Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy											Date: March 2019	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604212N / *Other Helicopter Development*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	93.773	26.423	23.579	28.835	-	28.835	54.458	122.976	148.231	151.192	Continuing	Continuing
1109: *CH/MH-53*	58.003	17.234	12.409	16.454	-	16.454	9.062	2.552	2.594	2.644	Continuing	Continuing
2460: *VH-3/VH-60*	35.770	1.301	1.310	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	38.381
3406: *Attack and Utility Replacement Aircraft*	0.000	7.888	9.860	12.381	-	12.381	45.396	120.424	145.637	148.548	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Program Element includes funding for the development support for improvements to current systems for CH/MH-53, MH-60 development, VH-3/VH-60, and new development of Attack and Utility Replacement Aircraft (AURA) capability. The H-53 is the premier heavy lift helicopter for the Marine Corps and the only operational airborne mine sweeping platform for the Navy. H-53 RDT&E efforts focus on trade studies and risk reduction measures to identify candidate survivability, safety, avionics, cargo handling, cockpit and other airframe specific improvements to extend the service life. The VH-3/VH-60 is required to provide safe and timely transportation for the President and Vice President of the United States, heads of state and others as directed by the White House Military Office. AURA is a Joint Department initiative to address vertical lift capability requirements and determine feasible and affordable solutions in support of the Joint Warfighter.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	26.786	32.128	33.940	-	33.940
Current President's Budget	26.423	23.579	28.835	-	28.835
Total Adjustments	-0.363	-8.549	-5.105	-	-5.105
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-8.549			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.363	0.000			
• Program Adjustments	0.000	0.000	-5.520	-	-5.520
• Rate/Misc Adjustments	0.000	0.000	0.415	-	0.415

Change Summary Explanation

The FY 2020 funding request was reduced by $2.873 million to account for the availability of prior year execution balances.

2460 VH-3/VH-60: FY 2020 decrease in funding due to completion of efforts for VH Executive Helicopter Aircraft Life Management Program.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy	Date: March 2019
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604212N *I Other Helicopter Development*

Cost/Technical/Schedule:
1109 CH/MH-53: Not Applicable
2460 VH-3/VH-60: Not Applicable
3406 Attack and Utility Replacement Aircraft: Not Applicable

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604212N / *Other Helicopter Development*	Project (Number/Name) 1109 / *CH/MH-53*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
1109: *CH/MH-53*	58.003	17.234	12.409	16.454	-	16.454	9.062	2.552	2.594	2.644	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The H-53 helicopter is the premier heavy lift helicopter for the Marine Corps and the only operational airborne mine sweeping platform for the Navy. H-53 efforts will continue to develop and qualify components, prior to production and approval decisions, in order to replace obsolete system components. Emphasis will be placed on supportability improvement modifications that will sustain the H-53 aircraft until the transition of the H-53K is complete. These efforts combined, will significantly improve the readiness of the H-53 fleet while reducing long term operational and supportability costs. Survivability efforts to address improved situational awareness to pilots will include improved Digital Interoperability and improve Degraded Visual Environment Awareness. Modeling and simulation will be used to the maximum practical extent throughout this effort. Manned Flight Simulator will be utilized to develop, install and test interim modifications to existing H-53 legacy avionics, while maintaining the original basic system footprint and functionality. As a part of this effort, a complete Electro Magnetic Vulnerability assessment will be required for the affected and/or modified systems.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: H-53 Avionics	2.848	3.716	4.960	0.000	4.960
Articles:	-	-	-	-	-
FY 2019 Plans: Integrate software applications for cockpit and avionics improvements, to include the development of new sensors. Develop flight control computer and test set design modifications to address anticipated obsolescence issues. Conduct Business Case Analyses to determine impact of high Operation and Support cost drivers and address alternatives to mitigate identified issues. Development and Integration of improved Degraded Visual Environmental Awareness to include coupled flight control capability.					
FY 2020 Base Plans: Continue to integrate software applications for cockpit and avionics improvements, to include the development of new sensors. Develop flight control computer and test set design modifications to address anticipated obsolescence issues. Conduct Business Case Analyses to determine impact of high Operation and Support cost drivers and address alternatives to mitigate identified issues. Development and Integration of improved Degraded Visual Environmental/Low Speed Precision Control Awareness to include coupled flight control capability.					
FY 2020 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 1109 / *CH/MH-53*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase of $1.244M from FY 2019 to FY 2020 is required for test set development, hardware and software development efforts, and ground and flight tests required for Degraded Visual Environment (DVE)/Low Speed Precision Control (LSPC) integration.					
Title: H-53 Survivability	1.296	1.472	2.013	0.000	2.013
Articles:	-	-	-	-	-
FY 2019 Plans: Perform trade studies, risk reduction, design, development, model, integration and test activities for H-53 survivability to include increased situational awareness via digital interoperability. ***FY 2020 Base Plans:*** Continue to perform trade studies, risk reduction, design, development, model, integration and test activities for H-53 safety and survivability to include increased situational awareness via digital interoperability/Low Speed Precision Control. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase of $.541M from FY 2019 to FY 2020 funds additional requirements for situational awareness in the H-53E aircraft.					
Title: H-53 Propulsion	0.442	0.450	0.413	0.000	0.413
Articles:	-	-	-	-	-
FY 2019 Plans: Conduct Business Case Analyses to determine impact of high Operation and Support Propulsion cost drivers. Develop, manufacture and test the new production T-64 fuel control prototype to improve safety, operability, reliability, while eliminating obsolescence issues. ***FY 2020 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 1109 / *CH/MH-53*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Continue to conduct Business Case Analyses to determine impact of high Operation and Support Propulsion cost drivers. Develop, manufacture and test the new production T-64 fuel control prototype to improve safety, operability, reliability, while eliminating obsolescence issues. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** There is no significant change from FY 2019 to FY 2020.					
Title: Project Management Support ***Articles:*** ***FY 2019 Plans:*** Provide in-house, field activity, and contractor support of IPTs to allow for studies and analyses, preparation of acquisition documentation and examination of equipment and avionics for the H-53. Efforts include, but are not limited to, government development support, engineering support, product management support, system engineering and logistics support, and travel for the H-53 program. ***FY 2020 Base Plans:*** Continue to provide in-house, field activity, and contractor support of IPTs to allow for studies and analyses, preparation of acquisition documentation and examination of equipment and avionics for the H-53. Efforts include, but are not limited to, government development support, engineering support, product management support, system engineering and logistics support, and travel for the H-53 program. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** There is no significant change from FY 2019 to FY 2020.	1.620 -	1.652 -	1.620 -	0.000 -	1.620 -
Title: H-53 Airframe ***Articles:*** ***FY 2019 Plans:*** Develop software tool to support aircraft diagnostics, health monitoring and Fatigue Life Estimating (FLE) which will interface with Naval Enterprise Logistics Support Systems. The systems will provide a seamless environment for processing data, troubleshooting and documenting the technical updates required for the H-53 airframe.	2.175 -	1.554 -	1.429 -	0.000 -	1.429 -

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 1109 / *CH/MH-53*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Continue to develop tools to study/analyze and qualify components, prior to production and approval decisions, in order to replace obsolete system components. Perform trade studies, risk reduction, design, development, integration and test activities for the H-53 airframe to include, but not limited to, main rotor head, cowlings, aircraft structure, drive train, and various dynamic components. ***FY 2020 Base Plans:*** Continue to develop software tool to support aircraft diagnostics, health monitoring and Fatigue Life Estimating (FLE) which will interface with Naval Enterprise Logistics Support Systems. The systems will provide a seamless environment for processing data, troubleshooting and documenting the technical updates required for the H-53 airframe. Continue to develop tools to study/analyze and qualify components, prior to production and approval decisions, in order to replace obsolete system components. Perform trade studies, risk reduction, design, development, integration and test activities for the H-53 airframe to include, but not limited to, main rotor head, cowlings, aircraft structure, drive train, and various dynamic components. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease of $.125M from FY 2019 to FY 2020 due to decrease in Fatigue life Estimating test events.					
Title: APR-39D(V)2	8.853	3.565	6.019	0.000	6.019
Articles:	-	-	-	-	-
FY 2019 Plans: Continue development and integration of APR-39D(V)2 to consolidate digital interoperability and improve the probability of detection against radar guided threats. Corrects deficiencies from previous receiver by enabling self protection from radar guided threats on the battlefield. ***FY 2020 Base Plans:*** Continue development and integration of APR-39D(V)2 to consolidate digital interoperability and improve the probability of detection against radar guided threats. Corrects deficiencies from previous receiver by enabling self protection from radar guided threats on the battlefield. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 1109 / *CH/MH-53*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
The FY20 funding increase supports APR-39 contract costs.					
Accomplishments/Planned Programs Subtotals	17.234	12.409	16.454	0.000	16.454

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APN/0528: *H-53 Series*	39.125	51.965	40.513	-	40.513	74.341	135.652	188.034	170.881	Continuing	Continuing

Remarks

APN-5 funding profile does not include funding designated for the CH-53K aircraft (OSIPS 007-19 and 008-19).

D. Acquisition Strategy

This is a non-ACAT program. H-53 RDT&E efforts will focus on trade studies and risk reduction measures to identify candidate survivability, interoperability, safety, avionics, cargo handling, cockpit and other airframe specific improvements to extend the service life.

E. Performance Metrics

Successfully perform studies, analysis and develop software to address emergent H-53 issues. Successfully support developmental and operation test activities to qualify aircraft modifications/upgrades.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 1109 / *CH/MH-53*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWC AD : Patuxent River, MD	5.573	1.618	Nov 2017	0.784	Nov 2018	1.518	Nov 2019	-		1.518	Continuing	Continuing	Continuing
Systems Engineering Contract	C/CPFF	Various : Various	0.737	0.500	Feb 2018	1.191	Feb 2019	1.191	Feb 2020	-		1.191	0.000	3.619	3.619
Systems Engineering	WR	Various : Various	0.540	0.600	Nov 2017	1.616	Nov 2018	1.953	Nov 2019	-		1.953	Continuing	Continuing	Continuing
Design and Development	WR	Various : Various	0.000	4.729	Mar 2018	1.839	Mar 2019	1.323	Mar 2020	-		1.323	0.000	7.891	-
Prior Year Prod Dev no longer funded in the FYDP	TBD	TBD : TBD	19.475	0.000		0.000		0.000		-		0.000	0.000	19.475	-
		Subtotal	26.325	7.447		5.430		5.985		-		5.985	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	Various	Various : Various	5.143	4.876	Mar 2018	2.175	Mar 2019	4.865	Mar 2020	-		4.865	Continuing	Continuing	Continuing
GFE	Various	NAWC AD : Patuxent River, MD	3.581	0.137	Nov 2017	0.280	Nov 2018	0.280	Nov 2019	-		0.280	Continuing	Continuing	Continuing
		Subtotal	8.724	5.013		2.455		5.145		-		5.145	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	Various	Various : Various	8.914	1.674	Mar 2018	1.835	Mar 2019	2.420	Mar 2020	-		2.420	Continuing	Continuing	Continuing
		Subtotal	8.914	1.674		1.835		2.420		-		2.420	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 1109 / *CH/MH-53*

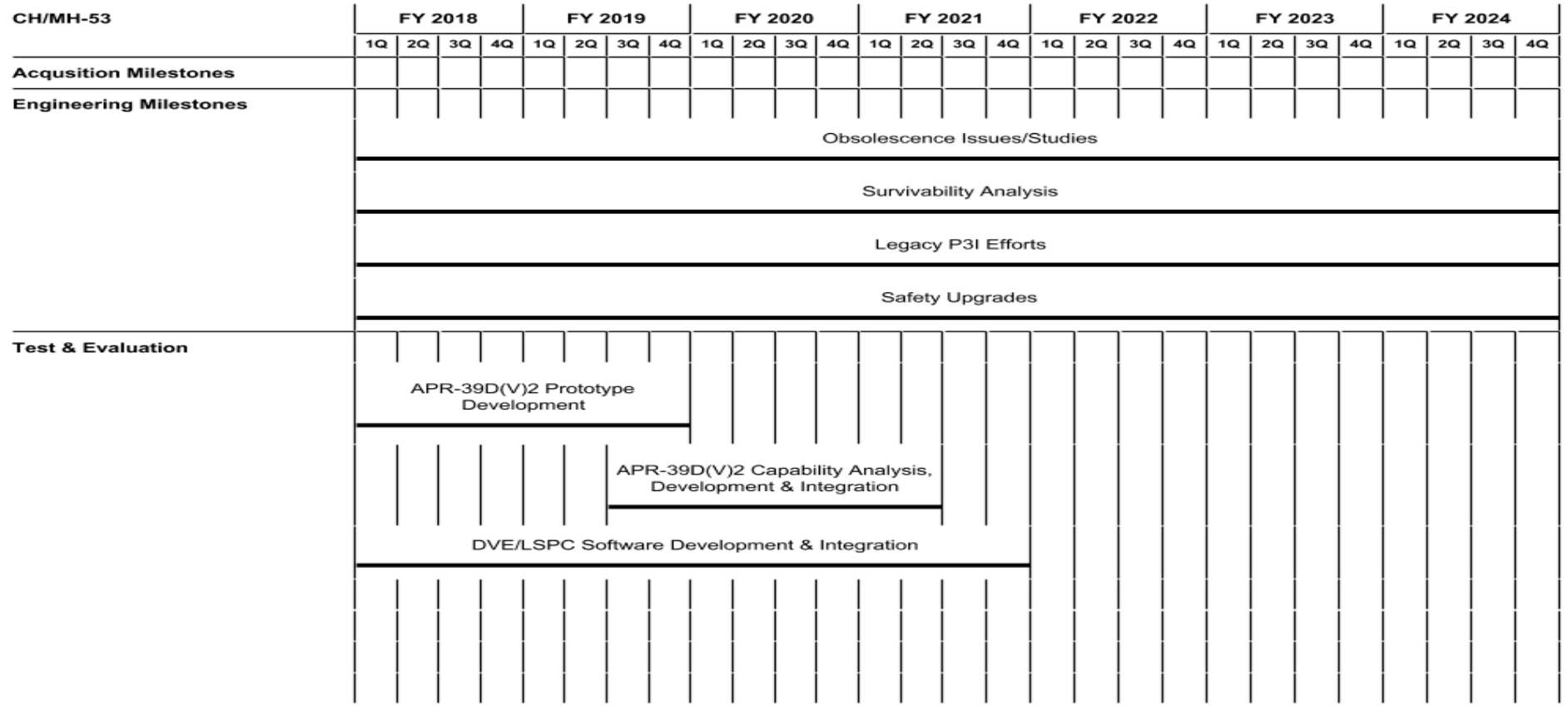
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NAWC AD : Patuxent River, MD	7.318	2.950	Nov 2017	2.439	Nov 2018	2.654	Nov 2019	-		2.654	Continuing	Continuing	Continuing
Travel	Various	Various : Various	2.048	0.150	Oct 2017	0.250	Oct 2018	0.250	Oct 2019	-		0.250	Continuing	Continuing	Continuing
Prior Year Mgmt no longer funded in the FYDP	Various	Various : Various	4.674	0.000		0.000		0.000		-		0.000	0.000	4.674	-
		Subtotal	14.040	3.100		2.689		2.904		-		2.904	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	58.003	17.234		12.409		16.454		-		16.454	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 1109 / *CH/MH-53*



2020DON - 0604212N - 1109

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 1109 / *CH/MH-53*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CH/MH-53				
Engineering Milestones: - Obsolescence Issues/Studies	1	2018	4	2024
Engineering Milestones: - Survivability Analysis	1	2018	4	2024
Engineering Milestones: - Legacy P3I Efforts	1	2018	4	2024
Engineering Milestones: - Safety Upgrades	1	2018	4	2024
Test & Evaluation: APR-39D(V)2 Prototype Development	1	2018	4	2019
Test & Evaluation: APR-39D(V)2 Capability Analysis, Development & Integration	3	2019	2	2021
Test & Evaluation: Degraded Visual Environment/Low Speed Precision Control Development & Integration	1	2018	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604212N / *Other Helicopter Development*	Project (Number/Name) 2460 / *VH-3/VH-60*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
2460: *VH-3/VH-60*	35.770	1.301	1.310	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	38.381
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Marine Helicopter Squadron One (HMX-1) is required to provide safe and timely transportation for the President and Vice President of the United States, heads of state and others as directed by the White House Military Office. Currently two Type, Model, Series aircraft are used by HMX-1 for the Presidential support mission - the VH-3D and the VH-60N. This project currently funds the VH Executive Helicopter's Aircraft Life Management Program (ALMP).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: VH Executive Helicopter Aircraft Life Management Program	1.301	1.310	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: VH Executive Helicopter Aircraft Life Management Program: Provides for management and improvement of all Executive Helicopter systems readiness including safety, operational weight, mission availability, structural integrity, component reliability, maintainability, software, and obsolescence issues as they arise. ***FY 2019 Plans:*** Provide government program management and engineering support for efforts associated with the Aircraft Life Management Program ensuring aircraft availability and mission readiness to the VH Executive Helicopters. ***FY 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY20 decrease due to completion of VH Executive Helicopter Aircraft Life Management Program efforts.					
Accomplishments/Planned Programs Subtotals	1.301	1.310	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 2460 / *VH-3/VH-60*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APN/056600: *Executive Helicopters Series*	31.787	23.566	8.933	-	8.933	28.751	60.690	76.978	78.505	Continuing	Continuing

Remarks

Results of the Aircraft Life Management Program trade studies and risk reduction efforts will lead to modifications to be addressed through the program's Obsolescence Management Program and VH Comm Suite Upgrade Operational Safety and Improvement Programs as directed by the Deputy Secretary of Defense.

D. Acquisition Strategy

VH Executive Helicopter ALMP will include trade studies and risk reduction efforts necessary to address safety, operational weight, mission availability, structural integrity, component reliability, maintainability, software, and obsolescence issues as they arise.

E. Performance Metrics

Completion of VH Executive Helicopter Aircraft Life Management Program efforts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 2460 / *VH-3/VH-60*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	SS/CPFF	Sikorsky : Stratford, CT	8.675	0.000		0.000		0.000		-		0.000	0.000	8.675	8.675
Primary HW Development	SS/CPFF	Sikorsky : Stratford, CT	0.899	0.000		0.000		0.000		-		0.000	0.000	0.899	0.899
Software Development	SS/FFP	Rockwell Collins : Cedar Rapids, IA	2.425	0.000		0.000		0.000		-		0.000	0.000	2.425	2.425
Systems Engineering	WR	NAWCAD : Patuxent River, MD	1.987	0.000		0.000		0.000		-		0.000	0.000	1.987	-
Systems Engineering	Various	Various : Various	0.607	0.000		0.000		0.000		-		0.000	0.000	0.607	-
Prior Year Prod Dev no longer funded in the FYDP	Various	Various : Various	5.321	0.000		0.000		0.000		-		0.000	0.000	5.321	-
Systems Engineering	SS/FFP	Lockheed Martin : Greenfield, SC	0.000	0.000		0.342	Nov 2018	0.000		-		0.000	0.000	0.342	0.342
		Subtotal	19.914	0.000		0.342		0.000		-		0.000	0.000	20.256	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation-WBLoS	WR	NAWCAD : Patuxent River, MD	2.102	0.299	Nov 2017	0.000		0.000		-		0.000	0.000	2.401	-
		Subtotal	2.102	0.299		0.000		0.000		-		0.000	0.000	2.401	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD : Patuxent River, MD	3.234	0.952	Nov 2017	0.938	Nov 2018	0.000		-		0.000	0.000	5.124	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 2460 / *VH-3/VH-60*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering	SS/CPFF	NAVSEA : Washington Navy Yard, DC	0.630	0.020	Nov 2017	0.000		0.000		-		0.000	0.000	0.650	0.650
Travel	Various	Various : Various	0.397	0.030	Oct 2017	0.030	Oct 2018	0.000		-		0.000	0.000	0.457	-
Prior Year Mgmt Services no longer funded in the FYDP	Various	Various : Various	9.493	0.000		0.000		0.000		-		0.000	0.000	9.493	-
		Subtotal	13.754	1.002		0.968		0.000		-		0.000	0.000	15.724	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	35.770	1.301		1.310		0.000		-		0.000	0.000	38.381	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 2460 / *VH-3/VH-60*

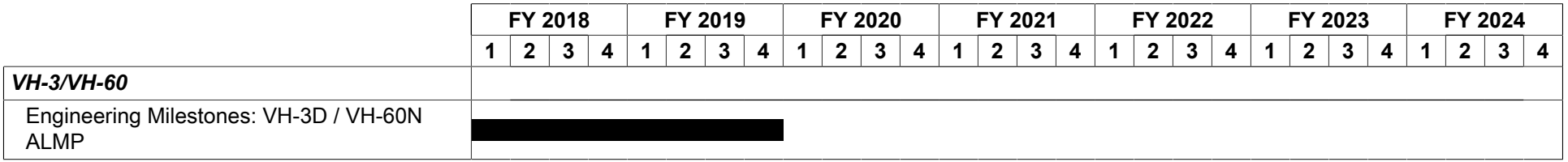


Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 2460 / *VH-3/VH-60*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
VH-3/VH-60				
Engineering Milestones: VH-3D / VH-60N ALMP	1	2018	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604212N / *Other Helicopter Development*	Project (Number/Name) 3406 / *Attack and Utility Replacement Aircraft*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
3406: *Attack and Utility Replacement Aircraft*	0.000	7.888	9.860	12.381	-	12.381	45.396	120.424	145.637	148.548	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Attack and Utility Replacement Aircraft (AURA) is a Joint Department initiative to address vertical lift capability requirements and determine feasible and affordable solutions in support of the Joint Warfighter. The AURA Capability Set 3 (CS3) program, led by the Department of the Army, will develop and field a replacement for US Army and USMC aircraft with a more capable, maintainable, and reliable rotorcraft to meet the needs of the services. AURA will provide unmatched strategic, operational, and tactical agility to perform a multitude of missions currently unachievable by any conventionally configured rotorcraft. AURA will be a force multiplier with superior performance, payload, survivability, agility, endurance, and reliability that enables warfighters to win in a complex world. AURA offers revolutionary operational opportunities over current Vertical Take Off Landing (VTOL) aircraft and will field by 2031.

The Marine Corps AURA requirements emphasize range and speed similar to the MV-22. AURA will increase the Marine Air Ground Task Force's (MAGTF) capacity of long-range fires. AURA will utilize DOTmLPF-P that will include all facets of a program with particular focus on life-cycle cost reductions through common processes, support equipment, logistic support and component commonality utilizing non-materiel solutions, such as maintenance strategies, training solutions, and infrastructure requirements. The air vehicle will include primary mechanical, electrical, pneumatic, and structural components such as drivetrain, generators, landing gear, pumps, controls, seats, etc. The mission subsystems will include all on- and off-board components with embedded control software for those components that provide all mission functionality, cockpit displays, cockpit hardware subsystem controllers, and interfaces. The architecture will include the fundamental organization of the complete system, the processing method/component(s), the system level software, the operating environment, and the on-aircraft infrastructure to facilitate integration of all subsystems and platform.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirement prior to full-rate production decision.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Attack and Utility Replacement Aircraft	7.888	9.860	12.381	0.000	12.381
Articles:	-	-	-	-	-
FY 2019 Plans:					
FY 2019 BASE PLANS WEAPONS AND SENSORS TESTING AND INTEGRATION:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 3406 / *Attack and Utility Replacement Aircraft*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Continue initial support for Attack and Utility Replacement (AURA) Analysis of Alternatives (AoA) to assess the technical feasibility, technical risk, and affordability of potential strategic solutions with the intent to develop the next generation of rotary wing aircraft supporting new Vertical Take Off Landing capabilities common with the US Army. Tasks to be performed include but are not limited to: AoA support, Acquisition Program Management functions, Engineering modeling and analysis, TEMP development, System Specification and Draft Capability Development Document development, and design trade studies and prototyping on the Air Vehicle and all associated systems. These efforts will include but not be limited to studies, virtual simulation, conceptual design, prototyping of Air Vehicle, Avionics, Propulsion and Dynamics, Communications and Navigation, Weapons and Fire Control, Human Systems Integration, Survivability and Vulnerability, Missions and Missions Systems Management, Reliability and Maintainability, Training, Logistics, Sensor, Pilotage and Targeting Systems, VMS/Flight Control, and Software/Hardware architecture. Support for these efforts will come from government, industry and academia such as Naval Research Labs, DARPA, John Hopkins APL, and various industry partners. Continued AURA contract awards for FY19 for contract support services, academia, or industry quick turn studies. All contract actions will be smaller scale efforts to support the overall initial AoA effort.					
FY 2020 Base Plans: FY 2020 BASE PLANS WEAPONS AND SENSORS TESTING AND INTEGRATION: Continue initial support for Attack and Utility Replacement (AURA) Analysis of Alternatives (AoA) to assess the technical feasibility, technical risk, and affordability of potential strategic solutions with the intent to develop the next generation of rotary wing aircraft supporting new Vertical Take Off Landing capabilities common with the US Army. Tasks to be performed include but are not limited to: AoA support, Acquisition Program Management functions, Engineering modeling and analysis, TEMP development, System Specification and Draft Capability Development Document development, and design trade studies and prototyping on the Air Vehicle and all associated systems. These efforts will include but not be limited to studies, virtual simulation, conceptual design, prototyping of Air Vehicle, Avionics, Propulsion and Dynamics, Communications and Navigation, Weapons and Fire Control, Human Systems Integration, Survivability and Vulnerability, Missions and Missions Systems Management, Reliability and Maintainability, Training, Logistics, Sensor, Pilotage and Targeting Systems, VMS/Flight Control, and Software/Hardware architecture. Support for these efforts will come from government, industry and academia such as Naval Research Labs, DARPA, John Hopkins APL, and various industry partners.					
FY 2020 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 3406 / *Attack and Utility Replacement Aircraft*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The increase from FY2019 to FY2020 funds risk mitigation studies and staffing increases to support a condensed timeline to the milestone.					
Accomplishments/Planned Programs Subtotals	7.888	9.860	12.381	0.000	12.381

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Army initiated an Analysis of Alternatives (AoA) in the 3rd Quarter FY 2017 to begin the assessment of the technical feasibility, operational feasibility, technical risk, and affordability of potential solutions. The AoA will take advantage of previous studies, ongoing Advanced Technology Development Science & Technology (S&T) projects, and input from Government, Industry and Academia. The results of the AoA and Technology Readiness Assessments will be used to assist in determining if a Milestone A or Milestone B entry is appropriate. Once the appropriate Milestone entry point has been determined, the program will enter at the appropriate Milestone with an appropriate RFP Release. The program will complete development and testing of the most cost effective system before entering the Production and Deployment phase in the FY2031 timeframe.

E. Performance Metrics

A studies and analysis contract will be awarded 2Q FY 2020.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604212N / *Other Helicopter Development*	Project (Number/Name) 3406 / *Attack and Utility Replacement Aircraft*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/CPFF	TBD : TBD	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	WR	NAWCAD : Patuxent River, MD	0.000	3.947	Mar 2018	2.990	Jan 2019	2.996	Jan 2020	-		2.996	Continuing	Continuing	Continuing
Development Support	WR	TBD : TBD	0.000	0.814	Jun 2018	0.550	Jan 2019	0.800	Jan 2020	-		0.800	Continuing	Continuing	Continuing
		Subtotal	0.000	4.761		3.540		3.796		-		3.796	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test and Evaluation	WR	TBD : TBD	0.000	0.575	Mar 2018	0.587	Nov 2018	0.511	Nov 2019	-		0.511	Continuing	Continuing	Continuing
Studies and Anaylsis	C/CPFF	TBD : TBD	0.000	0.175	Mar 2018	3.640	Jan 2019	5.766	Jan 2020	-		5.766	Continuing	Continuing	Continuing
		Subtotal	0.000	0.750		4.227		6.277		-		6.277	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	C/CPIF	Various : Various	0.000	0.100	Mar 2018	0.000	Nov 2018	0.238	Nov 2019	-		0.238	Continuing	Continuing	Continuing
Program Management Support	TBD	Various : Various	0.000	2.072	Mar 2018	1.613	Nov 2018	1.657	Nov 2019	-		1.657	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 3406 / *Attack and Utility Replacement Aircraft*

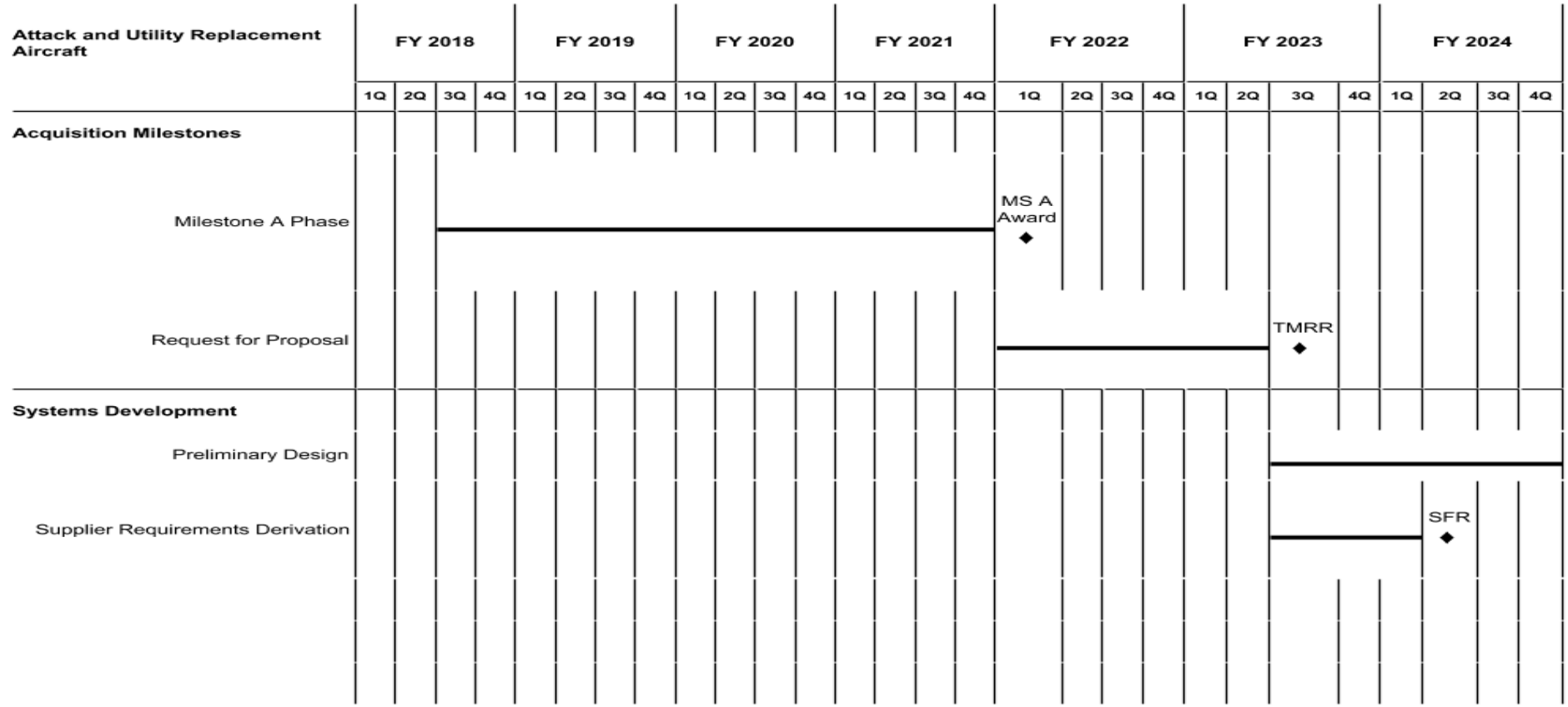
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	WR	NAVAIR : Patuxent River, MD	0.000	0.205	Mar 2018	0.480	Oct 2018	0.413	Oct 2019	-		0.413	Continuing	Continuing	Continuing
		Subtotal	0.000	2.377		2.093		2.308		-		2.308	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	7.888		9.860		12.381		-		12.381	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 3406 / *Attack and Utility Replacement Aircraft*



2020DON - 0604212N - 3406

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 3406 / *Attack and Utility Replacement Aircraft*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Attack and Utility Replacement Aircraft				
Acquisition Milestones: Milestone A Phase: Schedule Detail	3	2018	4	2021
Acquisition Milestones: Milestone A Phase: Milestone A Award	1	2022	1	2022
Acquisition Milestones: Request for Proposal: Schedule Detail	1	2022	2	2023
Acquisition Milestones: Request for Proposal: Technical Maturation Risk Reduction (TMRR) Award	3	2023	3	2023
Systems Development: Preliminary Design: Schedule Detail	3	2023	4	2024
Systems Development: Supplier Requirements Derivation: Schedule Detail	3	2023	1	2024
Systems Development: Supplier Requirements Derivation: SFR	2	2024	2	2024