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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2017 Navy **Date:** February 2016

<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603573N / <i>Advanced Surface Machinery Sys</i>
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	126.812	20.357	24.143	36.655	-	36.655	30.114	22.656	21.616	21.152	Continuing	Continuing
2471: <i>Integrated Power Systems (IPS)</i>	126.812	20.357	24.143	36.655	-	36.655	30.114	22.656	21.616	21.152	Continuing	Continuing

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

FY0217 funding request reflects increase of \$18 million for increased scope associated with Cybersecurity Boundary Defense Capability engineering for surface ship classes.

This PE includes the development of advanced surface ship hull, mechanical, and electrical (HM&E) components and systems for all future ships and back-fit ships where appropriate. This PE is managed by PMS 320, the Electric Ships Office, located organizationally within PEO SHIPS, with responsibility for developing Naval Power and Energy Systems that focus on energy efficiency, providing power to mission systems, and platform integration of those components and systems. The mission of PMS 320 is to develop and provide smaller, simpler, more affordable and more capable electric power systems for all Navy platforms and focus Navy and industry investments.

This PE is the bridge between Science and Technology (S&T) and ship platform and mission systems acquisition programs by identifying prospective applications for S&T research, advanced development, and performing additional product development and qualification when necessary to meet platform or mission system requirements. This PE also includes cybersecurity Boundary Defense Capability (BDC) development. BDC funds will be utilized for engineering tasks necessary to implement a cyber security boundary defense capability for the Hull, Mechanical and Electrical (H,M&E) control systems on surface ships. The H,M&E systems to be protected will include Machinery Control Systems, Electrical Power Systems, Damage Control and Firefighting, Auxiliary Machinery and Fluid Systems, Engines and Power Transmission Systems, Gas Turbine Systems, Video Systems, as well as other H,M&E systems. The intent of the total boundary defense capability will be to allow the ship to better protect, detect, respond, and recover from a cyber attack on the H,M&E enclave on surface ships.

In October 2009, SECNAV outlined a set of specific objectives supporting U.S. Navy energy reform including several aimed at significantly reducing Fleet fuel consumption and improving our energy security posture. PMS 320 supports the DON Energy Goals by employing an integrated approach to develop and transition more affordable technologies that satisfy increasing shipboard power demands and high operational tempo while improving energy efficiency, reducing fuel consumption, and reducing Total Ownership Cost.

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<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
Previous President's Budget	21.026	25.904	23.221	-	23.221
Current President's Budget	20.357	24.143	36.655	-	36.655
Total Adjustments	-0.669	-1.761	13.434	-	13.434
• Congressional General Reductions	-	-0.011			
• Congressional Directed Reductions	-	-1.750			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.669	0.000			
• Program Adjustments	0.000	0.000	-2.000	-	-2.000
• Rate/Misc Adjustments	0.000	0.000	15.434	-	15.434

**Change Summary Explanation**

FY 2015 funding request reflects a reduction of \$0.669 million to account for SBIR/STTR Transfer.

FY 2016 funding request reflects congressional reductions of \$1.750 million for program execution delays and \$0.011 million for FFRDC.

FY 2017 funding request reflects reductions of \$2 million in support of other program adjustments, \$0.718 million to account for prior year available balances, \$1.542 million for the Department of the Navy to comply with the Bipartisan Budget Act of 2015, and \$0.306 million to account for rates/miscellaneous adjustments. FY0217 funding request also reflects an increase of \$18 million for increased scope associated with cybersecurity boundary defense capability engineering for surface ship classes

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Navy										<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 1319 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603573N / <i>Advanced Surface Machinery Sys</i>				<b>Project (Number/Name)</b> 2471 / <i>Integrated Power Systems (IPS)</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
2471: <i>Integrated Power Systems (IPS)</i>	126.812	20.357	24.143	36.655	-	36.655	30.114	22.656	21.616	21.152	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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

The program increase between FY2016 & FY0217 funding request also reflects an increase of \$18 million for increased scope associated with cybersecurity boundary defense capability engineering for surface ship classes.

This project supports the development and transition strategy of Navy Power and Energy Systems including power generation, power conversion, power distribution, energy storage, power utilization and automation and control functions for fully integrated electric propulsion (such as T-AKE -1 class or DDG1000 class), hybrid electric propulsion (such as LHD 8 and LHA(R) class), as well as legacy mechanical propulsion ships (such as DDG51 class). This project supports optimized integration of mission systems, appropriate component and system controls, integration of components and systems into future and current ships, and providing power and energy system solution alternatives to new and existing platforms.

Project developments are aligned with the Navy's 30 year shipbuilding plan via the Naval Power and Energy Systems Technology Development Roadmap, which outlines the way ahead for future developments and provides a basis for coordinated planning and investment by the Navy and private industry.

This project develops and transitions products that increase energy efficiency (and thereby create fewer greenhouse gas emissions and reduce dependence upon foreign petroleum sources), provide additional power to mission systems, integrates those components and systems into ship platforms, and defining cybersecurity capabilities that will be implemented on current in-service Hull, Mechanical and Electrical (HM&E) systems as well as future systems.

DON Energy Initiatives - Energy Storage Module (ESM) and Advanced Power Generation Module (APGM): This project supports the DON Energy Initiative designed to reduce ship energy consumption and increase mission effectiveness through longer time on station. The ESM will provide stable backup power to enable DDG51 Class single genertor operations (and significant fuel savings) when operational situations permit. The APGM includes back fit and forward fit developments including the AG9160RF, Twin Spool, and Gas Turbine (GT) efficiency upgrades. The AG9160RF Gas Turbine Generator (GTG) is an upgrade to the DDG1000 auxiliary gas turbine and will provide increased power to meet DDG51 Flight III requirements for advanced sensors and future weapons with reduction in life cycle costs through increased fuel efficiency over legacy gas turbine generator sets. Twin Spool GTGs will adapt an aero derivative fuel efficient gas turbine to improve fuel efficiency 12-15% over current single shaft gas turbines, reduce total ownership costs, and increase time on station. GT upgrades will provide operational readiness and fuel efficiency improvements to existing gas turbine engines for both backfit and new construction ships.

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Mission Power: Designs, develops, tests and integrates shipboard power systems to incorporate advanced sensors, Directed Energy and other advanced weapons. Design and testing includes Modeling and Simulation, as well as land based testing, to reduce risk and demonstrate readiness for shipboard use. Air Missile Defense Radar (AMDR) Power Conversion Module (PCM) provides power conversion from ship's 4160 VAC distribution systems to 1000 VDC to support AMDR Radar.

Cybersecurity Boundary Defense Capability (BDC): Develops an approach to implement a cybersecurity boundary defense capability for HM&E control systems on surface ships. HM&E systems to be protected will include Machinery Control Systems, Electrical Power Systems, Damage Control and Firefighting, Auxiliary Machinery and Fluid systems, Engines and Power Transmission Systems, Gas Turbine Systems, Video Systems as well as other HM&E systems. Design and technical data packages for software and hardware solutions will be developed. The intent of the total boundary defense capability will be to allow the ship to better protect, detect, respond, and recover from potential cyber attacks on the HM&E enclave on surface ships.

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

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<b>Title:</b> Energy Efficiency	7.628	10.590	11.397	0.000	11.397
<b>Articles:</b>	-	-	-	-	-
<b>FY 2015 Accomplishments:</b>					
Completed studies to incorporate mission power support capabilities, in addition to Stable Backup Power (SBP), in the design of the Energy Storage Module (ESM). Completed preliminary design of ESM prototype and ordered remaining LLTM. Continued ESM land based test planning. Continued qualification testing of ESM battery sub-system.					
Completed design of DDG51 Flight III 4.2MW Advanced Power Generation Module (APGM) High Efficiency Plus (HE+) gas turbine engine featuring 2-3% fuel savings over predecessor DDG1000 engines, completed Preliminary Design (PD) of the generator set module, and entered into Detailed Design leading to Critical Design Review in FY16. Began procuring material required for build of APGM Generator Set.					
Developed comprehensive plan to support Future Surface Combatant power generation requirements featuring 4-10MW Twin Spool gas turbine powered generator sets having superior fuel savings over predecessor single shaft units.					
Continued planning for future gas turbine operational readiness and fuel efficiency upgrades.					
<b>FY 2016 Plans:</b>					
Complete design and begin manufacture of ESM prototype for mission system support. Prepare test plans and procedures for Factory Acceptance Testing (FAT) of ESM prototype. Continue qualification of ESM prototype battery sub-system in preparation for testing. Prepare Test Plans and Procedures for ESM prototype land based testing at Florida State University Center for Advanced Power Systems (FSU CAPS). ESM prototype will be					



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

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
<p><b><i>FY 2015 Accomplishments:</i></b>                      Completed design of DDG51 Flight III Air Missile Defense Radar (AMDR) Power Conversion Module (PCM) shipboard units and ordered Long Lead Time Material (LLTM) for four (4) Low Rate Initial Production (LRIP) units which will support DDG51 Flight III AMDR Developmental Testing (DT) at the Surface Combat System Center (SCSC) Wallops Island, VA and DDG51 Flight III electrical integration testing at the Naval Surface Warfare Center (NSWC) Philadelphia, PA. Commenced planning DDG51 Flight III AMDR PCM LRIP Factory Acceptance Test (FAT) and Environmental Qualification Tests (EQT). Commenced planning for the Power Hardware in the Loop (PHIL) testing at Florida State University. Continued to support the ship building program office planning for electrical system validation testing at the NSWC Philadelphia PA land based test site. Initiated planning for PCM / AMDR combat system integration testing in support of AMDR Developmental Testing (DT) at Wallops Island.</p> <p>Continued developing the concept of a modular, scalable intermediate power and energy system made of common building blocks to support multiple mission systems on various ships. This concept is known as Energy Magazine (EM). The EM can be utilized in back fit and forward fit applications with existing ship power systems and is expected to incorporate building blocks common with the ESM prototype and ESM SBP. Continued EM performance specification development and acquisition approach.</p> <p><b><i>FY 2016 Plans:</i></b>                      Exercise contract options to Manufacture two (2) LRIP units. LRIP units will support DDG51 Flight III AMDR Developmental Testing (DT) at the Surface Combat System Center (SCSC) Wallops Island, VA. Commence Factory Acceptance Test. Continue planning for DDG51 Flight III AMDR PCM LRIP Factory Acceptance Test (FAT) and Environmental Qualification Tests (EQT). Continue planning and commence site modifications for the Power Hardware in the Loop (PHIL) testing at FSU CAPS. Continue planning for electrical system validation testing at the NSWC Philadelphia, PA land based test site, and continue to support the ship building program office planning for PCM / AMDR combat system integration testing in support of AMDR Developmental Testing (DT) at Wallops Island, VA.</p> <p>Continue developing the concept of a modular, scalable intermediate power and energy system made of common building blocks to support multiple mission systems on various ships. This concept is known as Energy Magazine (EM). The EM can be utilized in back fit and forward fit applications with existing ship power systems</p>					

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

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
and is expected to incorporate building blocks common with the ESM prototype and ESM SBP. Continue EM performance specification development and acquisition approach.					
<p><b>FY 2017 Base Plans:</b> Conduct Factory Acceptance Test and Environmental Qualification Test (EQT) on AMDR PCM LRIP units. Conduct Power Hardware in the Loop (PHIL) testing at FSU CAPS. Continue to support the ship building program office planning for PCM / AMDR combat system integration testing in support of AMDR Developmental Testing (DT) and planning for electrical system validation testing at the NSWC Philadelphia, PA land based test site. Following successful completion of FAT, EQT, and PHIL testing, prepare LRIP units for delivery to DDG51 Flight III AMDR Developmental Testing (DT) at the Surface Combat System Center (SCSC) Wallops Island, VA.</p> <p>Validate mission system power interfaces within existing ship designs with ESM prototype testing. Begin preparation for simulations of advanced power system architectures for fully integrated power and energy systems for potential future surface combatants. Begin developing specifications and acquisition documentation in order to demonstrate at full scale a modular, scalable Energy Magazine to be incorporated into existing platform designs and satisfying the needs of multiple mission systems ready for ship installations.</p> <p><b>FY 2017 OCO Plans:</b> N/A</p>					
<p><b>Title:</b> Naval Power Technology Development / Platform Integration &amp; Transition</p> <p align="right"><b>Articles:</b></p> <p><b>FY 2015 Accomplishments:</b> Completed biennial update of the Naval Power and Energy Systems Technology Development Roadmap. Supported maturation and transition of ONR Future Naval Capabilities (FNC) products to meet TDR identified gaps.</p> <p>Continued to execute the Advanced Electric Power and Propulsion Project, Project Arrangement (short title AEP3 PA or PA) ref DoD-MOD-N-12-0001 which is an agreement between the US and UK Governments to cooperate on a scope of work associated with characterizing, developing, modeling, and de-risking electrical power and propulsion system architectures and equipment for future surface and submarine platforms to meet the needs of both Navies.</p>	1.221	1.432	1.104	0.000	1.104
	-	-	-	-	-

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

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
<p>Continued to develop power and propulsion system configurations in support of future surface ship acquisition programs. Develop alternative power and propulsion solutions for future surface combatants and amphibious ships. Continue to improve baseline power system performance by performing analysis, modeling and simulation, life cycle cost analysis, producibility studies, module development, and ship integration studies and planning. Continued to analyze alternatives for supplying power to advanced radars, combat systems, and electric weapons power demands and potential interfaces to develop optimum alternative solutions. Continued assessments of Naval Power System alternate architectures to best meet emerging ship requirements.</p> <p>Continued Combat Power and Energy System Overarching Integrated Product Team (OIPT).</p> <p>Generated strategy, technology development plan and resource requirements for future surface combatant integrated power and energy system.</p> <p><b>FY 2016 Plans:</b> Continue to execute the Advanced Electric Power and Propulsion Project, Project Arrangement (short title AEP3 PA or PA) ref DoD-MOD-N-12-0001 which is an agreement between the US and UK Governments to cooperate on a scope of work associated with characterizing, developing, modeling, and de-risking electrical power and propulsion system architectures and equipment for future surface and submarine platforms to meet the needs of both Navies. Commence execution of PA complimentary effort (Directed Energy Power Systems (DEPS)) under the Coalition Warfare Program (CWP).</p> <p>Continue to develop power and propulsion system configurations in support of future surface ship acquisition programs. Develop alternative power and propulsion solutions for future surface combatants and amphibious ships. Continue to improve baseline power system performance by performing analysis, modeling and simulation, life cycle cost analysis, producibility studies, module development, and ship integration studies and planning. Continue to analyze alternatives for supplying power to advanced radars, combat systems, and electric weapons power demands and potential interfaces to develop optimum alternative solutions. Continue assessments of Naval Power System alternate architectures to best meet emerging ship requirements.</p> <p>Commence biennial update of the Naval Power and Energy Systems Technology Development Roadmap.</p> <p>Continue to support maturation and transition of ONR Future Naval Capabilities (FNC) products to meet TDR identified gaps.</p>					

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

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
<p>Continue Combat Power and Energy System Overarching Integrated Product Team (OIPT).</p> <p>Continue to generate strategy, technology development plan and resource requirements for future surface combatant integrated power and energy system.</p> <p><b>FY 2017 Base Plans:</b> Continue to execute the Advanced Electric Power and Propulsion Project, Project Arrangement (short title AEP3 PA or PA) ref DoD-MOD-N-12-0001 which is an agreement between the US and UK Governments to cooperate on a scope of work associated with characterizing, developing, modeling, and de-risking electrical power and propulsion system architectures and equipment for future surface and submarine platforms to meet the needs of both Navies. Continued execution of PA complimentary effort (Directed Energy Power Systems (DEPS)) under the Coalition Warfare Program (CWP).</p> <p>Continue to develop power and propulsion system configurations in support of future surface ship acquisition programs. Develop alternative power and propulsion solutions for future surface combatants and amphibious ships. Continue to improve baseline power system performance by performing analysis, modeling and simulation, life cycle cost analysis, producibility studies, module development, and ship integration studies and planning. Continue to analyze alternatives for supplying power to advanced radars, combat systems, and electric weapons power demands and potential interfaces to develop optimum alternative solutions. Continue assessments of Naval Power System alternate architectures to best meet emerging ship requirements.</p> <p>Complete biennial update of the Naval Power and Energy Systems Technology Development Roadmap. Support maturation and transition of ONR Future Naval Capabilities (FNC) products to meet TDR identified gaps.</p> <p>Continue to support maturation and transition of ONR Future Naval Capabilities (FNC) products to meet TDR identified gaps.</p> <p>Continue Combat Power and Energy System Overarching Integrated Product Team (OIPT).</p> <p>Continue to generate strategy, technology development plan and resource requirements for future surface combatant integrated power and energy system.</p> <p><b>FY 2017 OCO Plans:</b></p>					

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<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
N/A					
<b>Title:</b> Cybersecurity Boundary Defense Capability  <b>FY 2015 Accomplishments:</b> Not Applicable  <b>FY 2016 Plans:</b> Not Applicable  <b>FY 2017 Base Plans:</b> Conduct the following studies: cybersecurity assessment of DDG 51 and CG 47 ship class Hull, Mechanical and Electrical (H,M&E) systems; analysis of inter-enclave interfaces; enhanced firewall application analysis; and, Boundary Defense Capability.  Plan for future studies on intra-H,M&E enclave controls point, H,M&E cyber situational awareness tools, message authentication, intrusion detection system, Host level protection, and intrusion prevention systems.  <b>FY 2017 OCO Plans:</b> N/A	0.000	0.000	16.152	0.000	16.152
<b>Articles:</b>	-	-	-	-	-
<b>Accomplishments/Planned Programs Subtotals</b>	20.357	24.143	36.655	0.000	36.655

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

N/A

**Remarks**

**D. Acquisition Strategy**

This program develops and transitions higher performance and more affordable electric power and propulsion systems to both new construction and back fit ship applications using an evolutionary acquisition approach. For new contract awards, full and open competition is utilized to the maximum extent possible to provide maximum benefit to the Navy at the lowest possible cost to the taxpayer. When able to meet Navy requirements, commercial technology is leveraged to further minimize cost to the Navy. Cybersecurity efforts will maximize use of government field activity labs and already contracted HM&E equipment vendors.

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**E. Performance Metrics**

This project will execute 100% of the signed Technology Transition Agreements with ONR; complete 100% of the advanced developments currently planned for the Energy Storage Module and Power Generation Module; achieve up to 10% Specific Fuel Consumption (SFC) improvement for Advanced Power Generation Module; mature technology to Technology Readiness Level (TRL) 6 by milestone decisions for ship acquisition program; and, complete HM&E cybersecurity studies and production of a boundary defense capability architecture and implementation approach for HM&E systems on surface ships in alignment with the Task Force Cyber Awareness (TFCA) goals.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy** **Date:** February 2016

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<b>Product Development (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Product Development	SS/FFP	Rolls Royce : Walpole, MA	12.941	3.445	Feb 2015	8.465	Nov 2015	4.822	Oct 2016	-		4.822	Continuing	Continuing	Continuing
Product Development	SS/BOA	General Electric Company : Cincinnati, OH	3.560	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	C/FFP	DRS : DRS, Milwaukee WI	10.077	11.385	Mar 2015	9.945	Oct 2015	7.700	Oct 2016	-		7.700	Continuing	Continuing	Continuing
Product Development	C/CPFF	Various : Various	32.043	1.391	Nov 2014	1.372	Oct 2015	3.121	Oct 2016	-		3.121	Continuing	Continuing	Continuing
Product Development	WR	NSWCCD-SSES : Phila, PA	41.520	3.545	Oct 2014	3.531	Oct 2015	4.060	Oct 2016	-		4.060	Continuing	Continuing	Continuing
Cybersecurity BDC	WR	NSWCCD-SSES : Phila, PA	0.000	0.000		0.000		9.152	Feb 2017	-		9.152	Continuing	Continuing	Continuing
Cybersecurity BDC	WR	NSWCDD : Dahlgren, VA	0.000	0.000		0.000		2.000	Dec 2016	-		2.000	Continuing	Continuing	Continuing
Cybersecurity BDC	C/CPIF	Boeing : Huntington Beach, CA	0.000	0.000		0.000		2.500	Mar 2017	-		2.500	Continuing	Continuing	Continuing
Cybersecurity BDC	C/FP	Various HM&E Equipment Vendors : Various	0.000	0.000		0.000		2.000	Feb 2017	-		2.000	Continuing	Continuing	Continuing
Cybersecurity BDC	C/CPIF	Various : Various	0.000	0.000		0.000		0.500	Feb 2017	-		0.500	Continuing	Continuing	Continuing
<b>Subtotal</b>			100.141	19.766		23.313		35.855		-		35.855	-	-	-

**Remarks**  
 Cybersecurity Boundary Defense Capability (BDC) scope is now included in this PE/PU which increases Product Development by ~\$18M in FY17. Cybersecurity BDC engineering develops approaches to implement cybersecurity BDC for the Hull, Mechanical and Electrical (H,M&E) control systems on surface ships. The majority of funding will be executed by government field activities who will conduct several studies that identify cybersecurity solutions and a range of alternatives including technical and cost tradeoffs.

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2017 Navy</b>												<b>Date:</b> February 2016			
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<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2015</b>		<b>FY 2016</b>		<b>FY 2017 Base</b>		<b>FY 2017 OCO</b>		<b>FY 2017 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Test and Evaluation	WR	NSWCCD-SSES : Phila, PA	24.954	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
<b>Subtotal</b>			24.954	0.000		0.000		0.000		-		0.000	-	-	-
<b>Management Services (\$ in Millions)</b>				<b>FY 2015</b>		<b>FY 2016</b>		<b>FY 2017 Base</b>		<b>FY 2017 OCO</b>		<b>FY 2017 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Management	C/CPFF	Herren Associates : Alexandria, VA	1.717	0.591	Oct 2014	0.830	Oct 2015	0.800	Oct 2016	-		0.800	Continuing	Continuing	Continuing
<b>Subtotal</b>			1.717	0.591		0.830		0.800		-		0.800	-	-	-
<b>Project Cost Totals</b>			126.812	20.357		24.143		36.655		-		36.655	-	-	-
<b>Remarks</b>															

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy

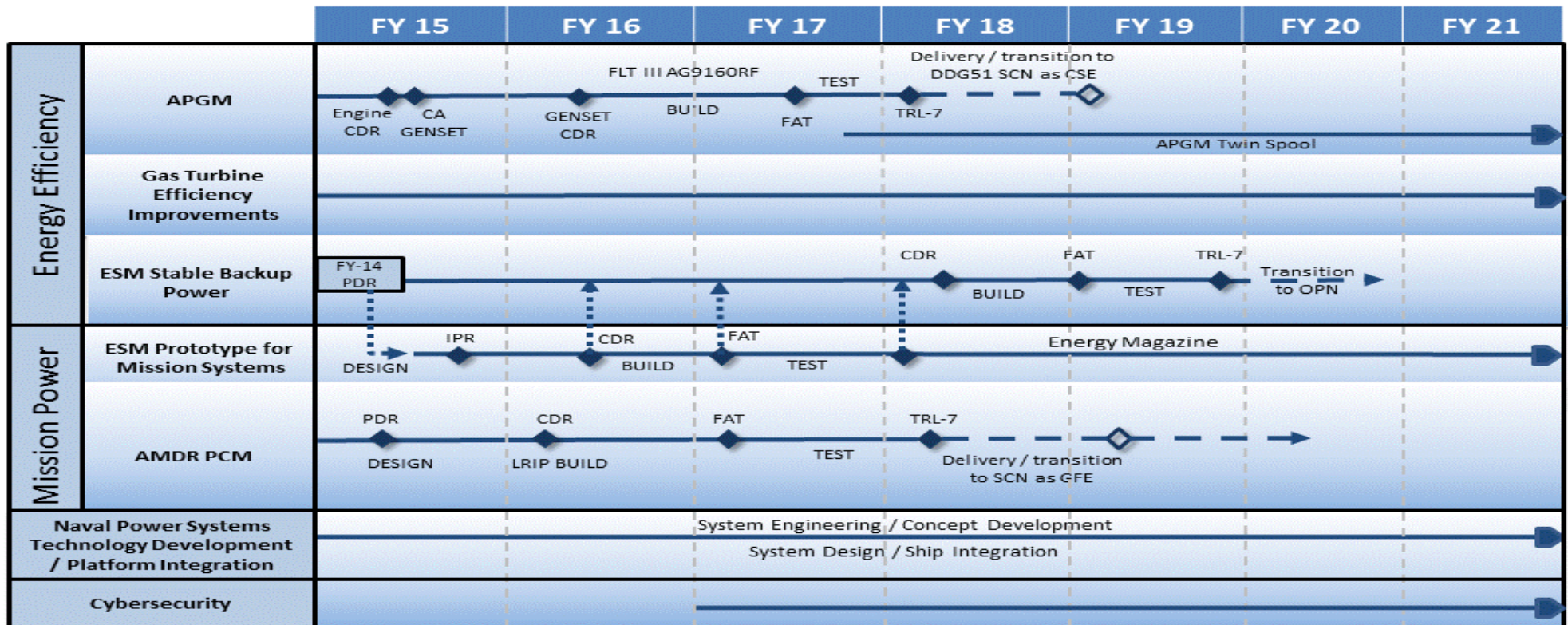
Date: February 2016

Appropriation/Budget Activity  
1319 / 4

R-1 Program Element (Number/Name)  
PE 0603573N / *Advanced Surface Machinery Sys*

Project (Number/Name)  
2471 / *Integrated Power Systems (IPS)*

PE 0603573N



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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Navy		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603573N / <i>Advanced Surface Machinery Sys</i>	<b>Project (Number/Name)</b> 2471 / <i>Integrated Power Systems (IPS)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 2471</b>				
Energy Efficiency	1	2015	4	2021
Mission Power	1	2015	4	2021
Naval Power Technology Development / Platforms Integration & transition	1	2015	4	2021
Cybersecurity BDC	1	2017	4	2021

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