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CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification							DATE: February 2007	
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7					R-1 ITEM NOMENCLATURE PE 0101221N Strategic Sub & Wpns Sys Spt			
COST (\$ in Millions)	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
Total PE Cost* (total may or may not add due to rounding)	87.9	126.7	81.4	96.8	57.4	57.5	59.2	52.1
J2228 Technology Applications Program	82.9	80.9	45.2	45.5	47.0	47.0	48.7	51.6
J3158 Enhanced Special Weapons	0.0	42.9	6.0	0.9	0.9	0.0	0.0	0.0
J0951 TRIDENT II	0.0	0.0	0.0	0.0	9.1	10.0	10.0	0.0
J3196 Reliable Replacement Warhead	0.0	0.0	30.0	50.0	0.0	0.0	0.0	0.0
S0004 TRIDENT Submarine System Improvement	1.5	0.2	0.3	0.4	0.4	0.5	0.5	0.5
0004C Thin Plate Pure Lead Technology	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9A66N Advanced Conventional Strike Capability (SLIRBM)	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0
9A67N Free Electron Laser Facility	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0
A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION								
<p>The Technology Applications Program supports the TRIDENT II (D5) Submarine Launched Ballistic Missile (SLBM) that provides the U.S. a weapon system with greater accuracy and payload capability as compared to the TRIDENT I (C4) system. TRIDENT II enhances U.S. strategic deterrence providing a survivable sea-based system capable of engaging the full spectrum of potential targets with fewer submarines. This Program Element supports investigations into new technologies which would help mitigate the program impact due to component obsolescence and a rapidly decreasing manufacturing support base. These efforts include Reentry System Applications and Guidance System Applications, Radiation Hardened Electronics Applications, and Strategic Propulsion Applications.</p> <p>The Enhanced Special Weapons effort supports the Nuclear Weapons Security program and SSBN Escort mission. The policies and requirements regarding the safeguard of nuclear weapons within the Department of Defense is established by DoD S5210.41M. Within the Department of the Navy, nuclear weapons are limited to TRIDENT Fleet Ballistic Missiles (FBM), either deployed aboard TRIDENT submarines or located landside at Naval Submarine Base, Kings Bay, or Naval Submarine Base, Bangor where missiles are first assembled as well as repaired. The Chief of Naval Operations (CNO) has assigned the Strategic Systems Programs, the FBM program manager, with mission responsibility for the safeguard of FBM nuclear technologies. This budget supports efforts directed at improving the current technological baseline through a series of studies focusing on land and waterside requirements, including both surface and underwater. Collectively, these efforts will improve countermeasure technologies addressing detection, delay and denial.</p> <p>The TRIDENT II effort supports the SSBN Planning and Operational Flexibility (SPOF) that is the follow-on program to the SLBM Retargeting System (SRS) program. SPOF provides targeting planning tools and added connectivity between United States Strategic Command (STRATCOM), Naval Surface Warfare Center (NSWC) Dahlgren and the Fleet. SPOF will provide the following new capabilities in response to initiatives required by STRATCOM and substantiated by the Nuclear Posture Review (NPR): 1) improved flexibility and responsiveness, 2) enhanced accuracy and effectiveness, and 3) information management and the decision making tools/capabilities.</p> <p>The Reliable Replacement Warhead Program (RRW) is an effort to provide reliable replacement warheads to the nation's nuclear stockpile. The program will allow the design of replacement warheads that are more efficient to manufacture, are safer and more secure, eliminate environmentally hazardous materials, and increase design performance margins. The design of RRW will enable transformation to a more efficient and responsive nuclear weapons research, development, and production infrastructure in support of the Nuclear Posture Review and the requirements of the new Strategic Triad.</p> <p>The TRIDENT Submarine System Improvement Program develops and integrates command and control improvements needed to maintain TRIDENT Submarine operational capability through the life cycle of this vital strategic asset. The program conducts efforts needed to maintain strategic connectivity, ensure platform invulnerability, and reduce lifecycle costs through Obsolete Equipment Replacement (OER) and commonality.</p>								

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B. (U) Program Change Summary:

	FY 2006	FY 2007	FY 2008	FY 2009
Previous Presidents Budget (FY 2007 President's Controls)	92.2	124.5	88.1	88.3
Current President's Budget Controls (FY 2008 PB Budget)	87.9	124.0	81.4	96.8
Total Adjustments	-4.3	-0.5	-6.7	8.5
 Summary of Adjustments				
Program Reduction (Project 2228)			-40.0	-40.0
SBIR Reduction (Project 2228)	-2.2			
Efficiency Reduction (Project 3158)			-2.0	-2.0
Program Realignment for Nuclear Weapon Security (Project 3158)		-0.2	5.0	
SSBN funding adjustment (Project S0004)	-1.5			0.1
Reliable Replacement Warhead Program(Project 3196)			30.0	50.0
Pricing Adjustments (Project 2228)	-0.6	-0.3	0.3	0.4

C. (U) Other Program Funding Summary: See enclosed R-2a for each individual project data.

D. (U) Acquisition Strategy: See enclosed R-2a for each individual project data.

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EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2007	
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7					PROJECT NUMBER AND NAME Technology Applications J2228			

COST (\$ in Millions)	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
Project Cost J2228 Technology Applications	82.9	80.9	45.2	45.5	47.0	47.0	48.7	51.6
RDT&E Articles Qty	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This project supports implementation of a coordinated Navy/Air Force Reentry System Applications Program (RSAP), a coordinated Navy/Air Force Strategic Guidance Applications Program (GAP), a coordinated Navy/Air Force Strategic Propulsion Applications Program (SPAP), and a coordinated Department of Defense Radiation Hardened Applications Program (RHAP). Reentry vehicle and guidance technology had been rapidly eroding beyond the point of being capable to respond to increasing aging phenomena and future requirements. The SPAP program, which commenced in FY 2004, demonstrates and validates technologies unique to strategic missile applications. The RHAP program, which commence in FY 2004, address production, qualification and manufacturing issues associated with strategic and space radiation hardened electronics. The December 2001 DOD Nuclear Posture Review determined that infrastructure is a critical part of the new triad and these efforts form part of the infrastructure that supports the nuclear force structure.

The RSAP program, through sustainment of the reentry vehicle technology base, will maintain confidence in the dependability and reliability of strategic SLBM and ICBM weapon systems over the long term when no new systems will be in development. Critical and unique attributes necessary for the design, development and in-service support of current and modernized SLBM reentry systems have been defined and will be maintained to insure a functioning readiness application technical capability in reentry is preserved. Working closely with the Air Force, Navy and Air Force requirements have been integrated into a comprehensive program. The program maintains close coordination with the DOD Science and Technology (S&T) community in order to: leverage S&T programs, ensure system driven technology base requirements are considered in contract awards, eliminate duplication of effort and provide an opportunity to demonstrate appropriate emerging technologies through a reentry flight test evaluation process.

The GAP program provides a minimum strategic guidance core technology development capability consistent with the Strategic Advisory Group (SAG) recommendations to COMSTRATCOM. The SAG recommend that SSP establish a program which preserves this critical design and development core. It is a basic bridge program which develops critical guidance technology applicable to any of the existing Air Force/Navy strategic missiles. The objective is to transition from current capability to a long term readiness status required to support deployed systems. Air Force and Navy guidance technology requirements are integrated and needs prioritized. Efforts are focused on alternatives to technologies identified as system "weak links." Currently system accuracy and functionality depends upon key technologies which provide radiation hardened velocity, attitude and stellar sensing capabilities. As the underlying technologies that currently provides these capabilities age and are no longer technically supportable, modern alternatives must be made available in order to allow for orderly replacement. there is no commercial market for these technologies and their viability depends on the strategic community.

The SPAP program is a coordinated Navy/Air Force effort and addresses infrastructure needs by exercising critical development skills to allow for future large-scale rocket motor test firings. A sound base of demonstrated technologies suitable for Strategic Missile applications will be maintained and will provide the nation a talent base and source of technologies suitable for a follow-on development program. Boost propulsion (missile stages), post boost propulsion (missile payload delivery vehicle) and Ordnance (separation events and flight termination events and are all integral parts of missile propulsion application efforts. As a result of affordability reductions made to the Technical Applications programs during the POM-08 process, the SPAP program will be terminated beginning in FY2008.

The RHAP program sustains critical skills in radiation hardened electronics by advancing radiation hardened simulation technologies to reflect the processes in future systems. These efforts become of greater importance because of the shrinking industrial base for radiation hardened electronics, the unavailability of underground testing resources, and the loss of radiation hardened expertise. These efforts are coordinated by the Radiation Hardened Oversight Council (RHOC) chaired by the Director, Defense Research & Engineering (DDR&E). The RHAP program focuses on a coordinated Productization & Qualification Program which provides a transition between Science Technology (S&T) and production by efficient utilization of limited resources, sharing of information to eliminate redundancy, increased use of common part/technologies, coordination into the RHOC technology road map and implementation of the OSD (AT&L) investment strategy. The RHAP compliments the GAP electronic part activities by specifically focusing on those tasks required to ensure producibility of radiation hardened parts. As a result of affordability reductions to the Technical Applications programs during the POM-08 process, the RHAP program will be terminated beginning in FY2008.

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B. (U) Accomplishments/Planned Program

	FY 2006	FY 2007	FY 2008	FY 2009
Reentry Systems Application Program (RSAP)	26.6	27.0	27.7	28.1
RDT&E Articles Quantity				

(U) FY 2006 PLAN

(U) (\$26.6) Continue Reentry System Applications Program. Fully obligated.

FY 2006 efforts include:

- (U) Maintain the current capability and support the planned service life extension of Navy reentry systems.
- (U) Continue development and ground testing of reentry vehicle candidate heatshield and nosetip materials including those available from Science & Technology (S&T)
- (U) Flight test alternative low-cost heatshield and replacement nosetip material.
- (U) Flight test operationally aged heatshields to support aging trends and replacement materials assessments.
- (U) Complete development and flight test advanced reentry instrumentation such as inertial sensor and avionics computer, encapsulated on the updated engineering instrumentation package.
- (U) Maintain RSAP technical program plan, conduct system assessments and continue Vulnerability & Hardening certification process development in absence of Nuclear Under Ground Testing (UGT) facilities.
- (U) Continue Reentry Body material development and advanced flight test instrumentation activities.
- (U) Continue development of advanced GPS receiver
- (U) Ground test advanced reentry material systems and advanced instrumentation components.
- (U) Develop test instrumentation to demonstrate D5LE missile reentry body interface compatibility.

(U) FY 2007 PLAN

(U) (\$27.0) Continue Reentry System Applications Program. Full obligation is projected by the 3rd Quarter of the first year.

FY 2007 efforts include:

- (U) Maintain the current capability and support the planned service life extension of Navy reentry systems.
- (U) Continue development and ground testing of reentry vehicle candidate heatshield and nosetip materials including those available from Science & Technology (S&T)
- (U) Flight test alternative low-cost heatshield and replacement nosetip material.
- (U) Flight test operationally aged heatshields to support aging trends and replacement materials assessments.
- (U) Complete development and flight test advanced reentry instrumentation such as inertial sensor avionics computer, encapsulated on the updated engineering instrumentation package.

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B. (U) Accomplishments/Planned Program

(U) FY 2008 PLAN

(U) (\$27.7) Continue Reentry System Applications Program. Full obligation is projected by the 4th quarter of the first year.

FY 2008 efforts include:

- (U) Maintain the current capability and support the planned service life extension of Navy reentry systems.
- (U) Continue development and ground testing of reentry vehicle candidate heatshield and nosetip materials including those available from Science & Technology (S&T)
- (U) Flight test alternative low-cost heatshield and replacement nosetip material.
- (U) Flight test operationally aged heatshields to support aging trends and replacement materials assessments.
- (U) Complete development and flight test advanced reentry instrumentation such as inertial sensor and avionics computer, encapsulated on the updated engineering instrumentation package.
- (U) Maintain RSAP technical program plan, conduct system assessments and continue Vulnerability & Hardening certification process development in absence of Nuclear Under Ground Testing (UGT) facilities.
- (U) Continue Reentry Body material development and advanced flight test instrumentation activities.
- (U) Continue development of advanced GPS receiver
- (U) Ground test advanced reentry material systems and advanced instrumentation components.
- (U) Develop test instrumentation to demonstrate D5LE missile reentry body interface compatibility.
- (U) Continue to develop the capability to produce Thermocouple (TC) Plugs at significantly reduced cost to the Government.
- (U) Create and execute plan to build Life Extension Test Bed (LETB) #2 Flight Test Body

(U) FY 2009 PLAN

(U) (\$28.1) Continue Reentry System Applications Program. Full obligation is projected by the 3rd Quarter of the first year.

FY 2009 efforts include:

- (U) Maintain the current capability and support the planned service life extension of Navy reentry systems.
- (U) Continue development and ground testing of reentry vehicle candidate heatshield and nosetip materials including those available from Science & Technology (S&T)
- (U) Flight test alternative low-cost heatshield and replacement nosetip material.
- (U) Flight test operationally aged heatshields to support aging trends and replacement materials assessments.
- (U) Complete development and flight test advanced reentry instrumentation such as inertial sensor avionics computer, encapsulated on the updated engineering instrumentation package.
- (U) Maintain RSAP technical program plan, conduct system assessments and continue Vulnerability & Hardening certification process development in absence of Nuclear Under Ground Testing (UGT) facilities.
- (U) Continue Reentry Body material development and advanced flight test instrumentation activities.
- (U) Continue development of advanced GPS receiver
- (U) Ground test advanced reentry material systems and advanced instrumentation components.
- (U) Develop test instrumentation to demonstrate D5LE missile reentry body interface compatibility.

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B. (U) Accomplishments/Planned Program

	FY 2006	FY 2007	FY 2008	FY 2009
Guidance Application Program (GAP)	21.1	21.4	17.5	17.4
RDT&E Articles Quantity				

(U) FY 2006 PLAN

(U) (\$21.1) Continue Strategic Guidance Applications Programs (GAP). Fully obligated.

FY 2006 efforts include:

- (U) Complete the prototype virtual system simulation model and demonstrate models in a closed-loop system. Modeling and simulation support for sub-system design and Hardware in the Loop (HWIL) infrastructure development.
- (U) Continue to evaluate alternate sensor technologies, (accelerometer, gyro, and stellar) and proximity electronics for application in the D5 Life Extension Guidance system and/or replacement of system weak links. Evaluate prototype radiation-hard sensor build and test results for appropriate applications.
- (U) Continue design, build and evaluate Silicon Oscillator Accelerometer (SOA) support electronics and improved build processes. Prove SOA capability to meet Rad-Hard strategic goals.
- (U) Alternate Pendulous Integrating Gyro Accelerometer (AltPIGA) Develop producible long life, low cost hemispherical gas bearing wheel.
- (U) Hemispherical Resonator Gyro (HRG). Examine and demonstrate technologies for reducing long term bias trending. Improve performance during and following shock and vibration events.
- (U) Interferometric Fiber Optic Gyro (IFOG). Improve IFOG proximity electronics hardness to strategic radiation levels.

(U) FY 2007 PLAN

(U) (\$21.4) Continue Strategic Guidance Applications Programs (GAP). Full obligation is projected by the 3rd Quarter of the first year.

FY 2007 efforts include:

- (U) Support the Inertial Measurement Unit (IMU) system integration effort, model simulation development in support of the enhanced ground testing (EGT) task, support remaining non-real-time subsystem/system simulation effort and support software Verification & Validation (V&V) testing.
- (U) Continue to evaluate alternate sensor technologies, (accelerometer, gyro, and stellar) and proximity electronics for application in the D5 Life Extension Guidance system and/or replacement of system weak links. Evaluate prototype radiation-hardened sensor build and test results for appropriate applications.
- (U) Continue design, build and evaluate SOA support electronics and improved build processes. Test the all-silicon SOA in a strategic radiation environment.
- (U) (AltPIGA) Develop producible long-life, low cost hemispherical gas bearing wheel and commercial processes/vendors for mass produced flexure/pick off assemblies for AltPIGA.
- (U) (IFOG) Build and radiation test complete sense head. Perfect technologies and processes for producing low cost Rad-Hard fiber. Conduct investigations to improve circumvention and recovery performance.
- (U) (HRG) Improve benign scale factor performance. Examine and demonstrate technologies for reducing long term bias trending. Improve performance during and following shock and vibration events.

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B. (U) Accomplishments/Planned Program

(U) FY 2008 PLAN

(U) (\$17.5) Continue Strategic Guidance Applications Programs (GAP). Full obligation is projected by the 3rd quarter of the first year.

FY 2008 efforts include:

- (U) Production and Qualification (P&O) of OPTELECOM-based components for use in strategic grade sensors (e.g.fiber light source, integrated optics chip, couplers.).
- (U) Continue to evaluate emergent alternate sensor technologies, (accelerometer, gyro, and stellar) with an emphasis on providing existing performance in a significantly reduced form factor.
- (U) Assess feasibility of advanced stellar sensor technologies for use a strategic application; specifically, active pixel and camera-on-a-chip architectures will be evaluated.
- (U) Utilize the capabilities of the Virtual System Simulation (VSSim) to conduct system trade studies that support precision guidance application for boost phase and boost-thru-reentry scenarios.
- (U) Complete the development of alternate sources for critical components required to support D5LE emergent sensors.
- (U) Conduct investigations to improve circumvention and recovery performance.
- (U) (SOA) Continue design, build, evaluate and demonstrate SOA as a strategic grade accelerometer.

(U) FY 2009 PLAN

(U) (\$17.4) Continue Strategic Guidance Applications Programs (GAP). Full obligation is projected by the 3rd Quarter of the first year.

FY 2009 efforts include:

- (U) Production and Qualification (P&O) of OPTELECOM-based components for use in strategic grade sensors (e.g.fiber light source, integrated optics chip, couplers.).
- (U) Continue to evaluate emergent alternate sensor technologies, (accelerometer, gyro, and stellar) with an emphasis on providing existing performance in a significantly reduced form factor.
- (U) Assess feasibility of advanced stellar sensor technologies for use a strategic application; specifically, active pixel and camera-on-a-chip architectures will be evaluated.
- (U) Utilize the capabilities of the Virtual System Simulation (VSSim) to conduct system trade studies that support precision guidance application for boost phase and boost-thru-reentry scenarios.
- (U) Complete the development of alternate sources for critical components required to support D5LE emergent sensors.
- (U) Conduct investigations to improve circumvention and recovery performance.
- (U) (SOA) Continue design, build, evaluate and demonstrate SOA as a strategic grade accelerometer. Continue to evaluate alternate sensor technologies, (accelerometer, gyro, and stellar) and proximity electronics.

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B. (U) Accomplishments/Planned Program

	FY 2006	FY 2007	FY 2008	FY 2009
Strategic Propulsion Applications Program (SPAP)	17.0	17.5	0.0	0.0
RDT&E Articles Quantity				

(U) FY 2006 PLAN

(U) (\$17.0) Continue SPAP program. Fully obligated.

FY 2006 efforts include:

- (U) Conduct biennial Industrial Base assessment.
- (U) Complete boost rocket motor test demonstration.
- (U) Complete boost rocket motor post test assessment and evaluation.
- (U) Complete component tests for identified post boost control technologies.
- (U) Continue component tests for identified missile ordnance technologies.

(U) FY 2007 PLAN

(U) (\$17.5) Continue SPAP program. Full obligation is projected by the 3rd Quarter of the first year.

FY 2007 efforts include:

- (U) Continue to evaluate and down-select suitable technologies for boost motor test.
- (U) Continue component tests for identified post boost control technologies.
- (U) Continue to evaluate and down-select suitable post boost control technologies test.
- (U) Contingency planning for post boost and ordnance demonstration test.

(U) FY 2008 PLAN

(U) (\$0) Program Terminated.

(U) FY 2009 PLAN

(U) (\$0) Program Terminated.

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B. (U) Accomplishments/Planned Program

	FY 2006	FY 2007	FY 2008	FY 2009
Radiation Hardened Applications Program (RHAP)	18.2	15.0	0.0	0.0
RDT&E Articles Quantity				

(U) FY 2006 PLAN

(U) (\$18.2) Continue RHAP program. Fully obligated.

FY 2006 efforts include:

- (U) Initiate productization of 0.15 micron digital Complimentary Metal Oxide Semiconductor - Silicon On Insulator (CMOS SOI) technology.
- (U) Continue productization of 0.35 micron mixed-signal SOI technology.
- (U) Complete productization and initiate qualification of 0.35 micron digital SOI technology.
- (U) Complete productization and initiate qualification of 0.7 micron mixed-signal SOI technology.
- (U) Initiate productization of primary non-volatile memory technology, Magnetic (MRAM).
- (U) Continue productization and qualification of high-voltage analog SOI technology.
- (U) Complete physics based modeling methods for nuclear radiation effects (X-ray, gamma, and neutron) on missile and guidance/missile components.
- (U) Continue physics based modeling for nuclear radiation effects on complex digital circuits with built in testability.
- (U) Continue evaluation and validation of post radiation SPICE models for dose rate, total ionizing dose, neutron and single event effects.
- (U) Initiate physics based modeling of survivability and rail-span collapse of complex digital circuits in dose-rate (x-ray and gamma) environment.

(U) FY 2007 PLAN

(U) (\$15.0) Continue RHAP program. Full obligation is projected by the 3rd Quarter of the first year.

FY 2007 efforts include:

- (U) Complete productization and initiate qualification of 0.15/0.35 micron digital CMOS SOI products (RHPPC, ASICs, SRAM, SSI logic).
- (U) Complete productization and initiate qualification of 0.35/0.7 micron mixed-signal SOI products (ADC, DAC, Comparator, LV Opamp, Multiplexer).
- (U) Continue productization and qualification of primary non-volatile memory technology and product Magnetic (MRAM).
- (U) Complete productization and initiate qualification of high-voltage analog SOI products (Vref, HV op-amp, PCIC, clock driver).
- (U) Complete physics based modeling for nuclear radiation effects on complex digital circuits with built in testability.
- (U) Complete evaluation and validation of post radiation Simulation Program with Integrated Circuit Emphasis (SPICE) models for dose rate, total ionizing dose, neutron and single event effects.
- (U) Continue physics based modeling of survivability and rail-span collapse of complex digital circuits in dose-rate (x-ray and gamma) environment.

(U) FY 2008 PLAN

(U) (\$0) Program Terminated.

(U) FY 2009 PLAN

(U) (\$0) Program Terminated.

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C. (U) Other Program Funding Summary: (Dollars in Thousands)

<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>Total Complete</u>	<u>Total Cost</u>
N/A	N/A								

D. (U) Acquisition Strategy:

Contracts will continue to be awarded to those sources who were engaged in the TRIDENT II (D5) development program and are currently engaged in the production and/or operational support of the deployed D5 Strategic Weapons Systems on the basis of Other Than Full and Open Competition pursuant to the authority of 10 U.S.C. 2304 (c) (1) and (3) implemented by FAR 6.302.-1, 3, 4

E. (U) Major Performers:

- LMMS/CA - Reentry Body Systems Integration (RSAP)
- NSWC/VA - Heatshield Noretip materials development (RSAP)
- ITT/CO - Vulnerability and hardness technologies (RSAP)
- CSDL/MA - Reentry Systems flight test instrumentation (RSAP)
- DOE/NM - Advanced fuzing technology (RSAP)
- CSDL/MA - Guidance Application program support (GAP)
- CSDL/MA - Analog, digital, mixed-signal and discrete radiation model development (RHAP)
- HI/FL - RADHARD application specific integrated Circuit library (RHAP)
- NGMS/CA - RADHARD oxi-nitride non-volatile memory productization (RHAP)
- BAE/MD - 4M-bit RADHARD Chalcogenide non-volatile memory product development (RHAP)
- NAWC/CA - Rocket Motor testing and integration (SPAP)
- LMSSC/CA - Missile Systems Integration (SPAP)
- NSWC/VA - Coordinating and executing ordnance tests (SPAP)

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EXHIBIT R-3, Cost Analysis											DATE: February 2007		
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Cost Categories	Contract Method & Type	Performing Activity &	Total PYs Cost	FY 06 Cost	FY0 06 Award Date	FY 07 Cost	FY 07 Award Date	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Support & Management														
Technology Applications	SS-CPFF	LMSS/CA	83.3	11.6	12-05	14.1	02-07	11.8	12-07	11.8	10-08	Cont.	Cont.	TBD
Technology Applications	WR	NSWC/VA	51.5	5.7	10-05	5.9	01-07	6.5	10-07	7.0	10-08	Cont.	Cont.	TBD
Technology Applications	MIPR	DOE/NM	19.9	3.9	10-05	1.4	12-06	1.0	10-07	1.0	10-08	Cont.	Cont.	TBD
Technology Applications	SS-CPFF	CSDL/MA	11.1	3.4	10-05	3.2	11-06	3.7	10-07	3.7	10-08	Cont.	Cont.	TBD
Technology Applications	SS-CPFF	ITT/CO	4.0	1.8	10-05	1.9	10-06	1.3	10-07	1.9	10-08	Cont.	Cont.	TBD
Technology Applications	SS-CPFF	CSDL/MA	156.6	18.0	02-06	20.1	11-06	18.4	02-08	17.4	10-08	Cont.	Cont.	TBD
Technology Applications	SS-CPFF	LMMSC/CA	24.5	15.0	12-05	16.8	02-07	0.0		0.0		Cont.	Cont.	TBD
Technology Applications	WR	NAWC/CA	2.9	0.4	10-05	0.1	11-06	0.0		0.0		Cont.	Cont.	TBD
Technology Applications	WR	NSWC/VA	1.2	0.8	10-05	0.6	11-06	0.0		0.0		Cont.	Cont.	TBD
Technology Applications	SS-CPFF	CSDL/MA	7.4	3.5	02-06	10.7	11-06	0.0		0.0		Cont.	Cont.	TBD
Technology Applications	SS-CPFF	HI/FL	11.8	10.3	10-05	0.0		0.0		0.0		Cont.	Cont.	TBD
Technology Applications	SS-CPFF	NGMS/CA	2.5	0.0		0.0		0.0		0.0		Cont.	Cont.	TBD
Technology Applications	SS-CPFF	AERO	0.0	0.0		3.0	2-06	0.0		0.0		Cont.	Cont.	TBD
Technology Applications	SS-CPFF	BAE/MD	1.8	0.0		0.0		0.0		0.0		Cont.	Cont.	TBD
Technology Applications	SS-CPFF	INTERSIL	1.5	2.0	10-05	0.0		0.0		0.0		Cont.	Cont.	TBD
Technology Applications	VARIOUS	VARIOUS	3.4	6.5	VAR	3.1	VAR	2.5		2.7		Cont.	Cont.	TBD
Subtotal Product Development			383.4	82.9		80.9		45.2		45.5				

Remarks:

Total Cost			383.4	82.9		80.9		45.2		45.5		Cont.	Cont.	TBD

Remarks:

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EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2007	
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7					PROJECT NUMBER AND NAME Enhanced Special Weapons J3158			
COST (\$ in Millions)	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
Project Cost J3158 Enhanced Special Wpns	0.0	42.9	6.0	0.9	0.9	0.0	0.0	0.0
RDT&E Articles Qty	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<p>A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION</p> <p>The Enhanced Special Weapons effort supports the Nuclear Weapons Security program and SSBN Escort mission. The policies and requirements regarding the safeguard of nuclear weapons within the Department of Defense is established by DoD S5210.41M. Within the Department of the Navy, nuclear weapons are limited to TRIDENT Fleet Ballistic Missiles (FBM), either deployed aboard TRIDENT submarines or located landside at Naval Submarine Base, Kings Bay or Naval Submarine Base, Bangor where missiles are first assembled as well as repaired. The Chief of Naval Operations (CNO) has assigned the Strategic Systems Programs, the FBM program manager, with mission responsibility for the safeguard of FBM nuclear assets. More specifically, the mission includes landside and pier operations as well as transits to and from the dive point, each of which present challenges to personnel as well as existing technologies. This budget supports efforts directed at improving the current technological baseline through a series of studies focusing on land and waterside requirements, including both surface and underwater. Collectively, these efforts will improve countermeasure technologies addressing detection, delay and denial.</p>								

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EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2007
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7	PROJECT NUMBER AND NAME: Enhanced Special Weapons J3158	

B. (U) Accomplishments/Planned Program

	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost J3158 Enhanced Special Weapons	0.0	35.0	5.0	0.0
RDT&E Articles Quantity				

(U) FY 2007 PLAN

(U) (\$35.0) Enhanced Special Weapons/SSBN Escort Mission. Full obligation is projected by the 3rd quarter of the fiscal year.

FY 2007 efforts include:

(U) Initiate Development and Test of a prototype system consisting of two independent palletized units. Two units are required in order to properly demonstrate "system-level" capabilities and countermeasure effectiveness while operating in an at-sea scenario.

(U) FY 2008 PLAN

(U) (\$5.0) Enhanced Special Weapons/SSBN Escort Mission. Full obligation is projected by the 3rd quarter of the fiscal year.

FY 2008 efforts include:

(U) Complete prototype development and test program. Once the prototypes are completed, plans are to continue with follow-on tests and proofing as a lead in to production which is now planned for FY 2009. Participants in the program will continue to be TARDAC and MIT as the technical and scientific experts and SPA as management's support in addition to the winner of the prototype competition being run in FY 2007.

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EXHIBIT R-2a, RDT&E Project Justification	DATE: February 2007
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7	PROJECT NUMBER AND NAME: Enhanced Special Weapons J3158

B. (U) Accomplishments/Planned Program

	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost J3158 Enhanced Special Weapons	0.0	6.0	0.9	0.9
RDT&E Articles Quantity				

(U) FY 2007 PLAN

(U) (\$6.0) Enhanced Special Weapons/Nuclear Weapons Security program. Full obligation is projected by the 3rd quarter of the first year.

FY 2007 efforts include:

(U) Underwater Close-in Defense: This effort is focused on developing an advanced underwater vehicle and diver detection and deterrence system for the protection of high value maritime assets while they are in port. The conceptual system involves a physical net-like barrier that combines use of fiber-optic sensing and alerting technology to provide an extremely high positive detection rate and extremely low false alarm rate. The concept design also includes increased alert time to improve positive identification of intruders and for activation of response systems.

(U) Remotely Operated Weapons Technologies: This task is directed to enhancing the current ROWs technology that uses direct copper connection and modifies it to a network for Navy applications. In addition, new features (i.e. target tracking) for added capabilities will be researched and prototyped.

(U) Land Water Interface Sensors: This effort includes research into existing sensor technologies to improve capabilities in areas where current sonar's and land based sensors capabilities could be improved. Initial findings are expected to be sufficient to warrant development and test of prototype.

(U) Technology Reviews: This task involves reviews and assessments of technologies and advanced concepts for applicability or potential adaptation to protective measures required for safeguard of nuclear assets.

(U) Access Doors: This task explores developing new concepts, technologies and designs for doors and closures protecting nuclear assets.

(U) Final Denial Technologies: This task explores concept weapons, microwaves, acoustic devices, etc. for application to denial requirements related to protection of nuclear assets.

(U) Smart Sensors : This task researches new technologies and concepts for detecting explosives or explosive devices from greater distances than currently available.

(U) Research and study leading to new or improved technologies in both active and passive protection systems to be used in the safeguarding of Navy's nuclear assets.

(U) FY 2008 PLAN

(U) (\$0.9) Enhanced Special Weapons/Nuclear Weapons Security program. Full obligation is projected by the 3rd Quarter of the first year.

FY 2008 efforts include:

(U) Underwater Close-in Defense: This effort is focused on developing an advanced underwater vehicle and diver detection and deterrence system for the protection of high value maritime assets while they are in port. The conceptual system involves a physical net-like barrier that combines use of fiber-optic sensing and alerting technology to provide an extremely high positive detection rate and extremely low false alarm rate. The concept design also includes increased alert time to improve positive identification of intruders and for activation of response systems.

(U) Technology Reviews: This task involves reviews and assessments of technologies and advanced concepts for applicability or potential adaptation to protective measures required for safeguard of nuclear assets.

(U) FY 2009 PLAN

(U) (\$0.9) Enhanced Special Weapons/Nuclear Weapons Security program. Full obligation is projected by the 3rd Quarter of the first year.

FY 2009 efforts include:

(U) Underwater Close-in Defense: This effort is focused on developing an advanced underwater vehicle and diver detection and deterrence system for the protection of high value maritime assets while they are in port. The conceptual system involves a physical net-like barrier that combines use of fiber-optic sensing and alerting technology to provide an extremely high positive detection rate and extremely low false alarm rate. The concept design also includes increased alert time to improve positive identification of intruders and for activation of response systems.

(U) Technology Reviews: This task involves reviews and assessments of technologies and advanced concepts for applicability or potential adaptation to protective measures required for safeguard of nuclear assets.

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EXHIBIT R-2a, RDT&E Project Justification	DATE: February 2007
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7	PROJECT NUMBER AND NAME: Enhanced Special Weapons J3158

C. (U) Other Program Funding Summary: (Dollars in Thousands)

<u>Nuclear Weapons Security</u>	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Complete	Total Cost
MILCON (CNI)	94.3	48.1	39.5	50.4	55.2	227.3	0.0	286.6	continuing	continuing
OPN BA7/812800/PE 0208147N	50.3	21.9	51.4	61.4	30.0	26.0	26.5	27.0	continuing	continuing
O&MN BA1/1D2D/PE Various	60.0	86.4	77.1	92.1	81.4	82.5	84.0	85.8	continuing	continuing
Transit/Escort										
MILCON (CNI)	0.0	0.0	0.0	0.0	25.0	35.0	0.0	0.0	continuing	continuing
OPN BA1/1210/PE 0204228N	60.9	20.8	8.6	0.0	22.5	66.9	68.2	69.5	continuing	continuing
WPN BA4/4217/PE 0101228N	5.1	0.0	7.0	45.4	44.3	31.2	0.0	0.0	continuing	continuing
O&MN BA1/1D2D/PE 0101221N	39.7	63.7	73.4	86.9	87.2	85.6	87.4	89.2	continuing	continuing

D. (U) Acquisition Strategy:
 Procurements are being executed through a combination of private contractors (large and small business), government Centers of Excellence (COEs), other government agencies and the Naval Submarine Bases, Kitsap and Kings Bay. Contract awards are based upon "best value" determinations, and where practical will be performance based or include incentive provisions.

E. (U) Major Performers:

- TBD - Marinization of Integrated Army Active Protection System (IAAPS) and deliver two (2) operational prototype units.
- NFESC/CA - Underwater Close-in defense
- DOE/NM - Technology Reviews
- APL/MD - Remotely Operated Weapons technologies; final denial technologies.

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EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2007	
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7					PROJECT NUMBER AND NAME Reliable Replacement Warhead J3196			
COST (\$ in Millions)	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
Project Cost J3196 Reliable Replacement Warhead	0.0	0.0	30.0	50.0	0.0	0.0	0.0	0.0
RDT&E Articles Qty	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<p>A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION</p> <p>The Reliable Replacement Warhead Program is a joint DOE and DoD effort to provide reliable replacement warheads to the nations nuclear stockpile. As further reductions continue to be made to the stockpile, the long-term implications of successive refurbishments of the legacy warheads from the Cold War must be considered. Each refurbishment is further from the tested configurations of these highly optimized systems, raising concerns about the ability to ensure stockpile safety and reliability over the very long term without underground nuclear testing. By relaxing Cold War design constraints (e.g. maximum yield in a minimum size/weight package), the RRW program will allow the design of replacement warheads that are more efficient to manufacture, are safer and more secure, eliminate environmentally hazardous materials and increase design performance margins, thus ensuring long-term confidence in reliability and a correspondingly reduced chance of requiring nuclear tests. Improving safety and security in a post-9/11 threat environment is a primary objective. RRW provides opportunities to incorporate the latest technological advances for precluding unauthorized use and access. RRW will enable transformation to a more efficient and responsive nuclear weapons research, development, and production infrastructure in support of the Nuclear Posture Review and the requirements of the new Strategic Triad. Once it can be demonstrated that replacement warheads can be produced on a timescale in which geopolitical threats could emerge, or respond in a timely way to technical problems in the stock pile, then non-deployed warheads can be further reduced and meet the President's vision of the smallest stockpile consistent with the nation's security requirements. In 2005, an RRW design competition was initiated in which two independent design teams from the nuclear weapons labs explored RRW options. In December 2006, the Nuclear Weapons Council on selecting a The team selected will lead the development of an RRW design to replace a portion of the deployed warheads for the Navy's TRIDENT SLBM system. In partnership with the selected design team, the DoD and NNSA will conduct a study to further define the design and develop detailed cost estimates for RRW development and production. This estimate will form the basis of the POM-10 input. The numbers shown here are the DoD dollars required to develop the cost estimate and the current estimate of the DoD portion of the effort required for the first two years of the design and development effort.</p>								

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EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2007
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7	PROJECT NUMBER AND NAME: Reliable Replacement Warhead J3196	

B. (U) Accomplishments/Planned Program

	FY 2006	FY 2007	FY 2008	FY 2009
Reliable Replacement Warhead	0.0	0.0	30.0	50.0
RDT&E Articles Quantity				

(U) FY 2008 PLAN

(U) (\$30 M) Continue the RRW Program into Phase 3 Engineering Development, when approved by Congress and the Nuclear Weapons Council. Full obligation is projected by the 3rd Quarter of the first year.

FY 2008 efforts include:

- (U) Engineering development of AF&F for RRW.
- (U) Developmental Test and Evaluation of AF&F components and subsystems.
- (U) Systems engineering and integration of RRW with the TRIDENT D5 Weapon System.
- (U) Engineering development of ancillary reentry body types for RRW.

(U) FY 2009 PLAN

(U) (\$50 M) Continue the RRW Program into Phase 3 Engineering Development, when approved by Congress and the Nuclear Weapons Council. Full obligation is projected by the 3rd Quarter of the first year.

FY 2009 efforts include:

- (U) Continue engineering development of AF&F for RRW.
- (U) Continue developmental Test and Evaluation of AF&F components and subsystems.
- (U) Continue systems Engineering and integration of RRW with the TRIDENT D5 Weapon System.
- (U) Continue engineering development of ancillary reentry body types for RRW.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-7	PROGRAM ELEMENT NUMBER AND NAME PE 0101221N Strategic Sub & Wpns Sys Spt	PROJECT NUMBER AND NAME 9999 Congressional Plus-Up : 0004C

CONGRESSIONAL PLUS-UPS:

	FY 06	FY 07		
0004C				
Title of Congressional Add - Thin Plate Pure Lead Technology	3.500			

Thin Plate Pure Lead Batteries - Submarine main storage batteries are the primary back-up source of power for nuclear submarines. Thin Plate Pure Lead technology (TPPL) is designed to improve the efficiency of the chemical reaction that occurs on the plates of batteries. Hence, incorporating TPPL technology into submarine batteries could significantly increase the achievable energy, power density and life of future submarine batteries. This effort would attempt to scale up the current TPPL product to a size suitable for use in submarine main storage batteries. It is possible that by coupling TPPL plates with VRLA battery technology, the Navy could further increase the energy, power density and life of VRLA submarine main storage batteries. The increase in battery life could result in a commensurate reduction in life cycle cost. The \$3.5M received will continue the research and development program to support the development and manufacture of TPPL technology for submarine main storage battery applications.

	FY 06	FY 07		
9A66N				
Advanced Conventional Strike Capability (SLIRBM)		1.295		

A study will be conducted utilizing the baseline data developed during performance of the Submarine Launched Intermediate Range Ballistic Missile (SLIRBM) Boost Motor Demonstration contracts. This study will focus on providing best value missile system design concepts. Cost considerations will include development, production, operational, and disposal costs over the life of the program. This Congressional add belongs to SSP.

	FY 06	FY 07		
9A67N				
Free Electron Laser Facility		1.345		

The Free Electron Laser Program is for advanced capability Linear Accelerator (LINAC) to include a three stage accelerator section and an electron storage ring that will reduce the main limitation (electrical noise and micro-beam structure) of current LINAC technology. The enhanced LINAC will allow future large chips to be tested while meeting strategic test requirements. This Congressional add belongs to SSP.