FY 2004/2005 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2003
Exhibit R-2

BUDGET ACTIVITY: 3 PROGRAM ELEMENT: 0603236N
PROGRAM ELEMENT TITLE: Warfighter Sustainment Advanced Technology

COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 2002 ACTUAL	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	FY 2006 ESTIMATE	FY 2007 ESTIMATE	FY 2008 ESTIMATE	FY 2009 ESTIMATE
R2915 Warfighter Sustainment Advanced Technology	55,291	56,273	53,132	56,053	62,973	65,650	66,939	68,273
R3008 High Speed Vessel		24,449						
R9021 Low Volume Production Technology	3,388	2,885						
R9022 National Center for Remanufacturing and Resource Recovery	963	0						
R9023 Commercial Off The Shelf (COTS) Carbon Fiber Qualification Program	966	1,467						
R9024 Distance Learning Information Technology (IT) Center	12,299	0						
R9147 Defense Systems Modernization and Readiness Initiative		3,913						
R9148 Emerging/Critical Interconnection Technologies Program (E/CIT)		977						
R9149 Energy and Environmental Technology		3,325						
R9150 Integrated Aircraft Health		1,663	1,662					
R9151 Wire Chaffing Detection Technology		1,368						
TOTAL	72,907	96,320	54,794	56,053	62,973	65,650	66,939	68,273

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

FY 2004/2005 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2003
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BUDGET ACTIVITY: 3 PROGRAM ELEMENT: 0603236N
PROGRAM ELEMENT TITLE: Warfighter Sustainment Advanced Technology

Warfighter Sustainment Advanced Technology supports: a) the Integrated Warfare Architecture (IWAR) Support Areas for Manpower and Personnel, Training, and Readiness; b) the IWAR Mission Areas; c) the Future Joint Warfighting Capabilities identified by the Joint Chiefs of Staff; and d) the Future Naval Capabilities (FNC) for Capable Manpower, Total Ownership Cost, and Littoral Combat/Power Projection. It develops technologies that enable the Navy to 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 developed in this PE enable reduced operating costs through life-extension of legacy systems, increased efficiency of future propulsion systems and improved diagnostic tools. The Expeditionary Logistics investment addresses transformational Naval surface distribution/replenishment techniques, and improves the situational awareness of readiness and operating logistics status. The High Speed Vessel develops technology to enable a future generation of fast ships for rapid movement of military payloads from CONUS to theater as well as within theater. Speeds of up to 70 knots will be considered. Increased payload fraction and reduced friction drag are key technical objectives. Technologies to be demonstrated include advanced hull forms, drag reduction, power dense propulsion, high strength-to-weight ratio structural materials, and rapid cargo handling.

Within the Naval Transformation Roadmap, this investment will support 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 the PE, the programs described are representative of the work included in this PE.

B. PROGRAM CHANGE SUMMARY:

	FY 2002	FY 2003	FY 2004	FY 2005
FY 2003 President's Budget Submission:	72,798	82,542	54,950	60,146
Adjustments from FY 2003 President's Budget:				
Congressional Adds		15,950		
Cong, Rescissions/Adjustments/Undist. Reductions	-352	-1,128		
Execution Adjustments	1,651			
NWCF Rate Adjustments			38	72
Efficiencies at NWCF Activities			-329	-324
S&T Program Adjustments			1,400	-2,632
Pay Raise/Inflation Adjustments		-1,044	-1,265	-1,209
SBIR Reduction	-1,190			
FY 2004/2005 President's Budget Submission:	72,907	96,320	54,794	56,053

FY 2004/2005 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2003
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BUDGET ACTIVITY: 3 PROGRAM ELEMENT: 0603236N
PROGRAM ELEMENT TITLE: Warfighter Sustainment Advanced Technology

PROGRAM CHANGE SUMMARY EXPLANATION:

Technical: Not Applicable.
Schedule: Not Applicable.

FY 2004/2005 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET
Exhibit R-2a

DATE: February 2003

BUDGET ACTIVITY: 3
PROGRAM ELEMENT: 0603236N
PROGRAM ELEMENT TITLE: Warfighter Sustainment Advanced Technology
PROJECT NUMBER: R2915
PROJECT TITLE: Warfighter Sustainment Advanced Technology

COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 2002 ACTUAL	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	FY 2006 ESTIMATE	FY 2007 ESTIMATE	FY 2008 ESTIMATE	FY 2009 ESTIMATE
R2915 Warfighter Sustainment Advanced Technology								
TOTAL	55,291	56,273	53,132	56,053	62,973	65,650	66,939	68,273

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program supports: a) the Integrated Warfare Architecture (IWAR) Support Areas for Manpower and Personnel, Training, and Readiness; b) the IWAR Mission Areas; c) the Future Joint Warfighting Capabilities identified by the Joint Chiefs of Staff; and d) the Future Naval Capabilities (FNC) for Capable Manpower, Total Ownership Cost, and Littoral Combat/Power Projection. It develops technologies that enable the Navy to 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 developed in this program enable reduced operating costs through life-extension of legacy systems, increased efficiency of future propulsion systems and improved diagnostic tools. The Expeditionary Logistics investment is focused on Naval surface distribution in the areas of selective offload, at-sea arrival and assembly, and indefinite sustainment, and improves the situational awareness of readiness and operating logistics status

Within the Naval Transformation Roadmap, this investment will support 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.

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY02	FY03	FY04	FY05
Manpower and Personnel Development	2,757	4,121	4,569	2,900

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. Fleet readiness is enhanced and personnel costs reduced via technologies such as modeling and simulation, mathematical optimization, advanced testing, statistical forecasting, information visualization, data warehousing, data cleansing, web-based knowledge management, and human performance measurement.

FY 2004/2005 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2003
Exhibit R-2a

BUDGET ACTIVITY: 3 PROGRAM ELEMENT: 0603236N PROJECT NUMBER: R2915
PROGRAM ELEMENT TITLE: Warfighter Sustainment Advanced Technology PROJECT TITLE: Warfighter Sustainment Advanced Technology

FY 2002 ACCOMPLISHMENTS

- Initiated Attrition Reduction Technologies. Tested measures and modified indices aimed at reducing attrition during the first year of service.
- Initiated Distribution Incentive System. Developed a baseline of various distribution incentive pay using simulations, experimental economics and surveys.
- Continued the development of the Rating Identification Engine (RIDE) algorithms and the Jobs and Occupational Interest in the Navy (JOIN) interest profiles.
- Continued Enlisted Manpower and Personnel Integrated Planning System (EMPIPS). Integrated the following: Minimal Statistical Summary Reports (MiniStats); Web Target; and Skilled Personnel Projection for Enlisted Retention (SKIPPER). Demonstrated a manpower and personnel planning tool as a single integrated system.
- Completed the Models of Navy Compensation and Personnel Behavior (MODCOMP). Delivered retention forecasting tool to Assistant Chief of Naval Personnel for Military Personnel Policy and Career Progression.
- Completed the Comprehensive Officer Force Management Environment (CHROME). Delivered in-year and out-year behavioral loss models to Military Personnel Plans and Policy Division.

FY 2003 PLANS

- Initiate Non-Cognitive Measures of Personality and Social Competency Related to Teamwork. Fully integrate psychometrics of measures into test plan.
- Initiate Enterprise Management System. Integrate database, statistical models and graphical user interface into decision support system.
- Initiate Career Case Manager Technologies. Develop a natural language interface for sailor/marine career queries and career management.
- Initiate Web Based Marketplace for Sailors and Jobs. Development of a web based market environment to facilitate the distribution and assignment of military personnel.
- Continue Attrition Reduction Technologies. Demonstrate person-organization fit model and integrate into attrition reduction model.
- Continue Distribution Incentive System: Develop incentive management prototype and analyze data associated with Sailor preference and propensities to volunteer for chronically difficult-to-fill locations and jobs.
- Continue the Enlisted Manpower and Personnel Integrated Planning System (EMPIPS). Complete the decision support systems, database, and documents integration efforts in EMPIPS. Incorporate the compensation models from the Models of Navy Compensation and Personnel Behavior (MODCOMP) into EMPIPS.

- Complete the Rating Identification Engine (RIDE) algorithms and the Jobs and Occupational Interest in the Navy (JOIN) interest profiles.
- Complete the aptitude interest model and transition algorithm to Navy Recruiting Command. Improved matching of recruit aptitude with initial job assignment will result in reduction in first-term attrition and increased reenlistments through enhanced job satisfaction.

FY 2004 PLANS

- Continue Non-Cognitive Measures and improve probability of adaptation to service, the person-organization-job fit/match to reduce attrition and improve first-term retention.
- Continue Attrition Reduction Technologies. Test measures and modify indices aimed at reducing attrition during the first year of service. This will provide a comprehensive system that contains Navy specific metrics on causes of attrition and low retention rates.
- Continue Distribution Incentive System, a real time distribution incentive system that allows the Navy to efficiently allocate a broad array of monetary and non-monetary distribution incentives.
- Continue Enterprise Management System. This product will enable personnel managers to recognize developing force management problems in time to prevent catastrophic actions/reactions.
- Continue Career Case Manager Technologies, a natural language interface that allows Sailors and Marines to effectively manage their military career.
- Continue Web-Based Marketplace for Sailors and Jobs. Develop intelligent agent technology for use as career and job negotiators for sailors, commands and detailers.
- Complete Enlisted Manpower & Personnel Integrated Planning system (EMPIPS) and provide an end-to-end view of personnel system that identifies and minimizes system inefficiencies.

FY 2005 PLANS

- Continue Enterprise Management System. Validate a suite of forecasts and trend models to provide an advanced warning system of changes in the external environment factors and internal policy impacts.
- Continue Career Case Manager Technologies. Test and validate natural language response items and validity of knowledge database.
- Continue Web-Based Marketplace for Sailors and Jobs. Test and validate rule based intelligent agent interface.
- Complete a comprehensive set of Attrition Reduction Technologies, indicators, and measures.

- Complete a series of Non-Cognitive Measures to determine personality and social competencies.
- Complete a set of business rules, and incentive structures in order to "incentivize" traditionally difficult-to-fill jobs and locations for the Distribution Incentive System.

	FY02	FY03	FY04	FY05
Training Systems	17,492	19,321	10,994	12,660

This effort improves mission effectiveness and safety by applying both simulation and instructional technology to the design of affordable education and training methods and systems. Focus is on the development and evaluation of systems to improve basic through advanced individual and team training, skill maintenance, and mission rehearsal capability. 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.

FY 2002 ACCOMPLISHMENTS

- Initiated the Prototype Virtual Technology/Environments for realistic Landing Craft Air Cushion (LCAC) and Advanced Amphibious Assault Vehicle (AAAV) simulators. Simulators improve coordination among crew members of driving and fighting vehicles to maintain and enhance combat readiness (VIRTE - DEMO I).
- Initiated the development of Battle Group Level Advanced Under Sea Warfare (USW) Visualization (VISTRA - BG) systems.
- Initiated Virtual At-Sea Training (VAST) task aimed at integrating existing technologies to produce an advanced prototype system to provide shipboard Naval Surface Fire Support (NSFS) training. The system combines live fire with synthetic targets and terrain to support realistic training at-sea, and constructive fire to support training dockside. The system includes an acoustic array to record the fall of shot from ship guns; the Battle Force Tactical Trainer (BFTT) to calculate shot trajectories and ship geo-location; the Joint Semi-Automated Forces (JSAF) system that contains authoritative models for targets, target terrain, and weapons; and ISMT-E, a Marine Corps spotter training system. Initiated a task to up-grade the acoustic scoring system component of VAST.
- Continued the development of Deployable Sonar Operations Training (DSOT).
- Continued the development of intelligent agents for real-time scenario modification for distributed exercises (HPA - IAGENTS).
- Completed the development of the Synthetic Cognition for Operational Team Training (SCOTT).
- Completed integration efforts leading to a preliminary demonstration of VAST at the Naval Surface Warfare Center NSWC-Dahlgren gun test range on the Potomac River.

FY 2003 PLANS

- Initiate the development of human performance assessment tools in support of the Navy-wide distributed learning training vision (HPA - ASSESS).
- Initiate the development of virtual technology and environments for close quarter combat (CQB) for military operations in urban terrain (VIRTE - DEMO II).
- Initiate task to design, test and demonstrate an expendable, buoy-based acoustic scoring system for Virtual At-Sea Training (VAST). Initiate task to develop enhanced technologies for real-time data transmission of scenario, participant status, force disposition, and spatial orientation information between airborne Naval combat air platforms and shore based simulator and simulation control systems. Initiate task to modify an existing common synthetic battlespace, now employed in the Fleet Battle Experiments, to support an integrated NSFS and AirVAST training constellation in support of combined operations. Initiate task to empirically evaluate deployed NSFS VAST systems to identify needed refinements and training effectiveness.
- Continue the development of collaborative networked visualization systems for sensor operations and training for operators and for Officers/Tacticians, at BG/Fleet/Theater level (VISTRA - DESRON)
- Continue task aimed at integrating existing technologies to produce an advanced prototype system providing shipboard Naval Surface Fire Support training. Continue up-grade the acoustic scoring system component of VAST.
- Complete the development of a Prototype Virtual Technology/Environments for realistic Landing Craft Air Cushion (LCAC) and Advanced Amphibious Assault Vehicle (AAAV) simulators. Simulators improve coordination among crew members of driving and fighting vehicles to maintain and enhance combat readiness (VIRTE - DEMO I).
- Complete the development of intelligent agents for real-time scenario modification for distributed exercises (HPA - IAGENTS).
- Complete the development of Deployable Sonar Operations Training (DSOT).

FY 2004 PLANS

- Initiate task to evaluate alternative ways to display information in the cockpit to support Naval air combat training in airborne platforms. Task to design advanced training technologies that uniquely exploit the training capabilities offered by the Virtual At-Sea Training (VAST) capabilities and to present scenarios to the air crew in the airborne cockpit and to stimulate airborne platform sensor systems while monitoring shipboard weapon systems in real time.
- Continue the development of human performance assessment tools in support of the Navy-wide distributed learning training vision (HPA - ASSESS).
- Continue the development of human performance assessment tools for distributed environments (HPA - ASSESS).

- Continue the development of collaborative networked visualization systems for sensor operations and training for operators and for Officers/Tacticians, at BG/Fleet/Theater level (VISTRA - DESRON).
- Continue the development of Virtual Technology and Environments (VIRTE) Demo II, Close Quarters Battle (CQB) for Military Operations in Urban Terrain (MOUT).
- Continue task to design, test and demonstrate an expendable, buoy-based acoustic scoring system for Virtual At-Sea Training (VAST). Continue task to develop enhanced technologies for real-time data transmission of scenario, participant status, force disposition, and spatial orientation information between airborne Naval combat air platforms and shore based simulator and simulation control systems. Continue task to modify an existing common synthetic battlespace, now employed in the Fleet Battle Experiments, to support an integrated NSFS and AirVAST training constellation in support of combined operations. Continue task to empirically evaluate deployed NSFS VAST systems to identify needed refinements and training effectiveness.
- Complete task aimed at integrating existing technologies to produce an advanced prototype system providing shipboard Naval Surface Fire Support training. Complete upgrade of acoustic scoring system for VAST.

FY 2005 PLANS

- Initiate development of collaborative networked visualization systems for Battlegroup and theater multi-sensor employment training, planning and decision support (VISTRA - BG).
- Initiate task to design an architecture to support integration of NSFS and AirVAST into a joint operations constellation that includes cross-echelon training for dismounted infantry, submarine-based land attack missile launch, United States Air Force Close Air Support (CAS) participation, and artillery crews in urban operations and amphibious assault.
- Continue the development of human performance assessment tools in support of the Navy-wide distributed learning training vision (HPA - ASSESS).
- Continue the development of Virtual Technology and Environments (VIRTE) Demo II, Close Quarters Battle (CQB) for Military Operations in Urban Terrain (MOUT).
- Continue task to design, test and demonstrate an expendable, buoy-based acoustic scoring system for Virtual At-Sea Training (VAST). Continue task to develop enhanced technologies for real-time data transmission of scenario, participant status, force disposition, and spatial orientation information between airborne Naval combat air platforms and shore based simulator and simulation control systems. Continue task to modify an existing common synthetic battlespace, now employed in the Fleet Battle Experiments, to support an integrated NSFS and AirVAST training constellation in support of combined operations. Continue task to empirically evaluate deployed NSFS VAST systems to identify needed refinements and training effectiveness.

- Continue task to evaluate alternative ways to display information in the cockpit to support Naval air combat training in airborne platforms. Continue task to design advanced training technologies that uniquely exploit the training capabilities offered by the Virtual At-Sea Training (VAST) capabilities to present scenarios to the air crew in the airborne cockpit and to stimulate airborne platform sensor systems while monitoring shipboard weapon systems in real time.
- Complete the development of collaborative visualization systems for sensor operations and training for operators and for Officers/Tacticians, at BG/Fleet/Theater level (VISTRA - DESRON).

	FY02	FY03	FY04	FY05
Human Systems Integration	380	1,073	1,316	1,141

This effort supports the warfighter by designing affordable user-centered systems that are easy to use and train. Focus is on the application of a reusable user-centered design process to design a user interface to support user tasks, extraction of software requirements, and development of software design models.

FY 2002 ACCOMPLISHMENTS

- Initiated a software architecture feasibility prototyping effort by interfacing to Tactical Tomahawk Weapons Control System's (TTWCS) Missile Manager Cell Preselection.
- Initiated development of a Transition Plan to include the products of this effort into future versions of TTWCS.
- Continued integration of Land Attack task and Human-Computer Interaction (HCI) designs into the rapid prototype.
- Continued evaluation of the integrated Land Attack rapid prototype and subsequent integration of lessons-learned into the rapid prototype.
- Continued design of a software architecture to accommodate a task-based user interface for Land Attack systems.
- Continued system assessment of legacy Land Attack systems and identification of requirements to accommodate the task-based user interface design.
- Continued extraction, logging, and tracing of task and HCI software requirements.
- Continued development of software design representation in Unified Modeling Language of the task and HCI designs.
- Continued development of Java reference code to test the generated software requirements and design.
- Completed development and testing of a software architecture feasibility prototyping effort with Missile Manager Cell Preselection.

FY 2003 PLANS

- Continue integration of Land Attack task and Human-Computer Interaction (HCI) designs into the rapid prototype.

- Continue evaluation of the integrated Land Attack rapid prototype and subsequent integration of lessons-learned into the rapid prototype.
- Continue design of a software architecture to accommodate a task-based user interface for Land Attack systems.
- Continue system assessment of legacy Land Attack systems and identification of requirements to accommodate the task-based user interface design
- Continue extraction, logging, and tracing of task and HCI software requirements.
- Continue development of software design representation in Unified Modeling Language of the task and HCI designs.
- Continue development of Java reference code to test the generated software requirements and design.
- Complete development of a transition plan for including the products of this effort into future versions of Tactical Tomahawk Weapons Control System's (TTWCS).

FY 2004 PLANS

- Initiate Land Attack Training Capability development and evaluation.
- Continue evaluation of the integrated Land Attack rapid prototype.
- Continue system assessment of legacy Land Attack systems and identification of requirements to accommodate the task-based user interface design.
- Continue extraction, logging, and tracing of task and Human-Computer Interaction (HCI) software requirements.
- Continue development of software design representation in Unified Modeling Language of the task and HCI designs.
- Continue development of Java reference code to test the generated software requirements and design.
- Complete integration of Land Attack task and HCI designs into the rapid prototype.
- Complete design of a software architecture to accommodate a task-based user interface for Land Attack systems.

FY 2005 PLANS

- Complete Land Attack Training Capability development and evaluation.
- Complete evaluation of the integrated Land Attack rapid prototype.
- Complete system assessment of legacy Land Attack systems and identification of requirements to accommodate the task-based user interface design.
- Complete extraction, logging, and tracing of task and Human-Computer Interaction (HCI) software requirements.
- Complete development of software design representation in Unified Modeling Language of the task and HCI designs.
- Complete development of Java reference code to test the generated software requirements and design.

FY 2004/2005 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET
Exhibit R-2a

DATE: February 2003

BUDGET ACTIVITY: 3

PROGRAM ELEMENT: 0603236N
PROGRAM ELEMENT TITLE: Warfighter Sustainment Advanced Technology

PROJECT NUMBER: R2915
PROJECT TITLE: Warfighter Sustainment Advanced Technology

	FY02	FY03	FY04	FY05
Turbine Engine Technology - Integrated High Performance Turbine Engine Technology (IHPTET)/ Versatile Affordable Advanced Turbine Engines (VAATE)	8,952	8,991	9,190	10,251

This activity provides integration and experimental engine testing of new gas turbine engine technologies to demonstrate readiness and reduce technical risk for entering engineering development. IHPTET is a Tri-Service program in which each Service contributes established shares of Advanced Technology funding and laboratory resources to meet specified goals of doubling thrust-to-weight ratio, halving fuel consumption by the year 2005 (relative to a 1987 baseline) and reducing acquisition and maintenance costs. Additional emphasis has been incorporated to address High Cycle Fatigue issues, which may be associated with propulsion system design system deficiencies. This activity covers the Navy's share of the demonstrator engine efforts under the Department of Defense (DoD)/National Aeronautics and Space Administration (NASA) Industry IHPTET program, ensuring that Navy unique design and operational requirements are met. Full scale integrated technology demonstration is essential to validate and transition technologies from applied research through advanced development, program design review, and system development. Without technology demonstrators, system acquisition cost and schedule risk would increase to unacceptable levels or weapons systems would have degraded operational performance.

The lack of technology demonstrator efforts could result in system development schedule increases of five or more years along with the associated increase in cost and risk. The objective of VAATE, which is scheduled to begin in FY04 is to develop and demonstrate versatile, durable, "intelligent" engine technologies for the spectrum of legacy, pipe line, and new military aircraft, rotorcraft, missiles, and unmanned air vehicles (UAVs). The VAATE goal is 10X improvement in turbine engine affordability (capability/cost) by 2017, with an interim goal of 6X by 2010. To achieve these goals, VAATE is organized into three interrelated focus areas, Durability; Intelligent Engine; and Versatile Core, that cover the three classes of turbine engines--Turbofan/Turbojet, Turboprop/Turboshaft, and Expendables. The Durability focus area has defined objectives that work to prevent component failure, predict and increase engine life and reliability, enhance repairability, improve inspection capability, and reduce operational deployment costs. The Intelligent Engine focus area has defined objectives that combine advanced aerodynamic, material, and structural concepts with emerging active control, health management, aircraft subsystem integration, and information technologies. The Versatile Core focus area has defined objectives that emphasize the development of maintenance friendly, low-emission, multi-use core engine technologies that enable a wide spectrum of affordable turbine-engine-based systems. VAATE is a DoD/DOE/NASA/industry program.

The technologies integrated into and demonstrated in the IHPTET demonstrator engines are closely related to the system requirements for the Joint Strike Fighter (JSF), F-18E/F, Multi-mission Maritime Aircraft (MMA), , SH-60R, and other future Navy platforms, so that the transition of these high risk and high payback technologies may be effectively accomplished. In addition, IHPTET technologies can transition to current legacy systems via engine Component Improvement Programs (CIP). A strong and viable U.S. propulsion program also provides a dual-use benefit to our country by enhancing our competitiveness in the international commercial engine market.

This long term activity, coordinated through Reliance, will provide for the future needs in air battlespace dominance and expeditionary forces support (Littoral Warfare Joint Mission Area (JMA), Increased platform mission endurance (Intelligence, Surveillance, and Reconnaissance JMA) and provide technology for increased affordability, platform survivability and increased mission effectiveness (Strike JMA). The activity funds three demonstrator engine classes.

Each engine class has specific performance goals that are divided into multiple phases. Phase I has been completed and demonstrated for each of the three classes of demonstrators. Phase II is currently underway in the engine demonstration phase, for all of the advanced component and system technologies. The Phase III concepts have been developed, and the design, integration and component technology efforts are being executed. The phase goals of each engine class are listed as follows and are referenced to a 1987 baseline (additional affordability goals have been developed for fighter/attack and turboprop/shaft classes).

Fighter/attack (Joint Technology Demonstrator Engine (JTDE)):
Phase I - 1991: +30% thrust/weight (Fn/Wt), +100 ^{O}F combustor inlet temperature (CIT), +300 ^{O}F turbine inlet temperature (TIT), -20% fuel burn.
Phase II - 1997: +60% Fn/Wt, +200 ^{O}F CIT, +600 ^{O}F TIT, -20% acquisition cost, -20% maintenance cost, -30% fuel burn.
Phase III - 2005: +100% Fn/Wt, +400^{O}F CIT, +900^{O}F TIT, -35% acquisition cost, -35% maintenance cost, -40% fuel burn.

Turboprop/shaft (Joint Turbine Advanced Gas Generator (JTAGG)):
Phase I - 1991: +40% shaft horsepower/weight (SHP/Wt), -20% specific fuel consumption (SFC), +300 ^{O}F TIT.
Phase II - 1997: +80% SHP/Wt, -30% SFC, +600 ^{O}F TIT, -20% acquisition cost, -20% maintenance cost.
Phase III - 2003: +120% SHP/Wt, -40% SFC, +1000 ^{O}F TIT, -35% acquisition cost, -35% maintenance cost.

Each engine company (Allison Advanced Development Company (AADC) (IN), Honeywell Engines and Systems (HES) (AZ), General Electric (GE) (OH & MA) and Pratt & Whitney (P&W) (CT & FL) attempts to utilize at least two engine builds or demonstrator tests within each Phase to demonstrate the performance and cost goals.

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Exhibit R-2a

DATE: February 2003

BUDGET ACTIVITY: 3
PROGRAM ELEMENT: 0603236N
PROGRAM ELEMENT TITLE: Warfighter Sustainment Advanced Technology
PROJECT NUMBER: R2915
PROJECT TITLE: Warfighter Sustainment Advanced Technology

FY 2002 ACCOMPLISHMENTS

- Continued the Phase II Joint Technology Demonstrator Engine (JTDE): Fabrication, assembly, and instrumentation of General Electric (GE)/Allison Advanced Development Company (AADC) demonstrator engine.
- Continued the Phase III JTDE: Design, component development, integration and fabrication of Pratt & Whitney (P&W) and GE/AADC Phase III demonstrator engines.
- Continued the Phase III Joint Turbine Advanced Gas Generator (JTAGG): Design, component development, integration and fabrication of Honeywell Engine and Systems (HES) Phase III demonstrator engines.Continued the Phase II JTAGG: Component optimization and second build of HES demonstrator to meet Phase II goals.
- Completed the Phase II JTAGG: Component optimization and second build of HES demonstrator to meet Phase II goals.
- Completed the Phase III JTDE Preliminary Design Review of the GE/AADC demonstrator engine.

FY 2003 PLANS

- Continue the Phase II JTDE: Fabrication, assembly, and instrumentation of General Electric (GE)/Allison Advanced Development Company (AADC) demonstrator engine.
- Continue the Phase III JTDE: Component development, integration, fabrication, assembly and instrumentation of GE/AADC and P&W demonstrator engines and demonstration of P&W and GE/AADC progress toward Phase III goals.
- Continue the Phase III JTAGG: Component development, integration, fabrication and initial core test of HES demonstrator to meet Phase III goals.
- Complete the Phase II JTAGG: Component optimization and third build of HES demonstrator to meet Phase II goals.

FY 2004 PLANS

- Initiate VAATE Phase I: Component design and technology development to meet the VAATE Phase I goals.
- Continue the Phase III JTDE: Component development, integration, fabrication, assembly and instrumentation of GE/AADC and P&W demonstrator engines and demonstration of P&W and GE/AADC progress toward Phase III goals.
- Continue the Phase III JTAGG: Component development, integration, fabrication and initial test of HES demonstrator to meet Phase III goals.
- Continue the Phase II JTDE: Fabrication, assembly, instrumentation and initiate testing of General Electric (GE)/Allison Advanced Development Company (AADC) demonstrator engine.

FY 2005 PLANS

- Initiate VAATE Phase I: Design, component development, integration and fabrication of Phase I demonstrator engines.

- Continue VAATE Phase I: Component design and technology development to meet VAATE Phase I goals.
- Continue the Phase III JTDE: Component development, integration, fabrication, assembly and instrumentation of P&W demonstrator engines and demonstration of P&W progress toward Phase III goals.
- Continue VAATE Phase I: Component design and technology development to meet the VAATE Phase I goals.
- Complete the Phase III JTAGG: Component development, integration, fabrication and test of HES demonstrator to meet Phase III goals.
- Complete the Phase II JTDE: Fabrication, assembly, and instrumentation of General Electric (GE)/Allison Advanced Development Company (AADC) demonstrator engine for meeting the Phase II goals.
- Complete the Phase III JTDE: Component development, integration, fabrication, assembly and instrumentation of GE/AADC demonstrator engines and demonstration of Phase III goals with the GE/AADC demonstrator engines.

	FY02	FY03	FY04	FY05
Airframe/Ship Corrosion	3,875	3,900	4,808	4,343

This activity includes an integrated approach for the control of the effects of external and internal corrosion in Naval weapon systems. The work develops advanced, cost effective prevention and lifecycle management technologies. This is particularly significant to life extension for the aging fleet.

FY 2002 ACCOMPLISHMENTS

- Initiated development of a single coat system for ship tanks (ballast tank).
- Initiated the Airframe Corrosion effort.
- Initiated development of a modular hybrid pier (demo hull section).
- Initiated development of an advanced coating and inhibitor applied washdown system for United States Marine Corps (USMC) vehicles, awarded contract for road test facility.

FY 2003 PLANS

- Initiate the development of single coat system for ship tanks (potable water tank).
- Initiate the development of the road test methodology for USMC vehicle.
- Initiate the development of a modular hybrid pier (Demo joint modules).
- Continue the development of single coat systems for ship tanks (ballast tank).
- Continue Airframe Corrosion efforts.
- Continue the development of a modular hybrid pier (Demo hull section).

- Continue the development of advanced coatings and inhibitor applied washdown system for USMC vehicles.

FY 2004 PLANS

- Initiate the development of single coat systems for ship tanks (Fuel-Compensated fuel tank).
- Continue Airframe Corrosion efforts.
- Continue the development of a modular hybrid pier (Demo hull section).
- Continue the development of advanced coatings and inhibitor applied washdown system for USMC vehicles.
- Continue the development of single coat system for ship tanks (potable water tank).
- Continue the development of the road test methodology for USMC vehicle.
- Continue the development of a modular hybrid pier (Demo joint modules).
- Complete the development of single coat systems for ship tanks (ballast tank).

FY 2005 PLANS

- Initiate the development of single coat systems for ship tanks (Collection-Holding-Transfer Tanks (CHT)).
- Continue the development of single coat systems for ship tanks (Fuel-Compensated fuel tank).
- Continue Airframe Corrosion efforts.
- Continue the development of advanced coatings and inhibitor applied washdown system for USMC vehicles.
- Continue the development of the road test methodology for USMC vehicle.

- Complete the development of a modular hybrid pier (Demo Module Testbed).
- Complete the development of single coat system for ship tanks (potable water tank).

	FY02	FY03	FY04	FY05
Smart Wiring	2,372	2,061	526	0

Smart Wiring is a subset of the Total Ownership Cost (TOC) Future Naval Capability (FNC). Smart Wiring will develop flight-qualified smart aircraft wiring system hardware and perform required flight demonstrations. Smart wiring embeds diagnostic and prognostic technologies into aircraft wiring systems to manage wiring system health. The goals of smart wiring are (1) reduce wiring maintenance man-hours by 20%, (2) reduce wiring induced mission aborts and non-mission capable hours by 20%, and (3) reduce in-flight electrical fires and subsequent loss of aircraft by 80%. Total Oil Monitoring System (TOMS) will develop an oil system for in-situ oil analysis of an Advanced Amphibious Assault Vehicle (AAAV) critical mobility system/subsystem. The "total" aspect of the system combines oil debris and oil condition

monitoring with a wireless intra-vehicle data/information delivery capability. Benefits of the technology program will be increased readiness, reduced system TOC, reduction in Hazardous Materials (HAZMAT), and reduction in maintenance tasks.

FY 2002 ACCOMPLISHMENTS

- Initiated the development of updated requirements document for smart wiring system.
- Initiated an award and executed a contract to develop safety-of-flight qualified hardware for smart wiring system. Intent was to develop and implement diagnostic wiring system for aircraft. System will detect and isolate wiring gaults with minimal off-aircraft test equipment.
- Initiated and completed a test of the Total Oil Monitoring System (TOMS) with actual lubricants from host system.
- Initiated and completed an engine stand test for the Total Oil Monitoring System-Advanced Amphibious Assault Vehicle (TOMS-AAAV) integration. Intent was to provide capability to analyze fluids onboard the vehicle as would be done at an established oil lab. Onboard analysis increases readiness, reduces maintenance cost and reduces quantity of hazardous materials requiring disposal (old oil samples).

FY 2003 PLANS

- Initiate Total Oil Monitoring System (TOMS)/vehicle integration (electronics/software).
- Continue smart wiring hardware and software development, lab/bench test analysis, flight test planning/hardware assessment.
- Complete Total Oil Monitoring System (TOMS) development and integration.
- Complete smart wires aircraft suitability/requirements analysis.

FY 2004 PLANS

- Smart wires flight development/test/certification.

FY 2005 PLANS- Not Applicable.

	FY02	FY03	FY04	FY05
Littoral Combat	2,716	2,997	3,564	4,648

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. Position location information is a specific focus area to improve the quality of live fire training, using position location information with timely after action reporting.

FY 2002 ACCOMPLISHMENTS

- Initiated the development of an advanced Position Location Information (PLI) and range instrumentation system for live fire training and enhanced safety.

FY 2003 PLANS

- Continue development and integration of the Position Location Information and range instrumentation system to include After Action Review (AAR) capability.

FY 2004 PLANS

- Update the PLI system to include the capability to collect azimuth, elevation and time of fire from a mortar. Demonstrate in a scheduled training exercise and obtain user feedback to incorporate into system.

FY 2005 PLANS

- Finalize the PLI system and demonstrate in a scheduled training exercise. Transition to acquisition.

	FY 02	FY 03	FY 04	FY 05
Strike Up/Strike Down Selective Offload Systems	95	3,278	5,891	4,554

The Strike Up/Strike Down activity will produce new techniques and systems to automate the transfer of cargo from the shipboard unload point to stowage spaces (strike down), and from stowage to the offload point for ship-to-ship or shore transit (strike up) during high sea states. The three main focus areas are: Cargo Movement, Cargo Stowage and Selective Offload. New technologies will include linear electric drive induction motors, high-strength composites, ship-motion compensation for force control-based systems, and intelligent systems and robotics.

FY 2002 ACCOMPLISHMENTS

- Initiated the assessment of shipboard strike up/strike down for carriers and logistics ships transition candidates. Transition candidates include advanced weapons elevators, linear electric drive transport, omni-directional vehicle technology, and blast mitigation technologies for naval ammunition storage. Assessment was based on the contribution to seabased sustainment, selective offload, and technological viability.

- Initiated down selects of most promising technologies in selective offload, cargo movement and cargo stowage.
- Initiated mature technology transition plan with PEO Carriers and National Defense Sealift Fund.

FY 2003 PLANS

- Continue down-selection of promising technologies for shipboard strike up/strike down for carriers and logistics ships transition candidates. Transition candidates include advanced weapons elevators, linear electric drive transport, automated storage and retrieval systems, and blast mitigation technologies for naval ammunition storage.
- Continue mature technology transition plan with PEO Carriers and National Defense Sealift Fund.

FY 2004 PLANS

- Initiate technology demonstration and testing, linked with Seapower 21 seabasing demonstrations and CVN21 aircraft carrier, for first group of matured capabilities.

FY 2005 PLANS

- Complete technology demonstration and testing, possibly linked with Seapower 21 seabasing demonstrations, for second group of matured capabilities in selective offload and strike up/down technologies.

	FY 02	FY 03	FY 04	FY 05
Seabase to Shore Surface Craft	0	1,873	2,276	0

These activity efforts will improve the capability for the transfer of personnel and cargo between sea base/logistics vessels and unimproved beaches during high sea states. It is necessary for indefinite sustainment of forces ashore, and is a key enabler for reconstitution and redeployment from a seabase. Initial technology will target Heavy Landing Craft Air Cushioned (LCAC) craft. The capabilities being developed include propulsion technologies, cargo stabilization technologies, advanced hull form technologies and the fabrication of lightweight robust structures that are needed for sustained operations at high speed in a moderate seaway.

FY 2002 ACCOMPLISHMENTS Not Applicable.

FY 2003 PLANS:

- Program initiation. Provided hydrodynamic modeling of a new propulsion system for the Heavy LCAC, addressing a 50% propulsion plant power increase in the same space.

FY 2004 PLANS:

- Complete hydrodynamic modeling and propulsion system technology exploration for the Heavy Landing Craft Air Cushioned Craft (HLCAC).

FY 2005 PLANS Not Applicable.

	FY 02	FY 03	FY 04	FY 05
Underway Replenishment/Material Transfer	3,803	937	5,018	5,196

These activity efforts will improve the current Underway Replenishment capability for the transfer of cargo between sea base/logistics vessels during high sea states, while increasing ship separation for safety. This is a key capability for indefinite sustainment of the seabase, and interoperability of the Naval task force. The capabilities being developed include load control, tensioned ropeways, and station keeping. Technology investment is focused on control systems, new materials, mathematical modeling and algorithm development, and new motor control and cooling principles.

FY 2002 ACCOMPLISHMENTS

- Initiated and completed a study of underway replenishment development of a 12K capacity system including station keeping and load control technologies, employing relative motion compensation, transfer load control and advanced materials.

FY 2003 PLANS

- Initiate development of a 12K underway connected replenishment capability with focused investment in algorithm development (mathematical modeling), and responsive controls for heavy loads (physical modeling). Materials investigation will continue through STTR program leveraging.
- Complete the mathematical modeling for the development of a 12K underway connected replenishment capability.

FY 2004 PLANS

- Continue the development of a 12K underway connected replenishment capability and responsive controls for heavy loads (physical modeling). Materials investigation will continue through Small Business Technology Transfer (STTR) program leveraging. Develop ship to ship positioning and load control systems and the development in motor response controls and motor cooling/heat dispersion.
- Complete the physical modeling for the development of a 12K underway connected replenishment capability.

FY 2005 PLANS

- Complete control system and heat dispersion development work. Conduct component demonstrations and complete transition to the National Defense Sealift office.

	FY 02	FY 03	FY 04	FY 05
High Speed Vessel Experiments	3,233	281	0	0

This effort is for short term participation in the Joint experimentation with the High Speed Vessel. Seakeeping and Structural data were collected and analyzed.

FY 2002 ACCOMPLISHMENTS

- Initiated the program and instrumented the leased joint vessel for structural and sea-keeping data collection during experimentation runs. Participated in the joint analysis efforts.

FY 2003 PLANS

- Complete the conclusion of the effort. Remove hardware from the leased vessel. Complete report writing and analysis.

FY 2004 PLANS Not Applicable.

FY 2005 PLANS Not Applicable.

	FY 02	FY 03	FY 04	FY 05
At Sea Arrival And Assembly	0	1,873	1,879	3,630

This effort supports the seabasing mission of marrying troops to equipment, and providing support to seaborne forces via surface distribution interfaces.

FY 2002 ACCOMPLISHMENTS Not Applicable.

FY 2003 PLANS

- Initiate technology studies through hydrodynamic modeling and seaway motion analysis. Formulate technology development plans in fending, ship to ship securing, and seaway cargo handling to include roll on/off ramps and crane motion control.

FY 2004 PLANS

- Continue investment and technology development in ship to ship securing systems and seaway cargo handling technologies. Technology investment will include lightweight materials and control algorithms.

FY 2005 PLANS

- Continue investment and technology development in ship to ship securing systems and seaway cargo handling technologies. Technology investment will include lightweight materials and control algorithms. Begin at-sea demonstrations.

	FY 02	FY 03	FY 04	FY 05
Consumption Reduction	0	0	0	3,630

This effort will provide technologies and processes for managing shipboard logistics across the spectrum of the seabased forces, to Navy and Marine Corps logistics needs. Energy production and storage, and advanced materials, will form the technology foundation. Intermediate support base activities for rapid runway repair, rapid pier upgrades, and expeditionary gap crossing will be reviewed for technology enhancement opportunities.

FY 2002 ACCOMPLISHMENTS Not Applicable.

FY 2003 PLANS Not applicable

FY 2004 PLANS Not applicable

FY 2005 PLANS Not applicable

- Initiate technology exploration in advanced basing with reduced lift and manpower demands. Key focus areas are on construction principles and energy demand reduction.

	FY 02	FY 03	FY 04	FY 05
Logistics Command and Control (C2)	7,131	4,870	3,101	3,100

Seabasing will require not only improvement in lift and distribution, but also a concentrated effort to reduce demand. This effort will apply technologies that benefit battlefield consumption reduction. Initiatives include Power Generation and Alternative Energy.

FY 2002 ACCOMPLISHMENTS

- Initiated the development of the Combat Service Support Tool Kit software modules for the Logistics Commander ashore, addressing areas such as supply chain management on the tactical battlefield, and an improved situational awareness with the Marine Air-Ground Task Force (MAGTF) Commander.

FY 2003 PLANS

- Continue the development of the Combat Service Support Tool Kit software modules for the Logistics Commander ashore, addressing areas such as deliberate engineering, route reconnaissance, supply chain management on the tactical battlefield, and an improved situational awareness with the MAGTF commander.

FY 2004 PLANS

- Complete Combat Service Support Tool Kit software modules for the Logistics Commander ashore, addressing areas such as deliberate engineering, route reconnaissance, supply chain management on the tactical battlefield, and an improved situational awareness with the MAGTF commander.

FY 2005 PLANS

- Initiate development in support to the joint task force commander. Address seabourne asset visibility across the seabased spectrum, lift scheduling at the operational and tactical level, and a sustainment component to the common operating picture.

	FY02	FY03	FY04	FY05
Advanced Shipboard Crane Motion System ATD	2,485	697	0	0

The Advanced Shipboard Crane Motion Control System Advanced Technology Demonstration (ATD) demonstrates a crane control system that combines recent advances in nonlinear control system technologies with existing strategic Auxiliary Crane Ship electro-hydraulic cranes. The control scheme will control load pendulation through sea state three by applying nonlinear control algorithms, appropriate to the ship motion environment, to the shipboard crane control system and the crane operator commands. This technology will extend the capability for ship to lighterage transfer of expeditionary warfare logistics to at least 300 containers per day in sea state three.

FY 2002 ACCOMPLISHMENTS

- Completed a pendulation control system demonstration for shipboard cranes at pierside and at anchor, permitting ship-to-shore transfer of logistics through sea state three.
- Completed the design, procurement/fabrication of the sensor and control package. Installed crane simulator/trainer for military operator training and conduct a demonstration of test ship roll simulation system. Demonstrated pendulation control system at pierside and at anchor.
- Completed during November and December 2002 extensive demonstrations in Norfolk, VA that validated the control mechanism and algorithms.

FY 2003 PLANS

- Complete effort and conduct at sea demonstration, during military exercises, funded by NAVSEA. This program ends in FY03.

FY 2004 PLANS Not Applicable.

FY 2005 PLANS Not Applicable.

C. OTHER PROGRAM FUNDING SUMMARY:

RELATED RDT&E:

NAVY RELATED RDT&E:
PE 0206624M - Marine Corps Combat Services Support
PE 0601152N - In-House Laboratory Independent Research
PE 0601153N - Defense Research Sciences
PE 0602123N - Force Protection Applied Research
PE 0602236N - Warfighter Sustainment Applied Research
PE 0603512N - Carrier System Development
PE 0604703N - Personnel, Training, Simulation, and Human Factors
PE 0605013M – Marine Corps Information Technology Development/MOD
PE 0605152N - Studies and Analysis Support – Navy

NON NAVY RELATED RDT&E:
PE 0601102A - Defense Research Sciences

PE 0602211A - Aviation Technology
PE 0603003A - Aviation Advanced Technology
PE 0603007A - Manpower, Personnel and Training Advanced Technology
PE 0601102F - Defense Research Sciences
PE 0602203F - Aerospace Propulsion
PE 0603216F - Aerospace Propulsion and Power Technology
PE 0601103D8Z - University Research Initiatives

D. ACQUISITION STRATEGY: Not applicable.

FY 2004/2005 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2003
Exhibit R-2a

BUDGET ACTIVITY: 3 PROGRAM ELEMENT: 0603236N PROJECT NUMBER: R3008
PROGRAM ELEMENT TITLE: Warfighter Sustainment Advanced Technology PROJECT TITLE: High Speed Vessel

COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 2002 ACTUAL	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	FY 2006 ESTIMATE	FY 2007 ESTIMATE	FY 2008 ESTIMATE	FY 2009 ESTIMATE
R3008 High Speed Vessel								
TOTAL		24,449						

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The High Speed Vessel project develops technology to enable a future generation of fast ships for rapid movement of military payloads from Continental United States (CONUS) to theater as well as within theater. Speeds of up to 70 knots will be considered in the design. Increased payload fraction and reduced friction drag are key technical objectives. Technologies to be demonstrated include advanced hull forms, drag reduction, power dense propulsion, and high strength-to-weight ratio structural materials.

	FY02	FY03	FY04	FY05
High Speed Vessel	0	24,449	0	0

Within the Naval Transformation Roadmap, this investment will support the achievement of Compressed Deployment and Employment Times and Enhanced Sea-Borne Positioning of Assets required by Sea Basing

B. PROGRAM ACCOMPLISHMENTS AND PLANS:

FY 2002 ACCOMPLISHMENTS Not Applicable.

FY 2003 PLANS

- Initiate and complete the development of a hydrodynamic testing system for high speed vessels, capable of conducting hydrodynamic drag and lift testing at appropriate fluid velocities and Reynolds number, and of evaluating potential drag reduction approaches. Downselect to preferred testing approach and complete detailed design. Order materials and begin assembly of hydrodynamic testing system. Conduct assessment of drag reduction system concept, including polymer and micro-bubble approaches. Begin ship conceptual design studies. Assess state of the art in ship structural materials, establish materials technology requirements, and establish technical approach. Assess state of the art in high speed, power dense propulsion systems and establish technical approach.
- Initiate and complete the award of contracts for hydrodynamic testing system components, for structural and propulsion component demonstrations, and for design of a Composite High Speed Vessel (CHSV).

FY 2004 PLANS Not Applicable.

FY 2005 PLANS Not Applicable.

C. OTHER PROGRAM FUNDING SUMMARY:

RELATED RDT&E:

NAVY RELATED RDT&E:
PE 0601153N - Defense Research Sciences
PE 0602123N - Force Protection Applied Research
PE 0603123N - Force Protection Advanced Technology
PE 0603758N - Navy Warfighting Experiments and Demonstrations

D. ACQUISITION STRATEGY: Not applicable.

CONGRESSIONAL PLUS-UPS:

R2739	FY02	FY03
Center for Integrated Manufacturing	*	0

Continued the effort started in FY01 to extend Navy oriented remanufacturing process research into condition assessment and technology insertion during system midlife. Develop a number of technology assessment and costing tools from private industry to more systematically deploy new technology in older systems, beginning with the design process. (*Appropriated in FY02 in PE 0603707N, $1,982)

R9022	FY02	FY03
National Center for Remanufacturing and Resource Recovery	963	0

Developed the methodology for military remanufacturing and resource recovery. Implemented a pilot study project by applying the military remanufacturing concept in a military environment.

R9023	FY02	FY03
Commercial Off The Shelf (COTS) Carbon Fiber Qualification Program	966	1,467

This effort is developing a high volume manufacturing technique for production of intermediate modulus (IM) carbon fibers that will be incorporated into strong lightweight polymer composites. This material will enable the development of advanced, lightweight, long-range Navy aircraft such as the Joint Strike Fighter. As part of the effort the contractor will complete the material properties database and will complete the qualification of this new low-cost, intermediate modulus carbon fiber.

R9024	FY02	FY03
Distance Learning Information Technology (IT) Center	12,299	0

Continued and expanded effort to standardize distance learning courseware and initiated an Advanced Distributed Learning (ADL) certification process.

R9147	FY02	FY03
Defense Systems Modernization and Readiness Initiative	0	3,913

Effort will continue work on systems modernization and readiness assessment and tracking. There are four specific focus areas in this effort: Material Aging, Life Cycle Engineering and Economic Decision System, Asset Health Management, Reliability Availability and Maintainability Initiative. These efforts will improve the longevity of the Navy's EA6B and

F14 programs, as well as the Marine Corps Light Armored Vehicle (LAV). Additionally, ONR will leverage this work as part of an ongoing conversion of an advanced seaborne craft and the forthcoming design of a fast catamaran.

R9148	FY02	FY03
For Emerging/Critical Interconnection Technologies Program (E/CIT)	0	977

The E/CIT will serve as a focus for the DoD to work with the U.S. electronic interconnection industry. The E/CIT will facilitate solutions to current military problem areas as well as evaluating new leading edge design and manufacturing technologies for both future military and commercial requirements prior to adoption by printed circuit board manufacturers.

R9149	FY02	FY03
Energy and Environmental Technology	*	3,325

Under Phases I and II of the Hawaii Energy and Environmental Technology Initiative, HNEI initiated research activities in fuel cell technologies and methane hydrates. A major accomplishment has been establishment of industrial partnerships to develop a state-of-the-art fuel cell test facility. As part of these partnerships, over $600,000 in equipment and infrastructure has been provided as cost-share. Activities during 2003 will include life testing and durability studies of Proton Exchange Membrane (PEM) fuel cells, development of transient characterization techniques to assess viability of PEM fuel cell systems for commercial and Naval applications, design and development of fuel cell systems for Navy specific needs such as unmanned undersea vehicles, and development of instrumentation for characterization of sea-floor methane hydrate resources. Teaming arrangements are also being put into place to include the Honolulu based Naval Undersea Warfare Center in fuel cell systems development and training activities.
(*Appropriated in FY02 In PE 0602805N, $2,499)

R9150	FY02	FY03	FY04
Integrated Aircraft Health	0	1,663	1,662

This effort will develop data interoperability software tools, diagnostic algorithms and processes to ensure improved affordability and safety through the application of integrated aircraft health management practices. The technology will enable reduced operating costs through life-extension of legacy systems and improved diagnostic tools that will decrease the number of unnecessary parts removals. FY04 Funding has been added to complete this FY03 Congressional Plus-up.

FY 2004/2005 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET
Exhibit R-2a

DATE: February 2003

BUDGET ACTIVITY: 3
PROGRAM ELEMENT: 0603236N
PROGRAM ELEMENT TITLE: Warfighter Sustainment Advanced Technology
PROJECT NUMBER: Various
PROJECT TITLE: Congressional Plus-Ups

R9151	FY02	FY03
Wire Chaffing Detection Technology	*	1,368

Decaying, aged wiring is an insidious and usually unseen problem to aircraft maintainers and operators. With most aircraft wiring hidden from view, an enabling technology to detect wiring faults prior to electrical malfunction is urgently needed. Wiring defects are most often initially manifested by chaffing, followed by cumbersome, costly and time consuming repair. To counter this reality, this program will investigate, develop, demonstrate and transition technology to detect onset of wire chaffing in aircraft wiring and wiring harnesses. (*Appropriated in FY02 in PE 0602236N, $1,348)

R9021	FY02	FY03
Low Volume Production Program	3,388	2,885

Develop the capability to repair massive defective parts (possibly no longer manufactured or available as spares) without the need for expensive and time-consuming reverse engineering. Could increase the life cycle and performance of expensive new parts via protective claddings using laser weld technology.