

EXHIBIT R-2, RDT&E Budget Item Justification						DATE: February 2007		
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-5			R-1 ITEM NOMENCLATURE LIGHTWEIGHT TORPEDO DEVELOPMENT / 0604610N					
COST (\$ in Millions)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total PE Cost	27.713	40.387	27.056	41.277	35.122	20.952	22.031	22.410
Lightweight Torpedo 2234	27.713	40.387	27.056	41.277	35.122	20.952	22.031	22.410

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

Lightweight Torpedo / 2234: The program designs, integrates and tests the Lightweight Torpedo (LWT, MK54). The Lightweight Torpedo provides performance improvements in shallow water, counter-measure environments. The Engineering Development Model (EDM) contract was awarded to Raytheon Systems Company in June 1996. The EDM contract has delivered twenty-one EDM units to support the in-water test program. Initial Operating Capability (IOC) achieved in 2004.

FY2006: Budget increases significantly to support a Pre-Planned Product Improvement Program (P3I) for MK54 using a hardware spirals development acquisition approach and Advanced Processor Build (APB) software upgrades process to enable rapid hardware and software improvements to the Fleet. The P3I program will focus on common LWT/HWT hardware and software architecture enhancements that will provide re-architecture / Torpedo Downloader System (TDS), MK54 VLA Integration, potential Insensitive Munitions Warhead (IM W/H) capability improvement, broadband array improvements, fully open architecture design, and connectivity / advanced interface, and Block Upgrade (BU). The APB program also will incorporate MK 48 ADCAP 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. Initiate development of High Altitude ASW Weapons Concept (HAAWC) Demo. FY07: Continue development of hardware/software improvements for P3I program. Conduct VLA Operational Testing (OT). Conduct MK54 HAAWC Demo. Conduct DT/OT for VLA Integration. Initiate development of MK54 high altitude launch capability from Maritime Patrol Aircraft (MPA). FY08: Continue development of hardware/software improvements for P3I program. Conduct DT/OT of new array. Continue software Block Upgrade. Continue development of MK54 high altitude launch capability from Maritime Patrol Aircraft (MPA). FY09: Complete P4 Upgrade Hardware Spirals. Complete software Block Upgrade. Begin Developmental Testing (DT) for MK54 HAAWC. Initiate DT/OT for APB.

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-2, RDT&E Project Justification		DATE: February 2007		
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME		
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-5	MK54 LWT 0604610N	LIGHTWEIGHT TORPEDO DEVELOPMENT / F2234		
B. PROGRAM CHANGE SUMMARY:				
Funding:	FY 2006	FY 2007	FY 2008	FY 2009
FY2007 President's Budget	31.348	40.540	31.434	42.493
FY08/09 President's Budget	27.713	40.387	27.056	41.277
Total Adjustments	-3.635	-0.153	-4.378	-1.216
Summary of Adjustments:				
Congressional Rescissions	0.000	-0.153	0.000	0.000
Congressional Increases	0.024	0.000	0.212	0.452
Program Reductions	-3.440	0.000	-4.590	-1.668
SBIR Adjustments	-0.219	0.000	0.000	0.000
Sub-Total	-3.635	-0.153	-4.378	-1.216
<p>Schedule: Block Upgrade moved to FY09 to align testing program with the Nose Array efforts to reduce testing costs. APB-1/Spiral 4 (Common) moved to FY10 to align with Heavyweight Torpedo commonality efforts. An APB Common Spiral added and to be delivery FY13. USV development delayed until FY10 to complete Nose Array development.</p> <p>Technical: FY06: loss of funds impacts the shipboard integration of the MK 54 equipped Vertical Launch ASW Rocket (VLA) on Flight IIA DDG and CG platforms. Integration into the SQQ-89(V)15 and SQQ-89A(V)15 fire control systems and Baselines V and VII of the Vertical Launch System will be deferred. FY08: loss of funds impacts the planned HAAWC program and will delay the program one year.</p>				

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-2a, RDT&E Budget Item Justification						DATE: February 2007		
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-5				R-1 ITEM NOMENCLATURE LIGHTWEIGHT TORPEDO DEVELOPMENT / 0604610N				
COST (\$ in Millions)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total PE Cost	27.713	40.387	27.056	41.277	35.122	20.952	22.031	22.410
Quantity of RDT&E Articles			1	3	1			1
Notes: Articles reflect: FY08 delivery of VLA Kit Integration; FY09: Block Upgrade (BU) and delivery of P4 Upgrade and new array; FY10: delivery of APB-1/Spiral 4 (Common); FY13: APB Common Spiral.								
A. (U) Mission Description and Budget Item Justification:								
Lightweight Torpedo / 2234: The program designs, integrates and tests the Lightweight Torpedo (LWT, MK54). The Lightweight Torpedo provides performance improvements in shallow water, counter-measure environments. The Engineering Development Model (EDM) contract was awarded to Raytheon Systems Company in June 1996. The EDM contract has delivered twenty-one EDM units to support the in-water test program. Initial Operating Capability (IOC) achieved in 2004.								

UNCLASSIFIED

EXHIBIT R-2a, RDT&E Budget Item Justification	DATE: February 2007
---	-------------------------------

APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-5	R-1 ITEM NOMENCLATURE LIGHTWEIGHT TORPEDO DEVELOPMENT / 0604610N
---	--

B. Accomplishments/Planned Program

MK54 Pre-Planned Product Improvement (includes MK54 VLA Integration) 2234	FY 06	FY 07	FY 08	FY 09
TOTAL	27.713	40.387	27.056	41.277
Quantity of RDT&E Articles			1	3

FY 2006 Accomplishments:

Completed FOT&E

Funding increased to support commencing development of hardware spirals improvements and software upgrades for Advanced Processor Build (APB).

Continued hardware spiral development to integrate Vertical Launch Anti Submarine Rocket (VLA) with MK54 torpedo. VLA efforts include hardware design, develop prototypes, hardware/software integration, and launch system integration; development includes efforts for hardware and software improvements of re-architecture / Torpedo Downloader System (TDS), and potential Insensitive Munitions Warhead (IM W/H) capability improvement.

Conducted MK54 HAAWC Demo.

Initiated P3I contract award efforts to contractors.

Initiated increased software upgrades development efforts in order to address fleet identified performance priorities for the MK54 LWT.

Initiated design and qualification of array and transmitter.

FY 2007 Plan:

Continue MK54 P3I hardware spiral development for the MK54 torpedo and Vertical Launch Anti Submarine Rocket (VLA). The VLA efforts include hardware design, develop prototypes, hardware/software integration, and launch system integration. The MK54 torpedo effort includes Torpedo Downloader System (TDS), Insensitive Munitions (IM) capability improvement, and MK54 Array replacement.

Continue software upgrades development efforts; software development to include coding, and modeling and simulation.

Conduct Operational Testing (OT) of VLA.

Initiate MK54 High Altitude ASW Weapon Concept (HAAWC) capability program.

FY 2008 Plan:

Continue development of hardware/software improvements for P3I program.

Continue Block Upgrade.

Continue development of MK54 high altitude launch capability from Maritime Patrol Aircraft (MPA).

Conduct DT/OT of new array.

FY 2009 Plan:

Complete DT/OT of new array and Block Upgrade.

Complete Block Upgrade.

Complete P4 Upgrade for Hardware Spirals.

Begin Developmental Testing (DT) for MK54 HAAWC.

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-2a, RDT&E Budget Item Justification						DATE: February 2007		
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-5			PROGRAM ELEMENT NUMBER AND NAME MK54 LWT 0604610N			PROJECT NUMBER AND NAME LIGHTWEIGHT TORPEDO DEVELOPMENT / F2234		
C. OTHER PROGRAM FUNDING SUMMARY:								
	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Torpedo MK 46 MODS / MK54 MODS 0 (WPN / PE 0204228N / BA3 / BLI 321500)	68.657	85.560	83.902	153.855	167.721	164.891	178.547	175.464
D. ACQUISITION STRATEGY:								
The EDM contract is held by Raytheon Systems Company. The contract was awarded as a Cost-Plus-Award Fee in June 1996 and was converted to Cost-Plus-Incentive Fee in December 1998. Sole Source Production Contract awarded in FY 2004 for MK48 ADCAP MODS/CBASS and MK54 Lightweight Torpedoes. P3I spiral acquisition strategy is to award EDM contract's among qualified producers.								
E. MAJOR PERFORMERS:								
NUWC, Newport: MK54 System Engineering, System Integration, Software development, and Hardware Engineering development. NUWC, Keyport: MK 54 Torpedo preparation for in-water testing and safety and environmental engineering including Fleet Exercise Section and Automatic Test Equipment. VLA: System Engineering and Integration. NSWC Indian Head: Warhead Development for torpedoes and VLA rocket motors. PEO-IWS 3, Dahlgren: VLA Integration: MK41 Vertical Launching System (VLS) Systems Integration and software development. PEO-IWS 5, Dahlgren: VLA Integration: ASW Fire Control system integration and software development. PMA 290: Development of MK54 high altitude launch capability. Lockheed Martin - Orlando: Development of MK54 high altitude launch capability. Raytheon Corporation: MK54 Hardware Development. Material System Incorporated: Hardware Design for array technology. Lockheed Martin - Akron : System Engineering for VLA integration.								

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

Exhibit R-3 Cost Analysis (page 1)											DATE: February 2007			
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT AND NAME					PROJECT NAME AND NUMBER						
RDT&E, N/BA-5			MK54 LWT 0604610N					Lightweight Torpedo F2234						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Hardware Development	WR	NUWC Newport/Keyport	CONT.	2.022	10/05	17.152	10/06	4.585	10/07	12.847	10/08	CONT.	CONT.	N/A
Hardware Development	SS/FP	Contractor TBD	N/A	1.929	09/06	9.772	10/06	11.361	10/07	14.502	10/08			
Hardware Development	WR	NSWC Indian Head	N/A	0.062	11/05	0.600	10/06	0.000		0.000		CONT.	CONT.	N/A
Hardware Development	WR	ARL/PSU State College, PA	CONT.	0.050	11/05	0.000		0.000		0.000				
Systems Engineering	WR	NUWC Newport/Keyport	CONT.	10.050	10/05	4.063	10/06	2.616	10/07	3.730	10/08	CONT.	CONT.	N/A
Systems Engineering	SS/FP	Lockheed Martin - Akron	CONT.	1.350	01/06	0.210	11/06	0.100	10/07	0.000		CONT.	CONT.	N/A
Systems Engineering	WR	PEO-IWS 3, Dahlgren	N/A	2.421	10/05	0.700	10/06	0.100	10/07	0.000		CONT.	CONT.	N/A
Systems Engineering	WR	PEO-IWS 5, Dahlgren	N/A	0.902	01/06	0.881	10/06	0.100	10/07	0.000		CONT.	CONT.	N/A
Systems Engineering	WR	NSWC PMA 290	CONT.	0.924	10/05	1.705	10/06	1.984	10/07	3.361	10/08			
Systems Engineering	WR	NAWCWD China Lake	N/A	0.379	10/05	0.000		0.000		0.000				
Systems Engineering	WR	PMS404		0.000		0.275	10/06	0.620	10/07	1.050	10/08			
Licenses														
Tooling														
GFE														
Award Fees														
Subtotal Product Development			CONT.	20.089		35.358		21.466		35.490		CONT.	CONT.	
Development Support Equipment														
Software Development	WR	NUWC Newport/Keyport	CONT.	4.744	10/05	4.000	10/06	4.601	10/07	4.372	10/08	CONT.	CONT.	N/A
Software Development	WR	ARL/PSU State College, PA	CONT.	0.000		0.000		0.000		0.000				
Training Development														
Integrated Logistics Support														
Configuration Management														
Technical Data														
GFE														
Subtotal Support			CONT.	4.744		4.000		4.601		4.372		CONT.	CONT.	
Remarks:														

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

Exhibit R-3 Cost Analysis (page 2)												DATE: February 2007		
APPROPRIATION/BUDGET ACTIVITY				PROGRAM ELEMENT AND NAME				PROJECT NAME AND NUMBER						
RDT&E, N/BA-5				MK54 LWT 0604610N				Lightweight Torpedo F2234						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	Cost to Complete	Total Cost	Target Value of Contract
System Test & Evaluation	WR	Operational Test Support	CONT.	0.300	10/05	0.600	10/06	0.550	10/07	0.700	10/08	CONT.	CONT.	N/A
System Test & Evaluation	WR	NUWC Newport/Keyport	CONT.	2.143	10/05	0.000	10/06	0.000	10/07	0.266	10/08	CONT.	CONT.	N/A
Subtotal T&E			CONT.	2.443		0.600		0.550		0.966		CONT.	CONT.	
Remarks:														
Contractor Engineering Support														
Government Engineering Support														
Program Management Support	Various	Anteon	CONT.	0.397	MISC.	0.389	MISC.	0.399	MISC.	0.409	MISC.			
Travel			CONT.	0.040	MISC.	0.040	MISC.	0.040	MISC.	0.040	MISC.			
Labor (Research Personnel)				0.000		0.000		0.000		0.000				
Overhead			CONT.	0.000	MISC.	0.000	MISC.							
Subtotal Management			CONT.	0.437		0.429		0.439		0.449				
Remarks:														
Total Cost			CONT.	27.713		40.387		27.056		41.277		CONT.	CONT.	
Remarks:														

UNCLASSIFIED

EXHIBIT R-4, Schedule Profile		DATE: February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, N/BA-5	PROGRAM ELEMENT AND NAME MK54 LWT 0604610N	PROJECT NAME AND NUMBER Lightweight Torpedo F2234

	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13
MK54 Development	FoT&E △							
MK54 Pre-Planned Product Improvement (P3I)								
Hardware Spirals			TDS/VLA △	ARRAY △	P4 UPGRADE △			
Software Upgrades				BLOCK UPGRADE △	APB-1 / SPIRAL 4 (COMMON) △		APB COMMON △	
DT/OT		VLA OT △		ARRAY DT/OT △		APB DT/OT △		
Unmanned Surface Vehicle (USV)						DEMO △		
High Altitude Capability	DEMO △				DT △	OT △	IOC △	

CLASSIFICATION: UNCLASSIFIED								
Exhibit R-4a, Schedule Detail						DATE: February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N/BA-5			PROGRAM ELEMENT AND NAME MK54 LWT 0604610N			PROJECT NAME AND NUMBER Lightweight Torpedo F2234		
Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
MK54 Development & Upgrades								
FOT&E	4Q							
MK54 Pre-Planned Product Improvement (P3I)								
Hardware Spirals	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Software Spirals	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
DT/OT		2Q-4Q	3Q-4Q	1Q	3Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Unmanned Surface Vehicle					1Q-4Q	1Q-4Q	1Q-2Q	
High Altitude Capability Demo	2Q-4Q	1Q						
High Altitude Capability		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q