Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy

DATE: February 2010

APPROPRIATION/BUDGET ACTIVITY

R-1 ITEM NOMENCLATURE

1319: Research, Development, Test & Evaluation, Navy

PE 0205632N: MK-48 ADCAP

BA 7: Operational Systems Development

COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
Total Program Element	25.994	34.235	26.234	0.000	26.234	26.746	27.161	27.780	28.365	Continuing	Continuing
0366: MK 48 ADCAP	15.622	28.260	26.234	0.000	26.234	26.746	27.161	27.780	28.365	Continuing	Continuing
9999: Congressional Adds	10.372	5.975	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	18.661

A. Mission Description and Budget Item Justification

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

MK-48 ADCAP (Advanced Capability) Research, Development, Test and Evaluation (RDT&E) program executes incremental evelopment 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 equirements 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

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy

APPROPRIATION/BUDGET ACTIVITY

R-1 ITEM NOMENCLATURE

1319: Research, Development, Test & Evaluation, Navy

PE 0205632N: MK-48 ADCAP

BA 7: Operational Systems Development

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 (\$ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	26.123	28.438	0.000	0.000	0.000
Current President's Budget	25.994	34.235	26.234	0.000	26.234
Total Adjustments	-0.129	5.797	26.234	0.000	26.234
 Congressional General Reductions 		0.000			
 Congressional Directed Reductions 		0.000			
 Congressional Rescissions 	0.000	-0.060			
 Congressional Adds 		6.000			
 Congressional Directed Transfers 		0.000			
 Reprogrammings 	0.000	0.000			
 SBIR/STTR Transfer 	-0.129	0.000			
 Program Adjustments 	0.000	0.000	26.234	0.000	26.234
 Rate/Misc Adjustments 	0.000	-0.143	0.000	0.000	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy

APPROPRIATION/BUDGET ACTIVITY

R-1 ITEM NOMENCLATURE

1319: Research, Development, Test & Evaluation, Navy

PE 0205632N: MK-48 ADCAP

BA 7: Operational Systems Development

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 9999: Congressional Adds

Congressional Add: Small Business Technology Insertion

Congressional Add: MK-48 TORPEDO POST-LAUNCH COMMUNICATION SYSTEM

Congressional Add: Undersea Weapons Enterprise Common Automated Test

Congressional Add: ASW Enhancements

 EM
 0.798
 0.000

 3.191
 0.000

 6.383
 0.000

 Congressional Add Subtotals for Project: 9999
 10.372
 5.975

FY 2009

0.000

10.372

FY 2010

5.975

5.975

Congressional Add Totals for all Projects

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

PROJECT

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy

APPROPRIATION/BUDGET ACTIVITY R-1 ITEM NOMENCLATURE

1319: Research, Development, Test & Evaluation, Navy

PE 0205632N: MK-48 ADCAP

0366: MK 48 ADCAP

BA 7: Operational Systems Development

DA 1. Operational Systems Develop	mem										
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0366: MK 48 ADCAP	15.622	28.260	26.234	0.000	26.234	26.746	27.161	27.780	28.365	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Notes: Articles reflect: FY09: delivery of final report and completion of software build for APB Spiral 1; FY11: delivery of final report and completion for APB Spiral 4.

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

MK-48 ADCAP RDT&E program executes incremental development of weapon performance improvements in two development product areas: (1) APBs, and (2) Torpedo Technology Insertion. The budget enables ACAT III development to address 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 ACP to develop MK-48 ADCAP; and FNC technologies being developed by the ONR.

B. Accomplishments/Planned Program (\$ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
TORPEDO APB	15.122	24.063	25.234	0.000	25.234
FY 2009 Accomplishments: Completed OT and Software Build for Spiral 1 Torpedo APB (\$100K). Continued development of APB Spiral 4 in preparation for software release in FY11 (\$15,022K). The APB technologies improve shallow water performance and increase the probability of kill. FY 2010 Plans: Continue development of APB Spiral 4 in preparation for software release (\$17,963K). Initiate development of APB Spiral 5 (\$100K). Small Business Tech Insertion Congressional add funds					
Torpedo Guidance & Control Open Architecture initiatives and the development of architecture commonality between both heavyweight and lightweight torpedoes (\$6,000K).					

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy **DATE:** February 2010 **PROJECT**

APPROPRIATION/BUDGET ACTIVITY

1319: Research, Development, Test & Evaluation, Navy

BA 7: Operational Systems Development

R-1 ITEM NOMENCLATURE PE 0205632N: MK-48 ADCAP

0366: MK 48 ADCAP

B. Accomplishments/Planned Program (\$ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Completion of OT and Software Build for Spiral 4 Torpedo APB (\$10,617K). Continue development of Spiral 5 (\$14,617K).					
OPERATIONAL TEST SUPPORT	0.500	4.197	1.000	0.000	1.000
FY 2009 Accomplishments: Completed APB Spiral 1 OT and analysis and delivered final report (\$200K). Provided for accreditation requirements and conducted analysis relating to APB Spiral 4 Software release (\$300K). The APB technologies improve shallow water performance and increase probability of kill.					
FY 2010 Plans: Provide for accreditation requirements and conduct analysis relating to APB Spiral 4 Software release planned in FY11.					
FY 2011 Base Plans: Complete APB Spiral 4 OT and analysis. Delivery of final report for APB Spiral 4.					
Accomplishments/Planned Programs Subtotals	15.622	28.260	26.234	0.000	26.234

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy

APPROPRIATION/BUDGET ACTIVITY

R-1 ITEM NOMENCLATURE PROJECT

1319: Research, Development, Test & Evaluation, Navy

PE 0205632N: *MK-48 ADCAP* 0366: *MK 48 ADCAP*

BA 7: Operational Systems Development

C. Other Program Funding Summary (\$ in Millions)

			<u>FY 2011</u>	FY 2011	<u>FY 2011</u>					Cost To	
<u>Line Item</u>	FY 2009	FY 2010	<u>Base</u>	OCO	<u>Total</u>	FY 2012	FY 2013	FY 2014	FY 2015	Complete	Total Cost
 WPN/3225: MK-48 Torpedo 	52.734	56.134	43.559	0.000	43.559	65.909	68.613	66.165	66.654	Continuing	Continuing

ADCAP Mods

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. Performance Metrics

Milestone Reviews.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy

DATE: February 2010

APPROPRIATION/BUDGET ACTIVITY

R-1 ITEM NOMENCLATURE

PROJECT

1319: Research, Development, Test & Evaluation, Navy

PE 0205632N: *MK-48 ADCAP* 0366: *MK 48 ADCAP*

BA 7: Operational Systems Development

Product Development (\$ in Millions)

				FY 2	2010	FY 2 Ba		FY 20 OC		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NUWC Newporrt (NPT) Newport RI	11.615	0.900	Apr 2010	0.000		0.000		0.000	Continuing	Continuing	Continuing
Primary Hardware Development	C/CPFF	Progeny Manassas VA	5.777	5.075	Jun 2010	0.000		0.000		0.000	Continuing	Continuing	Continuing
		Subtotal	17.392	5.975		0.000		0.000		0.000			

Remarks

Support (\$ in Millions)

				FY 2	2010	FY 2 Ba	-	FY 2 OC		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	WR	NUWC NPT Newport RI	11.372	0.627	Oct 2009	3.097	Oct 2009	0.000		3.097	Continuing	Continuing	Continuing
Software Development	C/Various	Various Not Specified	21.020	2.100	Dec 2009	13.197	Dec 2010	0.000		13.197	Continuing	Continuing	Continuing
Integrated Logistics Support	WR	NUWC NPT Newport RI	1.563	0.680	Oct 2009	0.000		0.000		0.000	Continuing	Continuing	Continuing
Systems Engineering	WR	NUWC NPT Newport RI	16.586	0.577	Oct 2009	0.587	Oct 2010	0.000		0.587	Continuing	Continuing	Continuing
Systems Engineering	C/Various	Various Not Specified	0.110	0.000		0.000		0.000		0.000	0.000	0.110	Continuing

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R-1 Line Item #179 Page 7 of 13

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy

DATE: February 2010

APPROPRIATION/BUDGET ACTIVITY

1319: Research, Development, Test & Evaluation, Navy

BA 7: Operational Systems Development

R-1 ITEM NOMENCLATURE

PE 0205632N: MK-48 ADCAP

PROJECT

0366: MK 48 ADCAP

Support (\$ in Millions)

				FY 20	010	FY 2 Ba		FY 2	-	FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	50.651	3.984		16.881		0.000		16.881			

Remarks

Test and Evaluation (\$ in Millions)

				FY 2	2010	FY 2 Ba	-	FY 2 OC		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	WR	NUWC NPT Newport RI	6.703	2.585	Oct 2009	1.298	Oct 2010	0.000		1.298	Continuing	Continuing	Continuing
Operational Test & Evaluation	WR	Operational Test Force Norfolk VA	1.750	4.340	Nov 2009	0.943	Nov 2010	0.000		0.943	Continuing	Continuing	Continuing
Modeling & Simulation	WR	NUWC NPT Newport RI	5.630	2.939	Oct 2009	1.176	Oct 2010	0.000		1.176	Continuing	Continuing	Continuing
Modeling & Simulation	C/CPFF	ARL / PSU State College PA	3.700	1.000	Dec 2009	1.000	Dec 2010	0.000		1.000	Continuing	Continuing	Continuing
Test & Evaluation	WR	NUWC Keyport (KPT) Keyport WA	10.570	6.810	Oct 2009	4.316	Oct 2010	0.000		4.316	0.000	21.696	Continuing
		Subtotal	28.353	17.674		8.733		0.000		8.733			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy

DATE: February 2010

APPROPRIATION/BUDGET ACTIVITY

R-1 ITEM NOMENCLATURE

PROJECT

1319: Research, Development, Test & Evaluation, Navy BA 7: Operational Systems Development

PE 0205632N: MK-48 ADCAP

0366: MK 48 ADCAP

Management Services (\$ in Millions)

		,											
				FY 2	010	FY 2 Ba		FY 2		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/Various	Alion Science Mclean VA	1.804	0.451	Oct 2009	0.425	Oct 2010	0.000		0.425	Continuing	Continuing	Continuing
Travel	WR	NAVSEA Washington DC	0.359	0.176	Oct 2009	0.195	Oct 2010	0.000		0.195	Continuing	Continuing	Continuing
	_	Subtotal	2.163	0.627		0.620		0.000		0.620			

Remarks

	Total Prior Years Cost	FY 2010		2011 ise	FY 2	2011 CO	FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	98.559	28.260	26.234		0.000		26.234			

Remarks

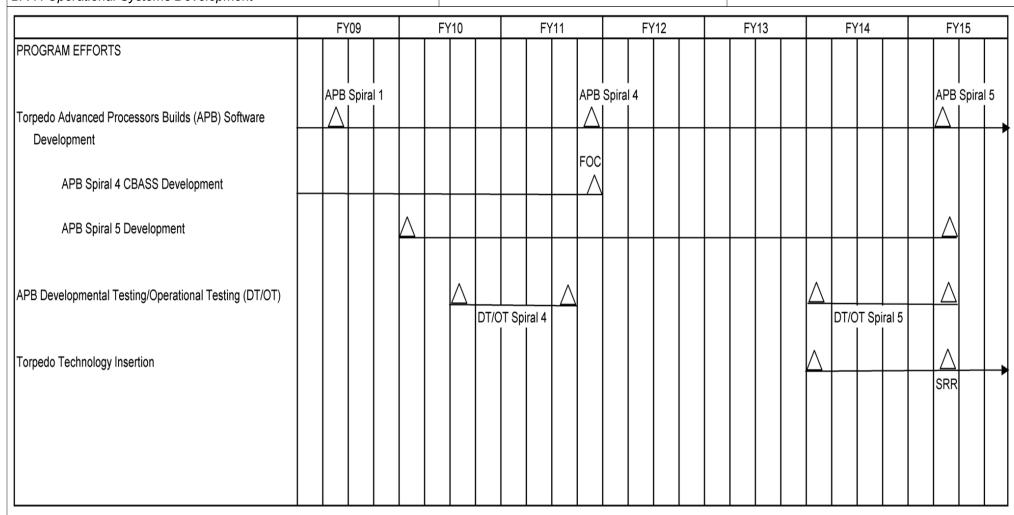
Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy

APPROPRIATION/BUDGET ACTIVITY

1319: Research, Development, Test & Evaluation, Navy
BA 7: Operational Systems Development

DATE: February 2010

R-1 ITEM NOMENCLATURE
PE 0205632N: MK-48 ADCAP
0366: MK 48 ADCAP



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Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy

APPROPRIATION/BUDGET ACTIVITY

1319: Research, Development, Test & Evaluation, Navy

BA 7: Operational Systems Development

R-1 ITEM NOMENCLATURE

PE 0205632N: MK-48 ADCAP

PROJECT

0366: MK 48 ADCAP

Schedule Details

	St	art	End	
Event	Quarter	Year	Quarter	Year
Torpedo Advanced Processor Build (APB) Software Development	1	2009	4	2015
APB Spiral 1 Delivery	2	2009	2	2009
APB Spiral 4 CBASS Development	1	2009	4	2011
Spiral 4 CBASS Developmental Testing/Operational Testing (DT/OT)	3	2010	3	2011
CBASS APB Spiral 4 Delivery	4	2011	4	2011
APB Spiral 5 Development	1	2010	2	2015
Spiral 5 Developmental Testing/Operational Testing (DT/OT)	1	2014	2	2015
Spiral 5 Delivery	2	2015	2	2015
Torpedo Technology Insertion	1	2014	4	2015
System Requirements Review (SRR)	2	2015	2	2015

DATE: February 2010

APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 7: Operational Systems Development				R-1 ITEM NOMENCLATURE PE 0205632N: <i>MK-48 ADCAP</i>			PROJECT 9999: Congressional Adds				
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: Congressional Adds	10.372	5.975	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	18.661
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy

Congressional adds for FY09 MK-48 Torpedo post-launch communication system, Undersea Enterprise Common Automated Test, and ASW Enhancements. Congressional add for FY10 for Small Business Technology Insertion.

B. Accomplishments/Planned Program (\$ in Millions)

	FY 2009	FY 2010
	0.000	5.975
Congressional Add: Small Business Technology Insertion		
FY 2010 Plans:		
Small Business Technology Insertion for Torpedo Gudiance and Control Open Architecture initiatives and the development of architectual commonality between both heavyweight and the lightweigth torpedos.		
0	0.798	0.000
Congressional Add: MK-48 TORPEDO POST-LAUNCH COMMUNICATION SYSTEM		
FY 2009 Accomplishments:		
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.		
	3.191	0.000
Congressional Add: Undersea Weapons Enterprise Common Automated Test		

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy

APPROPRIATION/BUDGET ACTIVITY

1319: Research, Development, Test & Evaluation, Navy

BA 7: Operational Systems Development

R-1 ITEM NOMENCLATURE

PE 0205632N: MK-48 ADCAP

PROJECT

9999: Congressional Adds

B. Accomplishments/Planned Program (\$ in Millions)

	FY 2009	FY 2010
FY 2009 Accomplishments: Evaluate the application of common automated test sets at the Heavyweight Torpedo depot and Intermediate Maintenance Activities (IMAs).		
Congressional Add: ASW Enhancements	6.383	0.000
FY 2009 Accomplishments: Funding applied to development and design of the new MK-48 ADCAP torpedo sub-assemblies required due to the depletion and obsolescence of many existing torpedo components.		
Congressional Adds Subtotals	10.372	5.975

C. Other Program Funding Summary (\$ in Millions)

N/A

D. Acquisition Strategy

Congressional Adds

E. Performance Metrics

Congressional Adds