

EXHIBIT R-2, RDT&E Budget Item Justification						DATE: February 2008		
APPROPRIATION/BUDGET ACTIVITY						R-1 ITEM NOMENCLATURE		
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-07						0204229N, TOMAHAWK & TMPC		
COST (\$ in Millions)		FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total PE Cost		22.384	15.687	14.212	13.435	10.841	9.579	9.319
0545 TOMAHAWK		16.805	11.235	14.212	13.435	10.841	9.579	9.319
9999 CONGRESSIONAL ADD		5.579	4.452					

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Tomahawk Weapons System (TWS) provides a Tomahawk cruise missile attack capability against targets on land (Tomahawk Land Attack Missile (TLAM)). The TLAM can be fitted with either Conventional unitary warhead (TLAM/C), nuclear warhead (TLAM/N) or submunition dispenser (TLAM/D). 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 (TACTOM) 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, and a lower production cost as compared to the Block III missile. Block IV provides a UHF 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 (BDI) messages. Block IV also includes a high anti-jam GPS receiver, navigation improvements and associated antenna systems. The Tomahawk program (A0545) also includes development of Torpedo Tube Launch (TTL) capability for submarines and the continuing advances identified as spiral development under the Tomahawk Baseline IV Operational Requirements Document (ORD), to include development of the Joint Chiefs of Staff (JCS)-directed incorporation of Selective Availability Anti-Spoofing Module (SAASM) capability. A third waiver will be requested as the program slipped its FY09 date for SAASM incorporation to FY10.

The Tomahawk Command and Control System (TC2S) Theater Mission Planning Center (TMPC) and Afloat Planning System (APS) (a shipboard version of TMPC) provide mission planning and employment support information for both the nuclear (TMPC only) and conventional TLAM, including the distribution of mission data and command information essential to TLAM employment via the Mission Distribution System (MDS) and associated communications infrastructure. Development of Tactical Tomahawk capabilities in TMPC/APS/MDS includes software development, integration, test, and delivery, including support for TECHEVAL and OPEVAL, training development, installation planning, and simulation/model development required by COMOPTEVFOR to offset live missile flights in TECHEVAL and OPEVAL. 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 (TTWCS) 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 (TTWCS) is required to meet the DoD IT Standards Registry (DISR), to meet FORCEnet compliance and be Internet Protocol Version 6 (IPv6) ready in order to remain interoperable within the Joint Service Architecture. These efforts provide battle-group tactical flexibility and responsiveness while maximizing TWS wartime capability. TTWCS entered Engineering and Manufacturing Development (EMD) in FY 99, with Phase A IOC (BLK III) in DEC 2003, and Phase B IOC (TACTOM) in June 2004.

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RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-07				R-1 ITEM NOMENCLATURE 0204229N, TOMAHAWK & TMPC
B. PROGRAM CHANGE SUMMARY				
Funding:	FY 2007	FY 2008	FY 2009	
Previous President's Budget:	24.144	11.405	14.227	
Current BES / President's Budget:	<u>22.384</u>	<u>15.687</u>	<u>14.212</u>	
Total Adjustments	-1.760	4.282	-0.015	
Summary of Adjustments				
Congressional Reductions				
Congressional Rescissions				
Congressional Undistributed Reductions	-0.476	-0.108		
Congressional Increases		4.480		
Economic Assumptions			-0.015	
Miscellaneous Adjustments	<u>-1.284</u>	<u>-0.090</u>		
Subtotal	-1.760	4.282	-0.015	
Schedule:				
TT SAASM Integration - is extended through 3Q FY10.				
Launch platform availability for flight test surface validation of TTWCS V5 did occur in 1Q FY07.				
TTWCS OTTR replaced by Alternative Systems Review (ASR)				
Development test for SAASM was deleted. SAASM capability will be demonstrated on an OTL Flight Test.				
TTWCS V6 Operational, Test and Evaluation (OT&E) is removed from schedule as requirements have been refined.				
Technical: Not Applicable				

APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-7	PROGRAM ELEMENT NUMBER AND NAME 0204229N, TOMAHAWK & TMPC			PROJECT NUMBER AND NAME 0545, TOMAHAWK				
COST (\$ in Millions)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	
0545 TOMAHAWK	16.805	11.235	14.212	13.435	10.841	9.579	9.319	
RDT&E Articles Qty	Not Applicable							

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APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-7	PROGRAM ELEMENT NUMBER AND NAME 0204229N, TOMAHAWK & TMPC	PROJECT NUMBER AND NAME 0545, TOMAHAWK
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B. ACCOMPLISHMENTS / PLANNED PROGRAM:

Tactical Tomahawk All-Up-Round (TACTOM AUR)	FY 2007	FY 2008	FY 2009
Accomplishments / Effort / Sub-total Cost	10.466	7.864	5.785
RDT&E Articles Qty			

Complete development of the Tactical Tomahawk Torpedo-Tube Launch (TT-TL) capability. Completed TTL software and hardware qualification testing, DT/OT flight tests. Continue hardware and software trade studies for Phase 2 ORD requirements. Incorporate Selective Availability Anti-Spoofing Module (SAASM) capability into the GPS and continue to develop Precision Terrain Aided Navigation (PTAN) capability.

Completed demonstration prototype of Precision Terrain Aided Navigation (PTAN) capability to demonstrate real-time operation. Initiated PTAN advance technology risk reduction efforts to develop next generation PTAN prototypes and to integrate PTAN capability into the missile simulation labs. Completed real-time processing capability for PTAN scenes.

Continue integration and development of a precision Radar Altimeter into the All-Up-Round (AUR).

TACTOM Command and Control	FY 2007	FY 2008	FY 2009
Accomplishments / Effort / Sub-total Cost	3.951	2.383	2.695
RDT&E Articles Qty			

Continue development and incorporation of new capabilities in Tomahawk Command and Control systems necessary for the employment of Tactical Tomahawk. Continue development of TTWS Integration Training Architecture. Continue development of related training and installation materials. Continue imagery upgrades to Tomahawk Command and Control System. Continue Test & Evaluation support for Tomahawk Command and Control Systems.

TACTOM Weapons Control System (TTWCS)	FY 2007	FY 2008	FY 2009
Accomplishments / Effort / Sub-total Cost	2.388	.988	5.732
RDT&E Articles Qty			

Initiate minimal Tactical Tomahawk Weapons Control System (TTWCS) viability development activities to reduce risks in the areas of overall TTWCS supportability, sustainment, and interoperability with external interfaces. Begin to address key DoD/DoN mandates such as Internet Protocol (IP)v6, FORCEnet, Open Architecture, and SAASM. Complete the development of TTWCS viability and enter the TECHEVAL/OPEVAL.

APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-7	PROGRAM ELEMENT NUMBER AND NAME 0204229N, TOMAHAWK & TMPC	PROJECT NUMBER AND NAME 0545, TOMAHAWK
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C. OTHER PROGRAM FUNDING SUMMARY:	PY	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	To Complete	Total Cost
WPN - BLI 210100 TOMAHAWK	9,765.580	353.031	380.486	281.096	289.975	304.778	334.276	337.097	CONT	12,046.319
OPN - BLI 525300 TOMAHAWK SUPPORT EQUIPMEN	74.074	62.839	53.601	61.976	61.165	61.430	61.426	62.548	486.092	985.151
OPN SPARES - BLI 902010 INITIAL SPARES	1.698	1.376	0.871	0.176	0.068	0.033	0.030	0.028	CONT	4.280
OPN SPARES - BLI 902090 VENDOR DIRECT SPAR	0.597	0.000	1.066	0.042	0.015	0.009	0.014	0.016	CONT	1.759

D. ACQUISITION STRATEGY:

(U) 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. Torpedo Tube Launch (TTL) capability will IOC in FY 2008. TTL missiles will be procured beginning in FY 08 within the current missile production budget as required to meet Fleet load-out requirements. Other spiral development capabilities (PTAN, Multi-effects Warhead, Anti Surface Warfare (ASUW) will be introduced after successful qualification and testing. Continue SAASM integration efforts.

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Exhibit R-3 Cost Analysis (page 1)										DATE:		
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT				PROJECT NUMBER AND NAME						
RDT&E,N / BA-7		0204229N, TOMAHAWK & TMPC				0545, TOMAHAWK						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost to Complete	Total Cost	Target Value of Contract
PRODUCT DEVELOPMENT												
PHD - Weapons Control System	C-CPAF	LOCKHEED MARTIN, Valley Forge, PA	91.064	.900	Dec 2006						91.964	91.964
Award Fees - WCS			4.996								4.996	
PHD - Weapons Control System	RX	NAVSEASYSCOM, WNY DC	.875					1.091	Nov 2008		1.966	
PHD-Mission Plan Systems TC2S	SS/CPFF	COMGLOBAL SYSTEMS, San Jose CA	36.314			.400	Dec 2007	.403	Dec 2008	3.100	40.217	40.217
PHD-Mission Plan Systems TC2S	VARIOUS	VARIOUS	7.674								7.674	7.674
Primary Hardware Devel - AUR	C/CPFF	RAYTHEON COMPANY, TUCSON, AZ	217.782					1.000	Nov 2008	10.651	229.433	229.433
Primary Hardware Devel - PTAN	C/CPFF	RAYTHEON COMPANY, TUCSON, AZ	2.644								2.644	2.644
Primary Hardware Devel- SAASM	C/CPFF	RAYTHEON COMPANY, TUCSON, AZ	5.582	1.143	Mar 2007						6.725	6.725
Primary Hardware Devel - TTL	C/CPAF	RAYTHEON COMPANY, TUCSON, AZ	11.272	.614	Dec 2006						11.886	11.886
Prim H/W Devel -TTL AWARD FEE	C/CPAF	RAYTHEON COMPANY, TUCSON, AZ	.819								.819	.819
Prim Hardware Devel -TTPC	C/CPFF	RAYTHEON COMPANY, TUCSON, AZ	3.189								3.189	3.189
Primary Hardware Devel - ASUW	C/CPFF	RAYTHEON COMPANY, TUCSON, AZ		.206	Apr 2007						.206	.206
Primary Hardware Devel - WCS	C/CPFF	RAYTHEON COMPANY, TUCSON, AZ	.828								.828	.828
Ship Integr - Launch Integr	RX	NAVSEASYSCOM, WNY DC	25.422	1.765	Various	2.556	Nov 2007	2.283	Nov 2008		32.026	
Ship Integration - Award Fee	C/CPFF	NAVSEASYSCOM, WNY DC	.752								.752	.752
Systems Engineering -	RX	JOHNS HOPKINS UNIV, COLUMBIA, MD	3.735	1.096	Various					5.781	10.612	
Systems Engineering - AUR	RX	JOHNS HOPKINS UNIV, COLUMBIA, MD	26.979	.395	Jan 2007			.400	Various		27.774	
Systems Engineering - AUR	C/FP	BOEING, St. Louis, MO	3.000								3.000	3.000
Systems Engineering - PTAN	RX	JOHNS HOPKINS UNIV, COLUMBIA, MD	2.691								2.691	
Systems Engineering - SAASM	C/CPFF	VARIOUS	.334	.288	Various	.350	Various	.275	Various	.250	1.497	1.497
Systems Engineering - AUR	C/FP	RAYTHEON COMPANY, TUCSON, AZ	14.237								14.237	14.237
Systems Engineering - TTL	C/FP	RAYTHEON COMPANY, TUCSON, AZ	.496								.496	.496
Systems Engineering - TTL	SS/CPFF	JOHNS HOPKINS UNIV, COLUMBIA, MD	.837	.075	Jan 2007						.912	.912
1974 thru TBIP Costs in 1996	VARIOUS	VARIOUS	2,176.447								2,176.447	2,177.647
SUBTOTAL PRODUCT DEVELOPMENT			2,637.969	6.482		3.306		5.452		19.782	2,672.991	

Note: Award Fees and prior years total \$6.567M.

SUPPORT												
Dev Sup- Weapons Contrl Sys	WX	NUWC DET, NEWPORT RI	20.632	.230	Nov 2006	.104	Nov 2007	.977	Nov 2008		21.943	
Development Support	SS/CPFF	SAIC, SAN DIEGO, CA	9.700								9.700	9.700
Development Support	WX	NAWCWD, CHINA LAKE CA		1.078	Nov 2006						1.078	
Development Support	WX	VARIOUS		.122	Various	.092	Various	.114	Various		.328	
Development Support - AUR SAASM	C/CPFF	SAIC, SAN DIEGO, CA				.260	Nov 2007	.275	Nov 2008		.535	.535
Development Support - AUR	SS/CPFF	SAIC, SAN DIEGO, CA	1.112					.200	Various	1.440	2.752	2.752
Development Support - AUR	WX	VARIOUS		.486	Various			.403	Various	13.140	14.029	
Development Support - AUR	WX	NAWC-WD CHINA LAKE, CA	63.256								63.256	
Development Support - PTAN	VARIOUS	VARIOUS	.020								.020	
Development Support - PTAN	C/CPFF	HONEYWELL INTL INC. Minneapolis	3.924								3.924	3.924
Development Support - PTAN	WX	NAWCWD, CHINA LAKE CA	.606								.606	
Development Support - SAASM	WX	VARIOUS		.115	Various	1.999	Various	.300	Various		2.414	
Development Support - TTL	SS/CPFF	SAIC, SAN DIEGO, CA	.391	.185	Nov 2006					.090	.666	.666
Development Support - TTL	WX	NUWC DET, NEWPORT RI	10.521								10.521	
Development Support - TTL	WX	VARIOUS	4.488	1.015	Various						5.503	
Government Eng Sup - SAASM	WX	STRATEGIC SYSTEMS PROGRAMS, WASH, DC		.683	Nov 2006	2.700	Nov 2007	.667	Nov 2008		4.050	
Government Eng Sup - SAASM	WX	VARIOUS	.035	.026	Various						.061	
Soft Dev-Mission Plan SysTC2S	RX	RAYTHEON COMPANY, TUCSON, AZ	5.100								5.100	
Soft Dev-Mission Plan SysTC2S	MIPR	HQ SEC OF AF-FMB, WASHINGTON DC		.951	Various					1.243	2.194	

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APPROPRIATION/BUDGET ACTIVITY										February 2008	
RDT&E,N / BA-7			PROGRAM ELEMENT			PROJECT NUMBER AND NAME					
RDT&E,N / BA-7			0204229N, TOMAHAWK & TMPC			0545, TOMAHAWK					
Soft Dev-Mission Plan SysTC2S	RX	JOHNS HOPKINS UNIV, COLUMBIA, MD	17.846	1.150	Various					.672	19.668
Soft Dev-Mission Plan SysTC2S	MIPR	LOCKHEED, Valley Forge, PA	7.104								7.104
Soft Dev-Mission Plan SysTC2S	RX	NAVY SYST MGT ACT, ARLINGTON VA	2.889	.950	Various	1.982	Various	2.292	Various	6.223	14.336
Soft Dev-Mission Plan SysTC2S	RX	NAVY SYST MGT ACT, ARLINGTON VA	4.326								4.326
Soft Dev-Mission Plan SysTC2S	RX	SAIC, SAN DIEGO, CA	14.307								14.307
Software Dev - Wpns Contr Sys	WX	NSWC Dahlgren	30.306	.909	Nov 2006	.110	Nov 2007	2.150	Nov 2008		33.475
Software Dev - Wpns Contr Sys	C/CPFF	LOCKHEED, Valley Forge, PA	99.246	.272	Jan 2007	.217	Jan 2008	1.382	Jan 2009		101.117
Software Dev - Wpns Contr Sys	RX	VARIOUS		.973	Various	.465	Various				1.438
Software Development - SAASM	C/CPFF	TBD									.000
Software Development - PTAN	RX	JOHNS HOPKINS UNIV, COLUMBIA, MD	1.702								1.702
SUBTOTAL SUPPORT			297.511	9.145		7.929		8.760		22.808	346.153

TEST & EVALUATION												
Dev Test & Eval	SS/CPFF	RAYTHEON COMPANY, TUCSON,AZ	42.883								42.883	42.883
Dev Test & Eval	RX	JOHNS HOPKINS UNIV, COLUMBIA, MD	1.602	.128	Jan 2007					.800	2.530	
Dev Test & Eval	WX	VARIOUS	37.023	.570	Various						37.593	
Dev Test & Eval	WX	VARIOUS	.275								.275	
Dev Test & Eval	WX	NUWC DET, NEWPORT RI	.375	.306	Apr 2007						.681	
SUBTOTAL TEST & EVALUATION			82.158	1.004						.800	83.962	

MANAGEMENT												
MGT & PROF SUPPT SRVC (NON-FFRDC)	SS/CPFF	SAIC, SAN DIEGO, CA	.227	.174	Dec 2006						.401	.401
SUBTOTAL MANAGEMENT			.227	.174							.401	.401

Remarks:

Total Cost			3,017.865	16.805		11.235		14.212		43.390	3,103.507	
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EXHIBIT R4, Schedule Profile																				DATE: February 2008										
APPROPRIATION/BUDGET ACTIVITY					PROGRAM ELEMENT NUMBER AND NAME										PROJECT NUMBER AND NAME															
RDT&E,N / BA-7					0204229N, TOMAHAWK & TMPC										0545, TOMAHAWK															
Fiscal Year	FY 2007				FY 2008				FY 2009				FY 2010				FY 2011				FY 2012				FY 2013					
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
<b>Acquisition Milestones</b>	★ TTL MSC					☆ TTL IOC																								
Missile Integration					SAASM INTEGRATION										☆ SAASM IOC															
TTWCS V5					☆ TTWCS v5 IOC																									
TTWCS v6 Viability / ASR					☆ Alternative System Review (ASR)																									
P3I																														
<b>Test &amp; Evaluation Milestones</b>																														
Operational Test (V5)			OT&E																											
<b>Production Milestones Deliveries</b>																														
LRIP III	210																													
FRP FY04 Deliveries - FRP 2	MYP 322		FRP 2 298																											
Deliveries - FRP 3					FRP 3 408																									
Deliveries - FRP 4 thru FRP 8										FRP 4 355		FRP 5 394		FRP 6 207		FRP 7 209		FRP 8 218												



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COST (\$ in Millions)			FY 2007		FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Project Cost			5.579		4.452					
RDT&E Articles Qty Not Applicable										

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

Congressional Adds: Precision Terrain-Aided Navigation (PTAN) and Tactical Tomahawk Weapons Control System (TTWCS).

B. ACCOMPLISHMENTS / PLANNED PROGRAM:

0545C PTAN		FY 2007	FY 2008	FY 2009
Accomplishments / Effort / Sub-total Cost		5.579	3.181	
RDT&E Articles Qty				

Initiate PTAN Advance technology risk reduction effort to develop next generation PTAN prototypes and to integrate PTAN capability into the missile simulation labs.

9999 Tomahawk Weapons Control System		FY 2007	FY 2008	FY 2009
Accomplishments / Effort / Sub-total Cost			1.271	
RDT&E Articles Qty				

Initiate alternative studies concerning loss of C4I Interoperability (Command, Control, Communication and Computer Interoperability), SSN TTWCS capability, hardware performance, obsolescence and supportability issues.