

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-2, RDT&E Budget Item Justification							DATE: February 2000			
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA4					R-1 ITEM NOMENCLATURE Conventional Munitions/0603609N					
COST (\$ in Millions)		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total PE Cost		37.098	39.087	28.619	26.900	24.528	26.368	25.194	CONT.	CONT.
Conventional Fuze/Warhead Package/K1821/U1821		23.991	24.635	24.528	18.552	18.766	19.000	19.524	CONT.	CONT.
Optical Correlators/ K2393/U2393*		0.000	3.978	0.000	0.000	0.000	0.000	0.000	CONT.	CONT.
Non-Nuclear Expendable Ordnance (NNEO)/K2299		2.250	1.353	0.867	0.950	0.958	0.976	1.002	CONT.	CONT.
Insensitive Munitions Advanced Development/S0363		9.889	9.121	3.224	7.398	4.804	6.392	4.668	CONT.	CONT.
Env Safe Energetic Materials/S2611		0.968	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.968
Quantity of RDT&E Articles										

*Funded in FY99 under 604366N/K2640/U2640

A. Mission Description and Budget Item Justification

Conventional Fuze/Warhead Package (Project K1821/U1821): The Navy requires improved lethality of air and surface launched ordnance to defeat advanced threats. Current specific requirements and initiatives to address them include: development of advanced missile fuzing system to replace MK 45 MOD 9 and MK 11 Target Detecting Devices (TDDs) for future production missiles (SM-2 Blocks IIIB and IVA); development of modeling and simulations for new reactive warhead; development of advanced components for future advanced ordnance system; and performance of a trade-off analysis for the selection of a future advanced ordnance package . This project will, in future years, also provide a vehicle to address emergent requirements by transitioning mature fuze and warhead technology from conceptual developments to engineering development with minimum technical and financial risk.

Non-Nuclear Expendable Ordnance (NNEO) (Project K2299): This item addresses improvements to Navy surface launched (2T) non-nuclear expendable ordnance. It supports transition of the Multi-Function Fuze from Engineering and Manufacturing Development (E&MD) to production.

Insensitive Munitions Advanced Development (IMAD) (Project S0363): Most Navy munitions react violently when exposed to unplanned stimuli such as fire, shock and bullet impact, thus presenting a great hazard to ships, aircraft, and personnel. This IMAD program will provide, validate, and transition technology for explosives, propellants, and ordnance to enable production of munitions insensitive to unplanned stimuli with no reduction to combat performance.

Environmentally Safe Energetic Materials (Project S2611): This project will mature and demonstrate energetic materials and processes for explosives, propellants, and pyrotechnics which minimize or eliminate any adverse environmental impact normally associated with these materials in production and demilitarization. These new environmentally safe materials will meet insensitive munitions and system performance requirements while lowering the total ownership costs of the weapon systems.

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EXHIBIT R-2, RDT&E Budget Item Justification

DATE:

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APPROPRIATION/BUDGET ACTIVITY

R-1 ITEM NOMENCLATURE

RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA4

Conventional Munitions/0603609N

Optical Correlator Technology (Project K2393): The purpose of this effort is to enhance next generation target discrimination and aimpoint selection performance.

Note: In accordance with 15 USC 638, \$.458M in FY 2000 is reserved for the Small Business Innovation Research (SBIR) assessment.

B. (U) Program Change Summary

	FY 1999	FY 2000	FY 2001
FY 2000 President's Budget:	40.596	34.309	31.318
Appropriated Value:	40.775	39.309	
Adjustment to FY 1999/2000 Appropriated Value/			
FY 2000 President's Budget:	-3.677	-0.222	-2.699
FY 2001 President's Budget Submit:	37.098	39.087	28.619

Funding:

FY99 change is due to SBIR transfer (-\$0.775), decreases for Insensitive Munitions for March 1999 update (-\$1.200), to fund approved emergent requirements and approved program reductions (\$-1.000), inflation savings (-\$0.185), actuals update (-\$0.349) below threshold reprogramming (-\$0.007), midyear review decision (\$-.482), and for various rate adjustments (-\$0.179); and an increase in Conventional Fuze/Warfare Package to fund approved emergent requirements (\$+0.500).

FY00 reduction is due to minor adjustments (-\$0.005) and undistributed congressional reductions (-\$0.217).

FY01 change is due to adjustments for Conventional Fuze (+\$4.300) and Insensitive Munitions (-\$1.900), a decrease for offsets required to finance high priority O&M,N deficiencies (-\$0.140), NWCF rate adjustments (+\$0.193), pricing adjustments (-\$0.469), Strategic Sourcing Program Redistribution (-\$0.183), an offset in Insensitive Munitions for higher priority programs (-\$4.500).

Schedule: Not applicable.

Technical: Not applicable.

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EXHIBIT R-2a, RDT&E Project Justification						DATE: February 2000				
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER			PROJECT NAME AND NUMBER						
RDT&E, N BA 4	Conventional Munitions/0603609N			Conventional Fuze and Warhead Package /K1821/U1821						
COST (\$ in Millions)		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost		23.991	24.635	24.528	18.552	18.766	19.000	19.524	Continuing	Continuing
RDT&E Articles Qty										
<p>A. Mission Description and Budget Item Justification The Navy requires improved lethality of air and surface launched ordnance to defeat advanced threats. This is the only Navy 6.3B RDT&E program that addresses improvements in warhead and fuze technology to meet this requirement. This program is a significant vehicle for orderly planning, timely and effective transition of Navy 6.2 and 6.3A investments into E&MD missile/weapon systems. This program addresses increased lethality against current and emerging threats, is responsive to all mission areas -- anti-air, strike, defense suppression, theater defense and ship defense, and supports development of complete ordnance sections. The current, on-going projects address significant technology advancements for missile systems by developing: mature physical concepts to enhance anti-air kill probability, advanced ordnance with augmented overland cruise missile defense and theater ballistic missile defense capabilities, and advanced seeker technology. The program supports the full spectrum of missile advanced development and technology improvements, and in future years will continue to provide the vehicle to address emergent requirements by transitioning mature development efforts into weapon systems with minimal technical and financial risk.</p> <p>(U) PROGRAM ACCOMPLISHMENTS AND PLANS:</p> <p>1. (U) FY 1999 ACCOMPLISHMENTS:</p> <ul style="list-style-type: none"> - (U) (\$.293) DIRECTIONAL ORDNANCE SYSTEM: Prepared final report and project closed-out. - (U) (\$.205) ADVANCED STRIKE WARFARE HIGH VELOCITY PENETRATOR: Conducted low-level testing and data collection. - (U) (\$1.209) ORDNANCE COMPONENT TECHNOLOGY: Completed efforts on high energy density capacitors. Initiated efforts on near field contact sensors and enhanced low energy exploding foil initiator. - (U) (\$1.344) ADVANCED ORDNANCE SECTION: Started interim down select to 3-4 warhead concepts variants. Incorporated updated fuze models, conducted critical experiments, performed fabrication/evaluation studies, performed end-game statistical assessments. Incorporated reactive fragments vulnerability models. - (U) (\$.484) FUZE CONTACT DEVICE: Completed baseline design. - (U) (\$1.430) MICRO-ELECTRICAL MACHINE SYSTEM (MEMS) SAFE & ARMING (S&A) DEVICE : Generated requirements and conducted critical tests. - (U) (\$1.275) REACTIVE MATERIAL WARHEAD: Conducted preliminary studies and risk reduction efforts. 										

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EXHIBIT R-2a, RDT&E Project Justification		DATE:
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER
RDT&E, N BA 4	Conventional Munitions/0603609N	Conventional Fuze and Warhead Packaging /K1821/U1821
<p>1. (U) FY 1999 ACCOMPLISHMENTS: (Continued)</p> <ul style="list-style-type: none">- (U) (\$3.617) LOW COST STANDARD FUZE: Developed requirements and started preliminary design of MK 45 MOD 9/11 replacement.- (U) (\$.052) UNCOOLED FOCAL PLANE ARRAY STUDY: Supported ONR study.- (U) (\$13.582) OFFICE OF SPECIAL PROJECTS- (U) (\$.500) To fund approved emergent requirements for Conventional Fuze/Warhead Package. <p>2. (U) FY 2000 PLAN:</p> <ul style="list-style-type: none">- (U) (\$1.101) ORDNANCE COMPONENT TECHNOLOGY: Initiate efforts on delayed functioning exploding foil initiator (EFI) and conduct tests of warhead fragmentation control candidates.- (U) (\$1.269) ADVANCED ORDNANCE SECTION: Conduct endgame analyses, test prototype warhead candidates.- (U) (\$1.330) MEMS S&A: Hardware evaluations, design arming control unit, reliability analysis.- (U) (\$.500) FUZE CONTACT DEVICE: Fabricate and evaluate baseline design.- (U) (\$2.000) LOW COST STANDARD FUZE: Begin critical design and development of hardware and software.- (U) (\$18.435) OFFICE OF SPECIAL PROJECTS <p>3. (U) FY 2001 PLAN:</p> <ul style="list-style-type: none">- (U) (\$1.690) ORDNANCE COMPONENT TECHNOLOGY: Continue evaluation of advanced warhead materials and fragmentation control techniques, continue EFI development.- (U) (\$3.000) ADVANCED ORDNANCE SECTION: Complete critical experiments.- (U) (\$2.500) MEMS S&A: Conduct critical tests.- (U) (\$.500) FUZE CONTACT DEVICE: Develop hardening requirements, initiate design optimization.- (U) (\$6.801) LOW COST STANDARD FUZE: Continue MK 45 MOD 12 TDD development.- (U) (\$1.062) KILL MECHANISMS: Initiate development methodology to evaluate alternate kill mechanisms.- (U) (\$8.975) OFFICE OF SPECIAL PROJECTS <p>B. Other Program Funding Summary: Not applicable. C. Acquisition Strategy: Not applicable. D. Program Schedule: Not Applicable.</p>		

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Exhibit R-3 Cost Analysis (page 1)										DATE: February 2000		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, N BA 4			Conventional Munitions/0603609N			Conventional Fuze and Warhead Package/K1821/U1821						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Design and Analysis	WR	NSWC/DD	28.123	1.825	11/98	0.528	11/99	1.980	11/00	Continuing	Continuing	
	WR	NAWC/China Lake	55.042	2.522	11/98	1.152	11/99	4.430	11/00	Continuing	Continuing	
	SS/CPAF	Motorola/Raytheon	4.474	1.600	12/98	0.000		0.000		0.000	6.074	6.074
	RC	ONR	0.000	0.052	01/99	0.000		0.000		Continuing	Continuing	
	PD	Office of Special Projects	7.751	0.000		0.000		0.000		0.000	7.751	N/A
Hardware Fabrication & Procurement	WR	NSWC/DD	5.000	0.700	11/98	0.312	11/99	0.947	11/00	Continuing	Continuing	
	WR	NAWC/China Lake	6.500	0.800	11/98	0.988	11/99	2.215	11/00	Continuing	Continuing	
	SS/CPAF	Motorola/Raytheon	0.300	0.200	12/98	0.000		0.761	11/00	0.000	1.261	1.261
Other	PD	Office of Special Projects	1.100	14.082	12/98	18.435	12/99	8.975	12/00	Continuing	Continuing	
Subtotal Product Development			108.290	21.781		21.415		19.308		Continuing	Continuing	
Remarks:												
Development Support Equipment												
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												

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Exhibit R-3 Cost Analysis (page 2)										DATE: February 2000		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, N BA 4			Conventional Munitions/0603609N			Conventional Fuze and Warhead Package/K1821/U1821						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Demonstration Test & Evaluation	WR	NSWC/DD	10.447	1.000	11/98	1.000	11/99	2.000	11/00	Continuing	Continuing	
	WR	NAWC/China Lake	10.482	1.000	11/98	2.000	11/99	3.000	11/00	Continuing	Continuing	
Subtotal T&E			20.929	2.000		3.000		5.000		Continuing	Continuing	
Remarks:												
Program Management Support	WR	NSWC/DD	1.899	0.050	11/98	0.075	11/99	0.075	11/00	Continuing	Continuing	
	WR	NAWC/China Lake	3.135	0.100	11/98	0.075	11/99	0.075	11/00	Continuing	Continuing	
	C/FPI	TMAI	0.000	0.010	11/98	0.020	11/99	0.020	11/00	Continuing	Continuing	
Travel	PD	NAVSEA Travel	0.200	0.050	Various	0.050	Various	0.050	Various	Continuing	Continuing	
Subtotal Management			5.234	0.210		0.220		0.220		Continuing	Continuing	
Remarks:												
Total Cost			134.453	23.991		24.635		24.528		Continuing	Continuing	
Remarks:												

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EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2000			
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER				PROJECT NAME AND NUMBER					
RDT&E, N BA 4	Conventional Munitions/0603609N				Non-Nuclear Expendable Ordnance (NNEO)/K2299					
COST (\$ in Millions)		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost		2.250	1.353	0.867	0.950	0.958	0.976	1.002	Continuing	Continuing
RDT&E Articles Qty										
<p>A. Mission Description and Budget Item Justification: This budget item addresses improvements to Navy surface launched (2T) non-nuclear expendable ordnance (NNEO) outside existing operational requirements. The commodities comprising 2T NNEO are: Major and medium caliber gun ammunition, small arms ammunition, other ship gun ammunition, pyrotechnics, and demolition items. There are no other RDT&E budget items supporting the 2T NNEO program. This project supports the Multi-function Fuze (MFF), Mk 2 Grenade Proximity Fuze and Cargo Competent Fuzes. These fuzes will be used with 5"/54 gun ammunition.</p> <p>(U) PROGRAM ACCOMPLISHMENTS AND PLANS:</p> <p>1. (U) FY 1999 ACCOMPLISHMENTS: - (U) (\$2.250) Multi-Function Fuze (MFF): Incorporated changes to the design of the fuze which reduces cost, increases producibility and improves performance. Pre-Planned Product Improvement (P3I) items include: new battery and semiconductor bridgewire. Achieve Milestone III.</p> <p>2. (U) FY 2000 PLANS: - (U) (\$1.353) Multi-Function Fuze (MFF): Incorporate pre-planned product improvement programs to reduce fuze unit cost, increase producibility and performance. P3I items include: multi-plexing air mode and initial velocity sensor.</p> <p>3. (U) FY 2001 PLANS: - (U) (\$.867) Multi-Function Fuze (MFF): P3I items include: evaluation of Micro-Electro-Mechanical System (MEMS) Technology and begin Preliminary Design.</p>										

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EXHIBIT R-2a, RDT&E Project Justification	DATE: February 2000
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APPROPRIATION/BUDGET ACTIVITY RDT&E, N BA 4	PROGRAM ELEMENT NAME AND NUMBER Conventional Munitions/0603609N	PROJECT NAME AND NUMBER Non-Nuclear Expendable Ordnance (NNEO)/K2299
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B. Other Program Funding Summary

1. (U) Related RDT&E: PE 0603795 (Naval Surface Fire Support)

2. (U) The 5"/54 Improved Conventional Munition projectile will be qualified with the MFF. Approval decision for proceeding with Low Rate Initial Production in 3rd quarter FY99. Milestone III scheduled for 1st quarter FY01.

Procurement of Ammunition, Navy and Marine Corps (PANMC) 5"/54 Ammunition, BLIN 025000, Cost Code AC100 and AC893 (Reno)

FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
0.0	11.0	8.0	7.2	6.7	6.8	6.8	TBD	TBD

C. Acquisition Strategy: Award 5-Year (Multi-Year) contract for MFF. As P3I are completed, they will be incorporated into the next production lot.

D. Schedule Profile

	FY 1999	FY 2000	FY 2001
Program Milestones			1Q MSIII 1Q IOC
Engineering Milestones			
T&E Milestones	1Q TECHEVAL OPEVAL	1Q TECHEVAL P31 1Q OPEVAL P31	
Contract Milestones	3Q PRODUCTION 3QPRODUCTION P3I	1Q PRODUCTION P3I	3Q PRODUCTION P3I

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Exhibit R-3 Cost Analysis (page 1)										DATE: February 2000		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, N BA 4			Conventional Munitions/0603609N			Non-Nuclear Expendable Ordnance (NNEO)/K2299						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NSWC Dahlgren	0.195	0.718	VAR	0.234	VAR	0.667	VAR	CONT.	CONT	N/A
	C/CPFF	ALLIANT	0.322	0.536	VAR	0.094	VAR	0.200	VAR	CONT.	CONT	N/A
	SS/CPFF	MOTOROLA	0.300	0.200	VAR	0.150	VAR	0.000		0.000	0.650	N/A
Subtotal Product Development			0.817	1.454		0.478		0.867		0.000	CONT	N/A
Remarks:												
Development Support Equipment												
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												

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Exhibit R-3 Cost Analysis (page 2)							DATE: February 2000					
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, N BA 4			Conventional Munitions/0603609N			Non-Nuclear Expendable Ordnance (NNEO)/K2299						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NSWC DAHLGREN	0.150	0.150	VAR	0.375	VAR	0.000		CONT.	CONT.	N/A
	WR	NAWC CHINA LAKE	0.150	0.200	VAR	0.200	VAR	0.000		CONT.	CONT.	N/A
Operational Test & Evaluation	WR	COMOPTEVFOR	0.400	0.148	VAR	0.000		0.000		0.000	0.548	N/A
Subtotal T&E			0.700	0.498		0.575		0.000		CONT.	CONT.	
Remarks:												
Contractor Engineering Support												
Government Engineering Support	WR	NSWC DAHLGREN	0.141	0.198	11/98	0.200	11/99	0.000		CONT	CONT.	N/A
Program Management Support	WR	NSWC DAHLGREN	0.054	0.080	11/98	0.080	11/99	0.000		CONT	CONT.	N/A
Travel	WR	NSWC DAHLGREN	0.010	0.010		0.010						
Labor (Research Personnel)												
Overhead	WR	NSWC DAHLGREN	0.010	0.010		0.010						
Subtotal Management			0.215	0.298		0.300		0.000		CONT	CONT.	N/A
Remarks:												
Total Cost			1.732	2.250		1.353		0.867		CONT.	CONT.	N/A
Remarks:												

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EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2000			
APPROPRIATION/BUDGET ACTIVITY RDT&E, N BA4		PROGRAM ELEMENT NAME AND NUMBER Conventional Munitions/0603609N			PROJECT NAME AND NUMBER INSENSITIVE MUNITIONS ADVANCED DEVELOPMENT / S0363					
COST (\$ in Millions)		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost		9.889	9.121	3.224	7.398	4.804	6.392	4.668	Continuing	Continuing
RDT&E Articles Qty										

A. (U) Mission Description and Budget Item Justification:

Most Navy munitions react violently when exposed to unplanned stimuli such as fire, shock and bullet impact, thus presenting a great hazard to ships, aircraft and personnel. This program will provide, validate and transition technology to all new weapon developments and priority weapon systems and enable production of munitions insensitive to these stimuli with no reduction in combat performance. The Insensitive Munitions (IM) Advanced Development Program is the Navy's focused effort on propellants, propulsion units, explosives, warheads, fuzes and pyrotechnics to reduce the severity of cook-off and bullet/fragment impact reactions, minimizing the probability for sympathetic detonation, both in normal storage and in use, increasing ship survivability and satisfying performance and readiness requirements. Each technology area is divided into subtasks addressing specific munition/munition class IM deficiencies. Energetic materials producibility is demonstrated to assure national capability to produce and load munitions systems. The program is being closely coordinated with other Military Departments, NATO and allied countries to eliminate redundant efforts and maximize efficiency. A joint service IM requirement has been developed. Insensitive munitions are identified as a DoD critical technology requirement and considered as part of a weapon design per DoD 5000.2R.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1999 ACCOMPLISHMENTS:

- (U) (\$1.892) Validated and assessed weapon systems POA&Ms for IM compliance. Compiled and analyzed weapon system, energetic material and generic technology IM test data.
- (U) (\$3.118) Demonstrated high explosives that show improved IM characteristics while maintaining or improving operational performance. Demonstrated improved performance deformable high explosives for new Anti-Air-Warfare Warheads. Demonstrated internal blast explosive and high performance pressed metal accelerating explosives and initiated qualification. Continued evaluation of a castable CL-20 based explosive and qualified low cost metal accelerating explosive.

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APPROPRIATION/BUDGET ACTIVITY RDT&E, N BA4	PROGRAM ELEMENT NAME AND NUMBER Conventional Munitions/0603609N	PROJECT NAME AND NUMBER INSENSITIVE MUNITIONS ADVANCED DEVELOPMENT / S0363
<p>1. (U) FY 1999 ACCOMPLISHMENTS: (Continued)</p> <ul style="list-style-type: none">- (U) (\$0.825) Evaluated IM ordnance concepts. Conducted system demonstrations of new high explosives combined with improved warhead and booster designed to support technology transitions. Continued modeling applications that reduce and enhance IM warhead design and test efforts. Evaluated improved air-to-air warheads and penetrator warheads. Evaluated IM properties of warheads reactive case materials. Demonstrated improved submunition case concepts.- (U) (\$4.054) Evaluated and demonstrated IM propellants and propulsion systems which provide improved or comparable performance to in-service systems and better IM characteristics. Combined candidate IM propellants and case concepts to demonstrate compliance with IM and performance requirements. Demonstrated performance of super high-pressure composite case motor. Demonstrated insensitive high-energy booster propellants and composite case motors. Continued demonstration of dual-pulse boost rocket motor for surface systems. <p>2. (U) FY 2000 PLAN:</p> <ul style="list-style-type: none">- (U) (\$1.810) Continue validation and assessment of weapon systems POA&Ms for IM compliance. Continue compilation and analysis of weapon system, energetic material and generic technology IM test data.- (U) (\$2.320) Demonstrate high explosives that show improved IM characteristics while maintaining or improving operational performance. Demonstrate high performance cast explosive. Continue qualification and evaluation of internal blast explosive and pressed metal accelerating explosives. Continue evaluation of improved performance deformable explosive. Begin qualification of high performance, low cost replacement for initiator explosives. Begin qualification of high performance booster explosive.- (U) (\$0.705) Evaluate IM ordnance concepts. Conduct system demonstrations of new high explosives combined with improved warhead and booster designed to support technology transitions. Continue modeling applications that reduce and enhance IM warhead design and test efforts. Complete evaluation of improved warhead concepts for shoulder launched weapons. Continue demonstration and evaluation of improved air-to-air warheads, reactive case warheads and penetrator warheads. Continue demonstration and evaluation of improved submunition case concepts.- (U) (\$3.286) Evaluate and demonstrate IM propellants and propulsion systems which provide improved or comparable performance to in-service systems and better IM characteristics. Combine candidate IM propellants and case concepts to demonstrate compliance with IM and performance requirements. Demonstrate an insensitive, multi mission, high performance rocket motor. Demonstrate high-pressure propellants in high-pressure composite motor cases. Continue demonstration of dual-pulse boost rocket motor for surface systems.- (U) (\$1.000) Continue the evaluation and demonstration of solventless processing of explosive molding powder. Demonstrate the recycle, recovery and reuse of hydrolyzable rocket propellant formulations. Evaluate and predict the environmental impact and associated life cycle costs for energetic materials and processes.		

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EXHIBIT R-2a, RDT&E Project Justification		DATE:
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER
RDT&E, N BA4	Conventional Munitions/0603609N	INSENSITIVE MUNITIONS ADVANCED DEVELOPMENT / S0363
<p>3. (U) FY 2001 PLAN:</p> <ul style="list-style-type: none">- (U) (\$1.209) Continue validation and assessment of weapon systems POA&Ms for IM compliance. Continue compilation and analysis of weapon system, energetic material and generic technology IM test data.- (U) (\$.750) Demonstrate high explosives that show improved IM characteristics while maintaining or improving operational performance. Continue qualification of internal blast explosive. Continue evaluation of pressed metal accelerating explosives. Continue qualification and begin transition high performance booster explosive to weapons systems.- (U) (\$1.265) Evaluate and demonstrate IM propellants and propulsion systems which provide improved or comparable performance to in-service systems and better IM characteristics. Combine candidate IM propellants and case concepts to demonstrate compliance with IM and performance requirements. Continue demonstration of an insensitive, multi-mission, high performance rocket motor. Complete demonstration of high-pressure propellants in high-pressure composite motor cases. Complete demonstration of dual-pulse boost rocket motor for surface systems. <p>B. (U) OTHER PROGRAM FUNDING SUMMARY: NOT APPLICABLE</p> <p>(U) RELATED RDT&E:</p> <ul style="list-style-type: none">(U) PE 0601153N (Defense Research Sciences)(U) PE 0602111N (Surface/Aerospace Surveillance and Weapons Technology)(U) PE 0602314N (Undersea Surveillance and Weapons Technology)(U) PE 0602315N (MCM, Mining and Special Warfare Technology)(U) PE 0603216N (Aviation Survivability) Project W0592 Aircraft and Ordnance Safety(U) PE 0604603N (Unguided Conventional Air-launched Weapons)(U) Cooperative technology transfer efforts with all weapons project offices are in progress. <p>C. (U) ACQUISITION STRATEGY: NOT APPLICABLE</p> <p>D. (U) SCHEDULE PROFILE: NOT APPLICABLE</p>		

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Exhibit R-2a, RDT&E Project Justification

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Exhibit R-3 Cost Analysis (page 1)										DATE: February 2000		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N BA4				PROGRAM ELEMENT Conventional Munitions/0603609N			PROJECT NAME AND NUMBER INSENSITIVE MUNITIONS ADVANCED DEVELOPMENT / S0363					
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Propulsion Dev. and Eval.	WR	NAWC WPN DIV/China Lake	75.700	3.554	11/98	2.786	11/99	1.265	11/00	Continuing	Continuing	NA
	RCP	NAWC WPN DIV/China Lake	9.000	0.500	11/98	0.500	11/99	0.000	11/00	Continuing	Continuing	NA
Explosives Dev. and Eval.	WR	NSWC/Indian Head Div	59.646	3.098	11/98	2.300	11/99	0.740	11/00	Continuing	Continuing	NA
Ordnance Dev. and Eval.	WR	NSWC/Dahlgren Div	17.550	0.825	11/98	0.705	11/99	0.000	11/00	Continuing	Continuing	NA
Pyrotechnics Dev. and Eval.	WR	NSWC/Crane Div	6.500	0.020	11/98	0.020	11/99	0.010	11/00	Continuing	Continuing	NA
Environmentally Safe Energetics Dev	WR	NSWC/Indian Head Div	0.000	0.000	NA	1.000	NA	0.000	11/00	0.000	1.000	NA
Subtotal Product Development			168.396	7.997		7.311		2.015		Continuing	Continuing	NA
<p>Remarks: This cost category includes technology development and subsequent test and evaluation of Insensitive Munitions concepts for propulsion, explosives, ordnance and pyrotechnics. Development of Environmentally Safe Energetic Materials will transition to S0363 in FY 00.</p>												
Development Support Equipment												
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
<p>Remarks: Support categories not applicable to this Non-ACAT program.</p>												

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Exhibit R-3 Cost Analysis (page 2)								DATE: February 2000				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, N			Conventional Munitions/0603609N			INSENSITIVE MUNITIONS ADVANCED DEVELOPMENT / SO363						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation												
Operational Test & Evaluation												
Tooling												
GFE												
Subtotal T&E			0.000	0.000		0.000		0.000		0.000	0.000	
<p>Remarks: This project, S0363, Insensitive Munitions Advanced Development (IMAD), is a Non-ACAT program. As such no formal, separate developmental or operational test and evaluation plans or efforts are included. Formal DT and OT is conducted once the concepts developed by IMAD are transitioned to weapon development and product improvement programs.</p>												
Contractor Engineering Support											0.000	
Government Engineering Support											0.000	
Program Management Support		NSWC IH DIV	23.867	1.876	11/98	1.790	11/99	1.189	11/00	Continuing	Continuing	NA
Travel		NAVSEASYSCOM	0.190	0.016	10/98	0.020	10/99	0.020	10/00	Continuing	Continuing	NA
Labor (Research Personnel)											0.000	
Overhead											0.000	
Subtotal Management			24.057	1.892		1.810		1.209		Continuing	Continuing	NA
<p>Remarks:</p>												
Total Cost			192.453	9.889		9.121		3.224		Continuing	Continuing	NA
<p>Remarks: Performing activities include: NSWC/DAHLGREN, NSWC/INDIAN HEAD, NAWC WP DIV/CHINA LAKE AND NSWC/CRANE</p>												

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Exhibit R-3, Project Cost Analysis
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EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2000			
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA4		PROGRAM ELEMENT NAME AND NUMBER Conventional Munitions/0603609N			PROJECT NAME AND NUMBER ENVIRONMENTALLY SAFE ENERGETIC MATERIALS / S2611					
COST (\$ in Millions)		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost		0.968	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.968
RDT&E Articles Qty										

A. (U) Mission Description and Budget Item Justification:

The development, manufacture and demilitarization of energetic materials generate significant quantities of waste. The generation and subsequent disposal of this waste has come under increased scrutiny and regulation by Federal, State and local officials. Additionally, due to environmental compliance and waste disposal issues, the cost of energetic materials is rapidly increasing. New technologies, energetic materials and ingredients that minimize any adverse environmental impact are being developed within the Navy's science and technology initiatives. These technologies are commonly referred to as "green" energetic materials. The efforts under this project will provide, validate, and transition technology for explosives, propellants and pyrotechnics using materials and compositions that have low adverse environmental impact in production and demilitarization, will meet insensitive munitions requirements and will have no reduction to combat performance.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1999 ACCOMPLISHMENTS:

- (U) (\$.968) Initiated the evaluation and demonstration of solventless processing of explosive molding powder. Began the demonstration of the recycle, recovery and reuse of hydrolyzable rocket propellant formulations. Initiated the evaluation and prediction of the environmental impact and associated life cycle costs for energetic materials and processes.

2. (U) FY 2000 PLAN: NOT APPLICABLE

3. (U) FY 2001 PLAN: NOT APPLICABLE

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EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2000
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA4	PROGRAM ELEMENT NAME AND NUMBER Conventional Munitions/0603609N	PROJECT NAME AND NUMBER ENVIRONMENTALLY SAFE ENERGETIC MATERIALS / S2611
<p>B. (U) OTHER PROGRAM FUNDING SUMMARY: NOT APPLICABLE</p> <p>(U) RELATED RDT&E:</p> <ul style="list-style-type: none">(U) PE 0601153N (Defense Research Sciences)(U) PE 0602111N (Surface/Aerospace Surveillance and Weapons Technology)(U) PE 0602314N (Undersea Surveillance and Weapons Technology)(U) PE 0602315N (MCM, Mining and Special Warfare Technology)(U) PE 0603216N (Aviation Survivability) Project W0592 Aircraft and Ordnance Safety(U) PE 0604603N (Unguided Conventional Air-launched Weapons) <p>C. (U) ACQUISITION STRATEGY: NOT APPLICABLE</p> <p>D. (U) SCHEDULE PROFILE: NOT APPLICABLE</p>		

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Exhibit R-2a, RDT&E Project Justification
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Exhibit R-3 Cost Analysis (page 1)										DATE: February 2000		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA4			PROGRAM ELEMENT Conventional Munitions/0603609N			PROJECT NAME AND NUMBER ENVIRONMENTALLY SAFE ENERGETIC MATERIALS / S2611						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Technology Development	WR	NSWC IH DIV	0.000	0.903	07/99	0.000	NA	0.000	NA	0.000	0.903	NA
Ancillary Hardware Development											0.000	
Systems Engineering											0.000	
Licenses											0.000	
Tooling											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal Product Development			0.000	0.903		0.000		0.000		0.000	0.903	
Remarks:												
Development Support Equipment											0.000	
Software Development											0.000	
Training Development											0.000	
Integrated Logistics Support											0.000	
Configuration Management											0.000	
Technical Data											0.000	
GFE											0.000	
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks: Categories do not apply.												

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Exhibit R-3 Cost Analysis (page 2)										DATE: February 2000		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA4			PROGRAM ELEMENT Conventional Munitions/0603609N			PROJECT NAME AND NUMBER ENVIRONMENTALLY SAFE ENERGETIC MATERIALS / S2611						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation												
Operational Test & Evaluation												
Tooling												
GFE												
Subtotal T&E			0.000	0.000		0.000		0.000		0.000	0.000	
<p>Remarks: This project, S2611, Environmentally, is a Non-ACAT program and a FY 99 Congressional plus-up. As such no formal, separate developmental or operational test and evaluation plans or efforts are included. Formal DT and OT is conducted once the concepts developed are transitioned to weapon development and product improvement programs.</p>												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support	WR	NSWC IH DIV	0.000	0.065	07/99	0.000	NA	0.000	NA	0.000	0.065	
Travel												
Labor (Research Personnel)												
Overhead												
Subtotal Management			0.000	0.065		0.000		0.000		0.000	0.065	
<p>Remarks:</p>												
Total Cost			0.000	0.968		0.000		0.000		0.000	0.968	
<p>Remarks:</p>												

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