Exhibit R-2, RDT&E Budget Item Justification: PB 2014 United States Special Operations Command	DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 1160482BB: *SOF Rotary Wing Aviation*

COST ($ in Millions)	All Prior Years	FY 2012	FY 2013#	FY 2014 Base	FY 2014 OCO ##	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
Total Program Element	164.301	46.199	24.430	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	234.930
D615: *SOF Rotary Wing Aviation*	164.301	46.199	24.430	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	234.930

FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

The FY 2014 OCO Request will be submitted at a later date

Note

Beginning in FY 2014, SOF Rotary Wing Aviation, Program Element 1160482BB has been consolidated into SO Aviation Systems, SOCOM Program Element 1160403BB.

A. Mission Description and Budget Item Justification

This SOF Rotary Wing Aviation projects develops SOF-unique modifications and upgrades to SOF rotary wing aircraft that operate in increasingly hostile environments. Rotary wing aircraft supported by this project include: MH-60M, MH-47G, and A/MH-6M. These aircraft provide aviation support to Special Operations Forces (SOF) in worldwide contingency operations and low-intensity conflicts. They must be capable of rapid deployment; undetected penetration of hostile areas; and operating at extended ranges under adverse weather conditions to infiltrate, provide logistics for, reinforce, and extract SOF. The threat is characterized by an extensive and sophisticated ground based air defense system and an upgraded air-to-air capability targeted against helicopters.

B. Program Change Summary ($ in Millions)	FY 2012	FY 2013	FY 2014 Base	FY 2014 OCO	FY 2014 Total
Previous President's Budget	51.123	24.430	47.448	-	47.448
Current President's Budget	46.199	24.430	0.000	-	0.000
Total Adjustments	-4.924	0.000	-47.448	-	-47.448
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-3.604	-			
• SBIR/STTR Transfer	-1.320	-			
• Other adjustments	-	-	-47.448	-	-47.448

Change Summary Explanation

FY 2012: Net decrease of $4.924 million is due to a reprogramming to program element 1160403BB SOF Aviation Systems Advanced Development to support Silent Knight Radar contract awards (-$3.546), a reprogramming to program element 1160402BB SOF Advanced Technology Development to support the Coalition Network (-$0.058 million) and a transfer of funds to Small Business Innovative Research (-$1.320 million).

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FY 2013: None.

FY 2014: Net decrease of $47.448 million due to this Program Element 1160482BB being consolidated into SOCOM Program Element 1160403BB, beginning in FY 2014.

Schedule: None.

Technical: None.

Exhibit R-2A, RDT&E Project Justification: PB 2014 United States Special Operations Command			DATE: April 2013
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COST ($ in Millions)	All Prior Years	FY 2012	FY 2013#	FY 2014 Base	FY 2014 OCO ##	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
D615: *SOF Rotary Wing Aviation*	164.301	46.199	24.430	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	234.930
Quantity of RDT&E Articles												

FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

The FY 2014 OCO Request will be submitted at a later date

A. Mission Description and Budget Item Justification

This project develops/upgrades SOF rotary wing aircraft systems that operate in increasingly hostile environments. Rotary wing aircraft supported by this project include: MH-60M, MH-47G, and A/MH-6M. These aircraft provide aviation support to SOF in worldwide contingency operations and low-intensity conflicts, and they must be capable of rapid deployment; undetected penetration of hostile areas; and operating at extended ranges under adverse weather conditions to infiltrate, provide logistics for, reinforce, and extract SOF. The threat is characterized by an extensive and sophisticated ground based air defense system and an upgraded air-to-air capability targeted against helicopters. Sub-projects include:

• A/MH-6M Block 3.0 Upgrade is necessary to restore structural, performance, and safety margins for the aircrews. An airframe structural modification will address structural failures due to high intensity, high gross weight operations, and a decade of battle damage. A main/tail rotor drive train and engine control replacement effort will reduce airframe loads and restore sufficient safety and performance margins. An avionics upgrade (NDI/COTS) will replace obsolescent components and provide basic situational awareness. This upgrade is critical to keep a 1960's vintage aircraft in the fight until a suitable replacement aircraft is available, estimated to be in the 2025 timeframe.

• Hostile Fire Indicating System (HFIS) detects, classifies, and alerts the aircrew to the presence of small arms and crew served weapons fire for SOF MH-47/60 platforms. By providing detection and angle of arrival information, the HFIS will allow the aircrew to perform evasive and counter-fire actions significantly increasing the aircraft's probability of survival . The Helicopter Survivability Task Force (HSTF) funds incorporated Hostile Fire Indication in the Infrared Spectrum as well as provided sensor fusion of Infrared, Ultra-Violet, and acoustic sensors to reduce false alarms and increase probability of detection.

• The MH-47 Engine Automatic Re-Light (EARL) system will detect the presence of an impending or an in-progress engine flame-out event and re-establish combustion within the engine to avoid an actual engine flame-out. EARL will recognize the event much faster than a pilot and then proceed to reignite/restart the engine while monitoring and adjusting engine parameters including the ignition system and fuel flow scheduling.

• MH-47 Low Cost Modifications program develops technologies to improve performance and safety of the MH-47G and decrease operational costs. Efforts include the Active Parallel Actuator System (APAS), Active Noise Cancellation (ANC), and Engine Barrier Filter.

Exhibit R-2A, RDT&E Project Justification: PB 2014 United States Special Operations Command		DATE: April 2013
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- Next Generation Forward Looking Infrared (NGFLIR) program procures a laser rangefinder and designator to the ANZSQ-3. The program also procures and installs the Forward Looking Infrared Radar (FLIR) Pre-Planned Product Improvement (P3I) drop-in, advanced dual color (long and mid-wave) IR detector upgrade for the ANZSQ-2 NGFLIR on the light and heavy assault platforms within the Army Special Operations Aviation (ARSOA) fleet.

- MH-60 SOF Modernization program provides for the systems engineering and platform integration efforts, to include continued flight and qualification testing and test support.

- Reduced Optical Signature Emissions Solution (ROSES) program provides reduced optical signature of the current infrared expendable decoys for purposes of reducing Army Special Operations Aviation (ARSOA) aircraft vulnerabilities. This flare solution will have the capability to decoy currently fielded infrared missiles and more sophisticated emerging threats.

- Degraded Visual Environment (DVE) solution will fuse information from currently fielded aircraft sensors with emerging technology to display real-time reference points, obstacles, and landing zone information to the aviator. The DVE solution will provide MH-47/60 aircrews with visual cues for obstacle avoidance and aircraft control during all phases of flight and significantly increase crew and passenger survivability in DVE such as dirt and snow. Additional funding is provided to begin software development.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2012	FY 2013	FY 2014
Title: A/MH-6M Block 3.0 Upgrade ***FY 2012 Accomplishments:*** Initiated development of cockpit upgrades, improved rotor systems, and upgrades to airframe. ***FY 2013 Plans:*** Continue development of cockpit upgrades, improved rotor systems, and upgrades to airframe.	4.865	13.145	0.000
Title: Hostile Fire Indicating System (HFIS) ***FY 2012 Accomplishments:*** Completed development of the detection, classification and alert systems for the HFIS.	0.629	0.000	0.000
Title: MH-47 Engine Automatic Re-Light (EARL) ***FY 2013 Plans:*** Development of the MH-47 fleet EARL system.	0.000	0.793	0.000
Title: MH-47 Low Cost Modifications ***FY 2012 Accomplishments:***	6.070	5.735	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2014 United States Special Operations Command		DATE: April 2013
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2012	FY 2013	FY 2014
Begin development of the Active Parallel Actuator Subsystem (APAS) and Active Noise Cancellation (ANC) technologies for the MH-47G. ***FY 2013 Plans:*** Continue development of the APAS and ANC technologies for the MH-47G. Begin development of the Engine Barrier Filter for the MH-47G.			
Title: Next Generation FLIR ***FY 2012 Accomplishments:*** Begin development of a multispectral (Image Intensified Television (IITV),Digital Television (DTV), Short-Wave Infrared (SWIR)) camera for us in the Q2 Sensor.	0.295	0.000	0.000
Title: MH-60 SOF Modernization Program ***FY 2012 Accomplishments:*** Completed systems integration and qualification efforts on one prototype MH-60M helicopter.	32.507	0.000	0.000
Title: Reduced Optical Signature Emissions Solution (ROSES) ***FY 2012 Accomplishments:*** Completed development of ROSES and started qualification testing.	1.833	0.000	0.000
Title: Degraded Visual Environment (DVE) ***FY 2013 Plans:*** Initiate development, integration, and testing of DVE sensors solution with avionics backbone (started with FY 2011 funds) for ARSOA platforms.	0.000	4.757	0.000
Accomplishments/Planned Programs Subtotals	46.199	24.430	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2012	FY 2013	FY 2014 Base	FY 2014 OCO	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
• PROC2: *ROTARY WING UPGRADES AND SUSTAINMENT*	39.221	74.832								Continuing	Continuing

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2014 United States Special Operations Command		DATE: April 2013
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D. Acquisition Strategy

• A/MH-6M Block 3.0 Upgrade is comprised of three major efforts: airframe/rotors, engine control, and cockpit. The airframe/rotors development effort will be a sole source contract to Boeing, who owns the technical data associated with the A/MH-6 airframe. The engine control work will be performed by Rolls-Royce and Goodrich Power and Engine Control (GPEC) under subcontract to Boeing. As part of the airframe upgrade, the main and tail rotor blades are being replaced with one of several blades available off-the-shelf through a competitive evaluation. The cockpit avionics architecture will be developed by Rockwell-Collins, with the intent to leverage the Common Avionics Architecture System (CAAS) source code to the extent possible. Any new hardware components will be NDI/COTS and will be competitively selected. The production software effort will be a FFP contract. Airframe modification and integration work will be conducted at the Special Operations Forces Support Activity (SOFSA) by the incumbent contractor.

• HFIS - This effort will develop, integrate, install, and field the capability to detect, classify, and alert the aircrew to the presence of small arms fire, anti-aircraft artillery, and rocket propelled grenades. HFIS will allow aircrews to perform evasive and counter-fire actions, which will increase aircraft survivability and mission success. A competitive source selection process will be conducted for the HFIS effort to the extent possible. Proprietary considerations may direct some efforts to the original equipment manufacturer. The HSTF funds incorporated Hostile Fire Indication in the Infrared Spectrum as well as provided sensor fusion of Infrared, Ultra-violet, and acoustic sensors to reduce false alarms and increase probability of detection.

• MH-47 EARL system - This effort develops and qualifies a solution to address safety issues in the MH-47 fleet through the development, test, qualification, and fielding of changes to the engine control system to perform automatic engine failure detection and flame-out protection. Proprietary considerations may direct some efforts to the original equipment manufacturer.

• MH-47 Low Cost Modifications - This efforts develops technologies to improve performance and safety of the MH-47G and decrease operational costs. Efforts include the APAS, ANC, and Engine Barrier Filter. This effort will consist mostly of Government executed integration, testing, and qualification efforts with some analytical engineering services to be procured. Because of proprietary considerations, efforts may be directed to the original equipment manufacturer.

• MH-60M SOF Modernization Program - This supports the Systems Integration and Qualification efforts on the prototype MH-60M helicopter. This includes, but is not limited to, government and contractor flight test support, engineering analysis, documentation, and airworthiness substantiation. There are no proprietary considerations that may direct some efforts to the original equipment manufacturer.

• ROSES - This effort developed and qualified a flare solution that discharges fewer expendables per dispense and emits less visible light to improve aircrew's ability to survive in sophisticated threat environments. Proprietary issues with the existing flare and lack of suitable alternatives (based upon market research) dictated a sole source contract with the current manufacturer as the best value to the Government.

• DVE - This effort integrates and qualifies a solution to address a safety of flight issue while flying in degraded visual environments. A competitive source selection process will be conducted for the DVE solution to the extent possible while capitalizing on Science and Technology initiatives and other Service DVE investments. Proprietary considerations may direct some efforts to the original equipment manufacturer. Additional funds will be employed to begin the development of the software/ firmware for the Synthetic Vision Backbone which uses Digital Terrain Elevation Data or High Resolution digital elevation maps, Threat Data, and Blue Force Tracker.

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This is combined with Q2 Electro-Optic Sighting System overlay and Silent Knight Radar or DVE sensors (not yet defined) to provide a synthetic vision scene to aid the aircrew in degraded visual environments. The Synthetic Vision Backbone is sensor agnostic, maximizing the use of a priori data with sensors used for change detection.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 United States Special Operations Command			DATE: April 2013
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
A/MH-6M Block 3.0 Upgrades	C/Various	PM MELB:Ft. Eustis, VA.	-	4.865	Jan 2013	13.145	Jan 2013	-		-		-	0.000	18.010	
Hostile Fire Indicating System	C/Various	Various:Various	-	0.629	Jan 2013	-		-		-		-	0.000	0.629	
MH-47G EARL	C/Various	PM TAPO:Ft. Eustis, VA.	-	-		0.793	Apr 2013	-		-		-	0.000	0.793	
MH-47G Low Cost Mods	C/Various	PM TAPO:Ft. Eustis, VA.	-	6.070	Dec 2012	5.735	Jan 2013	-		-		-	0.000	11.805	
ROSES	C/Various	PM TAPO:Ft. Eustis, VA.	6.667	1.833	Jan 2012	-		-		-		-	0.000	8.500	
DVE	C/Various	PM TAPO:Ft. Eustis, VA.	6.000	-		4.757	Aug 2013	-		-		-	0.000	10.757	
Next Generartion FLIR	C/Various	PM TAPO:Ft Eustis, VA	-	0.295	Nov 2012	-		-		-		-	0.000	0.295	
Prior Year - Completed efforts	Various	Various:Various	81.258	-		-		-		-		-	0.000	81.258	
		Subtotal	93.925	13.692		24.430		0.000		0.000		0.000	0.000	132.047	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MH-60 SOF Modernization Program	C/Various	Various:Various	49.261	32.507	Nov 2011	-		-		-		-	0.000	81.768	
Prior Years	Various	Various:Various	15.836	-		-		-		-		-	0.000	15.836	
		Subtotal	65.097	32.507		0.000		0.000		0.000		0.000	0.000	97.604	

Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 United States Special Operations Command		DATE: April 2013
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Years	Various	Various:Various	5.279	-		-		-		-		-	0.000	5.279	
		Subtotal	5.279	0.000		0.000		0.000		0.000		0.000	0.000	5.279	

	All Prior Years	FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	164.301	46.199		24.430		0.000		0.000		0.000	0.000	234.930	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2014 United States Special Operations Command		DATE: April 2013
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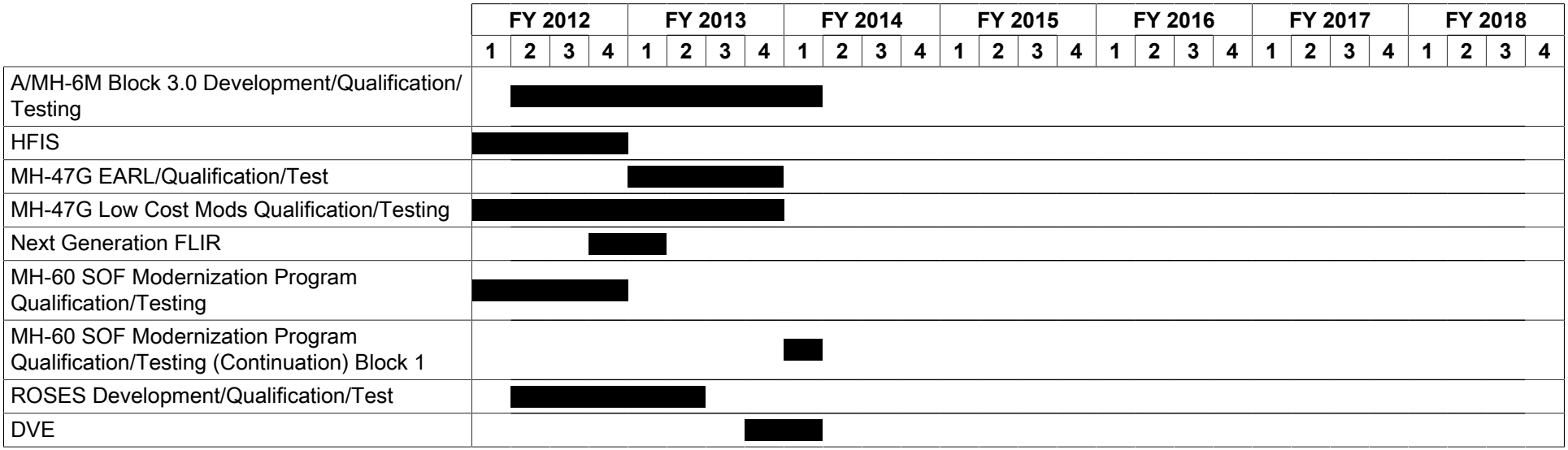

Exhibit R-4A, RDT&E Schedule Details: PB 2014 United States Special Operations Command		DATE: April 2013
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Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
A/MH-6M Block 3.0 Development/Qualification/Testing	2	2012	1	2014
HFIS	1	2012	4	2012
MH-47G EARL/Qualification/Test	1	2013	4	2013
MH-47G Low Cost Mods Qualification/Testing	1	2012	4	2013
Next Generation FLIR	4	2012	1	2013
MH-60 SOF Modernization Program Qualification/Testing	1	2012	4	2012
MH-60 SOF Modernization Program Qualification/Testing (Continuation) Block 1	1	2014	1	2014
ROSES Development/Qualification/Test	2	2012	2	2013
DVE	4	2013	1	2014