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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army										Date: May 2017			
Appropriation/Budget Activity					R-1 Program Element (Number/Name)								
2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development					PE 0607139A I Improved Turbine Engine Program								
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost	
Total Program Element	-	49.137	126.105	204.304	-	204.304	196.074	253.327	247.405	322.920	Continuing	Continuing	
ES6: Improved Turbine Engine Program	-	49.137	126.105	204.304	-	204.304	196.074	253.327	247.405	322.920	Continuing	Continuing	

## Note

For Fiscal Year (FY) 2014 and prior, all funding for the Improved Turbine Engine Program (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. This is not a New Start.

## A. Mission Description and Budget Item Justification

ITEP develops, tests, qualifies, and integrates the next generation turboshaft engine on the Black Hawk and Apache aircraft. The Improved Turbine Engine (ITE) replaces the existing T700 engine design originated in the 1970's 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 increasing 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, as well as integration into the airframe.

FY 2016 funding provided for dual vendor competitive Technology Maturation/Risk Reduction (TMRR) contract awards, initial engine design effort, and continued platform/engine integration trade studies. FY 2017 funding continues engine design effort and the platform/engine integration trade studies. FY 2018 funds the remaining TMRR engine design effort, the Engineering and Manufacturing Development (EMD) SSEB for entry into Milestone B (MS B), and concludes the platform/engine integration trade studies. In FY 2019, the EMD contract will be awarded to one vendor, and platform/engine integration design engineering will begin. FY 2020 funding continues both the EMD effort and platform/engine integration A-kit development, resulting in a Critical Design Review (CDR) in FY 2020. FY 2021 continues the EMD effort, provides for First Engine To Test (FETT), and begins physical airframe integration. FY 2022 funding will provide Preliminary Flight Rating (PFR) testing, leading to an Air Worthiness Rating (AWR).

If funding permits, ITEP will continue to pursue potential program acceleration directed by the May 2016 AROC.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army				Date: May 2017	
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development		R-1 Program Element (Number/Name) PE 0607139A / Improved Turbine Engine Program			
B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	51.164	126.105	186.264	-	186.264
Current President's Budget	49.137	126.105	204.304	-	204.304
Total Adjustments	-2.027	0.000	18.040	-	18.040
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Other Adjustments 1	-2.027	0.000	18.040	-	18.040
Change Summary Explanation					
For Fiscal Year (FY) 2014 and prior, all funding for the Improved Turbine Engine Program (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. This is not a New Start.					
Additional Army funding in FY 2018 provided to fully fund initial TMRR contracts to the MS-A Army Cost Position values.					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
ES6: Improved Turbine Engine Program	-	49.137	126.105	204.304	-	204.304	196.074	253.327	247.405	322.920	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

For Fiscal Year (FY) 2014 and prior, all funding for the Improved Turbine Engine Program (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. This is not a New Start.

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If funding permits, ITEP will continue to pursue potential program acceleration directed by the May 2016 AROC.

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

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Title:</b> ITEP	49.137	126.105	204.304
<b>Description:</b> ITEP - a multi-platform turbine engine development required across existing Army aircraft to fill the capability gaps for Army Aviation Operations			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Army		<b>Date:</b> May 2017	
<b>Appropriation/Budget Activity</b> 2040 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607139A / <i>Improved Turbine Engine Program</i>	<b>Project (Number/Name)</b> ES6 / <i>Improved Turbine Engine Program</i>	
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>
<p><b><i>FY 2016 Accomplishments:</i></b> Executed Systems Engineering/Program Management efforts, dual vendor competitive TMRR contract awarded, initial engine design effort, and continued aircraft platform/engine integration trade studies.</p> <p><b><i>FY 2017 Plans:</i></b> Systems Engineering/Program Management requirements, provide for incremental funding of dual vendor competitive TMRR contracts awarded in FY16, initial engine design effort, and continues aircraft platform/engine integration trade studies.</p> <p><b><i>FY 2018 Plans:</i></b> Continue Systems Engineering/Program Management activities, provide for final increment of funding of dual vendor competitive TMRR contract awarded in FY16, culminating in a Preliminary Design Review (PDR), continues aircraft platform/engine integration trade studies. Executes EMD SSEB.</p>			
<b>Accomplishments/Planned Programs Subtotals</b>		49.137	126.105
<b>C. Other Program Funding Summary (\$ in Millions)</b>			
N/A			
<b>Remarks</b>			
For Fiscal Year (FY) 2014 and prior, all funding for the Improved Turbine Engine Program (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. This is not a New Start.			
<b>D. Acquisition Strategy</b>			
ITEP TMRR contracts were based on Full and Open Competition. Awarded Fixed Price Incentive (Firm Target) contracts in FY 2016 to two vendors for TMRR. Following a successful Milestone B decision, currently planned for 1Q19, there will be a down-select to one vendor to be awarded on a cost-plus-incentive-fee contract.			
<b>E. Performance Metrics</b>			
N/A			

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army												Date: May 2017			
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				
Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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) Improved Turbine Engine/ Future Vertical Lift (ITE/FVL), Various : Redstone Arsenal, AL	7.241	4.921	Oct 2015	6.568	Oct 2016	3.796	Oct 2017	-		3.796	Continuing	Continuing	Continuing
ITEP SEPM - Contractor	C/IDIQ	PMO Huntsville, AL Various : PMO Huntsville, AL Various	2.178	2.604	Oct 2015	1.246	Oct 2016	1.892	Oct 2017	-		1.892	Continuing	Continuing	Continuing
ITEP SEPM - OGA	MIPR	PMO Huntsville, AL Various : PMO Huntsville, AL Various	5.211	4.443	Oct 2015	-		3.499	Oct 2017	-		3.499	Continuing	Continuing	Continuing
ITEP EMD SSEB	MIPR	PMO Huntsville, AL Various : PMO Huntsville, AL Various	0.000	-		-		7.744	Oct 2017	-		7.744	0.000	7.744	0.000
Subtotal			14.630	11.968		7.814		16.931		-		16.931	-	-	-
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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 Technology Maturation/Risk Reduction (TMRR) Contracts	C/FPIF	General Electric Company (GE), and Advanced Turbine Engine Company (ATEC) : Lynn, MA (GE), and Huntsville, AL (ATEC)	0.000	32.910	Aug 2016	104.478	Oct 2016	118.698	Oct 2017	-		118.698	0.000	256.086	0.000

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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					
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Boeing - ITEP Vehicle Platform Integration Trade Studies Contract	SS/IDIQ	Program Management Office (PMO) Improved Turbine Engine/ Future Vertical Lift (ITEP/FVL), Various : Redstone Arsenal, AL	15.798	-		2.905	Oct 2016	3.325	Oct 2017	-		3.325	1.500	23.528	0.000
Sikorsky Aircraft - ITEP Vehicle Platform Integration Trade Studies Contract	SS/FPIF	Program Management Office (PMO) Improved Turbine Engine/ Future Vertical Lift (ITEP/FVL), Various : Redstone Arsenal, AL	18.900	-		4.468	Oct 2016	5.833	Oct 2017	-		5.833	1.630	30.831	0.000
EMD Program Acceleration	C/FPIF	TBD : TBD	0.000	-		-		20.000	Oct 2017	-		20.000	0.000	20.000	0.000
Apache Integration and Qualification Phase 1	SS/CPFF	The Boeing Company : Phoenix, AZ	0.000	-		-		29.806	Jan 2018	-		29.806	0.000	29.806	0.000
Subtotal			34.698	32.910		111.851		177.662		-		177.662	3.130	360.251	0.000
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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 Engineering Support - Organic	Allot	Program Management Office (PMO) Improved Turbine Engine/ Future Vertical Lift (ITEP/FVL), Various : Redstone Arsenal, AL	0.000	0.164	Oct 2015	1.143	Oct 2016	0.313	Oct 2017	-		0.313	Continuing	Continuing	Continuing

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: FY 2018 Army</b>												<b>Date: May 2017</b>			
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<b>Support (\$ in Millions)</b>				<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
ITEP Engineering Support - Contractor	C/IDIQ	Program Management Office (PMO) Improved Turbine Engine/ Future Vertical Lift (ITEP/FVL), Various : Redstone Arsenal, AL	0.000	0.781	Oct 2015	1.662	Oct 2016	2.704	Oct 2017	-		2.704	Continuing	Continuing	Continuing
ITEP Engineering Support - OGA	MIPR	Program Management Office (PMO) Improved Turbine Engine/ Future Vertical Lift (ITEP/FVL), Various : Redstone Arsenal, AL	0.000	3.314	Oct 2015	3.635	Oct 2016	6.694	Oct 2017	-		6.694	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.000	4.259		6.440		9.711		-		9.711	-	-	-
			<b>Prior Years</b>	<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>			49.328	49.137		126.105		204.304		-		204.304	-	-	-
<b>Remarks</b>															

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army																Date: May 2017																					
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																	
Event Name										FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
										1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
ITEP Systems Engineering/Program Management																																					
ITEP Development Engineering																																					
(1) EMD RFP Release Decision Point										1																											
(2) Milestone B										2																											
ITEP Detailed Design (EMD)																																					
ITEP Air Vehicle Integration Trade Studies																																					
ITEP Air Vehicle Integration																																					



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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> FY 2018 Army			<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 2040 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607139A / <i>Improved Turbine Engine Program</i>	<b>Project (Number/Name)</b> ES6 / <i>Improved Turbine Engine Program</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
ITEP Systems Engineering/Program Management	1	2015	1	2026
ITEP Development Engineering	4	2016	2	2018
EMD RFP Release Decision Point	4	2017	4	2017
Milestone B	1	2019	1	2019
ITEP Detailed Design (EMD)	1	2019	2	2024
ITEP Air Vehicle Integration Trade Studies	1	2015	4	2018
ITEP Air Vehicle Integration	2	2018	2	2024