Exhibit R-2, PB 2010 Navy RDT&E Budget Item Justification								DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY 1319 - Research, Development, Test & Evaluation, Navy/BA 2 - Applied Research					R-1 ITEM NOMENCLATURE PE 0602114N POWER PROJECTION APPLIED RESEARCH					
COST ($ in Millions)	**FY 2008 Actual**	**FY 2009 Estimate**	**FY 2010 Estimate**	**FY 2011 Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	103.744	98.651	59.787						Continuing	Continuing
0000: POWER PROJECTION APPLIED RESEARCH	103.744	98.651	59.787						Continuing	Continuing

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 (Jan 2007). 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 PE supports both advanced technology research and near to mid-term transition opportunities. The advanced research focus is primarily on High Energy Lasers (HEL), Electromagnetic railgun development, advanced rocket propulsion, electro-optic/infrared (EO/IR) sensor technologies. The mid-term effort is focused on developing and demonstrating technologies supporting the Future Naval Capability (FNC) Program Enabling Capabilities (ECs) for Marine and Unmanned Vehicle Tactical Intelligence, Surveillance and Reconnaissance (ISR), Advanced Naval Fires Technology, Hostile Fire Detection and Response, Weapons of Mass Destruction (WMD), and Dynamic Target Engagement & Enhanced Sensor Capabilities. Within the Naval Transformation Roadmap, this investment will achieve two of four key transformational capabilities required by Sea Strike as well as technically enable the Littoral Sea Control key transformational capability within Sea Shield.

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 2008	FY 2009	FY 2010	FY 2011
Previous President's Budget	106.667	79.913	79.343	
Current BES/President's Budget	103.744	98.651	59.787	
Total Adjustments	-2.923	18.738	-19.556	
Congressional Program Reductions		-0.279		
Congressional Rescissions				
Total Congressional Increases		19.200		
Total Reprogrammings	-0.124			
SBIR/STTR Transfer	-0.812			
Congressional Action - Realignment of congressional add from NAVY to ARMY	-1.987			
Program Adjustments			-19.715	
Rate/Misc Adjustments		-0.183	0.159	

Congressional Increase Details ($ in Millions)	FY 2008	FY 2009
Project: 9999, **ADVANCED PROPULSION FOR GUN LAUNCHED PROJECTILES AND MISSILES**	0.772	0.000
Project: 9999, **AGING MILITARY AIRCRAFT FLEET SUPPORT**	1.164	1.596
Project: 9999, **CLUSTERED MILLIMETER WAVE IMAGING SENSORS & MANUFACTURING**	1.545	0.000
Project: 9999, **COMBUSTION LIGHT GAS GUN PROJECTILE**	3.085	3.988
Project: 9999, **ELECTRONIC MOTION ACTUATION SYSTEMS**	0.000	0.798
Project: 9999, **HIGH ENERGY CONVENTIONAL ENERGETICS (PHASE II)**	4.911	3.190
Project: 9999, **HIGH POWER FREE ELECTRON LASER DEVELOPMENT FOR NAVAL APPLICATIONS**	1.987	2.394
Project: 9999, **MARINE MAMMAL HEARING AND ECHOLOCATION RESEARCH**	0.000	1.596
Project: 9999, **MARINE MAMMALS - EFFECTS OF SOUND**	0.772	0.000
Project: 9999, **MILLIMETER WAVE IMAGING**	0.000	1.596
Project: 9999, **MODULAR PAYLOAD SYSTEMS**	1.934	0.000
Project: 9999, **MULTIFUNCTIONAL OXIDE MATERIALS APPLICATIONS AND DEVICES (MFMA)**	1.931	0.000

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Congressional Increase Details ($ in Millions)	FY 2008	FY 2009
Project: 9999, **STRIKE WEAPON PROPULSION (SWEAP)**	1.928	2.394
Project: 9999, **UNMANNED AERIAL VEHICLE FUEL CELL POWER SOURCE WITH HYBRID REFORMING**	1.937	1.596

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

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COST ($ in Millions)	**FY 2008 Actual**	**FY 2009 Estimate**	**FY 2010 Estimate**	**FY 2011 Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
0000: POWER PROJECTION APPLIED RESEARCH	103.744	98.651	59.787						Continuing	Continuing

A. Mission Description and Budget Item Justification

This project addresses the technology issues involving the Navy's capability to project naval power on the broad seas and in the littoral regions.

B. Accomplishments/Planned Program ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
DIRECTED ENERGY AND EM GUNS (FORMERLY ELECTRIC WEAPONS)	43.016	47.817	36.895	

The goal of this activity is to develop Directed Energy (DE) and Electric Propulsion power weapons for Navy applications. The Directed Energy portion of this activity consists of two elements. The first element involves applied research and development of technologies supporting advanced accelerators with applications to directed energy weapons. The second portion of activity is the Free Electron Laser (FEL)Innovative Naval Prototype (INP)which if successful could be applicable for shipboard applications as a defensive weapon against advanced cruise missiles and asymmetric threats. The other major component in this activity is the Electro Magnetic (EM) gun program that is focused on developing the technology to launch a long range projectile from Navy ships. This activity also includes NRL investment/ performance in these research areas.

The increase from FY 2008 to FY 2009 is due to a larger investment in advance technology component development and testing required as the FEL program progresses to the higher power weapons-level outputs. Decrease from FY 2009 to FY 2010 is due to the reduction of 6.2 investment in the EM railgun and Direct Engery. The amount of the decrease was partially offset by the increase of the Free Electron Laser (FEL) investment in preparation for the FEL demonstration program.

FY 2008 Accomplishments:

Directed Energy:

- Continued cryomodule and FEL component development at the FEL testing and integration facility.

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B. Accomplishments/Planned Program ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
- Continued investigation into the application of FEL technology to other areas including advanced materials, optics, bioscience, medical, manufacturing, weaponization, and solid state physics. - Continued 1 micron filamentation, halo limitation, and short Rayleigh range studies. - Continued testing of Radio Frequency (RF) gun High Voltage Power Supply (HVPS) components which are required for the 100 kW high current injector. - Initiated investigations of high power microwave sources, fiber lasers, and beam control technologies for target detection, acquisition, tracking, aimpoint maintenance of DE systems for ship and air target engagements. - Initiated development of high power optical and amplifier components for high power weapons level lasers. - Initiated aero-optical mitigation techniques for DE applications. EM Gun: - Continued material, physics and thermal property research for both launchers and projectiles. - Continued launcher and projectile component investigations and preliminary development, lethality studies and preliminary design for projectile, Bore Life Launcher component testing, IPT and bore life consortium collaborations between industry, Navy and the Army electromagnetic launch program. - Continued bore life risk reduction tests by scaling laboratory launcher muzzle energy from 8 to 16MJ to ensure bore life characteristics of the rails and insulators apply at the higher energies. Finalized projectile conceptual designs from two industry vendors and began projectile preliminary design. - Continued conceptual design of rotating machine pulsed power. - Completed preliminary design of the electromagnetic demonstration launchers with industry partners. - Completed investigation of surface treatments such as advanced coatings or "MAX-phase" materials to harden the rails in electromagnetic railguns. - Completed development of designs for viable novel electric weapon architectures that enhance performance and maintainability. - Initiated preliminary designs of pulse power systems and begin examination of system interface with ship integration.				

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B. Accomplishments/Planned Program ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
FY 2009 Plans: Directed Energy and Accelerator Research: - Continue all efforts of FY 2008, less those noted as completed above. - Continue applied directed energy and accelerator research in: Compton radiation scattering, multiple dielectric thin film coatings, bunch characteristics of electron beam emittance, high grade electromagnetic field generators, electron beam lattice configuration, novel electron beam generation, novel high flux subatomic particle emission, high gain photonic amplification, fundemental power efficiency conversion. In addition continue the development of physics based models for: characterization of subatomic particle interaction and propagation and modeling for validation of photon control structures. - Initiate Innovative Naval Prototype (INP) program for FEL. EM Gun: - Continue material, physics and thermal property research for both launchers and projectiles. - Continue launcher and projectile development. - Continue preliminary design and lethality studies of projectile, design of next generation pulse power systems, IPT and Bore Life Consortium collaborations. - Initiate development of modeling and simulation capability to support bore life development and testing. *FY 2010 Plans:* Directed Energy and Accelerator Research: - Continue all efforts of FY 2009. - Continue applied DE and accelerator research efforts of FY09. - Continue Innovative Naval Prototype (INP) program for the FEL. The FEL INP will design, develop, demonstrate and test an FEL that will operate at a weapons level power output (approximately 100 kW). EM Gun: - Continue all efforts of FY 2009. Applied Electromagnetics for High Power Weapons:				

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B. Accomplishments/Planned Program ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
- Initiate a program to conduct applied research into applied electromagnetics as it applies to lasers, high power microwaves, and advanced sensors, including Modeling and Simulation tools for Directed Energy Weapons.				
HIGH SPEED PROPULSION AND ADVANCED WEAPON TECHNOLOGIES The high speed weapons work in this activity is focused on demonstrating propulsion and vehicle technologies for Mach3+ to Mach8 capable weapons. The solid rocket motor Integrated High Performance Rocket Propulsion Technology (IHPRPT) technology development activities will provide improved rocket based weapon performance. The rocket technologies apply to both air dominance and strike weapons and will provide both improved range and speed. This work includes technologies associated with high acceleration capable projectile structures, high temperature and high strength materials to enable projectiles to survive high speed launch environment, improved thermal prediction methodologies and test techniques, wide dynamic pressure adaptable projectile controls and non-explosively launched lethal mechanisms. The high speed projectile technologies are intended to support long range Naval Fire Support weapons. Decrease from FY 2008 to FY 2009 is due to additional high speed weapons ground testing in FY 2008. The decrease from FY 2009 to FY 2010 is due to the completion of the IHPRPT program. *FY 2008 Accomplishments:* Integrated High Performance Rocket Propulsion Technology (IHPRPT): - Continued demonstration of air-to-air system that uses new energetic ingredient compositions to meet Phase III IHPRPT performance goals. - Continued development of surface launch component technologies. Asymmetric Threat & Laser Control Technologies: - Continued development of propulsion and high temperature materials technologies to enable high speed weapons. - Continued demonstrating dual mode warhead effectiveness in both above and below water detonations.	9.622	7.741	1.557	

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B. Accomplishments/Planned Program ($ in Millions)		**FY 2008**	**FY 2009**	**FY 2010**	**FY 2011**
FY 2009 Plans: Integrated High Performance Rocket Propulsion Technology: - Complete program through demonstration of Solid Rocket Motor Phase III goals at the subsystem level. Asymmetric Threat & Laser Control Technologies: - Initiate high speed projectile technology development. - Initiate High Power Microwave (HPM) technology development. *FY 2010 Plans:* High Speed Projectile & Advanced Weapon Technologies (Formerly Asymmetric Threat & Laser Control Technologies): - Continue development of compact High Power Microwave weapon systems, specifically those needed for compact source generators and compact antenna designs. - Continue high speed projectile technology development. Advanced Propulsion Technologies for Unmanned Combat Air System (UCAS): - Initiate development of technologies for a highly survivable embedded propulsion and power system which requires good thrust specific fuel consumption for missions requiring long range and endurance.					
NAVIGATION, ELECTRO OPTIC/INFRARED (EO/IR), AND SENSOR TECHNOLOGIES This activity describes Navy Science and Technology (S&T) investments in the areas of EO/IR devices and advanced sensors and includes NRL investment/performance in the technology areas of Electronics, Electronic Warfare, and Communications. The decrease from FY 2008 to FY 2009 is a result of realigning efforts more appropriately budgeted under the Strike and Littoral Combat Activity in this PE. Decrease from FY 2009 to FY 2010 is due to a reduction in NRL related EO/IR/Sensor development activities.		6.649	5.403	3.842	

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B. Accomplishments/Planned Program ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
FY 2008 Accomplishments: Navigation Technologies: - Program transferred to PE 0602271N under the RF Navigation Technology activity. Electro Optic/Infrared: - Continued Millimeter Wave (MMW) and TeraHertz (THz) Imaging effort. - Continued with development of ultra low noise uncooled nanotechnology infrared sensors, and development of electronic field of view and zoom imagers. - Continued development nanoatomic sensor nonvolatile memories. - Continued development of new processes/methodologies to enable construction of composite countermeasures that fit the engagement timeline while maintaining effectiveness against existing and emerging IR guided threats. - Continued the development of an active optics system that can survey a wide area and instantly, non-mechanically zoom-in on an area of interest for target tracking/identification. Communications: - Continued covert high bandwidth communications effort. - Continued development of free space laser communications systems with the development of a hybrid infrared system with dramatically lower power requirements at the sensor/transmitter. - Continued development of Micro Air Vehicle (MAV). - Completed small hyperspectral sensor development. Autonomous Systems: - Continued design and development of a disposable MAV which will enable the airborne delivery and precision placement of miniature EW sensors and payloads. - Continued the design of an advanced auto gyrator that combines a swashplateless rotor system and active stability augmentation for autonomous systems. - Completed development of near optimal trajectory planners to enhance the capabilities of UAVs and other distributed autonomous systems. - Completed development of a compact, efficient heavy fuel engine for UAVs.				

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B. Accomplishments/Planned Program ($ in Millions)		**FY 2008**	**FY 2009**	**FY 2010**	**FY 2011**
- Initiated the development of a novel beam steering method in phased array radar using optical fiber based slow light techniques. - Initiated the development of machine-vision algorithms and guidance strategies to enable the precision autonomous recovery of small sensor platforms on moving naval vessels. - Initiated the development of an autonomous soaring capability and intelligent path planning for extracting energy from the environment thereby conserving onboard fuel stores of autonomous air vehicles. - Initiated development of high power fiber lasers in mid-IR (2-5 μm) based upon highly nonlinear IR transmitting chalcogenide photonic crystal fibers. *FY 2009 Plans:* Electro Optic/Infrared: - Continue development of ultra low noise uncooled nanotechnology infrared sensors. - Continue development of electronic field of view and zoom imagers. - Continue the development of an active optics system that can survey a wide area and instantly, non-mechanically zoom-in on an area of interest for target tracking/identification. Transferred to PE 0602271N - Continue development of new processes/methodologies to enable construction of composite countermeasures that fit the engagement timeline while maintaining effectiveness against existing and emerging IR guided threats. - Continue development of high power fiber lasers in mid-IR (2-5 μm) based upon highly nonlinear IR transmitting chalcogenide photonic crystal fibers. Transferred to PE 0602271N - Complete THz Imaging project through transition to 6.3 development. - Initiate effort to develop ultra-high-sensitivity detectors suitable for use in focal plane arrays (FPAs) for the short-wave infrared (SWIR) spectral band. Transferred to PE 0602271N - Initiate effort to develop mid & Long wave IR focal plane arrays using graded-bandgap W-type-II superlattices w/much higher detectivity than that of state-of-the-art HgCdTe (MCT). Transferred to PE 0602771N - Initiate development of tunable narrowband infrared absorption technology.					

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B. Accomplishments/Planned Program ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
Autonomous Systems: - Continue the development of a novel beam steering method in phased array radar using optical fiber based slow light techniques. - Continue the development of machine-vision algorithms and guidance strategies to enable the precision autonomous recovery of small sensor platforms on moving naval vessels. - Continue the development of an autonomous soaring capability and intelligent path planning for extracting energy from the environment thereby conserving onboard fuel stores of autonomous air vehicles. - Complete design and development of a disposable MAV which will enable the airborne delivery and precision placement of miniature EW sensors and payloads. - Complete the design of an advanced auto gyrator that combines a swashplateless rotor system and active stability augmentation for autonomous systems. Electronic Warfare: - Initiate development of an ultra-lean combustor for recuperated gas turbines. *FY 2010 Plans:* Electro Optic/Infrared: - Continue development of tunable narrowband infrared absorption technology. - Complete development of new processes/methodologies to enable construction of composite countermeasures that fit the engagement timeline while maintaining effectiveness against existing and emerging IR guided threats. Autonomous Systems: - Complete the development of a novel beam steering method in phased array radar using optical fiber based slow light techniques. - Complete the development of machine-vision algorithms and guidance strategies to enable the precision autonomous recovery of small sensor platforms on moving naval vessels.				

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B. Accomplishments/Planned Program ($ in Millions)		**FY 2008**	**FY 2009**	**FY 2010**	**FY 2011**
- Complete the development of an autonomous soaring capability and intelligent path planning for extracting energy from the environment thereby conserving onboard fuel stores of autonomous air vehicles. Electronic Warfare: - Continue all efforts of FY 2009.					
STRATEGIC SUSTAINMENT The Strategic Sustainment activity develops technologies which will sustain and improve Navy's strategic system capabilities in the areas of Radiation Hardened System Design (RAD HARD), Solid Rocket Motor Ignition (SRM) Response, and drag reduction devices. The reduction from FY 2008 to FY 2009 is due to the completion of the Strategic System Infrastructure (SSI) program in FY 2008. *FY 2008 Accomplishments:* SSI: - Completed Missile propulsion efforts by conducting final testing. - Completed Advanced PBCS Valve Technology and Materials program efforts by conducting materials compatibility tests, Integrated Valve Assembly demo, subscale propellant mixes and a manifold concept demo. - Completed Ordnance Initiation Technologies program by demonstrating and documenting new ordnance initiation technology that meets the requirements.		6.451	0.000	0.000	
STRIKE AND LITTORAL COMBAT TECHNOLOGIES The focus of this activity is on those technologies that will support Naval Precision Strike Operations and provide the Navy of the future the ability to quickly locate, target, and strike critical targets ashore.		9.971	10.448	7.580	

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B. Accomplishments/Planned Program ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
The net increase in funding between FY 2008 and FY 2009 is due to the realignment of efforts from the Navigation EO/IR activity and the planned reduction of funding for FNC efforts in this activity. Decrease from FY 2009 and FY 2010 is due to delay in start of Selectable Ouput Weapons and Mult-Target Laser Designator. *FY 2008 Accomplishments:* Discriminate and Provide Terminal Guidance for Weapons Targeted at Moving Targets: - Initiated development of Weapons Data Link terminal to improve in-flight control of weapons in real time. Initial work will focus on research to improve RF amplification at high bandwidths and low-observable, high gain weapon mounted antennas. Dynamic Target Engagement: - Continued development of Decision Support System for dynamic target engagement. - Continued development of remote sensor fusion hardware for ground sensors, an ultra endurance UAV, and a GMTI sensor for use on UAVs. (formerly funded in PE's 0602235N, 0603640M, and 0603114N) Advanced Naval Fires Technology Spiral 1 (ANFT): - Continued development of passive interferometric imaging system to detect millimeter wave RF anomalies within the background environment by using exotic signal processing techniques. Increased Capability Against Moving and Stationary Targets: - Continued development of passive interferometric imaging system to detect millimeter wave RF anomalies within the background environment by using exotic signal processing techniques. - Completed IWS technology development. - Completed genetic algorithm selection process for communication jamming. - Initiated development of Direct Attack Seeker Head (DASH) by developing low cost multi-passive array technology using Imaging Infrared (IIR) and millimeter Wave (mmW) in a common aperture architecture. - Initiated development of Multi-Mode Sensor/Seeker (MMSS) technology development to develop advanced signal processing techniques to classify and identify moving targets using Automatic Target Recognition (ATR).				

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B. Accomplishments/Planned Program ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
- Initiated the development of signal processing techniques to improve situational awareness and autonomous detection of hostile fire events in a dynamic urban clutter environment. Transferred to 0602271N - Initiated the development of techniques to combine current IR/EO technology and recent findings on the characteristics of the eye to classify and identify optical devices and individuals in real time at militarily significant ranges. Transferred to 0602271N - Initiated the development of a process to detect hostile camouflaged or hidden targets in shadows and diverse backgrounds of militarily challenging environments. Transferred to 0602271N				
FY 2009 Plans: Discriminate and Provide Terminal Guidance for Weapons Targeted at Moving Targets: - Continue development of Weapons Data Link terminal toward weapon scalability and modularity. Dynamic Target Engagement: - Complete development of Decision Support System for dynamic target engagement. Increased Capability Against Moving and Stationary Targets: - Complete the mmW component design for the DASH multi-sensor weapon seeker and begin the mmW sensor fabrication and testing. In conjunction with building the sensor suite of the Multi-mode Sensor/ Seeker, continue development of advanced signal processing techniques, which will classify and identify moving targets using Automatic Target Recognition (ATR). Enhanced Weapons Technologies: - Continue development of passive interferometric imaging system to detect millimeter wave RF anomalies within the background environment by using exotic signal processing techniques.				

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B. Accomplishments/Planned Program ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
- Continue the development of signal processing techniques to improve situational awareness and autonomous detection of hostile fire events in a dynamic urban clutter environment. Transferred to 0602271N - Continue the development of techniques to combine current IR/EO technology and recent findings on the characteristics of the eye to classify and identify optical devices and individuals in real time at militarily significant ranges. Transferred to 0602271N - Continue the development of a process to detect hostile camouflaged or hidden targets in shadows and diverse backgrounds of militarily challenging environments. Transferred to 0602271N - Initiate three new products to expand current Counter Air / Counter Air Defense capabilities by providing improved range and end-game maneuverability while decreasing Time-of-Flight. Specific tasks to begin design and development phase are: Counter Air Advanced Medium-Range Air-to-Air Missile (AMRAAM) Improvements / Counter Air Defense Improvement / High Speed Components. - Initiate development and apply emerging technologies that support delivery of Technology Oversight Group approved FNC enabling capabilities structured to close operational capability gaps in power projection; package emerging power projection technologies into deliverable FNC products and ECs that can be integrated into acquisition programs within a five year period; and mature power projection technologies that support naval requirements identified within the Sea Strike and FORCEnet naval capability pillars. *FY 2010 Plans:* Discriminate and Provide Terminal Guidance for Weapons Targeted at Moving Targets: - Weapon Data Link project transitions to PE 0603114N. Increased Capability Against Moving and Stationary Targets: - Continue the Direct Attack Seeker Head (DASH) project by developing and testing of the radar sensor and procurement of the IIR sensor. - Continue the Multi-Mode Sensor/Seeker (MMSS) project. Enhanced Weapon Technologies: - Continue all efforts of FY 2009, less those noted as completed above.				

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B. Accomplishments/Planned Program ($ in Millions)		**FY 2008**	**FY 2009**	**FY 2010**	**FY 2011**
- Complete development of passive interferometric imaging system to detect millimeter wave RF anomalies within the background environment by using exotic signal processing techniques.					
WMD DETECTION The Chief of Naval Operations (CNO) in the Navy Strategic Plan (NSP) has directed that the Navy be able to combat Weapons of Mass Destruction (WMD) at sea and ashore. This activity addresses the development of key technologies for standoff detection of WMD's and component nuclear materials on ships at sea. The program will develop and demonstrate technology for actively detecting fissile material and other weapons of mass destruction. FY 2008 reflects the initiation of the WMD Detection Program. FY 2009 increase represents the ramping up of the program as continuing technological efforts evolve. The testing of the equipment in realistic maritime environments significantly increases the cost of testing. *FY 2008 Accomplishments:* - Initiated using particle beam (neutrons, gamma rays, muons, and others) to perform standoff detection of fissile material. - Initiated investigations into the use of Free Electron Laser (FEL) accelerator technologies for the detection of WMD's and nuclear components & materials. Conducted experiments to determine the ability of the FEL to perform remote detection of nuclear material on surfaces, and chemical biological agents in aerosol clouds. - Initiated development of hand-held and portable radiation detector technology to support maritime interdiction operations. - Initiated modeling and simulation efforts to determine the ability to use neutron activation analysis to locate smuggled nuclear weapons and material through underwater detection. *FY 2009 Plans:* - Continue all efforts of FY 2008.		6.069	8.094	9.913	

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B. Accomplishments/Planned Program ($ in Millions)		**FY 2008**	**FY 2009**	**FY 2010**	**FY 2011**
- Initiate planning for a maritime demonstration of standoff detection of fissile materials. This effort will involve formation of a team comprised of DoD, interagency, and international partners to support the demonstration. *FY 2010 Plans:* Weapons Mass Destruction Detection: - Continue all efforts of FY 2009.					

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C. Other Program Funding Summary ($ in Millions)

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
PE 0601152N/In-House Laboratory Independent Research									Continuing	Continuing
PE 0601153N/Defense Research Sciences									Continuing	Continuing
PE 0602123N/Force Protection Applied Research									Continuing	Continuing
PE 0602131M/Marine Corps Landing Force Technology									Continuing	Continuing
PE 0602203F/Aerospace Propulsion									Continuing	Continuing
PE 0602235N/Common Picture Applied Research									Continuing	Continuing
PE 0602303A/Missile Technology									Continuing	Continuing
PE 0602601F/Space Technology									Continuing	Continuing
PE 0602602F/ Conventional Munitions									Continuing	Continuing
PE 0602618A/Ballistics Technology									Continuing	Continuing
PE 0602624A/Weapons and Munitions Technology									Continuing	Continuing
PE 0602702E/Tactical Technology									Continuing	Continuing

Exhibit R-2a, PB 2010 Navy RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY 1319 - Research, Development, Test & Evaluation, Navy/BA 2 - Applied Research	R-1 ITEM NOMENCLATURE PE 0602114N POWER PROJECTION APPLIED RESEARCH	PROJECT NUMBER 0000

PE 0603004A/Weapons and Munitions Advanced Technology		
PE 0603114N/Power Projection Advanced Technology	Continuing	Continuing
PE 0603216F/Aerospace Propulsion and Power Technology	Continuing	Continuing
PE 0603640M/USMC Advanced Technology Demonstration (ATD)	Continuing	Continuing
PE 0603739E/Advanced Electronics Technologies	Continuing	Continuing
PE 0603790N/ NATO Research and Development	Continuing	Continuing

D. Acquisition Strategy

Not Applicable.

E. Performance Metrics

This PE develops early components technologies that if successful can be integrated into weapon systems that meet warfighter requirements. Most of the work in this PE can be classified between Technology Readiness Level (TRL) 2 (technology concept and/or application formulation) and TRL 4 (component and/or breadboard validation in laboratory environments). The metrics used to evaluate 6.2 programs are necessarily less precise than those used in 6.3 programs.

The metrics for this PE can be divided into two categories: technological and organizational/functional. Technological metrics address the success of the work performed. The primary technological metrics used in this PE involve laboratory experiments/tests demonstrating proof of the concept for the technology. This demonstration is frequently a hand-assembled functioning breadboard of the concept. The organizational/functional metrics applied to this PE include: transition of the technology to advanced development in a 6.3 PE and applicability of the technology to documented warfighter problems or requirements. Successful implementation of these categories would result in the application of a pass/fail metric and further evaluation for possible transition to a 6.3 development/demonstration program.

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