evaluation	WR	NSWC Carderock MD	7.098	1.522	Oct 2009	1.040	Oct 2010	0.000		1.040	0.000	9.660	Continuing

**UNCLASSIFIED**

R-1 Line Item #34

Page 11 of 42

**UNCLASSIFIED**

<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2011 Navy</b>										<b>DATE:</b> February 2010			
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>				<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>				<b>PROJECT</b> 2208: <i>CVN 21</i>					

**Test and Evaluation (\$ in Millions)**

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Developmental Test & Evaluation	WR	SPAWAR CA	2.878	0.379	Oct 2009	0.500	Oct 2010	0.000		0.500	0.000	3.757	Continuing
Developmental Test & Evaluation	C/CPFF	NAVSEA SeaPort Not Specified	0.143	0.000		0.000		0.000		0.000	0.000	0.143	Continuing
Developmental Test & Evaluation	C/CPAF	Raytheon Not Specified	0.984	0.299	Dec 2009	0.091	Dec 2010	0.000		0.091	0.000	1.374	Continuing
Developmental Test & Evaluation	Various/ Various	Miscellaneous Various	5.674	1.487	Oct 2009	1.301	Oct 2010	0.000		1.301	0.000	8.462	Continuing
Operational Test & Evaluation	WR	COMOPTEVFOR VA	3.607	0.763	Oct 2009	1.045	Oct 2010	0.000		1.045	0.000	5.415	Continuing
<b>Subtotal</b>			42.721	8.032		8.876		0.000		8.876	0.000	59.629	

**Remarks**

**Management Services (\$ in Millions)**

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DAWF	Various/ Various	Various Various	0.275	0.000		0.000		0.000		0.000	0.000	0.275	Continuing
<b>Subtotal</b>			0.275	0.000		0.000		0.000		0.000	0.000	0.275	

**Remarks**

**UNCLASSIFIED**

R-1 Line Item #34

Page 12 of 42



**UNCLASSIFIED**

**Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy**

**DATE:** February 2010

**APPROPRIATION/BUDGET ACTIVITY**

1319: *Research, Development, Test & Evaluation, Navy*  
 BA 4: *Advanced Component Development & Prototypes (ACD&P)*

**R-1 ITEM NOMENCLATURE**

PE 0603512N: *Carrier Systems Development*

**PROJECT**

2208: *CVN 21*

Fiscal Year	2009				2010				2011				2012				2013				2014				2015							
	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																																
Propulsion Plant																																
EMALS			TRR 2 △																													
Advanced Arresting Gear																																
Test & Evaluation Milestones																																
Development Test																																
Operational Test																																
Operational Assessments																																
Contract Milestones																																
IPPD Contract																																
CP Contract																																
Construction Contract																																
Full Funding (SCN)																																

**UNCLASSIFIED**

R-1 Line Item #34

Page 14 of 42

**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details: PB 2011 Navy</b>		<b>DATE:</b> February 2010
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	<b>PROJECT</b> 2208: <i>CVN 21</i>

Schedule Details

Event	Start		End	
	Quarter	Year	Quarter	Year
CVN 79 DAB PR	2	2012	2	2012
Propulsion Plant	1	2009	4	2015
EMALS TRR 2 (DT/OA)	3	2009	3	2009
EMALS SDD Complete	1	2012	1	2012
Advanced Arresting Gear (AAG) TRR 1 (IT)	1	2010	1	2010
AAG Config Review	1	2011	1	2011
AAG TRR 2 (IT)	3	2011	3	2011
Developmental Tests DT-B1	1	2009	4	2009
Developmental Tests DT-B2	1	2010	4	2011
Developmental Tests DT-B3	4	2011	2	2015
Developmental Tests DT-B4	2	2015	4	2015
Operational Tests Readiness Review 1	4	2009	4	2009
Operational Tests Readiness Review 2	4	2011	4	2011
Operational Tests Readiness Review 3	4	2013	4	2013
Operational Tests OT-B2	1	2009	2	2009
Operational Tests OT-B3	1	2010	1	2011
Operational Tests OT-B4	1	2012	1	2013
Operational Tests OT-B5	1	2014	1	2015

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<b>Exhibit R-4A, RDT&amp;E Schedule Details: PB 2011 Navy</b>		<b>DATE:</b> February 2010
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	<b>PROJECT</b> 2208: <i>CVN 21</i>

Event	Start		End	
	Quarter	Year	Quarter	Year
Operational Tests OT-C1	4	2015	4	2015
Operational Tests Report 1	3	2009	3	2009
Operational Tests Report 2	1	2011	1	2011
Operational Tests Report 3	1	2013	1	2013
Operational Tests Report 4	1	2015	1	2015
CVN 79 CP Contract Award	2	2009	2	2009
CVN 80 IPPD Contract Award	1	2013	1	2013
CVN 79 Construction Contract Award	1	2013	1	2013
CVN 80 CP Contract Award	1	2015	1	2015
CVN 78 Ship Delivery	4	2015	4	2015
CVN 79 SCN Full Funding	1	2013	4	2015

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**Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy** **DATE:** February 2010

<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	<b>PROJECT</b> 3216: <i>Tactical Support Center-Integration</i>
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COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3216: <i>Tactical Support Center-Integration</i>	0.000	5.133	8.583	0.000	8.583	2.349	5.067	4.002	5.199	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

**A. Mission Description and Budget Item Justification**

The CV-TSC program provides increased situational awareness to the CSG in support of force protection, primarily in the area of 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 SUW assets (S-3B until retirement, SH-60F helicopter). 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 will enable exchange of sensor, tactical and imagery data with the MH-60R initially and eventually with P-8 and BAMS aircraft.

**B. Accomplishments/Planned Program (\$ in Millions)**

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
MH-60R Integration Development for CV-TSC <i>FY 2010 Plans:</i> Design and develop the AN/SQQ-34(V)2 upgrade to support the MH-60R Multi Mission Helicopter. MH-60R Integration Increment 1 establishes initial link with helo through Ku-Band Common Data Link (CDL).  <i>FY 2011 Base Plans:</i> Continue development of the AN/SQQ-34(V)2 Increment 1 upgrade to support the MH-60R Multi Mission Helicopter. Begin design and development of Increment 2 upgrade to support multiple helos and link connectivity management.	0.000	5.133	8.583	0.000	8.583
Accomplishments/Planned Programs Subtotals	0.000	5.133	8.583	0.000	8.583

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2011 Navy		<b>DATE:</b> February 2010
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	<b>PROJECT</b> 3216: <i>Tactical Support Center-Integration</i>

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

<u>Line Item</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u> <u>Base</u>	<u>FY 2011</u> <u>OCO</u>	<u>FY 2011</u> <u>Total</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPN/2176: <i>Undersea Support Equipment (CV-TSC/CDL portion)</i>	6.356	20.088	19.866	0.000	19.866	20.305	8.774	0.591	0.599	Continuing	Continuing

**D. Acquisition Strategy**

The CV-TSC will be upgraded to support full deployments of KU-Band equipped MH-60R aircraft. The CV-TSC development activity is a government field activity, Naval Undersea Warfare Center, Division Keyport. Hardware procurements and back fit of the CV-TSC will use the AN/SQQ-34C as a baseline with additional hardware necessary for MH-60R support. Hardware shall be procured via a Request For Proposal (RFP) with industry. To the maximum extent possible, CV-TSC will use enterprise hardware initiatives being developed by the Navy in support of DDG-1000 and Aegis Modernization.

**E. Performance Metrics**

- Successfully complete Preliminary Design Review (PDR) and Critical Design Review (CDR) for MH-60R system upgrade.
- Utilize COTS-based Common Processor/Common Display Systems (CPS/CDS) to minimize Total Ownership Costs.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy** **DATE:** February 2010

<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	<b>PROJECT</b> 3216: <i>Tactical Support Center-Integration</i>
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**Product Development (\$ in Millions)**

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Non-Recurring Engineering	WR	NAVSEA Keyport WA	0.000	3.479	Jan 2010	1.372	Oct 2010	0.000		1.372	Continuing	Continuing	Continuing
System Eng / S/W Development	WR	NAVSEA Keyport WA	0.000	1.654	Jan 2010	4.838	Oct 2010	0.000		4.838	Continuing	Continuing	Continuing
Integration	WR	NAVSEA Keyport WA	0.000	0.000		1.873	Oct 2010	0.000		1.873	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.000	5.133		8.083		0.000		8.083			

**Remarks**

**Test and Evaluation (\$ in Millions)**

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test and Certification	WR	NAVSEA/Keyport WA	0.000	0.000		0.500	Oct 2010	0.000		0.500	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.000	0.000		0.500		0.000		0.500			

**Remarks**

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy** **DATE:** February 2010

<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	<b>PROJECT</b> 3216: <i>Tactical Support Center-Integration</i>
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	Total Prior Years Cost	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	0.000	5.133	8.583	0.000	8.583			

**Remarks**

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**Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy** **DATE:** February 2010

<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	<b>PROJECT</b> 3216: <i>Tactical Support Center-Integration</i>
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Fiscal Year	2009				2010				2011				2012				2013				2014				2015			
	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
Increment Development (Initial MH-60R Capabilities)					▲					▼																		
Verification and Validation										▲		▼																
Combat System Certification											▲	▼																
Increment Development (MH-60R Block Upgrades)							▲								▼													
Verification and Validation														▲		▼												
Combat System Certification															▲	▼												
Increment Development (MH-60R Block Upgrades / P-8 / BAMS Integration)																							▼					
Verification and Validation																						▲		▼				
Combat System Certification																							▲	▼				
Increment Development (MH-60R Block Upgrades / P-8 / BAMS Integration)																									▲			

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2011 Navy		<b>DATE:</b> February 2010
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	<b>PROJECT</b> 3216: <i>Tactical Support Center-Integration</i>

Schedule Details

Event	Start		End	
	Quarter	Year	Quarter	Year
Initial MH-60R Capabilities Development	2	2010	1	2011
Initial MH-60R Verification and Validation	2	2011	3	2011
Initial MH-60R Combat System Certification	3	2011	4	2011
MH-60R Block Upgrades Development	3	2010	2	2012
MH-60R Verification and Validation	2	2012	3	2012
MH-60R Combat System Certification	3	2012	4	2012
MH-60R Block Upgrades (P-8/BAMS Integration)(Increment 1)	3	2012	2	2014
Verification and Validation	3	2014	4	2014
Combat System Certification	4	2014	1	2015
MH-60R Block Upgrades (P-8/BAMS Integration) (Increment 2)	3	2014	4	2015

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2011 Navy									<b>DATE:</b> February 2010		
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>				<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>				<b>PROJECT</b> 3217: <i>KU-Band Common Data Link</i>			
<b>COST (\$ in Millions)</b>	<b>FY 2009 Actual</b>	<b>FY 2010 Estimate</b>	<b>FY 2011 Base Estimate</b>	<b>FY 2011 OCO Estimate</b>	<b>FY 2011 Total Estimate</b>	<b>FY 2012 Estimate</b>	<b>FY 2013 Estimate</b>	<b>FY 2014 Estimate</b>	<b>FY 2015 Estimate</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
3217: <i>KU-Band Common Data Link</i>	0.000	14.502	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.502
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		
<b>A. Mission Description and Budget Item Justification</b>											
<p>Develops a multi-mission, shipboard, high data rate Ku-Band data link between the embarked air assets and the Carrier combat system, enabling exchange of sensor, tactical and imagery data initially with the MH-60R Multi Mission Helicopter. It also provides capability for on-the-deck mission synchronization with MH-60R. Eventually, the KU-band data link will support other Ku-Band equipped aircraft, including the P-8 and BAMS. This effort will provide the Carrier with the capability to support multiple simultaneous aircraft on different missions, also completing the Kill Chain by linking sensor platform to sensor controllers and the ASW/SUW warfare commanders. This development effort will support the initial deployments of the Ku-Band equipped MH-60R Air wing for new construction Carriers, RCOH Carriers, and NIMITZ class back fits.</p>											
<b>B. Accomplishments/Planned Program (\$ in Millions)</b>											
							<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011 Base</b>	<b>FY 2011 OCO</b>	<b>FY 2011 Total</b>
Common Data Link Development							0.000	14.502	0.000	0.000	0.000
<i>FY 2010 Plans:</i> Development of Ku-Band data link between the embarked air assets and the Carrier combat system.											
Accomplishments/Planned Programs Subtotals							0.000	14.502	0.000	0.000	0.000

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2011 Navy		<b>DATE:</b> February 2010
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	<b>PROJECT</b> 3217: <i>KU-Band Common Data Link</i>

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

<u>Line Item</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u> <u>Base</u>	<u>FY 2011</u> <u>OCO</u>	<u>FY 2011</u> <u>Total</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPN/2176: <i>Undersea Support Equipment (CV-TSC/CDL Portion)</i>	6.356	20.088	19.866	0.000	19.866	20.305	8.774	0.591	0.599	Continuing	Continuing

**D. Acquisition Strategy**

The KU-Band Common Data Link will be upgraded on the Carrier to support full deployments of KU-Band equipped MH-60R aircraft. The required development for this effort will be completed in FY10. Procurements and back fit of the Ku-Band capability will be fielded starting in FY11. PEO C4I shall develop the additional capabilities by implementing an Engineering Change Proposal (ECP) to the AN/USQ-167 Communications Data Link System (CDL-S). ECP implementation shall be procured via a Request For Proposal (RFP) with industry. This would ensure the most efficient and cost effective implementation for Navy.

**E. Performance Metrics**

- Increase capability from one (1) 360 degree aircraft link to four (4) simultaneous 360 degree aircraft links, while reducing overall manning.

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**Exhibit R-2A, RDT&E Project Justification:** PB 2011 Navy **DATE:** February 2010

<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	<b>PROJECT</b> 4004: <i>EMALS</i>
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COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
4004: <i>EMALS</i>	87.284	94.143	50.341	0.000	50.341	22.999	4.670	3.274	2.775	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

**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. It also provides for the life cycle support of the system. The Electromagnetic Aircraft Launch System (EMALS) will replace the current steam catapult on CVN 78 and follow-on ships of the CVN 78

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.

**B. Accomplishments/Planned Program (\$ in Millions)**

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
EMALS	86.985	94.143	50.341	0.000	50.341
EMALS  <i>FY 2009 Accomplishments:</i> (1) EMALS System Development and Demonstration (SDD) Phase - Continue shipboard representative system development effort. Complete the manufacture and installation of a shipboard representative system into the System Facility Demonstration (SFD) site. Commission the SFD site. Initiate System Integration and Environment Testing and Highly Accelerated Life Testing (HALT). Continue High Cycle Testing (HCT). Provide management, system engineering, test and ship integration support.					

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R-1 Line Item #34

Page 25 of 42

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2011 Navy				<b>DATE:</b> February 2010				
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>		<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>		<b>PROJECT</b> 4004: <i>EMALS</i>				
<b>B. Accomplishments/Planned Program (\$ in Millions)</b>								
				<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011 Base</b>	<b>FY 2011 OCO</b>	<b>FY 2011 Total</b>
<p><i>FY 2010 Plans:</i>                      (1) EMALS SDD Phase - Continue SDD Phase. Continue shipboard representative system development effort. Complete HALT and Environmental Testing. Perform System Functional Demonstration, Deadload Testing, and Aircraft Compatibility Testing. Provide management, system engineering, test, and ship integration support. (2) EMALS Engineering and Life Cycle Support (E&amp;LCS) - Award the E&amp;LCS Contract during second quarter. Provide technical services, program management and logistics management in support of EMALS CVN 79 shipset efforts.</p> <p><i>FY 2011 Base Plans:</i>                      (1) EMALS SDD Phase - Continue shipboard representative system development effort. Continue testing and perform risk mitigation. Provide management, system engineering, test, and ship integration support.                      (2) EMALS E&amp;LCS - Continue E&amp;LCS Contract. Provide technical services, program management and logistics management in support of EMALS CVN 78 shipset efforts.</p>								
Defense Acquisition Workforce Fund				0.299	0.000	0.000	0.000	0.000
<p><i>FY 2009 Accomplishments:</i>                      Funded Defense Acquisition Workforce Fund</p>								
Accomplishments/Planned Programs Subtotals				87.284	94.143	50.341	0.000	50.341

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2011 Navy		<b>DATE:</b> February 2010
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	<b>PROJECT</b> 4004: <i>EMALS</i>

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

<u>Line Item</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u> <u>Base</u>	<u>FY 2011</u> <u>OCO</u>	<u>FY 2011</u> <u>Total</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• BLI 200100: <i>Carrier Replacement Program</i>	3,915.642	1,219.927	2,639.569	0.000	2,639.569	494.823	2,418.293	3,386.556	2,284.498	Continuing	Continuing

**D. Acquisition Strategy**

The CVN 78 will be 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, 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 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 High Cycle Test (HCT) Phase II Full Load Testing. Successfully complete Highly Accelerated Life Test (HALT) Phase I and Phase II (extended). Successfully complete Commissioning Testing at the SDD test facility. Successfully complete SFD testing. Successfully complete EQT testing.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy** **DATE:** February 2010

<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	<b>PROJECT</b> 4004: <i>EMALS</i>
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**Product Development (\$ in Millions)**

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Aircraft Launch, Recovery & Support	C/CPAF	Northrop Grumman VA	83.352	0.000		0.000		0.000		0.000	0.000	83.352	Continuing
Aircraft Launch, Recovery & Support	C/CPAF	General Atomics (PDRR) CA	82.719	0.000		0.000		0.000		0.000	0.000	82.719	Continuing
Aircraft Launch, Recovery & Support	C/CPAF	General Atomics (SDD) CA	258.533	67.776	Dec 2009	29.858	Oct 2010	0.000		29.858	32.018	388.185	404.670
Aircraft Launch, Recovery & Support	WR	NAWC Lakehurst NJ	41.504	3.200	Nov 2009	0.000		0.000		0.000	0.000	44.704	Continuing
Aircraft Launch, Recovery & Support	C/CPAF	NGSB-NN VA	2.536	0.000		0.000		0.000		0.000	0.000	2.536	Continuing
Aircraft Launch, Recovery & Support	Various/ Various	Miscellaneous Various	3.301	0.020	Dec 2009	0.000		0.000		0.000	0.000	3.321	Continuing
Aircraft Launch, Recovery & Support	C/CPAF	General Atomics (SDD) - Award Fee CA	5.719	7.430	Dec 2009	4.750	Oct 2010	0.000		4.750	0.000	17.899	17.899
<b>Subtotal</b>			477.664	78.426		34.608		0.000		34.608	32.018	622.716	422.569

**Remarks**  
A 36.9 million prior approval reprogramming was approved in April 2008 with FY07 dollars and is included in Total Prior Year Cost.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy** **DATE:** February 2010

<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	<b>PROJECT</b> 4004: <i>EMALS</i>
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**Test and Evaluation (\$ in Millions)**

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Aircraft Launch, Recovery & Support	WR	NAWC Lakehurst NJ	42.845	15.717	Dec 2009	15.733	Dec 2010	0.000		15.733	1.700	75.995	Continuing
<b>Subtotal</b>			42.845	15.717		15.733		0.000		15.733	1.700	75.995	

**Remarks**

**Management Services (\$ in Millions)**

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DAWF	Various/ Various	Not Specified Not Specified	0.299	0.000		0.000		0.000		0.000	0.000	0.299	Continuing
<b>Subtotal</b>			0.299	0.000		0.000		0.000		0.000	0.000	0.299	

**Remarks**

Project Cost Totals	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	520.808	94.143		50.341		0.000		50.341	33.718	699.010	422.569

**Remarks**

**UNCLASSIFIED**

R-1 Line Item #34

Page 29 of 42

**UNCLASSIFIED**

**Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy**

**DATE:** February 2010

**APPROPRIATION/BUDGET ACTIVITY**

1319: *Research, Development, Test & Evaluation, Navy*  
 BA 4: *Advanced Component Development & Prototypes (ACD&P)*

**R-1 ITEM NOMENCLATURE**

PE 0603512N: *Carrier Systems Development*

**PROJECT**

4004: *EMALS*

Fiscal Year	2009				2010				2011				2012				2013				2014				2015							
	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																																
Propulsion Plant																																
EMALS			TRR 2 △												SDD Complete △																	
Advanced Arresting Gear							TRR 1 △				Cont Review △				TRR 2 △																	
Test & Evaluation Milestones																																
Development Test																																
Operational Test																																
Operational Assessments																																
Contract Milestones																																
IPPD Contract																																
CP Contract																																
Construction Contract																																
Full Funding (SCN)																																

**UNCLASSIFIED**

R-1 Line Item #34

Page 30 of 42

**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details: PB 2011 Navy</b>		<b>DATE:</b> February 2010
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	<b>PROJECT</b> 4004: <i>EMALS</i>

Schedule Details

Event	Start		End	
	Quarter	Year	Quarter	Year
CVN 79 DAB PR	2	2012	2	2012
Propulsion Plant	1	2009	4	2015
EMALS TRR 2 (DT/OA)	3	2009	3	2009
EMALS SDD Complete	1	2012	1	2012
Advanced Arresting Gear (AAG) TRR 1 (IT)	1	2010	1	2010
AAG Config Review	1	2011	1	2011
AAG TRR 2 (IT)	3	2011	3	2011
Developmental Tests DT-B1	1	2009	4	2009
Developmental Tests DT-B2	1	2010	4	2011
Developmental Tests DT-B3	4	2011	2	2015
Developmental Tests DT-B4	2	2015	4	2015
Operational Tests Readiness Review 1	4	2009	4	2009
Operational Tests Readiness Review 2	4	2011	4	2011
Operational Tests Readiness Review 3	4	2013	4	2013
Operational Tests OT-B2	1	2009	2	2009
Operational Tests OT-B3	1	2010	1	2011
Operational Tests OT-B4	1	2012	1	2013
Operational Tests OT-B5	1	2014	1	2015

**UNCLASSIFIED**

R-1 Line Item #34

Page 31 of 42

**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details: PB 2011 Navy</b>		<b>DATE:</b> February 2010
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	<b>PROJECT</b> 4004: <i>EMALS</i>

Event	Start		End	
	Quarter	Year	Quarter	Year
Operational Tests OT-C1	4	2015	4	2015
Operational Tests Report 1	3	2009	3	2009
Operational Tests Report 2	1	2011	1	2011
Operational Tests Report 3	1	2013	1	2013
Operational Tests Report 4	1	2015	1	2015
CVN 79 CP Contract Award	2	2009	2	2009
CVN 80 IPPD Contract Award	1	2013	1	2013
CVN 79 Construction Contract Award	1	2013	1	2013
CVN 80 CP Contract Award	1	2015	1	2015
CVN 78 Ship Delivery	4	2015	4	2015
CVN 79 SCN Full Funding	1	2013	4	2015

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**Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy** **DATE:** February 2010

<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	<b>PROJECT</b> 4005: <i>Smart Carrier</i>
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COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
4005: <i>Smart Carrier</i>	1.585	1.794	1.628	0.000	1.628	1.771	1.792	1.838	1.879	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

**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 Advanced Damage Control System (ADCS) software improvements, Electronic Valve Operator automation, Superior Sound Technology, Vibration Monitoring/Rotating Machinery Diagnostic Tools, 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.

Multi Mission Helicopter. Upgrades to legacy systems will enable exchange of sensor, tactical and imagery data with the MH-60R initially and eventually with P-8 and Broad Area

**B. Accomplishments/Planned Program (\$ in Millions)**

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Smart Carrier	1.577	1.794	1.628	0.000	1.628

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**Exhibit R-2A, RDT&E Project Justification:** PB 2011 Navy **DATE:** February 2010

<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	<b>PROJECT</b> 4005: <i>Smart Carrier</i>
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<b>B. Accomplishments/Planned Program (\$ in Millions)</b>	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Defense Acquisition Workforce Fund <i>FY 2009 Accomplishments:</i> Funded Defense Acquisition Workforce Fund	0.008	0.000	0.000	0.000	0.000
<b>Accomplishments/Planned Programs Subtotals</b>	1.585	1.794	1.628	0.000	1.628

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011 Base</u>	<u>FY 2011 OCO</u>	<u>FY 2011 Total</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• OPN/98100: <i>Items Under \$5M Smart Carrier (LT 140)</i>	15.220	15.566	16.325	0.000	16.325	0.000	0.000	0.000	0.000	0.000	47.111

**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, UPS Replacements, ADCS Software Improvements (AFSSS/FCCS) Software Development Test, Electronic Valve Operator Automation, Superior Sound Technology (5MC) Development/Integration, Vibration Monitoring/Rotating Machinery Diagnostic Tools SW Development, Vibration Monitoring/Rotating Machinery Diagnostic Tools SW Development Test, Expanded Condition-Based Maintenance-Rotating Machinery, Reboiler Automation SW/HW Development, Liquid Load Management SW Development/Test, Advanced Fire and Smoke Sender System Development, Integrated Condition Assessment System Software Development.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy** **DATE:** February 2010

<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	<b>PROJECT</b> 4005: <i>Smart Carrier</i>
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**Product Development (\$ in Millions)**

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Ship Integration	WR	NAVSEA Phil	0.840	0.125	Nov 2009	0.147	Nov 2010	0.000		0.147	0.000	1.112	Continuing
<b>Subtotal</b>			0.840	0.125		0.147		0.000		0.147	0.000	1.112	

**Remarks**

**Support (\$ in Millions)**

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Software Development	WR	NAVSEA Phil	5.587	0.644	Nov 2009	0.595	Nov 2010	0.000		0.595	0.000	6.826	Continuing
Program Management Support	WR	NAVSEA Phil	1.750	0.260	Nov 2009	0.250	Nov 2010	0.000		0.250	0.000	2.260	Continuing
Training Development	WR	NAVSEA Phil	0.470	0.095	Nov 2009	0.080	Nov 2010	0.000		0.080	0.000	0.645	Continuing
Integrated Logistics Support	WR	NAVSEA Phil	0.880	0.200	Nov 2009	0.120	Nov 2010	0.000		0.120	0.000	1.200	Continuing
<b>Subtotal</b>			8.687	1.199		1.045		0.000		1.045	0.000	10.931	

**Remarks**

**UNCLASSIFIED**

R-1 Line Item #34

Page 36 of 42

**UNCLASSIFIED**

**Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy** **DATE:** February 2010

<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	<b>PROJECT</b> 4005: <i>Smart Carrier</i>
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**Test and Evaluation (\$ in Millions)**

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Developmental Test & Evaluation	WR	NAVSEA Phil	2.886	0.470	Nov 2009	0.436	Nov 2010	0.000		0.436	Continuing	Continuing	Continuing
<b>Subtotal</b>			2.886	0.470		0.436		0.000		0.436			

**Remarks**

**Management Services (\$ in Millions)**

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DAWF	Various/ Various	Various Various	0.008	0.000		0.000		0.000		0.000	0.000	0.008	Continuing
<b>Subtotal</b>			0.008	0.000		0.000		0.000		0.000	0.000	0.008	

**Remarks**

Project Cost Totals	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	12.421	1.794		1.628		0.000		1.628			

**Remarks**

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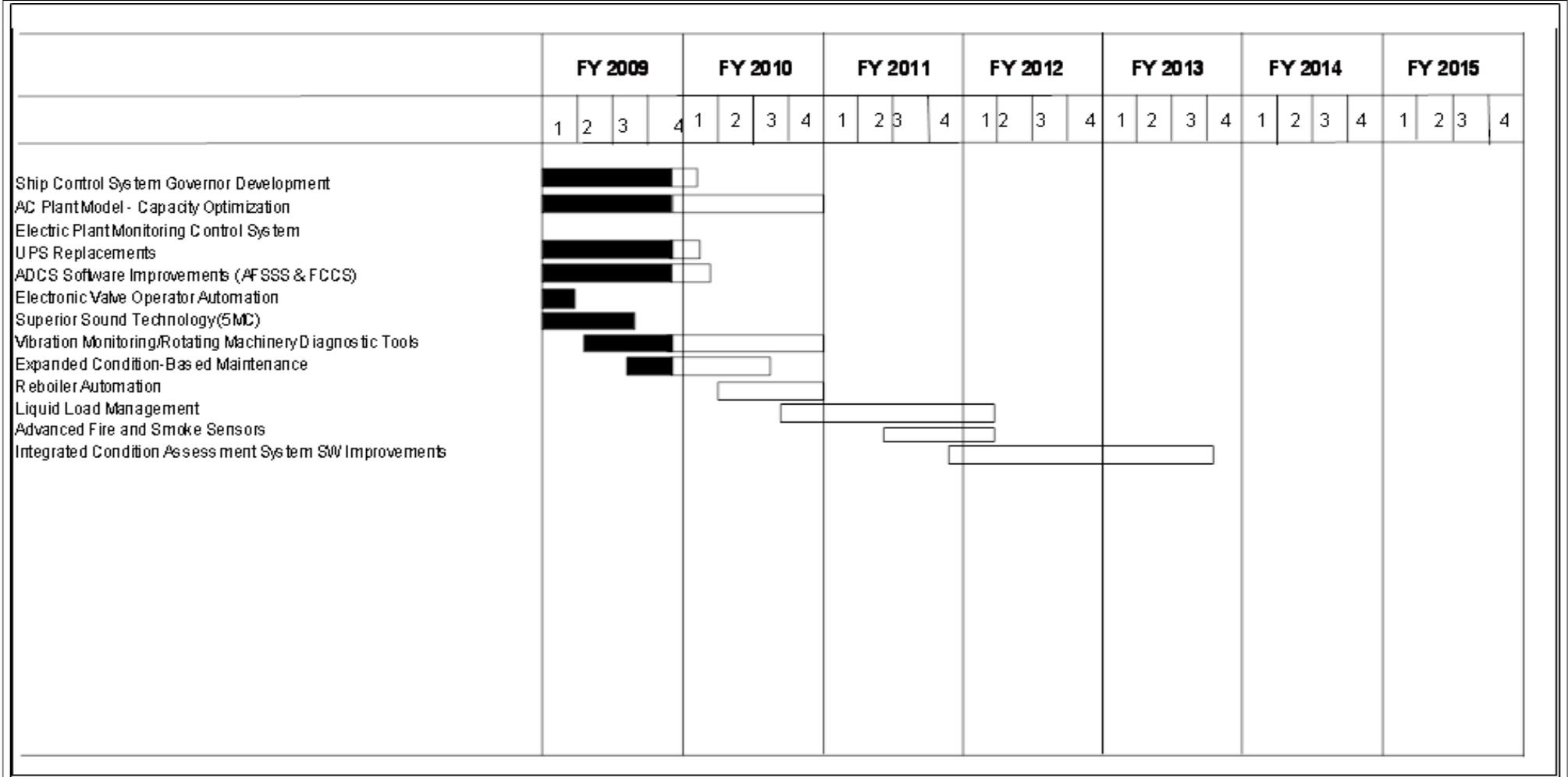
R-1 Line Item #34

Page 37 of 42

**UNCLASSIFIED**

**Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy** **DATE:** February 2010

<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	<b>PROJECT</b> 4005: <i>Smart Carrier</i>
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<b>Exhibit R-4A, RDT&amp;E Schedule Details: PB 2011 Navy</b>		<b>DATE:</b> February 2010
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	<b>PROJECT</b> 4005: <i>Smart Carrier</i>

Schedule Details

Event	Start		End	
	Quarter	Year	Quarter	Year
Ship Control System Governor Software Development	1	2009	1	2010
AC Plant Model - Capacity Optimization	1	2009	4	2010
UPS Replacements	1	2009	1	2010
ADCS Software Improvements (AFSSS/FCCS) Software Development Test	1	2009	1	2010
Electronic Valve Operator Automation	1	2009	1	2009
Superior Sound Technology (5MC) Development/Integration	1	2009	3	2009
Vibration Monitoring/Rotating Machinery Diagnostic Tools SW Development	2	2009	2	2010
Vibration Monitoring/Rotating Machinery Diagnostic Tools SW Dev Test	3	2010	4	2010
Expanded Condition-Based Maintenance - Rotating Machinery	3	2009	3	2010
Reboiler Automation SW/HW Development	2	2010	4	2010
Liquid Load Management SW Development/Test	3	2010	1	2012
Advanced Fire and Smoke Sensor System Development	2	2011	1	2012
Integrated Condition Assessment System Software Development	4	2011	3	2013

**UNCLASSIFIED**

R-1 Line Item #34

Page 39 of 42

**UNCLASSIFIED**

**Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy** **DATE:** February 2010

<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	<b>PROJECT</b> 9999: <i>Congressional Adds</i>
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COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: <i>Congressional Adds</i>	27.525	2.948	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	39.731
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

**A. Mission Description and Budget Item Justification**

Congressional Adds

**B. Accomplishments/Planned Program (\$ in Millions)**

	FY 2009	FY 2010
Congressional Add: Composite Mast for CVNs  <i>FY 2010 Plans:</i> Develop and validate a full scale composite aircraft carrier topside structure, providing a lightweight fragmentation/structural/fire integrated technology solution that can meet/exceed current performance requirements while reducing costs.	0.000	2.948
Congressional Add: IMPROVED CORROSION PROTECTION FOR ELECTROMAGNETIC  <i>FY 2009 Accomplishments:</i> Funding will be used to continue ongoing corrosion testing at Ocean City Research Testing facility in New Jersey. Various coupons and coating have been exposed up to 7 months now and will continue to be evaluated up to 3 years of exposure under simulated flight deck trough conditions. The funding will also be used to initiate a phase 2 study into the development of a corrosion inhibitor addition to the armature cooling to extend the armature s life. Phase one identified several candidates which look promising. The remainder of the funds will be utilized to interrogate and document the material	1.995	0.000

**UNCLASSIFIED**

R-1 Line Item #34

Page 40 of 42

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2011 Navy		<b>DATE:</b> February 2010
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	<b>PROJECT</b> 9999: <i>Congressional Adds</i>
<b>B. Accomplishments/Planned Program (\$ in Millions)</b>		
	<b>FY 2009</b>	<b>FY 2010</b>
properties of the alloys selected for use on EMALS. Fatigue and fracture data will be compiled under the unique conditions of the EMALS trough for in-service support of the EMALS system.		
Congressional Add: National Sensor Fusion Support for Puget Sound Por  <i>FY 2009 Accomplishments:</i> Funds will be used to incorporate National Sensors data into a fusion engine in order to provide a complete and accurate Common Tactical Picture (CTP) of the surface and subsurface threat environment to the at-sea Warfare Commanders. The National Sensor Fusion Configuration Item (NSFCI), as an integral part of the AN/UYQ-100, has demonstrated the capability to collect and integrate a wide variety of disparate geospatial and sensor data, to fuse the available data sources into real time vessel tracks and to provide military commanders with the CTP they need to support critical battlespace decisions. The NSF for PSPS is being developed as an application within the Service Oriented Architecture (SOA) of the Undersea Warfare - Decision Support System (USW-DSS) (AN/UYQ-100).	1.596	0.000
Congressional Add: EMALS  <i>FY 2009 Accomplishments:</i> Funding will be used to support additional scope of work resulting from complex ship integration, a re-planned Test and Evaluation Program to reduce risks for CVN 78, incorporation of the Production Assessment Review findings and the escalated costs of steel, copper and other materials. Additionally, the funding supported resolution of technical problems associated with Factory Acceptance Testing of the Power Conversion Subsystem, the Prime Power Interface Subsystem and Motor-Generator #4. The associated impacts caused test start delays for High Cycle Test Phase II and Highly Accelerated Life Testing.	23.934	0.000
Congressional Adds Subtotals	27.525	2.948

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**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2011 Navy		<b>DATE:</b> February 2010
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603512N: <i>Carrier Systems Development</i>	<b>PROJECT</b> 9999: <i>Congressional Adds</i>
<b>C. Other Program Funding Summary (\$ in Millions)</b> N/A		
<b>D. Acquisition Strategy</b> N/A		
<b>E. Performance Metrics</b> Congressional Adds		

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