Exhibit R-2, RDT&E Budget Item Justification: PB 2013 Navy										DATE: February 2012	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*				R-1 ITEM NOMENCLATURE PE 0204229N: *Tomahawk Mssn Planning Ctr*							
COST ($ in Millions)	**FY 2011**	**FY 2012**	**FY 2013 Base**	**FY 2013 OCO**	**FY 2013 Total**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**Cost To Complete**	**Total Cost**
Total Program Element	10.352	8.819	11.265	-	11.265	4.626	4.769	4.903	5.001	Continuing	Continuing
0545: *TOMAHAWK*	10.352	8.819	11.265	-	11.265	4.626	4.769	4.903	5.001	Continuing	Continuing

A. Mission Description and Budget Item Justification

Includes RDT&E funds for development of the Tomahawk encompassing Tomahawk Land-Attack Missile (TLAM) upgrades, Tactical Tomahawk Weapons Controls System, Tomahawk Command and Control System upgrades and other missile system improvements. The Tomahawk Weapons System provides a Tomahawk cruise missile attack capability against fixed and mobile targets. The Tomahawk Land-Attack missile can be fitted with either Conventional unitary warhead (TLAM/C), Nuclear warhead (TLAM/N) or submunition Dispenser (TLAM/D). Tomahawk is capable of being deployed from both submarines and surface ships. Launched from mobile, sea-based platforms, the land attack variant will significantly increase the total capability of joint forces.

B. Program Change Summary ($ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total
Previous President's Budget	10.587	8.819	8.616	-	8.616
Current President's Budget	10.352	8.819	11.265	-	11.265
Total Adjustments	-0.235	-	2.649	-	2.649
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.181	-			
• Program Adjustments	-	-	2.632	-	2.632
• Rate/Misc Adjustments	-	-	0.017	-	0.017
• Congressional General Reductions Adjustments	-0.054	-	-	-	-

Change Summary Explanation

Technical: Not applicable.

Schedule: Developmental Test/Operational Test changed to Integrated Test Post Milestone C - Phase F. - Correcting error to provide an accurate Milestone.

Tactical Tomahawk Weapons Control System V5.4.1 Sys Test Readiness Review schedule changed from 1 Quarter (Qtr) 2012 to 2 Qtr 2013 - End 2 Qtr 2013.

Exhibit R-2A, RDT&E Project Justification: PB 2013 Navy			DATE: February 2012
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COST ($ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
0545: *TOMAHAWK*	10.352	8.819	11.265	-	11.265	4.626	4.769	4.903	5.001	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Tomahawk Weapons System (TWS) provides a Tomahawk cruise missile attack capability against fixed and mobile targets. This program ensures that the TWS exploits state-of-the-art technology to preserve the efficiency of this proven weapon system, and includes all missile development, mission planning system development, and submarine and surface ship weapons control system development.

The Tactical Tomahawk All-Up-Round Block IV missile is a comprehensive spiral baseline upgrade to the TWS that provides the tactical commander a quick reaction response capability as well as improved flexibility, increased accuracy and higher lethality. A five-year multi-year (FY04-FY08) production contract was awarded in August 2004 for the production of up to 2200 Block IV Tomahawk missiles. The essential upgrades of the Block IV missile are: improved guidance, navigation, control and mission computer two-way satellite communications (SATCOM), and a lower production cost as compared to the Block III missile. Block IV provides a Ultra High Frequency SATCOM data link to enable the missile to receive in-flight mission modification messages, to transfer health and status messages and to broadcast Battle Damage Indication messages. Block IV also includes a high anti-jam Global Postitioning System receiver, navigation improvements and associated antenna systems. The Tomahawk Program also includes development of continuing advances identified as spiral development under the Tomahawk Baseline IV Operational Requirements Document, to include development of the Joint Multiple Effects Warhead System/Joint Capability Technology Demonstration.

Under the umbrella of the Theater Mission Planning Center (TMPC), the Tomahawk Command and Control System is the mission planning segment of the Tomahawk Weapon System that provides systems for the precision targeting, route planning, mission distribution, and strike management of Tomahawk cruise missile missions from sites located ashore and afloat. TMPC optimizes all aspects of the Tomahawk missile mission to successfully engage a target and has evolved into five scalable configurations: Cruise Missile Support Activities (CMSA) (2), Tomahawk Strike Mission Planning Cells (TSMPC) (3), Carriers (11), Firing Units (81), Command & Control Nodes (11), Labs (6), & Training Classrooms (6), for a total of 125 sites. A smaller Tactical Tomahawk Command and Control Systems (TC2S) version is being fielded on Carrier Vessels, Nuclear to support deployed Strike Group Commanders. Systems fielded at the CMSAs and TSMPCs provide mission planning and employment support information for conventional TLAM, including the distribution of mission data and command information essential to TLAM employment via the Mission Distribution System and associated communications infrastructure (CMSAs are the only organizations that can support Tomahawk Land Attack Missile/ Nuclear. Development of Tactical Tomahawk capabilities in TMPC/TC2S includes software development, integration, test, and delivery, including support for training development, installation planning, and simulation/model development required by Commander, Operational Test and Evaluation Force. This project also includes development related to national and tactical imagery architectures, as well as software development to decrease mission-planning time and increase the quality and accuracy of each mission for Block III and IV TLAM.

The Tomahawk Weapons Control System provides launch capability for surface and submarine platforms. Development of the Tactical Tomahawk Weapons Control System provides a common architecture to launch the Tactical Tomahawk Block IV and all variants in inventory. Development of upgrades to the Tactical Tomahawk Weapons Control System is required to meet the Department of Defense Information Technology Standards Registry, to meet FORCEnet compliance and be Internet

Exhibit R-2A, RDT&E Project Justification: PB 2013 Navy		DATE: February 2012
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Protocol Version 6 ready in order to remain interoperable within the Joint Service Architecture and to retain weapons system viability and usability for our Sailors. These efforts provide battle-group tactical flexibility and responsiveness while maximizing Tomahawk Weapons System wartime capability.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2011	FY 2012	FY 2013
Title: Tactical Tomahawk All-Up-Round (AUR)	6.633	5.320	8.797
Articles:	0	0	0
Description: Achieve Selective Availability Anti-Spoofing Module (SAASM) Full Operational Capability (FOC), and completion of the cooperatively funded United States Navy/United Kingdom Joint Multiple Effects Warhead System/Joint Capability Technology Demonstration (JMEWS/JCTD)multi-stage warhead technical demonstration. Include significant research and analysis of the worldwide target set capability gaps - to include Hard and Buried Targets (HDBT) and Prompt Global Strike (PGS) Targets - for which JMEWS is a potential solution. In addition, NAWCAD also provides engine power data/analysis in order to determine reserve power available to power potential upgrades to the Tomahawk AUR, such as JMEWS.			
FY 2011 Accomplishments: FY11: Continued JMEWS/JCTD. Continued Ordnance Alteration/Temporary Alteration efforts in support of the SEAWOLF program.			
FY 2012 Plans: FY12: Complete JMEWS/JCTD. Complete AUR platform integration of SAASM. Achieve SAASM program FOC.			
FY 2013 Plans: Begin acquisition milestone documentation for the Joint Multiple Effects Warhead System (JMEWS) transition. Requirements, Concept of Operations (CONOPS), and software development for Image Navigation technology. Non-recurring engineering, systems and software development, integration and testing of capability upgrades to address emergent threats, UONS and ORD target set gap.			
Title: Tactical Tomahawk Weapons Control System (TTWCS)	0.997	0.990	-
Articles:	0	0	
Description: Continue TTWCS Viability activities and complete SAASM integration of TTWCS V5.4.0 in order to enter Follow on Test and Evaluation (FOT&E) for fleet release.			
FY 2011 Accomplishments: FY11: Completed SAASM integration of TTWCS v5.4.0. Completed Developmental Test/Operational Test, Technical Readiness Review for TTWCS v5.4.0. Complete code porting of reuse code from UNIX to LINUX. Continued work to reduce Human Computer Interface complexity. Perform development efforts in support of Guided Missile Destroyer (DDG)-113, and DDG-1000.			
FY 2012 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2013 Navy		DATE: February 2012
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2011	FY 2012	FY 2013
FY12: Complete development of TTWCS viability and enter FOT&E. Prepare for Fleet Release of TTWCS v5.4.0. Continue development work on TTWCS v5.4.1 toward achievement of full TTWCS viability, and launch platform integration on platforms existing and in development.			
Title: Tactical Tomahawk Command and Control Systems	2.722	2.509	2.468
Articles:	0	0	0
Description: Development and incorporation of new capabilities in Tomahawk Command and Control systems necessary for the employment of Tactical Tomahawk. Imagery upgrades to Tomahawk Command and Control System. Continue Test & Evaluation support for Tomahawk Command and Control Systems. ***FY 2011 Accomplishments:*** FY11 - Continued Tomahawk Land Attack Missile (TLAM) navigation and accuracy and weapons delivery Circular Error Probable (CEP) studies and assessments necessary to ensure the Tomahawk Weapons System is properly employed; continued evaluation of Tactical Tomahawk Command and Control Systems (TC2S) design process to ensure Tactical Tomahawk missile performance characteristics are adequately modeled in TC2S. Continued evaluation of imagery formats resulting from National Geospatial Intelligence Agency (NGA) mandated architectural changes. ***FY 2012 Plans:*** FY12 - Continue TLAM navigation and accuracy and weapons delivery CEP studies and assessments necessary to ensure the Tomahawk Weapons System (TWS) is properly employed; continue evaluation of TC2S design process to ensure Tactical Tomahawk missile performance characteristics are adequately modeled in TC2S. Continue evaluation of imagery formats resulting from NGA mandated architectural changes. ***FY 2013 Plans:*** Continue TLAM navigation and accuracy and weapons delivery CEP studies and assessments necessary to ensure the TWS is properly employed; continue evaluation of TC2S design process to ensure Tactical Tomahawk missile performance characteristics are adequately modeled in TC2S. Continue evaluation of imagery formats resulting from NGA mandated architectural changes.			
Accomplishments/Planned Programs Subtotals	10.352	8.819	11.265

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
• WPN/2101: *Tomahawk*	596.674	297.606	308.970	0.000	308.970	322.960	329.184	336.608	342.577	1,170.571	14,855.749
• OPN/5253: *Tomahawk Support Equip*	88.217	70.261	77.767	0.000	77.767	69.449	61.743	61.846	62.984	838.523	1,528.090

Exhibit R-2A, RDT&E Project Justification: PB 2013 Navy		DATE: February 2012
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C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
• OPN/9020: *Initial and Vendor Direct Spares*	0.481	0.236	0.171	0.000	0.171	0.187	0.173	0.181	0.185	0.000	6.743

D. Acquisition Strategy

In 1998, the Tomahawk Baseline Improvement Program (TBIP) transitioned to the Tactical Tomahawk (Block IV) Program. This program is outlined in the Class Justification and Approval (CJ&A No. AIR-22448) signed by the Under Secretary of the Navy on 29 May 1998. The acquisition strategy was to transition the TBIP to Tactical Tomahawk. The Tactical Tomahawk development program was a cost-sharing contract between the Government and the Contractor to add capability to the missile. A multi-year full-rate production contract was awarded in August 2004 for FY 2004-2008 production. The FY09 through FY11 BLOCK IV Missile procurement strategy utilizes a FY 2009 annualized Firm Fixed Price contract, along with two fixed price option years for FY 2010 and FY 2011. FY 2009 through FY 2011 missile procurements have been exercised.

Research & Development technology demonstration capabilities (Multiple-Effects Warhead, Anti Surface Warfare) will be potentially introduced after successful qualification and testing. Complete Selective Availability Anti-Spoofing Module/Tactical Tomahawk Weapons Control System integration efforts.

E. Performance Metrics

The Navy seeks to improve the Tomahawk cruise missile attack capability against land targets through research and development done predominantly through defense contractors and government field activities.

Examples in the area of the All-Up-Round include development of candidate warheads that will enhance weapon ability to cover all assigned target types, provide a quick reaction response capability for the weapon system, and improved guidance, navigation, control, mission computer two-way satellite communications, and a high anti-jam Global Positioning System receiver all in line with state of the art technology.

In the area of the Weapons Control System, research and development is performed to ensure viability and usability of the system into the future, providing necessary upgrades to meet the Department of Defense Information Technology standards registry to comply with FORCEnet requirements and be Internet Protocol Version 6 ready to remain interoperable within Joint Service Architecture, in order to provide battle-group tactical flexibility and responsiveness needed to enable full wartime capability.

In the area of the Command and Control System, continue research and development in order to provide scalable configurations to deploy where and as needed to provide necessary command and control, development necessary to function with national and tactical imagery architectures, decrease mission planning time, and increase the quality and accuracy of each mission for the Tomahawk Weapons System.

All of these research and development efforts contribute to the Navy providing the very best weapon system to the war fighter to accomplish the combat mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2013 Navy		DATE: February 2012
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2012 Cost	FY 2012 Award Date	FY 2013 Base Cost	FY 2013 Base Award Date	FY 2013 OCO Cost	FY 2013 OCO Award Date	FY 2013 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Dev - AUR	C/CPFF	Raytheon Co.:Tucson, AZ	222.185	1.031	Jun 2012	-		-		-	7.764	230.980	230.980
Primary Hardware	C/CPFF	SSCI:Woburn, MA	-	-		2.124	Feb 2013	-		2.124	0.000	2.124	2.124
Systems Engineering - AUR	Reqn	NAVSEA:WNY, DC	30.037	0.275	Mar 2012	0.477	Feb 2013	-		0.477	0.650	31.439	
Prior Year cost no longer funded in FYDP	Various	Various:Various	2,405.912	-		-		-		-	0.000	2,405.912	
		Subtotal	2,658.134	1.306		2.601		-		2.601	8.414	2,670.455	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2012 Cost	FY 2012 Award Date	FY 2013 Base Cost	FY 2013 Base Award Date	FY 2013 OCO Cost	FY 2013 OCO Award Date	FY 2013 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	WR	NSWC:Dahlgren, VA	2.100	0.110	Feb 2012	0.127	Feb 2013	-		0.127	1.015	3.352	
Development Support - AUR	SS/CPFF	SAIC:San Diego, CA	4.277	0.718	Feb 2012	0.934	Feb 2013	-		0.934	3.325	9.254	9.254
Development Support - AUR	WR	Various:Various	1.776	0.110	Feb 2012	-		-		-	0.575	2.461	
Development Support - AUR	WR	NAWC:China Lake, CA	70.533	3.076	Feb 2012	4.800	Feb 2013	-		4.800	1.240	79.649	
Soft Dev-Mission Plan Sys TC2S	Reqn	NAVSEA:WNY, DC	21.345	1.113	Feb 2012	1.106	Feb 2013	-		1.106	6.720	30.284	
Soft Dev-Mission Plan Sys TC2S	Reqn	Navy Sys Mgt Act:VA	12.129	1.190	Feb 2012	1.367	Feb 2013	-		1.367	6.223	20.909	
Soft Dev-Mission Plan Sys	WR	NAWC:Pax River, MD*	0.352	0.206	Feb 2012	0.330	Feb 2013	-		0.330	0.720	1.608	
Soft Dev-Dev Weapons Control Sys	C/CPFF	Lockheed:Valley Forge, VA	106.545	0.990	Feb 2012	-		-		-	0.000	107.535	107.535
Prior Year cost no longer funded in FYDP	Various	Various:Various	122.404	-		-		-		-	0.000	122.404	
		Subtotal	341.461	7.513		8.664		-		8.664	19.818	377.456	

Remarks

* Funding sent to NAWC, PAXRIV beginning in FY10.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2013 Navy		DATE: February 2012
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Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2012 Cost	FY 2012 Award Date	FY 2013 Base Cost	FY 2013 Base Award Date	FY 2013 OCO Cost	FY 2013 OCO Award Date	FY 2013 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year cost no longer funded in FYDP	Various	Various:Various	83.412	-		-		-		-	0.000	83.412	
		Subtotal	83.412	-		-		-		-	0.000	83.412	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2012 Cost	FY 2012 Award Date	FY 2013 Base Cost	FY 2013 Base Award Date	FY 2013 OCO Cost	FY 2013 OCO Award Date	FY 2013 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year cost no longer funded in FYDP	Various	Various:Various	0.401	-		-		-		-	0.000	0.401	
		Subtotal	0.401	-		-		-		-	0.000	0.401	

	Total Prior Years Cost	FY 2012		FY 2013 Base		FY 2013 OCO		FY 2013 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	3,083.408	8.819		11.265		-		11.265	28.232	3,131.724	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2013 Navy		DATE: February 2012
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Exhibit R-4A, RDT&E Schedule Details: PB 2013 Navy		DATE: February 2012
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Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Tomahawk Mission Planning Center				
Acquisition Milestones: Milestones: TTWCS V5.4.0 Full Operational Capability (FOC)	1	2012	1	2012
Acquisition Milestones: Milestones: Tactical Tomahawk Missile Integration FOC	2	2012	2	2012
Acquisition Milestones: Milestones: TC2S 4.3 FOC	3	2012	3	2012
Acquisition Milestones: Milestones: TC2S 5.0 FOC	2	2015	2	2015
Acquisition Milestones: Milestones: TTWCS V5.4.1 FOC	2	2015	2	2015
Systems Development: Software Development: Tactical Tomahawk (TT) SAASM Integration	1	2011	1	2012
Systems Development: Hardware Development: TT Preplanned Product Improvement (P3I)	1	2011	4	2017
Systems Development: Hardware Development: Tactical Tomahawk (TACTOM) Full Rate Production, annualized BLOCK IV missile procurements (FY 2010-FY2020)	1	2011	4	2017
Systems Development: Reviews: Tactical Tomahawk Weapon Control System (TTWCS) V5.4.0 Integrated Test Post Milestone C-Phase F (IT-CF) Technical Readiness Review (TRR)	3	2011	3	2011
Systems Development: Reviews: TTWCS V5.4.1 TRR	2	2013	2	2013
Systems Development: Reviews: TTWCS V5.4.1 IT-CF TRR	3	2014	3	2014
Test and Evaluation: Tomahawk Comand and Control System (TC2S) 4.3 DT	1	2011	1	2012
Test and Evaluation: TC2S 5.0 IT-CF- III G	1	2011	1	2015