Exhibit R-2, RDT&E Budget Item Justification: PB 2014 Navy											DATE: April 2013	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 3: *Advanced Technology Development (ATD)*					R-1 ITEM NOMENCLATURE PE 0603114N: *Power Projection Advanced Technology*							
COST ($ in Millions)	**All Prior Years**	**FY 2012**	**FY 2013#**	**FY 2014 Base**	**FY 2014 OCO ##**	**FY 2014 Total**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	103.710	56.543	48.201	-	48.201	31.327	26.995	27.609	12.753	Continuing	Continuing
2911: *Power Proj Adv Tech*	0.000	103.710	56.543	48.201	-	48.201	31.327	26.995	27.609	12.753	Continuing	Continuing

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

The FY 2014 OCO Request will be submitted at a later date

Note

FY 2013 funding associated with Future Naval Capability (FNC) efforts are transferring to a new Program Element titled Future Naval Capabilities Advanced Technology Development (PE 0603673N). This is to enhance the visibility of the FNC Program by providing an easily navigable overview of all 6.3 FNC investments in a single location.

A. Mission Description and Budget Item Justification

The efforts described in this Program Element (PE) are based on investment directions as defined in the Naval S&T Strategic Plan approved by the S&T Corporate Board (Sep 2011). This strategy is based on needs and capabilities from Navy and Marine Corps guidance and input from the Naval Research Enterprise (NRE) stakeholders (including the Naval enterprises, the combatant commands, the Chief of Naval Operations (CNO), and Headquarters Marine Corps). It provides the vision and key objectives for the essential science and technology efforts that will enable the continued supremacy of U.S. Naval forces in the 21st century. The Strategy focuses and aligns Naval S&T with Naval missions and future capability needs that address the complex challenges presented by both rising peer competitors and irregular/asymmetric warfare.

This program develops and demonstrates advanced technologies, including Electromagnetic (EM) Rail Gun for naval weapon systems. This Program Element (PE) includes elements of the following Future Naval Capabilities (FNCs); Time Critical Strike, and ForceNet. Within the Naval Transformation Roadmap, this investment will achieve one of four key transformational capabilities required by Sea Strike, as well as technically enable elements of both Sea Shield and Force Net.

Due to the number of efforts in this PE, the programs described herein are representative of the work included in this PE.

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B. Program Change Summary ($ in Millions)	**FY 2012**	**FY 2013**	**FY 2014 Base**	**FY 2014 OCO**	**FY 2014 Total**
Previous President's Budget	114.270	56.543	45.522	-	45.522
Current President's Budget	103.710	56.543	48.201	-	48.201
Total Adjustments	-10.560	0.000	2.679	-	2.679
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-10.000	0.000			
• SBIR/STTR Transfer	-0.560	0.000			
• Program Adjustments	0.000	0.000	-0.321	-	-0.321
• Rate/Misc Adjustments	0.000	0.000	3.000	-	3.000

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy			DATE: April 2013
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COST ($ in Millions)	All Prior Years	FY 2012	FY 2013#	FY 2014 Base	FY 2014 OCO ##	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
2911: *Power Proj Adv Tech*	0.000	103.710	56.543	48.201	-	48.201	31.327	26.995	27.609	12.753	Continuing	Continuing

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

The FY 2014 OCO Request will be submitted at a later date

Note

The decrease of funding from FY 2012 to FY 2013 is the result of the transfer of resources from this R2 Activity to a new FNC R2 activities titled, Strike and Littoral Combat Technologies and Sea Strike. Efforts in this R2 Activity have been continued from FY 2012 to FY 2013 in the new R2 Activities to support all FNC program EC investments and the objective of Precision Strike Technology is the only effort that remains in this R-2 activity effective FY 2013.

A. Mission Description and Budget Item Justification

This project supports the Time Critical Strike (TCS) and ForceNet FNC components which address technological issues associated with the development of strike weapons that significantly decrease the launch to engagement timeline; provide the Navy of the future the ability to quickly locate, target, and strike critical targets; and enhance mission capabilities and operational utility of Naval forces by dramatically increasing the autonomy, performance, and affordability of Naval organic, Unmanned Vehicle systems. The Navy is furthering the development of solid state, high energy laser technology for use as a weapon system on future surface ships.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2012	FY 2013	FY 2014
Title: STRIKE AND LITTORAL COMBAT TECHNOLOGIES	17.484	0.000	0.000
Description: The focus of this activity is on those technologies that will support the Naval Precision Strike Operations and provide the Navy of the future the ability to quickly locate, target, and strike critical targets. This activity includes support to the following FNC Enabling Capabilities (ECs): Advanced Naval Fires Technology, Hostile Fire Detection and Response, Dynamic Target Engagement & Enhanced Sensor Capabilities, and Discriminate and Provide Terminal Guidance for Weapons Targeted at Moving Targets. The decrease in funding from FY 2012 to FY 2013 is due to the migration of this effort to the new PE for FNCs, PE 0603673N. ***FY 2012 Accomplishments:*** Increased Capability Against Moving and Stationary Targets: -Continue the Direct Attack Seeker Head (DASH) project to drive down seeker cost during the procurement and test of the infrared imaging seeker components. -Continue Multi-Mode Sensor/Seeker (MMSS) project to conduct a Critical Design Review (CDR) and initiate the build of a common aperture Laser Radar (LADAR) and infrared sensor system.			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2012	FY 2013	FY 2014
-Continue Multi-Target Laser Designator program. This effort will research advanced optical techniques to enable multiple simultaneous target designation in order to defeat multiple simultaneous targets or SWARM attacks. -Continue Strike Accelerator program. This effort will provide an advanced airborne capability to accurately identify targets using Advanced Target Recognition (ATR). These capabilities utilizing the F/A-18 E/F, AESA (Active Electronically Scanned Array) Radar and ATFLIR (Advanced Targeting Forward Looking Infrared) sensors will enable Strike Aircraft to quickly ID and Target maritime threats. Enhanced Weapon Technologies: -Continue three new products to address short-falls in current Counter Air (CA) and Counter Air Defense (CAD) capabilities by providing improved range and end-game maneuverability while decreasing Time-of-Flight. -Continued definition and documentation of system level requirements for airframe, thrust level, insensitive-munitions and safety/ reliability for CA Advanced Mid-Range Air-to-Air Missile (AMRAAM) Improvements. -Continue definition and documentation of system level requirements for CAD. -Continue definition and documentation of system level requirements for High Speed Components. -Continue development of advanced technologies that support delivery of Navy approved FNC enabling capabilities structured to close operational capability gaps in power projection. -Continue package advanced power projection technologies into deliverable FNC products and ECs that can be integrated into acquisition programs within a five year period. -Continue mature power projection technologies that support naval requirements identified within the Sea Strike and FORCEnet naval capability pillars. Selectable Output Weapon: -Continue Selectable Output Weapon Sea Strike Project. This project will develop and integrate new technologies to enable real-time selection of a munitions energetic output. High Energy Fiber Laser System: -Initiate development of an advanced laser weapon subsystem for demonstration on an air-borne platform. This system will provide the detection and defeat of current and future threats. -Initiate development of advanced technologies that support delivery of Navy approved FNC enabling capabilities structured to close operational capability gaps in power projection.			
Title: PRECISION STRIKE TECHNOLOGY	57.395	56.543	48.201
Description: This activity focuses on the development of high speed (Mach 3 to Mach 4+) strike and directed energy technologies which significantly decrease the engagement timeline from multiple sea surface and air launched platforms.			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2012	FY 2013	FY 2014
FY2013 to FY2014 reduction is due to the Solid State Laser (SSL) program completing efforts in 0603114N. Solid State Laser program funding continues in PE 0602114N for FY 2015. ***FY 2012 Accomplishments:*** Electromagnetic (EM) Railgun: -Continue development and testing of projectile component concepts at 32 MJ muzzle energy tests. -Continue ship integration study efforts. -Complete development and testing of single shot barrel life components with EM lab launcher to 32 MJ of muzzle energy, including a 100 shot demo. -Complete development of industry advanced launcher prototypes, including delivery and installation at EMLF facility for government test and evaluation with 100 shot demo. -Complete next generation, single shot, pulsed power concept design. -Complete final INP Phase I assessment of industry advanced launcher prototypes assessments. -Initiate next generation industry repetitive rate launcher development and test planning. -Initiate next generation repetitive rate pulsed power fabrication in support of future repetitive rate launcher testing. Long Range Anit-Ship Missile (LRASM): -Initiate and complete fabrication of flight hardware. -Initiate and complete launch canister expulsion tests. -Initiate and complete booster separation flight tests. -Initiate and complete integrated flight tests. Weapons System Improvement: -Continue kill-chain studies to identify and recommend engineering trades to enable weapon system interoperability and data fusion alternatives. These studies will assess engineering feasibility of various kill-chain options and assess the capability provided. ***FY 2013 Plans:*** Electromagnetic (EM) Railgun: -Continue all FY 2012 efforts unless completed above. -Complete next generation industry rep rate launcher conceptual/feasibility design. -Initiate fabrication of rep rate lab launcher for testing of barrel life components -Initiate next generation industry rep rate launcher preliminary design.			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2012	FY 2013	FY 2014
-Initiate component fabrication and testing of repetitive firing rate barrel life with EM lab launcher at tactically relevant muzzle energy. Weapons System Improvement: -Continue all efforts of FY 2012. Solid State Laser Technology Maturation Program (SSL-TMP): -Initiate development of a maritime beam director through competitive procurement, which will be capable of supporting missions such as small boat, UAV, and ISR disruption and defeat. This work will include Laser Beam Director scientific and engineering trade studies, including the development of a demonstration system which will take the output from a suitable high power, solid state laser (SSL) and track and maintain aim point over a stand-off distance through the maritime environment which includes atmospheric absorption and turbulence. -Initiate evaluation of at least one maritime beam director design through competitive procurement of selected subsystem parts. -Initiate and conduct initial testing for subcomponents needed for a maritime beam director obtained through competitive procurement. -Initiate Laser System Interface scientific and engineering trade studies, examining the various types of solid state, as well as other laser types. Efforts in this area will focus on the technologies that are suitable for developing a common interface, suitable for use by solid state slab, and solid state fiber optic laser systems - to permit industrial as well as scientific advancements to continue improving overall systems performance. -Initiate laser lethality studies of laser erosion, pitting, and ablation in order to develop understanding of power requirements and related requirements for a beam director and targeting system capable of performing Navy surface ship self defense missions. ***FY 2014 Plans:*** Electromagnetic (EM) Railgun: -Continue all efforts of FY 2013 unless completed above. Weapons System Improvement: -Continue all efforts of FY 2013. Solid State Laser Technology Maturation Program (SSL-TMP): -Continue all efforts of FY 2013.			
Title: DATA DECISION TOOLS ***Description:*** The Navy is furthering Decision Making Tools in the following areas:	9.726	0.000	0.000

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2012	FY 2013	FY 2014
1) Data to Decision: The Navy is performing a series of limited technology experiments (LTE) identifying issues to enable the integration of combat systems and C2 systems to enable rapid, accurate decision making. These experiments are integrating S&T capabilities directly into current combat systems and SOA C2 systems. This is a joint series of experiments with the AF and Army including Navy PEO IWS and PEO C4I which will lead to transition directly into the Advanced Capability Builds 12 - 16 for the IWS POR and into CANES for PEO C4I POR. In FY2012, Navy will continue work associated with the LTEs and perform integrated prototype testing in a more operational environment. 2) Autonomy and Data to Decision: This Navy effort involves integrated reverie and land scenarios. The objective is to develop autonomous networked sensor systems (disparate platforms and sensors) that significantly reduce (objective eliminate) human system management and analysis to enable small forces such as Navy reverie expeditionary teams to focus on the execution of missions with significant sensor support. Currently mission execution is limited by the number of people that have to be engaged in sensor management and analysis. Autonomous Data to Decision capability is also adaptable to autonomous sensor networks in support of forward operating base protection. More funds in the first year would enable a much richer diversity of sensors, platforms, and automated analysis techniques. The decrease in funding from FY 2012 to FY 2013 is due to the migration of these funds to the new PE for FNCs (PE 0603673N). ***FY 2012 Accomplishments:*** -Initiate and complete an integrated prototype testing in a operational environment for the integration of combat systems and C2 systems to enable rapid, accurate decision making. -Initiate and complete futhering diversity of sensors, platforms and automated analysis techniques.			
Title: CYBER SECURITY ARCHITECTURE	5.878	0.000	0.000
Description: The Cyber Security Architecture effort will establish a prototype environment that be used to integrate the results of numerous ongoing S&T efforts to build a cyber security architecture of ever increasing capability There are a number of strategies that have been taken to help mitigate cyber attacks. This effort is aimed at developing an integrated approach that draws on these different strategies and enables new concepts to be brought into the integrated approach. The key is developing a highly flexible architecture. The overarching approach is to providing integrated and modularized cyber defense platform with built-in multiple levels of intelligence for controlling and acting against known and new cyber attacks. The platform encompasses all levels of hierarchy and abstraction of cyber infrastructure, and allows for all cyber defense techniques to efficiently and synergistically co-exist, providing maximum collective coverage against cyber attacks and enhancing mission assurance. The decrease in funding from FY 2012 to FY 2013 is due to the migration of funding into the new PE for FNCs (PE 0603673N).			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2012	FY 2013	FY 2014
FY 2012 Accomplishments: -Initiate and complete a Cyber Security Architecture prototype environment.			
Title: EW/EP MODELING ***Description:*** Electronic Warfare/Electronic Protection (EW/EP) Technology Development, Modeling and Implementation: Research in this activity addresses EW battle space management. Project goal is to develop technology that will utilize EW for platform / task force protection through the integration of EW into a networked coherent structure to provide better fleet defense, and develop techniques to deny the enemy the effective use of their sensors to do battle space awareness and targeting by creating a distorted battle space picture. This effort also continues EP modeling and implementation improvements by funding upgrades to hardware and software required for the characterization of platforms, contribute to modeling and simulation of implementable solutions, and technology validation through flight demonstrations of those solutions. EP upgrades scheduled for transition to the platform program offices in FY 2013 and FY 2014. Decrease in funding from FY 2012 to FY 2013 is due to migration of funding into the new PE for FNCs (PE 0603673N). ***FY 2012 Accomplishments:*** -Initiate and complete integration of EW into a networked coherent structure to provide better fleet defense. -Initiate and complete development of EP techniques to deny enemy battlespace awareness. -Initiate and complete upgrades for improved EP modeling and simulation and for EP technology validation and transition.	13.227	0.000	0.000
Accomplishments/Planned Programs Subtotals	103.710	56.543	48.201

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

The metrics used are programmatic milestones and technical milestones, such as completion of technical trade studies examining suitable technologies for subsequent prototype development; incremental laboratory and field testing of components and sub-systems; and delivery of industry-developed prototypes for demonstration.