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EXHIBIT R-2, RDT&E Budget Item Justification							DATE:	
							2	May 2009
APPROPRIATION/BUDGET ACTIVITY			70	R-1 ITEM NOMENCLATURE	JCLATURE			
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7			P	E 0101221N Str.	ategic Sub & W	PE 0101221N Strategic Sub & Weapons System Support	Support	
COST (\$ in Millions)	FY2008	FY2009	FY2010					
Total PE Cost	64.292	78.537	74.939					
J2228 Technology Applications Program	40,903	45.344	45.637					
J3158 Enhanced Special Weapons	5.771	0.932	5.850					
S0004 TRIDENT Submarine Systems Improvement	0.271	0.347	0.386					
J3198 Underwater Launch Missile System	0.000	9.973	0.000					
J3196 Advanced Technologies for Arming, Fuzing, & Firing (AF&F) Systems	14.455	0.000	0.000					
9E10A Advanced Technology for Mk5 AF&F	0.000	9.973	0.000					
0951 Joint Warhead Fuze Sustainment	0.000	0.000	23,066					
9C47A /9999 Advanced LINAC Facility	2.892	3.191	0.000					
9E08A Adelos National Security Sensor System	0.000	1.995	0.000					
9E09A Enhanced Special Weapons/Nuclear Weapons Security	0.000	1.596	0.000					
9E11A Covert Robust Location Aware Wireless Network	0.000	1.596	0.000					
9E12A Maritime Security- Surface and Sub-Surface Surveillance	0.000	3.590	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 TRIDEN II (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 in investigations into new technologies which would help miligate 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 DoB SS2/10.41M. Within the Department of the Nawy, nuclear weapons are limited to IRIDENT Fleet Ballistic Missies (FBM), either deployed aboard IRIDENT submarines to located and/side at Naval Submarine Base. Bangor where missies 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 stategic 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 incluture AF&F. The focus is on technologies that have multi-service (havy and Air Force) and Multi-Nation (US and US) 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. \$10 0M of Y2008 funding was appropriated as a Congressional add to support advance technologies for the Mt& Arming, Fuzing, and Friing (AF&F). The Joint Wanthead Fuze Sustainment Program will begin in FY2010 as a development and studies program which integrates modern technologies into the Arming, Fuzing, and Friing (AF&F) development and modernization to improve reliability, safety and security, and develop common fuze components adaptable to current and future warheads.

The Advanced LINAC 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 Adelos National Sacurity Sensor System effort develops an advanced fiber optic sensor systems for counterterrorism and antiterrorism operations to meet figorous performance metrics necessary for nuclear facility, material, and weapons protection. The Adelos component will evaluate the use of advanced classification adjorithms for reduction of ideas positive detections of objects in proximity to fiber optic sensing elements. Adelos program also seek to exponent 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 Adelos fiber optic sensor system for the advanced detection, tracking, and classification of potential threat targets by employing advanced digital accurstic watermarking algorithms within a secure network for steganographic techniques to convey the classification and location information within the digital audio signal produced by the Adelos application

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 Seapord Security System. The Quad-S Program develops a tectical surveillance and recomaissance system in support of reach time monitoring of the complete specture of the maritime domain, underwater, surface, and individual maritime domain. 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.

R-1 SHOPPING LIST - Item No. 160 - 1 of 48

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RESEARCH DEVELOPMENT IEST & EVALUATION, NAVVIBA-7  COST (\$ in Millions)  FY2008  COST (\$ in Millions)  FY2008  FY2008  FY2009		veraged and incorporated into future AF&Fs. The focus is on technod UK) to identify, prioritize, develop, proof, and demonstrate future A ridened electronics, radiation hardened non-volatile memory, advanc
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVYIBA.7  COST (\$ in Millions)  COST (\$ in Millions)  FY2008  FY2009		veraged and incorporated into future AF&Fs. The focus is on technod UK) to identify, prioritize, develop, proof, and demonstrate future AI of the detection of the following state future and electronics, radiation hardened non-volatile memory, advance
PROJECT NUMBER AND NAME Advanced Technologies for Arming, Fuzing, and F J3196  0.0000  0.0000  0.0	R-1 SHOPPING LIST - Item No. 160 - 21 of 48	veraged and incorporated into future AF&Fs. The focus is on technod UK) to identify, prioritize, develop, proof, and demonstrate future AI UK) to identify, prioritize, develop, proof, and demonstrate future AI ridened electronics, radiation hardened non-volatile memory, advance

UNCLASSIFIED

#### CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification  APPROPRIATION/BUDGET ACTIVITY	DATE: May 2009
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	
RDT&E Articles Quantity (AF &F) Systems 14,455 0.000 0.000 RDT&E Articles Quantity 0.000 0.000 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.	d and incorporated into future AF&Fs.
(U) Support of USN, USAF, and UK engineer working group.	
(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.	ary reports.
(U) (\$4.5M) Department of Defense funding to support the Congressional Commission on Strategic Posture of the United States.	of the United States.

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#### CLASSIFICATION:

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

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#### CLASSIFICATION:

ABBBORDIATION (SUBSECT TO BECT SUSMICATION	ustification						DATE:
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7	EST & EVALUATION, NAVY/	BA-7			PROJECT NU	PROJECT NUMBER AND NAME  0951 Joint Warhead Fuze Sustainment	stainment
COST (\$ in	COST (\$ in Millions)	FY2008	FY2009 F	FY2010			
Project Cost 0951 Joint Warhead Fuze Sustainment	ze Sustainment	0.000	0.000	23.066			
RU1&E Articles Qty		0.000	0.000	0.000			
A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION	AND BUDGET ITEM JUSTIFI	CATION					
The Joint Warhead Fuze Sustainment Progr	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 technologic 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 (primarily circuit elements.)	s program which integrate rent and future warheads, ipplicability. Examples of atile memory, advance po	es modern technolog and with joint serv the technologies to ower systems, identit	es into the Arming, Fua ce and country applicat se investigated are adv.	ing, and Firing (AF&F billity. The Joint Warh ance safety systems a	development and ma ad Fuze Sustainment chitectures, improved and preliminary testir	dernization to improve re Program will focus on te- radar performance, mult
safety and security, and develop common furthal have multi-service (Navy and Air Force) radar integration, radiation hardened electro primarity circuit elements.)				cation of component qu	annication techniques		
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 (primarily circuit elements.)				cation of component qu	ramicanon recilinados		
safety and security, and develop common futhat have multi-service (Navy and Air Force) radar integration, radiation hardened electro (primarily circuit elements.)			,	cation of component qu	embranot iccilindae		
safety and security, and develop common futhal have multi-service (Navy and Air Force) radar integration, radiation hardened electro (primarily circuit elements.)			7	cation of component qu	embanot ischiida		
safety and security, and develop common futhat have multi-service (Navy and Air Force) radar integration, radiation hardened electro (primarily circuit elements.)				cation of component qu	embanot ischinda		
safety and security, and develop common futhat have multi-service (Navy and Air Force) radar integration, radiation hardened electro (primarily circuit elements.)				cation of component qu	emicanot iccilindad		

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7 2010 efforts include: <ul> <li>(U) Develop, proof, and demonstrate identified advanced technologies for future AF&amp;Fs.</li> <li>(U) Support USN, USAF, and UK engineer working group.</li> <li>(U) Perform component level testing of potential arming/fuzing devices and technologies.</li> <li>(U) Develop approach to address radiation hardening issues in electronic AF&amp;F components.</li> <li>(U) Down select Mk5 Life Extension Program Designs.</li> </ul>	)) FY 2010 PLAN )) (\$23.066) Identify, prioritize, develop, proof, and demonstrate advanced technologies that will be leveraged and inco		
	rporated into future AF&Fs.		PROJECT NUMBER AND NAME:    O951 Joint Warhead Fuze Sustainment   DATE:   May 2009
	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.	(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.	B. (U) Accomplishments/Planned Program    FY 2008   FY 2005   FY 2010

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