Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army											Date: February 2018	
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 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	-	111.638	204.304	192.637	-	192.637	246.810	240.846	315.360	250.728	Continuing	Continuing
ES6: *Improved Turbine Engine Program*	-	111.638	204.304	192.637	-	192.637	246.810	240.846	315.360	250.728	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 PE 0607139A, Project ES6.

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 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) Source Selection Evaluation Board (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). FY 2023 funding will provide for aircraft flight/qualification testing for both Apache and Black Hawk.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army					Date: February 2018
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 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	126.105	204.304	196.074	-	196.074
Current President's Budget	111.638	204.304	192.637	-	192.637
Total Adjustments	-14.467	0.000	-3.437	-	-3.437
• Congressional General Reductions	-10.056	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-4.411	-			
• Other Adjustments 1	-	-	-3.437	-	-3.437

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 PE 0607139A, Project ES6.

FY 2017 funding was reduced due to a delay in TMRR contract award.

The FY 2019 funding request was reduced by $3.437M to account for the availability of prior year execution balances.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018
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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
ES6: *Improved Turbine Engine Program*	-	111.638	204.304	192.637	-	192.637	246.810	240.846	315.360	250.728	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 PE 0607139A, Project ES6.

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 6000 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 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) Source Selection Evaluation Board (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). FY 2023 funding will provide for aircraft flight/qualification testing for both Apache and Black Hawk.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: ITEP	111.638	204.304	192.637
Description: ITEP - a multi-platform turbine engine development required across existing Army aircraft to fill the capability gaps for Army Aviation Operations			
FY 2018 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
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 2017	FY 2018	FY 2019
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. ***FY 2019 Plans:*** Down-select to a single vendor, and award an EMD contract to develop, test, and qualify the engine design. Platform/engine integration design engineering will begin. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Down-select to a single vendor results in an engine OEM EMD contract award in FY 2019.			
Accomplishments/Planned Programs Subtotals	111.638	204.304	192.637

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

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.

D. Acquisition Strategy

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, there will be a cost-plus-incentive-fee contract awarded to one vendor for EMD contractual effort.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army			Date: February 2018
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 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total 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	12.162	0.256	Oct 2016	13.267	Oct 2017	10.299	Oct 2018	-		10.299	Continuing	Continuing	Continuing
ITEP SEPM - Contractor	C/IDIQ	PMO Huntsville, AL Various : PMO Huntsville, AL Various	4.782	0.319	Oct 2016	4.567	Oct 2017	4.664	Oct 2018	-		4.664	Continuing	Continuing	Continuing
ITEP SEPM - OGA	MIPR	PMO Huntsville, AL Various : PMO Huntsville, AL Various	9.654	1.967	Oct 2016	3.394	Oct 2017	3.465	Oct 2018	-		3.465	Continuing	Continuing	Continuing
ITEP EMD SSEB	MIPR	PMO Huntsville, AL Various : PMO Huntsville, AL Various	-	-		7.744	Oct 2017	-		-		-	0.000	7.744	-
		Subtotal	26.598	2.542		28.972		18.428		-		18.428	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 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 Huntsville, AL (ATEC)	38.710	103.626	Oct 2016	115.907	Oct 2017	-		-		-	0.000	258.243	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army			Date: February 2018
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 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engine OEM EMD Contract	C/FPIF	TBD : TBD	-	-		-		129.903	Jan 2019	-		129.903	Continuing	Continuing	-
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	9.998	-		11.652	Oct 2017	-		-		-	0.000	21.650	-
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	-		4.832	Oct 2017	-		-		-	0.000	23.732	-
Apache Integration and Qualification Phase I	SS/CPFF	The Boeing Company : Phoenix AZ	-	-		29.806	Oct 2017	-		-		-	0.000	29.806	-
Platform Integration and Qualification Contracts, Phase I	SS/CPIF	Sikorsky Corporation, The Boeing Company : Stratford, CT; Phoenix, AZ	-	-		-		30.012	Oct 2018	-		30.012	Continuing	Continuing	-
		Subtotal	67.608	103.626		162.197		159.915		-		159.915	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ITEP Engineering Support - Organic	Allot	Program Management Office	0.164	0.149	Oct 2016	0.170	Oct 2017	0.174	Oct 2018	-		0.174	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army			Date: February 2018
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 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		(PMO) Improved Turbine Engine/ Future Vertical Lift (ITEP/FVL), Various : Redstone Arsenal, AL													
ITEP Engineering Support - Contractor	C/IDIQ	Program Management Office (PMO) Improved Turbine Engine/ Future Vertical Lift (ITEP/FVL), Various : Redstone Arsenal, AL	0.781	0.654	Oct 2016	3.488	Oct 2017	3.561	Oct 2018	-		3.561	Continuing	Continuing	Continuing
ITEP Engineering Support - OGA	MIPR	Program Management Office (PMO) Improved Turbine Engine/ Future Vertical Lift (ITEP/FVL), Various : Redstone Arsenal, AL	3.314	4.667	Oct 2016	9.477	Oct 2017	7.046	Oct 2018	-		7.046	Continuing	Continuing	Continuing
		Subtotal	4.259	5.470		13.135		10.781		-		10.781	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engine OEM EMD Contract	C/CPIF	TBD : TBD	-	-		-		2.697	Jan 2019	-		2.697	0.000	2.697	Continuing
Government Test Planning	SS/TBD	TBD : TBD	-	-		-		0.816	Oct 2018	-		0.816	0.000	0.816	-
		Subtotal	-	-		-		3.513		-		3.513	0.000	3.513	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army			Date: February 2018
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*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	98.465	111.638		204.304		192.637		-		192.637	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
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*

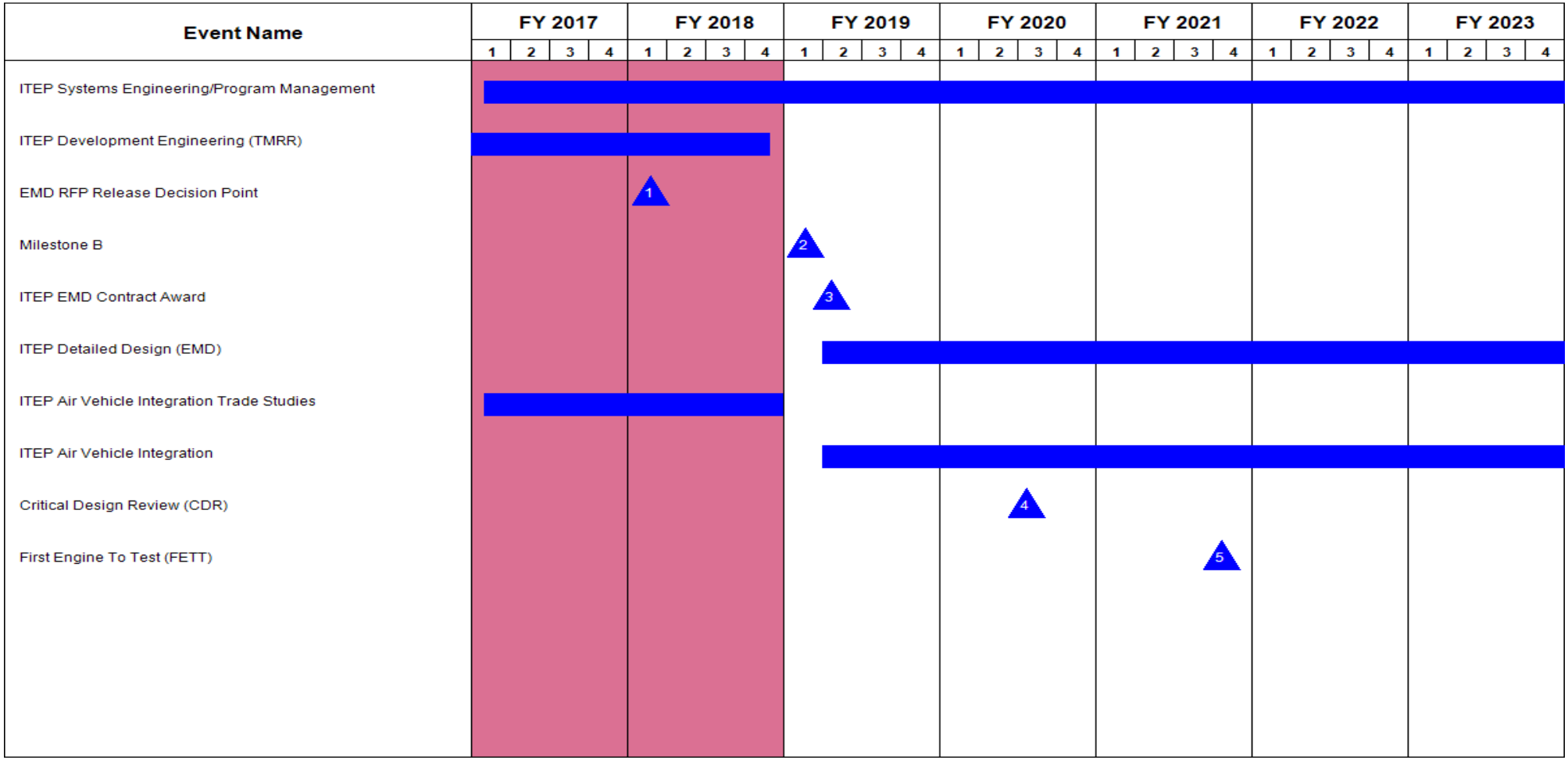

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607139A / *Improved Turbine Engine Program*	**Project (Number/Name)** ES6 / *Improved Turbine Engine Program*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
ITEP Systems Engineering/Program Management	1	2015	1	2026
ITEP Development Engineering (TMRR)	4	2016	4	2018
EMD RFP Release Decision Point	1	2018	1	2018
Milestone B	1	2019	1	2019
ITEP EMD Contract Award	2	2019	2	2019
ITEP Detailed Design (EMD)	2	2019	3	2024
ITEP Air Vehicle Integration Trade Studies	1	2015	4	2018
ITEP Air Vehicle Integration	2	2019	2	2024
Critical Design Review (CDR)	3	2020	3	2020
First Engine To Test (FETT)	4	2021	4	2021