Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0607139A *I Improved Turbine Engine Program*							
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	-	173.766	206.434	249.257	-	249.257	245.566	205.906	182.831	130.887	0.000	1,394.647
ES6: *Improved Turbine Engine Program*	-	173.766	206.434	249.257	-	249.257	245.566	205.906	182.831	130.887	0.000	1,394.647

A. Mission Description and Budget Item Justification

Improved Turbine Engine Program (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 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 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. ITEP is postured to accelerate based on General Electric contract incentives and integration.

Fiscal Year (FY) 2019 funds the Engineering and Manufacturing Development (EMD) contract that was awarded to General Electric in February 2019, platform/engine integration design engineering, and ballistic assessments ending in FY 2020. FY 2020 funding continues both the EMD effort and platform/engine integration A-kit development, engine Critical Design Review (CDR), engine component testing will begin, engine fit check will be performed for Apache and Black Hawk platforms, and the CDR for Apache. FY 2021 continues the EMD effort, continues engine component testing, leading to First Engine To Test (FETT), begins Preliminary Flight Rating (PFR) testing, completes the Black Hawk A-Kit CDR, and begins physical airframe integration. FY 2022 funding will continue PFR testing, leading to a Preliminary Flight Rated engine in FY 2023, and continues physical airframe integration. FY 2023 funding provides for aircraft flight/qualification testing for both Apache and Black Hawk and the initiation of engine full qualification testing. FY 2024 funding provides for completion of engine qualification, continuation of aircraft flight/qualification testing for both Apache and Black Hawk, and Low Rate Initial Production (LRIP). FY 2025 funding provides for engine integration and A-kit development for the H-60V platform, Initial Operational Test and Evaluation (IOTE) for Black Hawk and Apache, continuation of LRIP, and continuation of flight/qualification for both Black Hawk and Apache.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army					Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*		R-1 Program Element (Number/Name) PE 0607139A *I Improved Turbine Engine Program*			
B. Program Change Summary ($ in Millions)	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**
Previous President's Budget	188.903	206.434	279.600	-	279.600
Current President's Budget	173.766	206.434	249.257	-	249.257
Total Adjustments	-15.137	0.000	-30.343	-	-30.343
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-15.137	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-30.343	-	-30.343

Change Summary Explanation

For 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 PE 0607139A, Project ES6.

FY 2021 budget adjustment of $30.100M from the President's Budget 2019 submission was based on the Department's mission priorities during the budget build.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
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 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
ES6: *Improved Turbine Engine Program*	-	173.766	206.434	249.257	-	249.257	245.566	205.906	182.831	130.887	0.000	1,394.647
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Improved Turbine Engine Program (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 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 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. ITEP is postured to accelerate based on General Electric contract incentives and integration.

Fiscal Year (FY) 2019 funds the Engineering and Manufacturing Development (EMD) contract that was awarded to General Electric in February 2019, platform/engine integration design engineering, and ballistic assessments ending in FY 2020. FY 2020 funding continues both the EMD effort and platform/engine integration A-kit development, engine Critical Design Review (CDR), engine component testing will begin, engine fit check will be performed for Apache and Black Hawk platforms, and the CDR for Apache. FY 2021 continues the EMD effort, continues engine component testing, leading to First Engine To Test (FETT), begins Preliminary Flight Rating (PFR) testing, completes the Black Hawk A-Kit CDR, and begins physical airframe integration. FY 2022 funding will continue PFR testing, leading to a Preliminary Flight Rated engine in FY 2023, and continues physical airframe integration. FY 2023 funding provides for aircraft flight/qualification testing for both Apache and Black Hawk and the initiation of engine full qualification testing. FY 2024 funding provides for completion of engine qualification, continuation of aircraft flight/qualification testing for both Apache and Black Hawk, and Low Rate Initial Production (LRIP). FY 2025 funding provides for engine integration and A-kit development for the H-60V platform, Initial Operational Test and Evaluation (IOTE) for Black Hawk and Apache, continuation of LRIP, and continuation of flight/qualification for both Black Hawk and Apache.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: ITEP	173.766	197.059	249.257
Description: ITEP - a multi-platform turbine engine development required across existing Army aircraft to fill the capability gaps for Army Aviation Operations			
FY 2020 Plans: Continuation of the EMD engine development effort culminating in a CDR. Continued platform/engine integration and A-kit design/development resulting in two A-kit Preliminary Design Reviews (PDRs) - one for Apache and one for Black Hawk.			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
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 2019	FY 2020	FY 2021
Completion of ballistic assessment, begin engine component testing, and perform engine fit check for both platforms. Life cycle support planning, and completion of the Analysis of Product Support Alternatives. ***FY 2021 Plans:*** FY 2021 continues the EMD effort, continues engine component testing, leading to FETT, begins PFR testing, completes the Black Hawk A-Kit CDR, and begins physical airframe integration. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase is due to the start of PFR engine testing and A-kit manufacturing and testing.			
Title: FY 2020 SBIR/STTR Transfer ***Description:*** Funding transferred in accordance with Title 15 USC ?638 ***FY 2020 Plans:*** Funding transferred in accordance with Title 15 USC ?638 ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC ?638	-	9.375	-
Accomplishments/Planned Programs Subtotals	173.766	206.434	249.257

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.

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 CDR in FY 2020 and Black Hawk CDR in FY2021, the integration efforts will continue to include fabrication of the A-kits, flight test support, and pubs/provisioning.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
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)

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
ITEP SEPM - Organic	Allot	Program Management Office (PMO) Aviation Turbine Engines Project Office (ATE), Various : Redstone Arsenal, AL	25.708	10.299	Oct 2018	9.063	Oct 2019	10.998	Oct 2020	-		10.998	Continuing	Continuing	Continuing
ITEP SEPM - Contractor	C/IDIQ	Program Management Office (PMO) Aviation Turbine Engines Project Office (ATE), Various : Redstone Arsenal, AL	9.668	4.664	Oct 2018	3.425	Oct 2019	4.883	Oct 2020	-		4.883	Continuing	Continuing	Continuing
ITEP SEPM - OGA	MIPR	Program Management Office (PMO) Aviation Turbine Engines Project Office (ATE), Various : Redstone Arsenal, AL	15.015	3.465	Oct 2018	2.161	Oct 2019	3.588	Oct 2020	-		3.588	Continuing	Continuing	Continuing
ITEP EMD SSEB	MIPR	Program Management Office (PMO) Aviation Turbine Engines Project Office (ATE), Various : Redstone Arsenal, AL	5.708	-		-		-		-		-	0.000	5.708	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		9.375		-		-		-	0.000	9.375	-
		Subtotal	56.099	18.428		24.024		19.469		-		19.469	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
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)

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
ITEP Technology Maturation/Risk Reduction (TMRR) Contracts	C/FPIF	General Electric Company (GE), and Advanced Turbine Engine Company (ATEC) : Lynn, MA (GE), and Phoenix, AZ (ATEC)	259.970	-		-		-		-		-	0.000	259.970	-
Engine OEM EMD Contract	C/CPIF	General Electric Company (GE) : Lynn, MA	-	121.900	Feb 2019	136.178	Oct 2019	129.726	Oct 2020	-		129.726	Continuing	Continuing	Continuing
Boeing - ITEP Vehicle Platform Integration Trade Studies Contract	SS/IDIQ	The Boeing Company : Phoenix, AZ	15.200	-		-		-		-		-	0.000	15.200	-
Sikorsky Aircraft - ITEP Vehicle Platform Integration Trade Studies Contract	SS/FPIF	The Sikorsky Corporation : Stratford, CT	26.328	-		-		-		-		-	0.000	26.328	-
Platform Integration and Qualification Contracts	SS/CPIF	The Boeing Company, The Sikorsky Corporation : Phoenix, AZ, Stratford, CT	-	22.529	Aug 2019	35.449	Oct 2019	77.605	Oct 2020	-		77.605	Continuing	Continuing	Continuing
		Subtotal	301.498	144.429		171.627		207.331		-		207.331	Continuing	Continuing	N/A

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
ITEP Engineering Support - Organic	Allot	Program Management Office (PMO) Aviation Turbine Engines Project Office (ATE),	0.483	0.174	Oct 2018	0.178	Oct 2019	0.182	Oct 2020	-		0.182	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army		Date: February 2020
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*

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
		Various : Redstone Arsenal, AL													
ITEP Engineering Support - Contractor	C/IDIQ	Program Management Office (PMO) Aviation Turbine Engines Project Office (ATE), Various : Redstone Arsenal, AL	4.923	3.561	Oct 2018	2.296	Oct 2019	3.729	Oct 2020	-		3.729	Continuing	Continuing	Continuing
ITEP Engineering Support - OGA	MIPR	Program Management Office (PMO) Aviation Turbine Engines Project Office (ATE), Various : Redstone Arsenal, AL	14.632	7.046	Oct 2018	7.959	Oct 2019	11.867	Oct 2020	-		11.867	Continuing	Continuing	Continuing
Platform Integration Support	MIPR	Program Management Office (PMO) Apache and Black Hawk Project Offices : Redstone Arsenal, AL	-	-		-		6.079	Oct 2020	-		6.079	Continuing	Continuing	Continuing
		Subtotal	20.038	10.781		10.433		21.857		-		21.857	Continuing	Continuing	N/A

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
Government Test Planning/Test Setup and Analysis	SS/TBD	Program Management Office (PMO) Aviation Turbine Engines Project Office (ATE), Various : Redstone Arsenal, AL	-	0.128	Mar 2019	0.350	Oct 2019	0.600	Oct 2020	-		0.600	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
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*	

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
		Subtotal	-	0.128		0.350		0.600		-		0.600	Continuing	Continuing	N/A

	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	377.635	173.766		206.434		249.257		-		249.257	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
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*

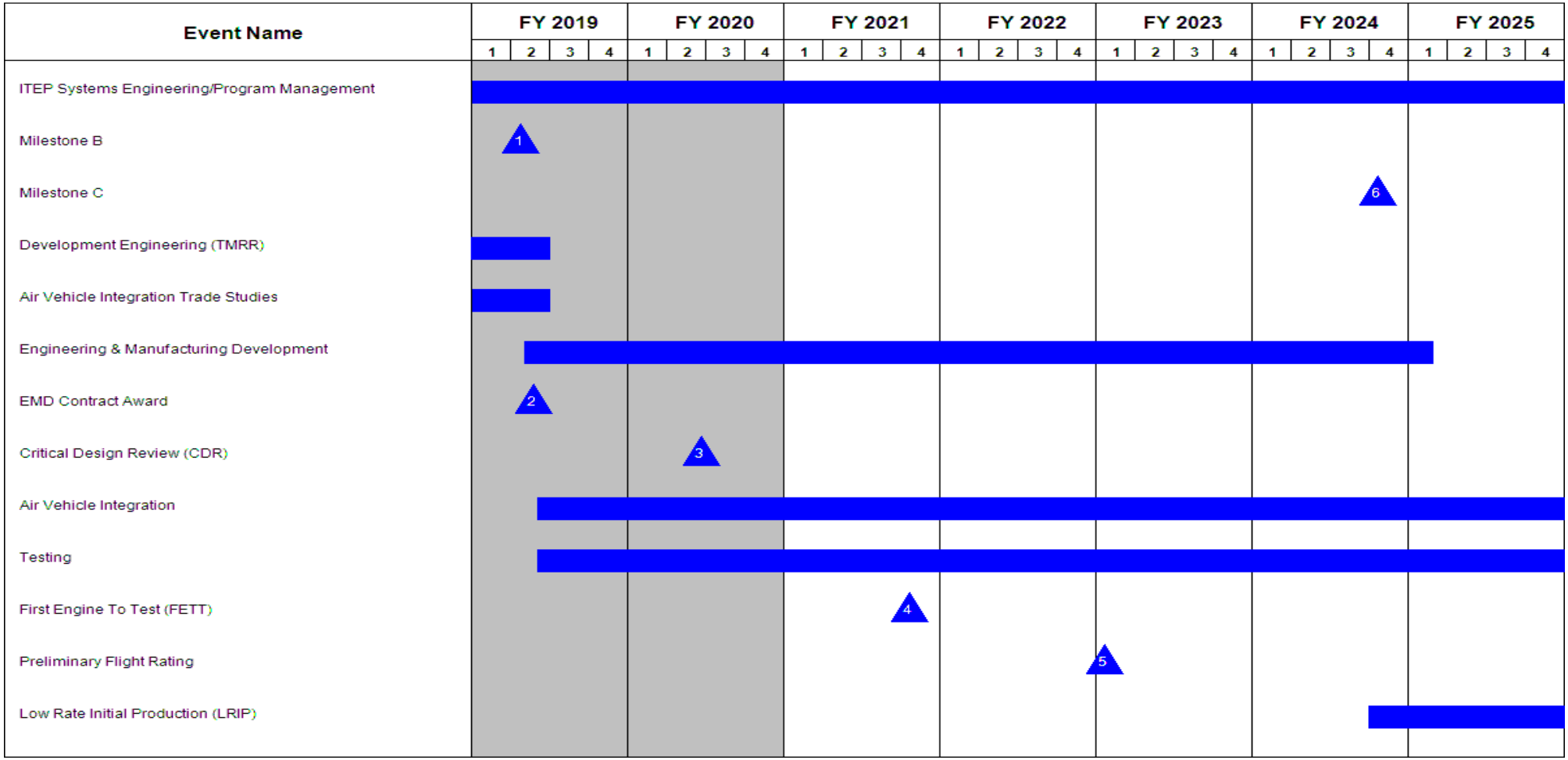

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607139A / *Improved Turbine Engine Program*	**Project (Number/Name)** ES6 / *Improved Turbine Engine Program*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
ITEP Systems Engineering/Program Management	1	2015	1	2026
Milestone B	2	2019	2	2019
Milestone C	4	2024	4	2024
Development Engineering (TMRR)	4	2016	2	2019
Air Vehicle Integration Trade Studies	1	2015	2	2019
Engineering & Manufacturing Development	2	2019	1	2025
EMD Contract Award	2	2019	2	2019
Critical Design Review (CDR)	2	2020	2	2020
Air Vehicle Integration	2	2019	4	2026
Testing	2	2019	1	2026
First Engine To Test (FETT)	4	2021	4	2021
Preliminary Flight Rating	1	2023	1	2023
Low Rate Initial Production (LRIP)	4	2024	4	2026