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EXHIBIT R-2, RDT&E Budget Item Justification

DATE: May 2009

APPROPRIATION/BUDGET ACTIVITY  
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/EA-7

R-1 ITEM NOMENCLATURE  
PE 0101221N Strategic Sub & Weapons System Support

	COST (\$ in Millions)								
	FY2008	FY2009	FY2010						
Total PE Cost	64,492	78,537	74,939						
J2228 Technology Applications Program	40,903	45,344	45,637						
J3158 Enhanced Special Weapons	5,771	9,932	5,850						
50004 TRIDENT Submarine Systems Improvement	0.271	0.347	0.326						
J3168 Underwater Launch Missile System	0.000	9,973	0.000						
J3166 Advanced Technologies for Arming, Fuzing, and Firing (AF&F) Systems	14,455	0.000	0.000						
9E10A Advanced Technology for MMS AF&F	0.000	9,973	0.000						
9E10A Joint Warhead Fuze Sustainment	0.000	0.000	23,066						
9C47A, 9999 Advanced LUNAC Facility	2,892	3,191	0.000						
9E08A Adels National Security Sensor System	0.000	1,995	0.000						
9E09A Enhanced Special Weapons/Nuclear Weapons Security	0.000	1,566	0.000						
9E11A Covert Robust Location Aware Wireless Network	0.000	1,566	0.000						
9E12A Maritime Security- Surface and Sub Surface Surveillance	0.000	3,550	0.000						

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

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.

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 SS210.41M. 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.

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.

The Underwater Launch Missile System (ULMS) effort develops capabilities definitions and assessments, science & technology development strategies, and conceptual work to prepare for R&D and future prototyping.

The Advanced Technologies for Arming, Fuzing, and Firing (AF&F) program supports efforts to develop, proof, and demonstrate advanced technologies that will be leveraged and incorporated into future AF&Fs. The focus is on technologies that have multi-service (Navy and Air Force) and Multi-Nation (US and UK) applicability. \$10.0M of FY 2008 funds supports a working group of engineers (USN, USAF, and UK) to identify, prioritize, develop, proof, and demonstrate future AF&F applications. \$10M of 2009 funding was appropriated as a Congressional add to support advanced technologies for the MMS Arming, Fuzing, and Firing (AF&F). The Joint Warhead Fuze Sustainment Program will begin in FY2010 as a development and studies program which integrates modern technologies into the Arming, Fuzing, and Firing (AF&F) development and modernization to improve reliability, safety and security, and develop common fuze components adaptable to current and future warheads.

The Advanced LUNAC Facility Program seeks to develop and complete the design for an advanced Linear Accelerator Facility to perform radiation simulation of transient dose rate events. This facility will perform with advanced capabilities to overcome limitations of existing facilities, allowing for greater efficiency in testing and reducing costs.

The Adels National Security Sensor System effort develops an advanced fiber optic sensor systems for counterterrorism and antiterrorism operations to meet rigorous performance metrics necessary for nuclear facility, material, and weapons protection. The Adels component will evaluate the use of advanced classification algorithms for reduction of false positive detections of objects in proximity to fiber optic sensing elements. Adels program also seek to expand the application of a unique fiber optic sensor system designed to provide covert surveillance and intelligence gathering of potential threats to our nation's nuclear activity.

The Enhanced Special Weapons/Nuclear Weapons Security effort supports the development of the Adels fiber optic sensor system for the advanced detection, tracking, and classification of potential threat targets by employing advanced digital acoustic watermarking algorithms within a secure network for steganographic techniques to convey the classification and location information within the digital audio signal produced by the Adels application software.

The Covert Robust Location Aware Wireless Network (CROWN) program develops a key foundation technology enabler to provide communication between multiple assets for a covert network capability that could be used on the submarine as a wireless network, and as a method to improve (relative terminal accuracy) that cannot be met today, especially in jammed or spoofed battlefields. The CROWN program provides the military precision relative location determination, tracking in a jammed environment, and high data rate communications with a low probability of being detected or intercepted by adversaries.

The Maritime Security- Surface and Sub-Surface Surveillance effort supports the development of the Quad-S Seaport Security System. The Quad-S Program develops a tactical surveillance and reconnaissance system in support of real-time monitoring of the complete spectrum of the maritime domain - underwater, surface, air, associated landside environments and individuals within those environments. This funding will also develop a needed Year-round test bed, to evaluate and test emerging maritime technologies against the operational capabilities needed by the U.S. Navy.

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RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7

PROJECT NUMBER AND NAME

Advanced Technologies for Arming, Fuzing, and Firing (AF&F) Systems  
J3196

COST (\$ in Millions)		FY2008	FY2009	FY2010						
Project Cost J3196 Advanced Technologies for Arming, Fuzing, and Firing (AF&F) Systems		14.455	0.000	0.000						
RDT&E Articles Qty		0.000	0.000	0.000						

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

The Advance Technologies for Arming, Fuzing, and Firing (AF&F) program supports the development, proofing, and demonstration of advanced technologies that will be leveraged and incorporated into future AF&Fs. The focus is on technologies that have multi-service (Navy and Air Force) and Multi-Nation (US and UK) applicability. \$10.0M of FY 2008 funds supports a working group of engineers (USN, USAF, and UK) to identify, prioritize, develop, proof, and demonstrate future AF&F applications. Examples of the technologies investigated are advance safety systems architectures, improved radar performance, multi-chip radar integration, radiation hardened electronics, radiation hardened non-volatile memory, advance power systems, identification of component qualification techniques, and preliminary testing of alternative components (primarily circuit elements)

\$4.5M of FY 2008 funding was used by the Department of Defense to fund the Congressional Commission on Strategic Posture of the United States.

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APPROPRIATION/BUDGET ACTIVITY

RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7

PROJECT NUMBER AND NAME:

Advanced Technologies for Arming, Fuzing, and Firing (AF&F) Systems J3196

B. (U) Accomplishments/Planned Program

	FY 2008	FY 2009	FY 2010
Advanced Technologies for Arming, Fuzing, & Firing (AF&F) Systems	14,455	0,000	0,000
RD&E Articles Quantity	0,000	0,000	0,000

(U) FY 2008 PLAN

(U) (\$10.0) Identify, prioritize, develop, proof, and demonstrate advanced technologies that will be leveraged and incorporated into future AF&Fs.  
FY 2008 efforts include:

- (U) Support of USN, USAF, and UK engineer working group.
- (U) Define Technical and Safety Requirements.
- (U) Assess and Develop an Above Ground Testing Plan.
- (U) Instrument, assemble, and perform three light initiated high explosive spray tests and complete summary reports.

(U) (\$4.5M) Department of Defense funding to support the Congressional Commission on Strategic Posture of the United States.

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EXHIBIT R-2a, RD1&E Project Justification		DATE:	May 2009	
APPROPRIATION/BUDGET ACTIVITY		PROJECT NUMBER AND NAME:		
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7		9E10A Advanced Technology for Mk5 AF&F		
B. (U) Accomplishments/Planned Program				
Project Cost 9E10A Advanced Technology for Mk5 AF&F		FY 2008	FY 2009	FY 2010
RD1&E Articles Quantity		0.000	9.973	0.000
		0.000	0.000	0.000
(U) FY 2009 PLAN				
(U) (\$9.973) Identify, prioritize, develop, proof, and demonstrate advanced technologies that will be leveraged and incorporated into future AF&Fs.				
FY 2009 efforts include:				
(U) Continue work in support of advanced technologies.				
(U) Support USN, USAF, and UK engineer working group.				
(U) Complete Light Initiated High Explosives proof of concept and generate test report.				
(U) Complete the down selection of new path length sensor technology.				
(U) Generate a Facilities Readiness Document.				
(U) Define Reentry Body/Reentry Vehicle Safety and Systems Architecture and Investigate Safety Architecture Trades.				

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APPROPRIATION/BUDGET ACTIVITY	DATE: May 2009
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7	
PROJECT NUMBER AND NAME 0951 Joint Warhead Fuze Sustainment	

COST (\$ in Millions)	FY2008	FY2009	FY2010						
Project Cost 0951 Joint Warhead Fuze Sustainment	0.000	0.000	23.066						
RDT&E Articles Qty	0.000	0.000	0.000						

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

The Joint Warhead Fuze Sustainment Program is a development and studies program which integrates modern technologies into the Arming, Fuzing, and Firing (AF&F) development and modernization to improve reliability, safety and security, and develop common fuze components adaptable to current and future warheads, and with joint service and country applicability. The Joint Warhead Fuze Sustainment Program will focus on technologies that have multi-service (Navy and Air Force) and Multi-Nation (US and UK) applicability. Examples of the technologies to be investigated are advance safety systems architectures, improved radar performance, multi-chip radar integration, radiation hardened electronics, radiation hardened non-volatile memory, advance power systems, identification of component qualification techniques, and preliminary testing of alternative components (primarily circuit elements.)

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APPROPRIATION/BUDGET ACTIVITY	PROJECT NUMBER AND NAME:	DATE:
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7	0951 Joint Warhead Fuze Sustainment	May 2009

B. (U) Accomplishments/Planned Program

	FY 2008	FY 2009	FY 2010
Project Cost 0951 Joint Warhead Fuze Sustainment	0.000	0.000	23.066
RDT&E Articles Quantity	0.000	0.000	0.000

(U) FY 2010 PLAN

(U) (\$23.066) Identify, prioritize, develop, proof, and demonstrate advanced technologies that will be leveraged and incorporated into future AF&Fs.

FY 2010 efforts include:

- (U) Develop, proof, and demonstrate identified advanced technologies for future AF&Fs.
- (U) Support USN, USAF, and UK engineer working group.
- (U) Perform component level testing of potential arming/fuzing devices and technologies.
- (U) Develop approach to address radiation hardening issues in electronic AF&F components.
- (U) Down select Mk5 Life Extension Program Designs.

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