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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army **Date:** March 2023

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0607139A / <i>Improved Turbine Engine Program</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	-	250.533	228.036	201.247	-	201.247	130.868	108.996	68.356	48.952	Continuing	Continuing
ES6: <i>Improved Turbine Engine Program</i>	-	250.533	228.036	201.247	-	201.247	130.868	108.996	68.356	48.952	Continuing	Continuing

Program MDAP/MAIS Code: 487

A. Mission Description and Budget Item Justification

This funding line is a key enabler of the army Modernization Priorities in support of the Improved Turbine Engine Program (ITEP). ITEP develops, tests, qualifies, and integrates the next generation turboshaft engine on Future Attack Reconnaissance Aircraft (FARA), Black Hawk and Apache aircraft. The Improved Turbine Engine (ITE) replaces the existing T700 engine design originated in the 1970s and meets the operational requirement of 6,000 feet pressure altitude and 95 degrees (6K/95). The ITE will fit inside the existing engine bays of the Black Hawk and Apache Helicopters and provides a significant power enhancement of up to fifty percent (total of 3,000 class shaft horsepower) with increased fuel efficiency. Additional benefits include improved design life, enhanced reliability, lower maintenance cost and restored capability lost due to aircraft weight growth without an increase to the logistics footprint. The program consists of systems engineering and program management, detailed design engineering, design assurance, hardware manufacturing and testing, component and module level development and testing, system level testing and qualification, and platform integration and qualification.

FY 2022 funding initiated component level testing for Preliminary Flight Rating (PFR), continued physical airframe integration, continued Live Fire detailed test planning, completed Apache A-Kit Incremental Critical Design Review #2 (iCDR), completed Black Hawk A-Kit PDR, and initiated Black Hawk A-Kit CDR. FY 2023 funding continues engine testing to achieve Preliminary Flight Rating (PFR) in FY 2024, provides for completion of Black Hawk A-Kit CDR, completes Live Fire detailed test planning, and provides funding for Long Lead Hardware for Initial Operational Test and Evaluation (IOTE) engines. FY 2024 funding completes PFR testing, provides for the delivery of flight test engines to platforms, initiates UH-60M aircraft flight/qualification activities, initiates AH-64E instrumentation and ground testing, and initiates engine qualification. FY 2025 funding initiates Live Fire static engine tests, continues UH-60M aircraft flight/qualification testing, initiates AH-64E aircraft flight/qualification testing, and continues engine qualification. FY 2026 funding completes Live Fire static engine tests, initiates IOTE activities, completes engine qualification and UH-60M qualification, continues AH-64E aircraft flight/qualification testing. FY 2027 funding begins engine integration for the H-60V platform, initiates Live Fire dynamic engine test, completes AH-64E qualification and continues IOTE activities. FY 2028 funding continues H-60V integration, completes H-60V A-kit CDR, completes Live Fire dynamic engine tests, and completes IOTE.

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B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	260.024	228.036	205.191	-	205.191
Current President's Budget	250.533	228.036	201.247	-	201.247
Total Adjustments	-9.491	0.000	-3.944	-	-3.944
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-9.491	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-3.944	-	-3.944
Change Summary Explanation					
Decreased funding to support higher Army priorities.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army										Date: March 2023		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607139A / Improved Turbine Engine Program				Project (Number/Name) ES6 / Improved Turbine Engine Program			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
ES6: Improved Turbine Engine Program	-	250.533	228.036	201.247	-	201.247	130.868	108.996	68.356	48.952	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This funding line is a key enabler of the army Modernization Priorities in support of the Improved Turbine Engine Program (ITEP). ITEP develops, tests, qualifies, and integrates the next generation turboshaft engine on Future Attack Reconnaissance Aircraft (FARA), Black Hawk and Apache aircraft. The Improved Turbine Engine (ITE) replaces the existing T700 engine design originated in the 1970s and meets the operational requirement of 6,000 feet pressure altitude and 95 degrees (6K/95). The ITE will fit inside the existing engine bays of the Black Hawk and Apache Helicopters and provides a significant power enhancement of up to fifty percent (total of 3,000 class shaft horsepower) with increased fuel efficiency. Additional benefits include improved design life, enhanced reliability, lower maintenance cost and restored capability lost due to aircraft weight growth without an increase to the logistics footprint. The program consists of systems engineering and program management, detailed design engineering, design assurance, hardware manufacturing and testing, component and module level development and testing, system level testing and qualification, and platform integration and qualification.

FY 2022 funding initiated component level testing for Preliminary Flight Rating (PFR), continued physical airframe integration, continued Live Fire detailed test planning, completed Apache A-Kit Incremental Critical Design Review #2 (iCDR), completed Black Hawk A-Kit PDR, and initiated Black Hawk A-Kit CDR. FY 2023 funding continues engine testing to achieve Preliminary Flight Rating (PFR) in FY 2024, provides for completion of Black Hawk A-Kit CDR, completes Live Fire detailed test planning, and provides funding for Long Lead Hardware for Initial Operational Test and Evaluation (IOTE) engines. FY 2024 funding completes PFR testing, provides for the delivery of flight test engines to platforms, initiates UH-60M aircraft flight/qualification activities, initiates AH-64E instrumentation and ground testing, and initiates engine qualification. FY 2025 funding initiates Live Fire static engine tests, continues UH-60M aircraft flight/qualification testing, initiates AH-64E aircraft flight/qualification testing, and continues engine qualification. FY 2026 funding completes Live Fire static engine tests, initiates IOTE activities, completes engine qualification and UH-60M qualification, continues AH-64E aircraft flight/qualification testing. FY 2027 funding begins engine integration for the H-60V platform, initiates Live Fire dynamic engine test, completes AH-64E qualification and continues IOTE activities. FY 2028 funding continues H-60V integration, completes H-60V A-kit CDR, completes Live Fire dynamic engine tests, and completes IOTE.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: ITEP	250.533	219.713	201.247
Description: ITEP - a multi-platform turbine engine development required across existing Army aircraft to fill the capability gaps for Army Aviation Operations			
FY 2023 Plans:			

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Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607139A / Improved Turbine Engine Program	Project (Number/Name) ES6 / Improved Turbine Engine Program		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>FY 2023 funding continues engine testing to achieve Preliminary Flight Rating (PFR) in FY 2024, provides for completion of Black Hawk A-Kit CDR, completion of Live Fire detailed test planning, and provides funding for Long Lead Hardware for Initial Operational Test and Evaluation (IOTE) engines.</p> <p>FY 2024 Plans: FY 2024 funding completes PFR testing, provides for the delivery of flight test engines to platforms, initiates UH-60M aircraft flight/qualification activities, initiates AH-64E instrumentation and ground testing, and initiation of engine qualification.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease from FY2023 to FY2024 due to reduction in Engine OEM contract efforts as engine design and development nears completion.</p>				
<p>Title: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR)</p> <p>Description: Funding transferred in accordance with Title 15 USC §638</p> <p>FY 2023 Plans: Funding transferred in accordance with Title 15 USC §638</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC §638</p>		-	8.323	-
Accomplishments/Planned Programs Subtotals		250.533	228.036	201.247
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
For FY 2014 and prior, all funding for ITEP was contained in Program Element (PE) 0203744A - Aircraft Modifications/Product Improvement Programs, Project 504. FY 2015 funding was initially moved to PE 0203744A, Project EB1. Prior to execution, FY 2015 and beyond funding was moved to to PE 0607139A, Project ES6.				
D. Acquisition Strategy				
Following a successful Milestone B decision, a cost-plus-incentive-fee contract was awarded to General Electric for EMD contractual effort in FY 2019.				
ITEP Platform Integration Trade Studies Contracts were awarded to the Boeing Company and the Sikorsky Corporation in FY 2015. In FY 2019, two follow-on efforts were awarded to design and develop A-kits to integrate the ITE into both the Apache and Black Hawk platforms. Following a successful Apache A-Kit iCDR in FY 2021 and FY 2022, and Black Hawk A-Kit CDR in FY2023, the integration efforts will continue to include fabrication of the A-kits, flight test support, and pubs/provisioning.				

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Upon completion of EMD, an LRIP contract will be awarded in FY 2026.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army **Date:** March 2023

Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607139A / Improved Turbine Engine Program	Project (Number/Name) ES6 / Improved Turbine Engine Program
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Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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
ITEP SEPM - Organic	Allot	Program Management Office (PMO) Aviation Turbine Engines Project Office (ATE), Various : Redstone Arsenal, AL	55.012	15.975	Oct 2021	9.881	Oct 2022	9.911	Oct 2023	-		9.911	Continuing	Continuing	Continuing
ITEP SEPM - Contractor	C/IDIQ	Program Management Office (PMO) Aviation Turbine Engines Project Office (ATE), Various : Redstone Arsenal, AL	21.365	3.878	Oct 2021	3.975	Oct 2022	4.217	Oct 2023	-		4.217	Continuing	Continuing	Continuing
ITEP SEPM - OGA	MIPR	Program Management Office (PMO) Aviation Turbine Engines Project Office (ATE), Various : Redstone Arsenal, AL	22.856	2.365	Oct 2021	2.425	Oct 2022	2.655	Oct 2023	-		2.655	Continuing	Continuing	Continuing
SBIR/STTR Transfer	TBD	Army : TBD	-	-		8.323	Sep 2023	-		-		-	0.000	8.323	-
Subtotal			99.233	22.218		24.604		16.783		-		16.783	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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
Engine OEM EMD Contract	C/CPIF	General Electric Company (GE) : Lynn, MA	341.134	133.200	Oct 2021	133.000	Oct 2022	86.369	Oct 2023	-		86.369	Continuing	Continuing	Continuing
Platform Integration and Qualification Contracts	SS/CPIF	The Boeing Company, The Sikorsky	94.317	74.615	Jan 2022	49.849	Oct 2022	75.514	Oct 2023	-		75.514	Continuing	Continuing	Continuing

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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
		Corporation : Phoenix, AZ, Stratford, CT													
Subtotal			435.451	207.815		182.849		161.883		-		161.883	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
ITEP Engineering Support - Organic	Allot	Program Management Office (PMO) Aviation Turbine Engines Project Office (ATE), Various : Redstone Arsenal, AL	1.017	0.186	Oct 2021	-		-		-		-	Continuing	Continuing	Continuing
ITEP Engineering Support - Contractor	C/IDIQ	Program Management Office (PMO) Aviation Turbine Engines Project Office (ATE), Various : Redstone Arsenal, AL	13.509	2.894	Oct 2021	2.966	Oct 2022	3.029	Oct 2023	-		3.029	Continuing	Continuing	Continuing
ITEP Engineering Support - OGA	MIPR	Program Management Office (PMO) Aviation Turbine Engines Project Office (ATE), Various : Redstone Arsenal, AL	40.756	8.203	Oct 2021	8.396	Oct 2022	8.502	Oct 2023	-		8.502	Continuing	Continuing	Continuing
Platform Integration Support	MIPR	Program Management Office (PMO) Apache and Black Hawk Project	9.720	6.075	Oct 2021	6.196	Oct 2022	6.304	Oct 2023	-		6.304	Continuing	Continuing	Continuing

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Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 7				PE 0607139A / Improved Turbine Engine Program				ES6 / Improved Turbine Engine Program							
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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
		Offices : Redstone Arsenal, AL													
Subtotal			65.002	17.358		17.558		17.835		-		17.835	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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
Government Test Planning/Flight Test Support and Analysis	SS/TBD	Program Management Office (PMO) Aviation Turbine Engines Project Office (ATE), Various : Redstone Arsenal, AL	6.911	3.142	Oct 2021	3.025	Oct 2022	4.746	Oct 2023	-		4.746	Continuing	Continuing	Continuing
Subtotal			6.911	3.142		3.025		4.746		-		4.746	Continuing	Continuing	N/A
Project Cost Totals			606.597	250.533		228.036		201.247		-		201.247	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607139A / Improved Turbine Engine Program	Project (Number/Name) ES6 / Improved Turbine Engine Program

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
ITEP Systems Engineering/Program Management	1	2015	4	2030
Milestone C	3	2026	3	2026
Engineering & Manufacturing Development	2	2019	3	2026
Critical Design Review (CDR)	4	2020	4	2020
Air Vehicle Integration	2	2019	4	2030
Testing	2	2019	3	2026
First Engine To Test (FETT)	3	2022	3	2022
Preliminary Flight Rating	3	2024	3	2024
Low Rate Initial Production (LRIP)	3	2026	3	2028
Full Rate Production	3	2028	4	2037
IOC	3	2029	3	2029