| Exhibit R-2, RDT&E Budget Item Justification: PB 2014 Navy | | | | | | | | | | | | DATE: April 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 3: *Advanced Technology Development (ATD)* | | | | | R-1 ITEM NOMENCLATURE<br>PE 0603236N: *Warfighter Sustainment Advd Tech* | | | | | | | |
| **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 | 68.955 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 68.955 |
| 2915: *Warfighter Sustainment Adv Tech* | 0.000 | 68.955 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 68.955 |

# 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 Science and Technology (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 S&T 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.

Warfighter Sustainment Advanced Technology supports: Manpower and Personnel, Training, and Readiness; and the Future Joint Warfighting Capabilities identified by the Joint Chiefs of Staff. It supports Future Naval Capabilities (FNC) Programs in Airframe/Ship Corrosion; Turbine Engine Technologies; Littoral Combat; Sea Base Planning, Operations and Logistics; and Sea Base Mobility and Interfaces. It develops technologies that enable the Navy to better recruit, select, classify, assign, and manage its people; to train effectively and affordably in classroom settings, in simulated and actual environments, and while deployed; and to effect human systems design into weapon systems. Other technologies enable reduced operating costs through life-extension of legacy systems and increased efficiency of future propulsion systems and improved diagnostic tools.

Within the Naval Transformation Roadmap, this investment supports the achievement of all the transformational capabilities of Sea Warrior and the transformational capabilities of: Ship to Objective Maneuver and Time Sensitive Strike required by Sea Strike; Littoral Sea Control and Anti-Sub Warfare required by Sea Shield; Compressed Deployment and Employment Times and Enhanced Sea-Borne Positioning of Assets required by Sea Basing; and Battlespace Integration required by FORCEnet.

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

| Exhibit R-2, RDT&E Budget Item Justification: PB 2014 Navy | | | | | DATE: April 2013 |
|---|---|---|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 3: *Advanced Technology Development (ATD)* | | | R-1 ITEM NOMENCLATURE<br>PE 0603236N: *Warfighter Sustainment Advd Tech* | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2012** | **FY 2013** | **FY 2014 Base** | **FY 2014 OCO** | **FY 2014 Total** |
| Previous President's Budget | 71.149 | 0.000 | 0.000 | - | 0.000 |
| Current President's Budget | 68.955 | 0.000 | 0.000 | - | 0.000 |
| Total Adjustments | -2.194 | 0.000 | 0.000 | - | 0.000 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | 0.021 | 0.000 | | | |
| • SBIR/STTR Transfer | -2.215 | 0.000 | | | |

**Change Summary Explanation**

Technical: Reflects a correction to the Seabasing INP funding profile to be consistent with the changes in complexity and cost associated with going from preliminary design and model development through prototype fabrication.

Schedule: N/A

| Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy | | | DATE: April 2013 |
|---|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 3: *Advanced Technology Development (ATD)* | R-1 ITEM NOMENCLATURE<br>PE 0603236N: *Warfighter Sustainment Advd Tech* | PROJECT<br>2915: *Warfighter Sustainment Adv Tech* | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2915: *Warfighter Sustainment Adv Tech* | 0.000 | 68.955 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 68.955 |

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

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

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

Warfighter Sustainment Advanced Technology supports Manpower and Personnel, Training, and Readiness; and the Future Joint Warfighting Capabilities identified by the Joint Chiefs of Staff. This project supports FNC Programs in Airframe/Ship Corrosion; Turbine Engine Technologies; Littoral Combat; Sea Base Planning, Operations and Logistics; and Sea Base Mobility and Interfaces. This project develops technologies that enable the Navy to better recruit, select, classify, assign, and manage its people; to train effectively and affordably in classroom settings, in simulated and actual environments, and while deployed; and to effect human systems integration into weapon systems. Other technologies enable reduced operating costs through life-extension of legacy systems, increased efficiency of future propulsion systems and improved diagnostic tools. Within the Naval Transformation Roadmap, this investment supports the achievement of all the transformational capabilities of Sea Warrior and the transformational capabilities of Ship to Objective Maneuver and Time Sensitive Strike required by Sea Strike; Littoral Sea Control and Anti-Submarine Warfare (ASW) required by Sea Shield; Compressed Deployment and Employment Times and Enhanced Sea-Borne Positioning of Assets required by Sea Basing; and Battlespace Integration required by FORCEnet.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2012 | FY 2013 | FY 2014 |
|---|---|---|---|
| ***Title:*** AIRFRAME/SHIP CORROSION/COST REDUCTION TECHNOLOGIES | 14.339 | 0.000 | 0.000 |
| ***Description:*** This activity includes an integrated approach for the control of the effects of external and internal corrosion in Naval weapon systems as well as cost reduction technology efforts. The work develops advanced, cost effective prevention and lifecycle management technologies. This is particularly significant to life extension for the aging fleet.<br><br>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 Enterprise and Platform Enablers. Efforts in this R2 activity have been continued from FY 2012 to FY 2013 into the new R2 activity to support all FNC program EC Investments.<br><br>***FY 2012 Accomplishments:***<br>- Continue all efforts of FY 2011.<br>- Initiate evaluation and design of rotorcraft structural health management sensors, architecture and diagnostics.<br>- Initiate development of sprayable acoustic damping systems for submarines to significantly reduce weight and costly maintenance procedures and increase operational readiness. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 3: *Advanced Technology Development (ATD)* | R-1 ITEM NOMENCLATURE<br>PE 0603236N: *Warfighter Sustainment Advd Tech* | PROJECT<br>2915: *Warfighter Sustainment Adv Tech* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2012 | FY 2013 | FY 2014 |
|---|---|---|---|
| - Initiate development of low temperature carbon supersaturation (LTCSS) technology to incorporate improved corrosion resistance and surface hardness to materials in erosion-corrosion environments.<br>- Initiate development of algorithms to incorporate into design module for corrosion prevention to predict the occurrence of corrosion and provide alternative solutions for use in component and system design. | | | |
| ***Title:*** HUMAN SYSTEMS DESIGN (FORMALLY INTEGRATION)<br><br>***Description:*** This effort supports the warfighter by providing enhanced capabilities by designing affordable user-centered systems that are efficient, easy to use, and provide required mission capabilities at lowest lifecycle costs. Such systems will be optimally designed for the right number and types of personnel, requiring minimum training while providing high skills retention.<br><br>This field of research is paramount to the reduction in complex naval systems design, acquisition, operation, and maintenance costs and improvements in the effectiveness of operations. Congressional, DoD, and Navy policies and instructions require Navy and Marine Corps Program Managers to have a comprehensive plan for Human Systems Design in the acquisition process to optimize total system performance, minimize total ownership costs, and ensure the system is built to accommodate the characteristics of the user population that will operate, maintain, and support the systems. A strong Human Systems Design effort is required to meet these goals.<br><br>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 Capable Manpower. Efforts in this R2 activity have been continued from FY 2012 to FY 2013 into the new R2 activity to support all FNC program EC Investments.<br><br>***FY 2012 Accomplishments:***<br>- Continue all efforts of FY 2011 less those noted as completed above.<br>- Complete developing a prototype and operational construct, processes, methods and software specifications to merge the full spectrum of Human Systems Engineering into the Navy's standards based, open-architecture, Integrated Product Data Environment.<br>- Complete development of mission performance optimization encompassing task centered design and advanced human performance modeling for achieving the requisite manning, both in numbers and capabilities, for the complex ships and systems of the future fleet. | 6.844 | 0.000 | 0.000 |
| ***Title:*** LITTORAL COMBAT<br><br>***Description:*** The goal of Littoral Combat is the application of technologies to enhance the ability of the Navy/Marine Corps team to execute the Naval portion of a joint campaign in the littorals. This activity considers all the critical functions of warfighting: command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR), fires, maneuver, | 6.000 | 0.000 | 0.000 |

| Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy | | DATE: April 2013 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 3: *Advanced Technology Development (ATD)* | R-1 ITEM NOMENCLATURE<br>PE 0603236N: *Warfighter Sustainment Advd Tech* | PROJECT<br>2915: *Warfighter Sustainment Adv Tech* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2012 | FY 2013 | FY 2014 |
|---|---|---|---|
| sustainment, force protection, and training. The activity includes support to the following FNC ECs; Battlefield Power, Reduced Support Costs 1, Advanced Naval Fires Technology Spiral 1, Combatant Commander (COCOM) to Marine Combat Identification (ID), Global Information Grid (GIG)-Compliant Networking, Hostile Fire Detection and Response Spiral 2, Position-Location-Information, Reduced Cost of Operations 1, Sea Base Collaborative Command and Control, Sea Base Mobility and Interfaces, and Sea Base Integrated Operations.<br><br>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 Enterprise and Platform Enablers. Efforts in this R2 activity have been continued from FY 2012 to FY 2013 into the new R2 activity to support all FNC program EC Investments.<br><br>***FY 2012 Accomplishments:***<br>- Continue all efforts of FY 2011.<br>- Continue and realign development and transition of technologies to reduce the load of warfighters by 1) reducing the weight of and improving the capability of the day/night weapon sight, 2) eliminating battery incompatibility, and 3) providing GUI-based software for tradeoff analyses bases on Military Operational Posture to PEs 0602131M, and 0603640M.<br>- Complete transition of advanced power generation technologies that enable reduction of the logistical burden on small tactical units to PM-Expeditionary Power Systems, Marine Corps Systems Command. | | | |
| ***Title:*** MANPOWER AND PERSONNEL DEVELOPMENT | 4.533 | 0.000 | 0.000 |
| ***Description:*** This activity provides Navy personnel system managers with the ability to attract and retain the right people and to place them in jobs that best use their skills, training, and experience. The application of modeling and simulation, mathematical optimization, advanced testing, information visualization, and human performance measurement technologies will enhance Fleet readiness and reduces personnel costs. These technologies enhance the Navy's ability to manage the force efficiently and maintain readiness with fewer people and smaller budgets; provide warfighting capabilities optimized for low-intensity conflict and littoral warfare; and operating and maintaining increasingly sophisticated weapons systems while managing individual workload and supporting optimal manning.<br><br>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 Capable Manpower. Efforts in this R2 activity have been continued from FY 2012 to FY 2013 into the new R2 activity to support all FNC program EC Investments.<br><br>***FY 2012 Accomplishments:***<br>- Continue all efforts of FY 2011 less those noted as completed above. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy | | DATE: April 2013 |
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| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 3: *Advanced Technology Development (ATD)* | R-1 ITEM NOMENCLATURE<br>PE 0603236N: *Warfighter Sustainment Advd Tech* | PROJECT<br>2915: *Warfighter Sustainment Adv Tech* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2012 | FY 2013 | FY 2014 |
|---|---|---|---|
| - Complete investigation of methods for composing minimally sized crews to facilitate the development of teamwork intensive proficiencies at an accelerated pace. | | | |
| ***Title:*** SEA BASE MOBILITY AND INTERFACES<br><br>***Description:*** This activity includes support for Sea Base Mobility and Interfaces and Force Closure. This activity improves the capability for transfer of cargo between Sea Base/Logistics vessels and employment of combat ready forces over unimproved beaches during high sea states. Capabilities being developed include propulsion technologies, maneuvering technologies, and advanced hull systems technologies needed for sustained operations at high speed in high sea states. This activity further supports the Seabasing mission of transporting troops, equipment, and materials from the seabase to shore, and providing support to seaborne forces via surface distribution interfaces.<br><br>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 Enterprise and Platform Enablers. Efforts in this R2 activity have been continued from FY 2012 to FY 2013 into the new R2 activity to support all FNC program EC Investments.<br><br>***FY 2012 Accomplishments:***<br>- Continue all efforts of FY 2011.<br>- Complete FNC EPE-FY07-02, MPF (F) Force final testing for the 38 MW Axial-Flow Waterjet. | 0.091 | 0.000 | 0.000 |
| ***Title:*** SEA BASE PLANNING, OPERATIONS AND LOGISTICS<br><br>***Description:*** This activity includes support for Sea Base Integrated Operations; Surface Connector Vehicle Transfer; Automated Weapons Assembly; and Sense and Respond Logistics. Sea Basing will require more robust afloat command and control for sustainment activities. Logistics must integrate with the joint task force common operating picture, and provide awareness of mission supportability and readiness at an operational and tactical level. This activity will produce techniques and systems to support automated transfer of cargo from shipboard unload/onload point to stowage spaces. This activity further supports the Seabasing mission of marshalling troops, equipment, and materials. It will improve current replenishment capabilities for transfer of cargo between Sea Base/Logistics vessels (large ship-to-ship) during high sea states, while maintaining safety of operations. Technologies include optical recognition, advanced robotics for weapons assembly, integrated data architectures, high-strength composites, wear-resistant coatings, environmental sensing, ship-motion compensation for force control-based systems, intelligent systems, and robotics.<br><br>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 Sea Basing (FNC). Efforts in this R2 activity have been continued from FY 2012 to FY 2013 into the new R2 activity to support all FNC program EC Investments. | 15.069 | 0.000 | 0.000 |

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| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 3: *Advanced Technology Development (ATD)* | R-1 ITEM NOMENCLATURE<br>PE 0603236N: *Warfighter Sustainment Advd Tech* | PROJECT<br>2915: *Warfighter Sustainment Adv Tech* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2012 | FY 2013 | FY 2014 |
|---|---|---|---|
| ***FY 2012 Accomplishments:***<br>- Continue all efforts of FY 2011, less those noted as completed above.<br>- Complete testing and integration of Sense & Response Logistics Common Operating Picture.<br>- Complete efforts on Interface Ramp Technologies development with demonstrations in relevant environments and transition to NAVSEA PMS385.<br>- Initiate model testing of Advanced Mooring System and planning of at-sea demonstration. | | | |
| ***Title:*** SEA BASING<br><br>***Description:*** This activity includes advancement of technologies to support the design and development of Sea Base Enabler Innovative Naval Prototypes (INP's). Areas include design and development of various Sea Basing prototypes in the areas of high speed, shallow draft and beachable connectors; and vessel to vessel interfaces.<br><br>The Sea Base Enabler INP effort was initiated in FY 2006. The INP program spans from conceptual design through prototype fabrication and testing. This INP plan includes the completion of the development and at-sea testing of the Rapid Deployable Seabasing Stable Transfer Platform demonstrator; the continuation of several land based and tow-tank based model construction and testing for the Sea Base to "Over-the-Shore" Connector Transformational Craft (T-CRAFT) Prototype; and the full scale component-level development, evaluation, and testing of critical T-CRAFT technologies.<br><br>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 Enterprise and Platform Enablers. Efforts in this R2 activity have been continued from FY 2012 to FY 2013 into the new R2 activity to support all FNC program EC Investments.<br><br>***FY 2012 Accomplishments:***<br>- Continue all efforts of FY 2011, less those noted as completed above. | 6.981 | 0.000 | 0.000 |
| ***Title:*** TRAINING SYSTEMS<br><br>***Description:*** This activity improves mission effectiveness and safety by applying both simulation and instructional technology to the design of affordable education and training methods and systems. Improved training efficiency and cost-effectiveness is achieved by applying operations research, modeling and simulation, and instructional, cognitive, and computer sciences to the logistics, development, delivery, evaluation, and execution of training. | 7.824 | 0.000 | 0.000 |

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| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 3: *Advanced Technology Development (ATD)* | R-1 ITEM NOMENCLATURE<br>PE 0603236N: *Warfighter Sustainment Advd Tech* | PROJECT<br>2915: *Warfighter Sustainment Adv Tech* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2012 | FY 2013 | FY 2014 |
|---|---|---|---|
| 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 Capable Manpower. Efforts in this R2 activity have been continued from FY 2012 to FY 2013 into the new R2 activity to support all FNC program EC Investments.<br><br>***FY 2012 Accomplishments:***<br>- Continue all efforts of FY 2011 less those noted as completed above.<br>- Complete development of game based training to more effectively enable better warfighter understanding of languages and cultures to enhance their regional expertise.<br>- Initiate development of simulation technologies to deliver safe, effective, and balanced live-virtual-constructive aviation training to achieve meaningful training and readiness levels without the costs involved with only using live assets. | | | |
| ***Title:*** TURBINE ENGINE TECHNOLOGY | 7.274 | 0.000 | 0.000 |
| ***Description:*** This activity provides integration and experimental engine testing of advanced gas turbine engine technologies to reduce their technical risk and demonstrate their readiness for transition. These technologies will enable advanced capabilities for Navy weapon systems at reduced total ownership costs. Versatile Affordable Advanced Turbine Engines (VAATE) is a DoD/DOE/NASA/Industry program to develop and demonstrate versatile, affordable, advanced engine technologies enabling for increased systems capabilities and reduced total ownership costs. The VAATE goal is 10X improvement in propulsion system affordability (capability/cost) by 2017, with interim goals of 4X by 2009 and 6X by 2013. The elements of the capability-to-cost index are increased thrust to weight; decreased specific fuel consumption; and reduced development, production, and maintenance costs for the entire integrated propulsion system. To achieve these goals, VAATE is organized into multiple product areas. Specifically for the Navy, the focus, as part of the Enterprise and Platform Enablers FNC, is on turbine engine capability enhancements for future and emerging systems. Technologies critical to Navy fighter jets are being worked, including low pressure turbine technologies for short takeoff and landing; high pressure turbine technologies for higher temperature, longer life; fan and compressor technologies for greater engine robustness and durability, and instrumentation and control technologies for greater engine state awareness and less unscheduled maintenance. Technologies being demonstrated include advanced aerodynamic, material, and structural concepts and emerging active control, prognostic health management, thermal management, aircraft subsystem integration, and information technologies.<br><br>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 Enterprise and Platform Enablers. Efforts in this R2 activity have been continued from FY 2012 to FY 2013 into the new R2 activity to support all FNC program EC Investments.<br><br>***FY 2012 Accomplishments:***<br>- Continue all efforts of FY 2011 less those noted as completed above. | | | |

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| APPROPRIATION/BUDGET ACTIVITY<br>1319: *Research, Development, Test & Evaluation, Navy*<br>BA 3: *Advanced Technology Development (ATD)* | R-1 ITEM NOMENCLATURE<br>PE 0603236N: *Warfighter Sustainment Advd Tech* | PROJECT<br>2915: *Warfighter Sustainment Adv Tech* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2012 | FY 2013 | FY 2014 |
|---|---|---|---|
| - Complete the VAATE Phase I demonstrator engine test with Pratt & Whitney (P&W) that includes STOVL clearance testing for turbine components. | | | |
| **Accomplishments/Planned Programs Subtotals** | 68.955 | 0.000 | 0.000 |

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

N/A

**Remarks**

**D. Acquisition Strategy**

Not applicable.

**E. Performance Metrics**

Efforts within this PE support the FNC program and are monitored at two levels. At the lowest level, each is measured against technical and financial milestones on a monthly basis. Annually, each FNC project is reviewed in depth for technical and transition performance by The Chief of Naval Research. Routine site visits to performing organizations are conducted to assess programmatic and technical progress. Most are reviewed annually or bi-annually by an independent board of visitors who assess the level and quality of the Science and Technology basis for the project.