Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force											Date: February 2020	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0401318F / *CV-22*							
COST ($ in Millions)	**Prior Years**	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**Cost To Complete**	**Total Cost**
Total Program Element	109.967	15.981	17.906	18.419	0.000	18.419	17.447	17.427	17.703	15.997	41.970	272.817
676033: *CV-22 RDT&E POST PRODUCTION*	109.967	15.981	17.906	18.419	0.000	18.419	17.447	17.427	17.703	15.997	41.970	272.817
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Program MDAP/MAIS Code: 212
Project MDAP/MAIS Code(s): N42

A. Mission Description and Budget Item Justification

The CV-22 is the Air Force Special Operations Forces (SOF) variant of the joint multi-mission V-22 tilt rotor aircraft. The CV-22 provides long-range, high-speed infiltration, exfiltration, and resupply to Special Forces teams in hostile, denied, and politically sensitive areas. The Navy is the lead service for the Joint V-22 program. The Joint Program Manager is responsible for managing all variants of the V-22. Department of the Navy (DoN) funds the development of the MV-22 and CMV-22. The Air Force funds the service common portion of the CV-22 while United States Special Operations Command (USSOCOM) funds the development and procurement of SOF peculiar systems. CV-22 RDT&E funding provides for the development, integration, and testing of service-common, mission critical aircraft modifications to improve operational effectiveness, platform survivability, and aircraft availability.

Nacelle Improvements: Funds the design and development of the CV-22 nacelle to increase engine time on wing by reducing ingestion of sand/dust and other particulate matter into the engine, improving reliability and maintainability and reducing operations and support costs. This is Air Force Special Operations Command's #1 priority for the CV-22 weapon system.

Enhanced Self-Deployment: RDT&E funding provides for the design, development, and testing of aircraft modifications to improve aircraft self-deployment capabilities (e.g., operating range, global response time) to mitigate emerging threats to the aircraft and mission accomplishment, and to identify and assess emerging air vehicle, propulsion system, avionics architecture, electronic warfare, situational awareness, and other weapon system solutions in meeting CV-22 Block C/20 capability requirements.

Future Capabilities/Affordable Sustainability: Funding provides for future modification planning, and for aircraft engineering changes/upgrades to address diminishing manufacturing source (DMS) and component obsolescence issues adversely affecting aircraft readiness and operational availability rates, as well as improved operational safety, suitability, cyber security, and mission effectiveness.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver CV-22 weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force	Date: February 2020
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401318F / *CV-22*

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	16.502	17.906	18.453	0.000	18.453
Current President's Budget	15.981	17.906	18.419	0.000	18.419
Total Adjustments	-0.521	0.000	-0.034	0.000	-0.034
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-0.013	0.000			
• SBIR/STTR Transfer	-0.507	0.000			
• Other Adjustments	-0.001	0.000	-0.034	0.000	-0.034

C. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Nacelle Improvements	8.141	10.303	10.586	-	10.586
Description: Funds design, development, and testing of V-22 Nacelle Improvements- Infrared Suppressor (IRS), Generator Control Unit (GCU) upgrade, heat exchanger improvements, engine health monitoring, and upgrade other nacelle systems and components. Common nacelle improvements for both the CV-22 and MV-22 fleets will increase overall aircraft readiness/availability, reduce platform operating life cycle costs, and mitigate impacts to aircraft performance and survivability. These improvements will be integrated, tested, and fielded as block modifications to minimize cost and impact on fleet operations and readiness.					
FY 2020 Plans: Design, develop, and test Nacelle Improvements; IRS redesign, IIS (EAPS 2.0), GCU, and engine health monitoring.					
FY 2021 Base Plans: Continue design, development, and testing of Nacelle Improvements; IRS redesign, IIS (EAPS 2.0), GCU, and engine health monitoring.					
FY 2020 to FY 2021 Increase/Decrease Statement:					

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force	Date: February 2020
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401318F / *CV-22*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Funding increased due to inflation adjustment.					
Title: Enhanced Self-Deployment Capabilities	7.840	7.603	7.833	-	7.833
Description: Develops capabilities to enhance self-deployment, such as improved ice protection, engine performance, performance buyback, navigation, communications, and battle space awareness/networking capabilities/multi domain command and control (MDC2); situational awareness; electronic warfare; weapons systems; defensive avionics systems and architecture; weight reduction initiatives; modular avionics/cyber security implementation and other changes to the underlying aircraft systems necessary to enable these capabilities. ***FY 2020 Plans:*** Continued design and development activities to enhance situational awareness, modular avionics architecture (MAA)/cyber security, and begin integration and develop flight control computer (FCC) obsolescence effort. ***FY 2021 Base Plans:*** Continue design and development activities to enhance situational awareness, MAA/cyber security, and integration and develop FCC obsolescence effort. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding increased due to inflation adjustment.					
Accomplishments/Planned Programs Subtotals	15.981	17.906	18.419	-	18.419

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• RDTE 07 PE 1160403BB: *Special Operations, Aviation Systems*	27.344	28.081	16.773	-	16.773	9.634	17.942	18.360	18.727	Continuing	Continuing
• APAF 02 Line Item Special Operation: *CV-22 Modification*	34.029	17.256	14.829	-	14.829	38.770	45.569	70.188	71.591	Continuing	Continuing
• APAF 05 Line Item V02200: *CV-22 Mods*	60.072	65.348	122.306	6.290	128.596	164.063	151.353	146.678	61.207	Continuing	Continuing
• APAF 06 Line Item 000999: *CV-22 Initial Spares/Repair Parts*	0.000	0.000	6.574	-	6.574	10.935	3.496	0.000	0.000	0.000	21.005

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force	Date: February 2020
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401318F / *CV-22*

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• APAF 07 Line Item C0V220: *CV-22 Post-Production Support*	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000
• RDTE 05 PE 0604262N: *V-22A Navy*	102.712	191.235	132.624	-	132.624	139.786	168.248	147.536	119.275	Continuing	Continuing

Remarks

In addition to the funding identified in the table above, prior year funding includes $520.411 in RDT&E, DW, BA07, PE 1160421BB: Special Operations, CV-22 Development, and $413.235M in RDT&E, AF, BA05, PE 0401318F: CV-22

E. Acquisition Strategy

The V-22 Joint Program Office (Naval Air Systems Command (NAVAIRSYSCOM), PMA-275) is developing new capabilities for the V-22 in block increments.

--Nacelle Improvements: IIS, IRS and GCU will utilize a combination of sole source and competitive contracts.

--Enhanced Self-Deployment Capabilities: Modular Avionics, FCC, and performance buyback will utilize a combination of sole source and competitive contracts.

Development activities for the V-22 program to date have been primarily performed by the prime contractor, Bell-Boeing, on a sole-source basis. Bell-Boeing is a strategic partnership between Bell Helicopter and Boeing Integrated Defense Systems. Efforts are underway to continue increasing competition where feasible, depending primarily on the level of platform integration required and Government rights to needed technical data.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401318F / *CV-22*	**Project (Number/Name)** 676033 / *CV-22 RDT&E POST PRODUCTION*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CV-22 Osprey Block 20 Development	SS/CPFF	Bell Boeing : Amarillo, TX	8.047	-		-		-		-		-	0.000	8.047	163.825
V-22 Nacelle Improvements	Various	Various : Various	53.898	6.945	Feb 2019	8.703	Mar 2020	8.906		-		8.906	0.000	78.452	-
CV-22 Osprey Enhanced Self-deployment Capability	Various	Various : Various	32.877	6.840	Mar 2019	6.133	Jun 2020	6.443		-		6.443	60.160	112.453	0.000
		Subtotal	94.822	13.785		14.836		15.349		-		15.349	60.160	198.952	N/A

Remarks

Block 20 Development Target Value of Contract differs from total cost because most of the Block 20 development cost was funded in PE 0401318F, BA05. In addition, the SOF peculiar development efforts were funded by USSOCOM MFP-11 funding.

Nacelle Improvements Development Target Value of Contract differs from total cost because this is a joint development funded by Navy and Air Force.

Prior Years funding ($322.656M) was executed in PE 0401318F, BA05.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CV-22 Osprey Engineering Technical Support and Studies	Various	Various : Various	5.599	1.000	Mar 2019	1.370	Mar 2020	1.370		-		1.370	9.721	19.060	0.000
		Subtotal	5.599	1.000		1.370		1.370		-		1.370	9.721	19.060	N/A

Remarks

Prior Years Funding $40.454M was executed in PE 0401318F (BA05).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401318F / *CV-22*	**Project (Number/Name)** 676033 / *CV-22 RDT&E POST PRODUCTION*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CV-22 Osprey Test & Evaluation Technical Support	Various	Various : Various	8.709	1.000	Dec 2018	1.500	Dec 2019	1.500	Dec 2020	-		1.500	7.323	20.032	0.000
		Subtotal	8.709	1.000		1.500		1.500		-		1.500	7.323	20.032	N/A

Remarks

Prior Years Funding $46.764M was executed in PE 0401318F (BA05).

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CV-22 Osprey Mission Support	Allot	AFLCMC/WIV : Patuxent River, MD	0.837	0.196	Nov 2018	0.200	Nov 2019	0.200	Nov 2020	-		0.200	1.896	3.329	-
		Subtotal	0.837	0.196		0.200		0.200		-		0.200	1.896	3.329	N/A

Remarks

Prior Years Funding $3.361M was executed in PE 0401318F (BA05).

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	109.967	15.981		17.906		18.419		-		18.419	79.100	241.373	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401318F / *CV-22*	**Project (Number/Name)** 676033 / *CV-22 RDT&E POST PRODUCTION*

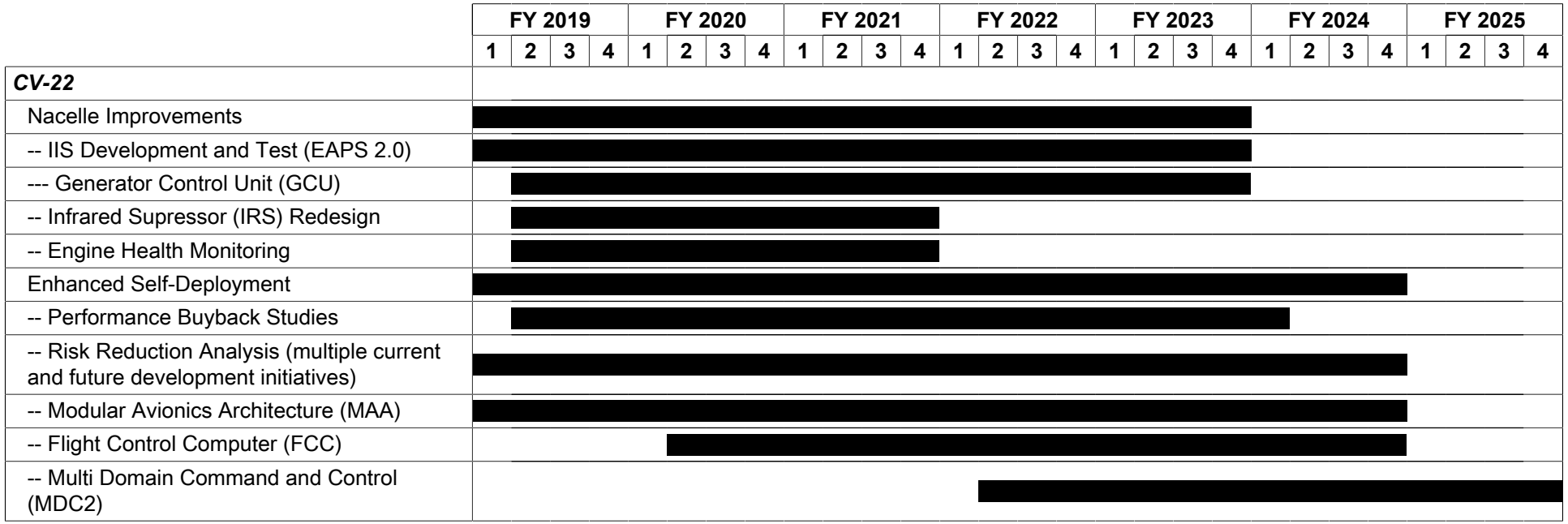

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401318F / *CV-22*	**Project (Number/Name)** 676033 / *CV-22 RDT&E POST PRODUCTION*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CV-22				
Nacelle Improvements	1	2019	4	2023
-- IIS Development and Test (EAPS 2.0)	1	2019	4	2023
--- Generator Control Unit (GCU)	2	2019	4	2023
-- Infrared Supressor (IRS) Redesign	2	2019	4	2021
-- Engine Health Monitoring	2	2019	4	2021
Enhanced Self-Deployment	1	2019	4	2024
-- Performance Buyback Studies	2	2019	1	2024
-- Risk Reduction Analysis (multiple current and future development initiatives)	1	2019	4	2024
-- Modular Avionics Architecture (MAA)	1	2019	4	2024
-- Flight Control Computer (FCC)	2	2020	4	2024
-- Multi Domain Command and Control (MDC2)	2	2022	4	2025