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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2013 Navy	<b>DATE:</b> February 2012
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APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE							
1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 5: <i>Development &amp; Demonstration (SDD)</i>				PE 0604245N: <i>H-1 Upgrades</i>							
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	58.638	67.569	31.105	-	31.105	47.226	46.850	47.560	48.397	Continuing	Continuing
2279: <i>4BW/4BN Upgrade</i>	58.638	67.569	31.105	-	31.105	47.226	46.850	47.560	48.397	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

The mission of the AH-1W attack helicopter is to provide rotary wing close air support, anti-armor, armed escort, armed/visual reconnaissance, survivability enhancements, and fire support coordination capabilities under day/night and adverse weather conditions. The mission of the UH-1N utility helicopter is to provide command and control and combat assault support under day/night and adverse weather conditions and special operations support; supporting arms coordination and aeromedical evacuation. Major modifications for both aircraft include 37 AH-1Ws converted to AH-1Zs, build 152 new AH-1Zs, remanufacture ten (10) H-1N helicopters and build 150 new UH-1Y models. Upgrades include: a new 4-bladed, composite rotor system with semi-automatic blade fold, new performance matched transmissions, T700 Engine Digital Electronic Control Units, new 4-bladed tail rotors and drive systems, more effective stabilizers, upgraded landing gear, tail pylon structural modifications, and common, fully integrated cockpits and avionics systems. These upgrades will add 10,000 flight hours to AH-1Z/UH-1Y airframes. The fully integrated cockpits will reduce operator workload and improve situational awareness, thus increasing safety and reducing the rate of aircraft attrition. They will provide considerable growth potential for future weapon systems and avionics, which will significantly increase mission effectiveness and survivability. The cockpits will also include integration of onboard mission planning, communications, digital fire control, self-navigation, night navigation/targeting, Joint Air-to-Ground Missile and Air-Launched Intercept Missile weapon systems management in nearly identical crew stations, which significantly reduces training requirements. These upgrades maximize commonality between the two aircraft and provide needed improvements in crew and passenger survivability, payload, power available, endurance, range, airspeed, maneuverability and supportability.

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<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 5: <i>Development &amp; Demonstration (SDD)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0604245N: <i>H-1 Upgrades</i>
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<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2011</b>	<b>FY 2012</b>	<b>FY 2013 Base</b>	<b>FY 2013 OCO</b>	<b>FY 2013 Total</b>
Previous President's Budget	60.498	72.569	28.060	-	28.060
Current President's Budget	58.638	67.569	31.105	-	31.105
Total Adjustments	-1.860	-5.000	3.045	-	3.045
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-5.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.005	-			
• SBIR/STTR Transfer	-1.547	-			
• Program Adjustments	-	-	3.041	-	3.041
• Rate/Misc Adjustments	-	-	0.004	-	0.004
• Congressional General Reductions Adjustments	-0.308	-	-	-	-

**Change Summary Explanation**

Technical: Not applicable.

Schedule: Changes to Software Development schedule for System Configuration Set 6.0 and SCS 7.0 completion from 3Q11 to 3Q12, and 3Q13 to 2Q14, respectively, due to limited test aircraft availability. Rerouting of aircraft parts was required to support OEF operations in Afghanistan. Associated Software Deliveries were adjusted accordingly.

Change to Lot 8 contract award from 2Q11 to 4Q11 to reflect actual contract award.

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Exhibit R-2A, RDT&E Project Justification: PB 2013 Navy									DATE: February 2012		
APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 5: Development & Demonstration (SDD)				R-1 ITEM NOMENCLATURE PE 0604245N: H-1 Upgrades				PROJECT 2279: 4BW/4BN Upgrade			
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
2279: 4BW/4BN Upgrade	58.638	67.569	31.105	-	31.105	47.226	46.850	47.560	48.397	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

**A. Mission Description and Budget Item Justification**

The mission of the AH-1W attack helicopter is to provide rotary wing close air support, anti-armor, armed escort, armed/visual reconnaissance, survivability enhancements, and fire support coordination capabilities under day/night and adverse weather conditions. The mission of the UH-1N utility helicopter is to provide command and control and combat assault support under day/night and adverse weather conditions and special operations support; supporting arms coordination and aeromedical evacuation. Major modifications for both aircraft include 34 AH-1Ws converted to AH-1Zs, build 155 new AH-1Zs, remanufacture ten (10) H-1N helicopters and build 150 new UH-1Y models. Upgrades include: a new 4-bladed, composite rotor system with semi-automatic blade fold, new performance matched transmissions, T700 Engine Digital Electronic Control Units, new 4-bladed tail rotors and drive systems, more effective stabilizers, upgraded landing gear, tail pylon structural modifications, and common, fully integrated cockpits and avionics systems. These upgrades will add 10,000 flight hours to AH-1Z/UH-1Y airframes. The fully integrated cockpits will reduce operator workload and improve situational awareness, thus increasing safety and reducing the rate of aircraft attrition. They will provide considerable growth potential for future weapon systems and avionics, which will significantly increase mission effectiveness and survivability. The cockpits will also include integration of onboard mission planning, communications, digital fire control, self-navigation, night navigation/targeting, Joint Air-to-Ground Missile and Air-Launched Intercept Missile weapon systems management in nearly identical crew stations, which significantly reduces training requirements. These upgrades maximize commonality between the two aircraft and provide needed improvements in crew and passenger survivability, payload, power available, endurance, range, airspeed, maneuverability and supportability.

**B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)**

	<b>FY 2011</b>	<b>FY 2012</b>	<b>FY 2013 Base</b>	<b>FY 2013 OCO</b>	<b>FY 2013 Total</b>
<b>Title:</b> Cuff and Yoke Redesign	22.900	33.640	18.111	-	18.111
<b>Articles:</b>	0	0	0		0
<b>FY 2011 Accomplishments:</b> Cuff and Yoke Redesign/Step 2 Completion contract awarded for Cuff and Yoke studies, analysis, and development.					
<b>FY 2012 Plans:</b> Cuff and Yoke Redesign/Step 3 final development for the redesign of Cuff and Yoke. Initiate detailed design activities including manufacturing process maturation and initial tooling development. Developmental laboratory testing will continue to increase in complexity as part of the detailed design effort, and low-risk sub-component qualification efforts will begin.					
<b>FY 2013 Base Plans:</b>					

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Exhibit R-2A, RDT&E Project Justification: PB 2013 Navy			DATE: February 2012			
APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 5: Development & Demonstration (SDD)		R-1 ITEM NOMENCLATURE PE 0604245N: H-1 Upgrades		PROJECT 2279: 4BW/4BN Upgrade		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total
Cuff and Yoke Redesign/Step 3 fatigue testing of component parts, instrumentation, and preparation for flight test.						
Title: System Configuration Set Development		24.662	16.877	8.260	-	8.260
Articles:		0	0	0		0
FY 2011 Accomplishments: System Configuration Set (SCS) 6.0- validation and verification, preparation for flight test. SCS 7.0- hardware & software (S/W) development including Digital Map, development of initial weapons capabilities, and corrections to Advanced Precision Kill Weapons System (APKWS). These efforts include system requirements definition and S/W requirements definition. Correction of hardware and S/W deficiencies as identified through test and/or due to obsolescence issues.						
FY 2012 Plans: SCS 6.0- complete testing on Build 2. SCS 7.0- continue hardware and S/W development efforts. Development of initial weapons capabilities and corrections. SCS 8.0- Joint Air-to-Ground Missile requirements definition and design. Correction of hardware and S/W deficiencies as identified through test and/or due to obsolescence issues.						
FY 2013 Base Plans: SCS 7.0- development efforts including incorporation of Joint Variable Message Format. SCS 8.0- continue requirements definition and begin design/development process. Correction of hardware and S/W deficiencies as identified through test and/or due to obsolescence issues.						
Title: Weapons and Sensors Testing and Integration		2.765	8.837	1.504	-	1.504
Articles:		0	0	0		0
FY 2011 Accomplishments: APKWS testing on the UH-1Y.						
FY 2012 Plans: Development, integration, and testing effort for APKWS on the AH-1Z. Target Sight System (TSS) turret test and evaluation activities for hardware and infrared improvement efforts.						
FY 2013 Base Plans:						

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2013 Navy							<b>DATE:</b> February 2012				
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 5: <i>Development &amp; Demonstration (SDD)</i>			<b>R-1 ITEM NOMENCLATURE</b> PE 0604245N: <i>H-1 Upgrades</i>			<b>PROJECT</b> 2279: <i>4BW/4BN Upgrade</i>					
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>											
			<b>FY 2011</b>	<b>FY 2012</b>	<b>FY 2013 Base</b>	<b>FY 2013 OCO</b>	<b>FY 2013 Total</b>				
Completion of Target Sight System (TSS) turret test and evaluation activities for hardware and infrared improvement efforts. Aircraft stores development, integration, and testing effort including APKWS, the M299A1 launcher, and Air-Launched Intercept Missile on the AH-1Z.											
<b>Title:</b> Air Vehicle and Avionics Development			8.311	8.215	3.230	-	3.230				
			0	0	0		0				
<b>Articles:</b>											
<b>FY 2011 Accomplishments:</b> Preliminary design and planning for component fatigue testing and Tail Rotor Blade (TRB) Redesign. Planning and analysis for mission computer components obsolescence mitigation and redesign.											
<b>FY 2012 Plans:</b> Continue TRB Redesign. Main Rotor Gear Box (MRGB) "run dry" improvement. Initiate component fatigue testing of hardware components shown to have the highest return on investment for sustainment total ownership cost and cost per flight hour management.											
<b>FY 2013 Base Plans:</b> Continue TRB redesign efforts. Continue MRGB "run dry" and component improvement; focus on new sump, coating and filter components. Conduct avionics development & testing on Digital Map/Video Data Link, air vehicle development box, cargo door redesign, Crash Survivable Flight Incident Recorder, design of aircrew restraint system, and Full Motion Video to enhance digitization. Mission computer components obsolescence and regression testing.											
<b>Accomplishments/Planned Programs Subtotals</b>			58.638	67.569	31.105	-	31.105				
<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2011</b>	<b>FY 2012</b>	<b>FY 2013 Base</b>	<b>FY 2013 OCO</b>	<b>FY 2013 Total</b>	<b>FY 2014</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• APN/017800: <i>UH-1Y/AH-1Z</i> <i>APN1</i>	881.235	734.186	790.591	29.800	820.391	844.514	842.406	827.696	974.562	1,757.650	10,995.089
<b>D. Acquisition Strategy</b> The USMC H-1 Upgrades is an ACAT 1C program which encompasses Engineering and Manufacturing Development of new end-items prior to a production approval decision. The prime contract is a sole source to Bell Helicopter Textron, Inc.											

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Exhibit R-2A, RDT&E Project Justification: PB 2013 Navy		DATE: February 2012
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 5: <i>Development &amp; Demonstration (SDD)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0604245N: <i>H-1 Upgrades</i>	<b>PROJECT</b> 2279: <i>4BW/4BN Upgrade</i>
<b>E. Performance Metrics</b> <p>Cuff and Yoke Redesign addresses fatigue life projections pursuant to Life Cycle Cost avoidance. Overall redesign effort strives to achieve a minimum 1500 hour fatigue life for cuff and yoke components and restores static strength to restore high-altitude performance to the UH-1Y.</p> <p>MRGB loss of lubrication prototype development and testing is an effort to meet the survivability requirement of 30-minutes of operation following a total loss of lubrication. The redesign, development, testing, qualification, and deployment of the MRGB improvements will allow the UH-1Y and AH-1Z to reduce their vulnerable area and greatly improve upon the current 17-minute limitation. This effort will also increase the survival rate of the aircrew and aircraft through improved resistance to ballistic threats.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2013 Navy										DATE: February 2012			
APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 5: Development & Demonstration (SDD)				R-1 ITEM NOMENCLATURE PE 0604245N: H-1 Upgrades				PROJECT 2279: 4BW/4BN Upgrade					
Product Development (\$ in Millions)				FY 2012		FY 2013 Base		FY 2013 OCO		FY 2013 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	SS/CPFF	BHTI:Amarillo, TX	15.187	37.683	Jan 2012	-		-		-	0.000	52.870	52.870
Primary Hardware Development2	SS/CPFF	BHTI:Amarillo, TX	12.600	-		18.277	Jan 2013	-		18.277	56.285	87.162	87.162
Systems Engineering	WR	NAWCAD:Pax River, MD	77.674	2.144	Nov 2011	0.828	Nov 2012	-		0.828	28,558.000	28,638.646	
Prior year Cost no longer funded in the FYDP	Various	Various:Various	1,140.880	-		-		-		-	0.000	1,140.880	
Subtotal			1,246.341	39.827		19.105		-		19.105	28,614.285	29,919.558	
Support (\$ in Millions)				FY 2012		FY 2013 Base		FY 2013 OCO		FY 2013 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
Development Support	SS/CPFF	BHTI:Amarillo, TX	18.427	14.741	Dec 2011	-		-		-	0.000	33.168	33.168
Software Development	SS/CPFF	BHTI:Amarillo, TX	-	-		7.518	Dec 2012	-		7.518	36.826	44.344	44.344
Software Development	WR	NAWCWD:China Lake, CA	19.065	6.342	Dec 2011	0.742	Dec 2012	-		0.742	23.965	50.114	
Prior year costs no longer funded in FYDP	Various	Various:Various	34.459	-		-		-		-	0.000	34.459	
Subtotal			71.951	21.083		8.260		-		8.260	60.791	162.085	
Test and Evaluation (\$ in Millions)				FY 2012		FY 2013 Base		FY 2013 OCO		FY 2013 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
Developmental Test and Evaluation	WR	NAWCAD:Pax River, MD	52.550	1.000	Nov 2011	0.701	Nov 2012	-		0.701	24.200	78.451	
Operational Test and Evaluation1	WR	COMOPTEVFOR:Norfolk, VA	27.898	1.750	Nov 2011	2.103	Nov 2012	-		2.103	16.800	48.551	

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis:</b> PB 2013 Navy											<b>DATE:</b> February 2012			
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: Research, Development, Test & Evaluation, Navy BA 5: Development & Demonstration (SDD)				<b>R-1 ITEM NOMENCLATURE</b> PE 0604245N: H-1 Upgrades				<b>PROJECT</b> 2279: 4BW/4BN Upgrade						

  

<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2012</b>		<b>FY 2013 Base</b>		<b>FY 2013 OCO</b>		<b>FY 2013 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Total Prior Years Cost</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Prior Year Cost no longer funded in FYDP	Various	Various:Various	17.312	-		-		-		-	0.000	17.312	
<b>Subtotal</b>			97.760	2.750		2.804		-		2.804	41.000	144.314	

  

<b>Management Services (\$ in Millions)</b>				<b>FY 2012</b>		<b>FY 2013 Base</b>		<b>FY 2013 OCO</b>		<b>FY 2013 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Total Prior Years Cost</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Contractor Engineering Supt	C/FFP	Various:Various	8.782	0.416	Oct 2011	0.329	Oct 2012	-		0.329	1.058	10.585	10.585
Program Management Supt	C/CPFF	Various:Various	11.515	3.000	Dec 2011	0.232	Dec 2012	-		0.232	0.512	15.259	15.259
Travel	WR	Various:Various	4.635	0.493	Oct 2011	0.375	Oct 2012	-		0.375	2.576	8.079	
Prior year costs no longer funded in FYDP	Various	Various:Various	0.077	-		-		-		-	0.000	0.077	
<b>Subtotal</b>			25.009	3.909		0.936		-		0.936	4.146	34.000	

  

			<b>Total Prior Years Cost</b>	<b>FY 2012</b>		<b>FY 2013 Base</b>		<b>FY 2013 OCO</b>		<b>FY 2013 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>			1,441.061	67.569		31.105		-		31.105	28,720.222	30,259.957	

  

**Remarks**

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Exhibit R-4, RDT&E Schedule Profile: PB 2013 Navy		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 5: <i>Development &amp; Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604245N: <i>H-1 Upgrades</i>	PROJECT 2279: <i>4BW/4BN Upgrade</i>

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2013 Navy			<b>DATE:</b> February 2012
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 5: <i>Development &amp; Demonstration (SDD)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0604245N: <i>H-1 Upgrades</i>	<b>PROJECT</b> 2279: <i>4BW/4BN Upgrade</i>	

**Schedule Details**

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>H-1 Upgrades</b>				
Acquisition Milestones: Milestones: IOC - AH-1Z	2	2011	2	2011
Systems Development: Software Development: SCS 6.0 Software Development	1	2011	3	2012
Systems Development: Software Development: SCS 7.0 Software Development	2	2011	2	2014
Systems Development: Software Development: SCS 8.0 Software Development	1	2012	1	2015
Systems Development: Software Development: SCS 9.0 Software Development	1	2014	1	2017
Systems Development: Software Development: SCS 10.0 Software Development	1	2016	4	2017
Systems Development: Cuff and Yoke (C&Y) Redesign Reviews: Preliminary Design Review (PDR)	1	2012	1	2012
Systems Development: Cuff and Yoke (C&Y) Redesign Reviews: Critical Design Review (CDR)	3	2012	3	2012
Systems Development: System Configuration Set (SCS) Reviews: SCS 7.0 PDR	2	2011	2	2011
Systems Development: System Configuration Set (SCS) Reviews: SCS 7.0 CDR	3	2011	3	2011
Systems Development: System Configuration Set (SCS) Reviews: SCS 8.0 PDR	4	2013	4	2013
Systems Development: System Configuration Set (SCS) Reviews: SCS 8.0 CDR	2	2014	2	2014
Test & Evaluation: C&Y Redesign Developmental Test (DT): Cuff and Yoke Redesign DT	4	2012	4	2014
Test & Evaluation: H-1 Improvements DT: H-1 Improvements DT	1	2011	4	2017
Test & Evaluation: H-1 Improvements Operational Test (OT): H-1 Improvements Operational Test (OT)	1	2011	4	2017
Production Milestones: Contract Awards: Lot 8	4	2011	4	2011
Production Milestones: Contract Awards: Lot 9	2	2012	2	2012
Production Milestones: Contract Awards: Lot 10	2	2013	2	2013

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