CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 7**	R-1 ITEM NOMENCLATURE **0205632N/MK-48 ADCAP**						
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	19.720	26.123	28.438				
0366 / MK 48 ADCAP	17.406	15.751	28.438				
9999 / CONGRESSIONAL ADDS	2.314	10.372	0.000				

A. MISSION DESCRIPTION:

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

MK-48 ADCAP (Advanced Capability) Research, Development, Test and Evaluation (RDT&E) program executes spiral development of weapon performance improvements in three development product areas: (1) Common Broadband Advanced Sonar System (CBASS), (2) Advanced Processor Builds (APBs), and (3) Torpedo Technology Insertion. The budget enables Acquisition Category (ACAT) III development to address Chief of Naval Operations (CNO) defined capability-based requirements and mission needs. This Program Element (0205632N/0366) is tied to development programs that leverage a joint United States/Australia Armaments Cooperative Project (ACP) to develop MK-48 ADCAP CBASS; and Future Naval Capability (FNC) technologies developed by the Office of Naval Research (ONR).

(U) Countermeasure (CM) sophistication and availability on the open market directly affects ADCAP kill proficiency and its ability to counter rapidly evolving threats. The focus of the MK-48 ADCAP torpedo Research and Development (R&D) program for FY01 and out shifted from being primarily concentrated on Software Block Upgrade (BUG) efforts towards coordinated hardware upgrades, rapid Commercial-Off-the-Shelf (COTS) insertion, and APBs to rapidly upgrade the ADCAP to counter evolving threats and maintain robust performance. The CBASS program developed and fielded a broadband sonar capable of identifying CMs and discriminating them from the target. CBASS developed 22 test articles (2 test vehicles and 20 Engineering Development Models {EDMs}). CBASS met Milestone II requirements on 6 March 1998 and received Milestone Decision Authority (MDA) approval to proceed into the Engineering and Manufacturing Development (EMD) phase. CBASS Phase I received Full Rate Production (FRP) decision in June 2006. Initial Operational Capability (IOC) occurred during FY06. The Commonwealth of Australia, Royal Australian Navy (RAN) is participating to jointly develop CBASS torpedo and signed an ACP Agreement March 2003. The intent of the CBASS program was to achieve improvements in shallow water torpedo performance.

(U) The MK-48 ADCAP torpedo R&D program focuses on two specific areas near term: Torpedo APBs and broadband sonar capability. The CNO continues to stress shallow water (less than 600 feet) as a critical operating area to counter third world diesel electric submarines. Torpedo testing in shallow water has demonstrated that in-service ADCAP has less than full capability in this difficult environment. However, this testing, in conjunction with laboratory simulation efforts, has shown that significant performance improvements can be made by implementing changes to weapon tactics and software algorithms. Development, implementation, and testing of these changes is being accomplished under the Torpedo APB program. This program also leverages the RAN joint torpedo program and FNC technologies developed by the ONR in the areas of torpedo broadband signal processing, tactics processing, and alertment. The Torpedo APB program also will incorporate MK-54 Lightweight torpedo algorithms and tactics software to create a Common Torpedo Development program. Future APB software builds will utilize the common torpedo software to deliver software and tactics to both the MK-48 ADCAP and MK-54 Lightweight torpedoes.

(U) The Torpedo Technology Insertion program will provide for evolutionary torpedo improvements and upgrades (including the transition and testing of advanced technologies from the R&D community (6.2/6.3 and contractors). This approach will incorporate developmental testing of the FNC transitioning technologies for ADCAP upgrades in the areas of torpedo sensors, weapon/platform connectivity, warhead lethality, speed and depth. These efforts will continue torpedo development investment at a lower cost and shorter term than traditional torpedo programs.

(U) Both FNC technologies and MK-54 Lightweight torpedo developments will be transitioned into ADCAP through Technology Insertion packages. Priorities for Technology Insertion are a new array to improve torpedo effectiveness, advanced processing, and advanced counter-countermeasure capability.

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	19.952	15.879	15.560
FY10 President's Budget	19.720	26.123	28.438
Total Adjustments	-0.232	10.244	12.878
(U) Summary of Adjustments			
Congressional Rescissions	0.000	0.000	0.000
Congressional Adjustments	0.000	10.329	0.000
SBIR/STTR/FTT Assessment	-0.210	0.000	0.000
Program Adjustments	-0.022	-0.039	13.407
Rate/Misc Adjustments	0.000	-0.046	-0.529
Total	-0.232	10.244	12.878

Funding remark: Torpedo APB FY10 funding increase provides necessary resources to complete Spiral 4 effort and initiate Spiral 5; funds the torpedo countermeasures (CM) required to meet testing requirements for Spiral 4; and funds the MK48 share of the Submarine Launched Acoustic Countermeasure Emulator (SLACE). No hardware is being procured.
Schedule remarks: APB Spiral 4 slipped due to unavailability of fleet assets and specific nature of scenarios and locations needed for Developmental Testing (DT)/Operational Testing (OT). Due to the adjustment of testing plans, additional time needed.
Technology Insertion is being delayed two years due to a reduction in CBASS Technology Insertion funding in FY09 and FY10.

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name	FY 2008	FY 2009	FY 2010						
MK-48 ADCAP MODS WPN/PE0204284N/BA-3/BLI 3225	72.858	52.889	61.608						

D. ACQUISITION STRATEGY:

Sole Source Production Contract awarded in FY04 for MK-48 ADCAP MODS, Lightweight MK-54, and Common Broadband Advanced Sonar System (CBASS) kits, including Royal Australian Navy (RAN) units.

E. MAJOR PERFORMERS:

Naval Undersea Warfare Center (NUWC) Division Newport; Newport, RI - System Integrator and Software Developer. Continued integration and development testing of CBASS hardware and software components and test equipment.

Raytheon awarded Sole Source Production Contract for MK-48 ADCAP MODS, Lightweight MK-54, and CBASS kits, including RAN units.

Commander Operational Test and Evaluation Force (COTF) - Test Planning, Independent Operational Evaluation.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 7**	PROGRAM ELEMENT NUMBER AND NAME **0205632N/MK-48 ADCAP**				PROJECT NUMBER AND NAME **0366/MK 48 ADCAP**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	17.406	15.751	28.438				
RDT&E Articles Qty	0	2	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Notes: Articles reflect: FY09: delivery of final report and completion of software build for Advanced Processor Build (APB) Spiral 1.

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

MK-48 Advanced Capability (ADCAP) Research, Development, Test and Evaluation (RDT&E) program executes spiral development of weapon performance improvements in two development product areas: (1) Advanced Processor Builds (APBs), and (2) Torpedo Technology Insertion. The budget enables Acquisition Category (ACAT) III development to address Chief of Naval Operations (CNO) defined capability-based requirements and mission needs. This Program Element (0205632N/0366) is tied to development programs that leverage a joint United States/Australia Armaments Cooperative Project (ACP) to develop MK-48 ADCAP; and Future Naval Capability (FNC) technologies being developed by the Office of Naval Research (ONR).

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 7**	PROGRAM ELEMENT NUMBER AND NAME **0205632N/MK-48 ADCAP**	PROJECT NUMBER AND NAME **0366/MK 48 ADCAP**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
TORPEDO APB	15.601	15.251	24.098
RDT&E Articles Quantity	0	1	0

FY08 - Operational testing (OT) of Spiral 1 Torpedo APB software build ($345K) planned for release in FY09 which provides full Spiral 1 capability and torpedo effectiveness gain. Continue Spiral 4 development ($15,256K). Improves shallow water performance and increases the probability of kill.

FY09 - Completion of OT and Software Build for Spiral 1 Torpedo APB ($100K). Continue development of APB Spiral 4 in preparation for software release ($15,151K). Improves shallow water performance and increases the probability of kill.

FY10 - Continue development of APB Spiral 4 in preparation for software release ($23,998K). Initiate development of APB Spiral 5 in preparation for software release ($100K).

	FY 2008	FY 2009	FY 2010
OPERATIONAL TEST SUPPORT	0.250	0.500	4.340
RDT&E Articles Quantity	0	1	0

FY08 - Conduct analysis for test and evaluation efforts prior to APB Spiral 1 release ($125K). Improves shallow water performance and increases probability of kill. Develop APB Spiral 4 Test Evaluation Master Plan (TEMP) ($125K).

FY09 - Complete APB Spiral 1 OT and analysis and deliver final report ($200K). Provide for accreditation requirements and conduct analysis relating to APB Spiral 4 Software release ($300K). Improves shallow water performance and increases probability of kill.

FY10 - Provide for accreditation requirements and conduct analysis relating to APB Spiral 4 Software release.

	FY 2008	FY 2009	FY 2010
TECHNOLOGY INSERTIONS	1.555	0.000	0.000
RDT&E Articles Quantity	0	0	0

FY08 - Continue development of Technology Insertion #1 and support plan for an Insensitive Munitions (IM) warhead. Improves shallow water performance and increases probability of kill.

FY09 - No work being performed due to program adjustments.

FY10 - No work being performed due to program adjustments.

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 7**		PROGRAM ELEMENT NUMBER AND NAME **0205632N/MK-48 ADCAP**				PROJECT NUMBER AND NAME **0366/MK 48 ADCAP**						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost ($000)			FY 2009 Cost ($000)	FY 2009 Award Date	FY 2010 Cost ($000)	FY 2010 Award Date			
Primary Hardware Development	WR	NUWC NPT	11.615			0.000	N/A	0.000	N/A			
Primary Hardware Development	Various	Various	5.777			0.000	N/A	0.000	N/A			
Subtotal Product Development			**17.392**			**0.000**		**0.000**				
Remarks: Various - TBD; Primary hardware development activity to be selected after evaluation of technologies from various vendors.												
Software Development	WR	NUWC NPT	10.622			0.760	OCT-08	0.770	OCT-09			
Software Development	Various	Various	19.039			2.100	DEC-08	2.100	DEC-09			
Integrated Logistics Support	WR	NUWC NPT	0.892			0.671	OCT-08	0.680	OCT-09			
Systems Engineering	WR	NUWC NPT	16.113			0.473	OCT-08	0.577	OCT-09			
Systems Engineering	Various	Various	0.110			0.000	N/A	0.000	N/A			
Subtotal Support Costs			**46.776**			**4.004**		**4.127**				
Remarks:												
Test & Evaluation	WR	NUWC NPT	4.778			1.925	OCT-08	5.560	OCT-09			
Operational Test & Evaluation	WR	Operational Test Force	1.250			0.500	NOV-08	4.340	NOV-09			
Modeling & Simulation	WR	NUWC NPT	4.361			1.269	OCT-08	2.999	OCT-09			
Modeling & Simulation	C,CPFF	ARL / PSU	2.700			1.000	DEC-08	1.000	DEC-09			
Test & Evaluation	WR	NUWC KPT	4.114			6.456	OCT-08	9.785	OCT-09			
Subtotal Test and Evaluation			**17.203**			**11.150**		**23.684**				
Remarks:												
Program Management Support	Various	Alion Science	1.353			0.451	OCT-08	0.451	OCT-09			
Travel	WR	NAVSEA	0.213			0.146	OCT-08	0.176	OCT-09			
Subtotal Management Services			**1.566**			**0.597**		**0.627**				
Remarks:												
Total Cost			**82.937**			**15.751**		**28.438**				

CLASSIFICATION:	UNCLASSIFIED							
EXHIBIT R-4, SCHEDULE PROFILE						DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 7**	PROGRAM ELEMENT NUMBER AND NAME **0205632N/MK-48 ADCAP**				PROJECT NUMBER AND NAME **0366/MK 48 ADCAP**			
PROGRAM EFFORTS	**FY08**	**FY09**	**FY10**					
ADCAP Performance Upgrades based on Fleet Priorities (DT/OT testing scheduled prior to each software spiral delivery)								
Torpedo Advanced Processor Builds (APB)		**APB Spiral 1** △	→					
CBASS Development			→					
APB Developmental Testing/Operational Testing (DT/OT)			**DT/OT** △→					
Torpedo Technology Insertion	**SP/SD**							

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 7**	PROGRAM ELEMENT NUMBER AND NAME **0205632N/MK-48 ADCAP**			PROJECT NUMBER AND NAME **0366/MK 48 ADCAP**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Torpedo Advanced Processor Build							
Software Development	1Q-4Q	1Q-4Q	1Q-4Q				
Software Delivery		2Q					
Developmental Testing/Operational Testing (DT/OT)			3Q-4Q				
CBASS Development	1Q-4Q	1Q-4Q	1Q-4Q				
Software Delivery							
Torpedo Technology Insertion							
Study Phase/System Development (SP/SD)	1Q-4Q						
System Requirements Review (SRR)							
Developmental Testing (DT)							
Developmental Testing/Operational Testing (DT/OT)							

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 7**	PROGRAM ELEMENT NUMBER AND NAME **0205632N/MK-48 ADCAP**	PROJECT NUMBER AND NAME **9999/CONGRESSIONAL ADDS**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
9C63A/Torpedo Post-Launch Communications System	1.543	0.798	0.000
RDT&E Articles Quantity	0	0	0

Torpedo Post-Launch Communications System Congressional add funds the MK-48 Heavyweight Torpedo (HWT) Post-Launch Communication System. This project will include evaluation of innovative flex-hose/guidance wire concepts using hydrodynamic computational simulation models, as well as fabrication, test and evaluation of prototype hardware to demonstrate compliance with Fleet requirements. higher bandwidth post-launch communication technologies will also be developed, tested and evaluated, and a new flex-hose will be designed. The new flex-hose concept is required to provide high reliability operation over the entire speed and depth operating envelope of the submarine including shallow water, near bottom engagements.

	FY 2008	FY 2009	FY 2010
9C62A/Digital Data for Weapons System Readiness	0.771	0.000	0.000
RDT&E Articles Quantity	0	0	0

Digital Data for Weapons System Readiness Congressional add funds for the MK-48 ADCAP Heavyweight Torpedo (HWT). This program will develop secure data sharing, analysis, and collaboration methodologies and tools for Heavyweight Torpedo programs. These funds will be used to organize and facilitate collaborate projects between industry, governmental facilities, and academia in order to improve the use and sharing of digital data in order to increase overall weapon system readiness.

	FY 2008	FY 2009	FY 2010
9E16A/ Undersea Weapons Enterprise Common Automated Test	0.000	3.191	0.000
RDT&E Articles Quantity	0	0	0

Automatic Test Equipment for the MK-48 Heavyweight Torpedo (HWT) will evaluate the application of common automated test sets at the Heavyweight Torpedo depot and Intermediate Maintenance Activities (IMAs). Funding will provide for the development, fabrication, and evaluation of new automatic test technologies and products that will consolidate unique test sets while reducing maintenance costs and significantly improving the testing and evaluation of torpedo hardware.

	FY 2008	FY 2009	FY 2010
9E17A / ASW Enhancements	0.000	6.383	0.000
RDT&E Articles Quantity	0	0	0

Anti-Submarine Warfare (ASW) Enhancements will develop and design new MK-48 ADCAP torpedo sub-assemblies required due to the depletion and obsolescence of many existing torpedo components.