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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604004F / <i>Advanced Engine Development</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	212.586	595.352	562.337	0.000	562.337	439.897	287.535	0.000	0.000	Continuing	Continuing
643608: <i>Advanced Engine Dev</i>	-	212.586	595.352	562.337	0.000	562.337	439.897	287.535	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Advanced Engine Development Program enables demonstration of advanced engine technology prototypes, like the adaptive cycle engines. Adaptive cycle engine technology enables next generation combat aircraft capabilities by combining the efficiency of high bypass turbofans used by commercial airlines with the performance demanded of military fighter engines. This technology has undergone initial development under the auspices of the Air Force Research Laboratory through the Adaptive Versatile Engine Technology (ADVENT) and Adaptive Engine Technology Demonstrator (AETD) programs. This program is maturing advanced propulsion system architectures, designs, component technologies and manufacturing processes to reduce associated risk in preparation for next-generation propulsion system development and platform integration.

The Adaptive Engine Transition Program (AETP) was moved to a new program element 0604534F, Adaptive Engine Transition Program (AETP) in FY 2023 to comply with 2023 Appropriations Bill and accompanying Joint Explanatory Statement direction to maintain separate budget lines for the AETP and Next Generation Adaptive Propulsion (NGAP) efforts.

This program element may include necessary emergent or unanticipated civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605827F. In FY 2023 0.305 million was expended for civilian pay expenses in this program element, and in FY 2024 4.910 million is forecasted for civilian pay expenses in this program element.

This effort is in Budget Activity 4, Advanced Component Development and Prototypes (ACD&P), because efforts are necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment.

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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	220.363	595.352	579.834	0.000	579.834
Current President's Budget	212.586	595.352	562.337	0.000	562.337
Total Adjustments	-7.777	0.000	-17.497	0.000	-17.497
• 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	0.000	0.000			
• SBIR/STTR Transfer	-7.777	0.000			
• Other Adjustments	0.000	0.000	-17.497	0.000	-17.497

Change Summary Explanation

FY 2025 - Funding decrease is due to Air Force funding re-prioritization.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Title: Next Generation Adaptive Propulsion	212.586	595.352	562.337
Description: The Next Generation Adaptive Propulsion (NGAP) effort will design and perform component risk reduction for adaptive engine prototypes enabling future Next Generation Air Dominance (NGAD) capabilities. NGAP will select appropriate adaptive engine technologies that can meet future Next Generation Air Dominance (NGAD) engine requirements while ensuring appropriate manufacturing and technology readiness levels.			
FY 2024 Plans: Continue adaptive prototyping planning and NGAP detailed design activities for future Next Generation Air Dominance (NGAD) capabilities. More details can be provided in an appropriate forum.			
FY 2025 Plans: Complete NGAP detailed design activities and transition to prototype engine fabrication and assembly activities.			
FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 funding decreased compared to FY 2024 by \$33.015M due to transition from prototype planning and detailed design activities to prototype engine fabrication and assembly, and the Air Force funding re-prioritization.			
Accomplishments/Planned Programs Subtotals	212.586	595.352	562.337

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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604004F / <i>Advanced Engine Development</i>
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D. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

E. Acquisition Strategy

The Air Force awarded two limited source, cost plus incentive fee contracts in FY 2016 to General Electric and Pratt & Whitney due to their unique qualifications to design a high performance, flight-weight adaptive turbine engine in the thrust class for the Adaptive Cycle Engine Transition Program (AETP). Embedded in each AETP contract was an option for the Next Generation Adaptive Propulsion (NGAP) effort through preliminary design. In FY 2018, these options were exercised and awarded to optimize risk reduction for future Next Generation Air Dominance (NGAD) capabilities through the NGAP effort. In fourth quarter FY 2022 new indefinite delivery, indefinite quantity (IDIQ) contracts for completion of NGAP detailed design and prototyping were awarded to General Electric (GE), Pratt & Whitney (PW), Boeing, Lockheed Martin (LM), and Northrop Grumman (NG). The new contracts include digital transformation requirements, scope to complete prototype detail design and execute prototype engine testing, digital Weapon System integration activity to reduce technology transition risk, and a contracting approach that enhances the program's acquisition agility. Competitively awarded orders and options under the IDIQ contracts enable work to be rapidly defined to accommodate available funding, provide continued competitive incentives to contractors, and enable rapid and efficient execution of funds. The government agency responsible for managing this program is the Air Force Life Cycle Management Center, Propulsion Directorate, Wright-Patterson Air Force Base, Ohio.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force												Date: March 2024			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
3600 / 4				PE 0604004F / Advanced Engine Development				643608 / Advanced Engine Development							
Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Next Generation Adaptive Propulsion (Preliminary Design) - GE	C/CPIF	GE : Evendale, OH	-	-		-		-		-		-	0.000	0.000	-
Next Generation Adaptive Propulsion (Preliminary Design) - PW	C/CPIF	PW : East Hartford, CT	-	-		-		-		-		-	0.000	0.000	-
Next Generation Adaptive Propulsion (Detailed Design & Prototyping) - GE	C/Variou	GE : Evendale, OH	-	100.531	Oct 2022	279.942	Oct 2023	263.362	Oct 2024	-		263.362	Continuing	Continuing	-
Next Generation Adaptive Propulsion (Detailed Design & Prototyping) - PW	C/Variou	PW : East Hartford, CT	-	100.277	Oct 2022	279.942	Oct 2023	263.362	Oct 2024	-		263.362	Continuing	Continuing	-
Next Generation Adaptive Propulsion (Detailed Design & Prototyping) - Boeing	C/Variou	Boeing : St Louis, MO	-	3.130	Oct 2022	4.868	Oct 2023	5.182	Oct 2024	-		5.182	Continuing	Continuing	-
Next Generation Adaptive Propulsion (Detailed Design & Prototyping) - LM	C/Variou	LM : Ft Worth, TX	-	3.130	Oct 2022	5.182	Oct 2023	5.182	Oct 2024	-		5.182	Continuing	Continuing	-
Next Generation Adaptive Propulsion (Detailed Design & Prototyping) - NG	C/Variou	NG : Palmdale, CA	-	3.130	Oct 2022	5.716	Oct 2023	5.182	Oct 2024	-		5.182	Continuing	Continuing	-
Subtotal			-	210.198		575.650		542.270		-		542.270	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Next Generation Adaptive Propulsion - Program Management Support	Various	Various : TBD	-	2.388	Dec 2022	19.702	Dec 2023	20.067	Dec 2024	-		20.067	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604004F / <i>Advanced Engine Developm ent</i>	Project (Number/Name) 643608 / <i>Advanced Engine Dev</i>
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Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	2.388		19.702		20.067		-		20.067	Continuing	Continuing	N/A
Project Cost Totals			-	212.586		595.352		562.337		-		562.337	Continuing	Continuing	N/A

Remarks
 GE - General Electric PW - Pratt & Whitney LM - Lockheed Martin NG - Northrop Grumman

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604004F / <i>Advanced Engine Developm ent</i>	Project (Number/Name) 643608 / <i>Advanced Engine Dev</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Next Generation Adaptive Propulsion</i>				
Initial Design, Preliminary Design	1	2023	1	2023
Adaptive Prototyping Plan, Detailed Design, Engine Fabrication, Engine Assessments	1	2023	4	2027

Note

The Next Generation Adaptive Propulsion effort consists of six phases initial design, preliminary design, adaptive prototyping planning, detailed design, engine fabrication, and engine assessments. Initial and preliminary design activities are complete.

Program deliverables include: military adaptive engine detailed design parameters and models; engine hardware (plus spare parts); matured technologies; major rig assessment data (controls, combustor, etc.); program reviews; and technology, affordability and sustainability studies for capability enabling propulsion systems providing options for future Next Generation Air Dominance (NGAD) family of systems capabilities.

Additional details can be provided in the appropriate forum.