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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
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Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603851F I Intercontinental Ballistic Missile - Dem/Val							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	27.424	32.356	44.109	0.000	44.109	65.582	66.944	68.165	9.896	Continuing	Continuing
641020: ICBM Guidance Applications	-	0.486	5.659	5.184	0.000	5.184	7.887	8.155	8.395	0.000	Continuing	Continuing
641021: ICBM Propulsion Applications	-	0.323	9.701	6.849	0.000	6.849	6.967	7.111	7.241	7.372	Continuing	Continuing
641022: ICBM Reentry Vehicle Applications	-	24.543	12.720	24.439	0.000	24.439	39.776	40.186	40.554	0.000	Continuing	Continuing
641024: ICBM Command & Control (C2) Applications	-	0.971	1.365	3.713	0.000	3.713	6.960	7.417	7.826	0.000	Continuing	Continuing
644209: Long Range Planning (LRP)	-	1.101	2.911	3.924	0.000	3.924	3.992	4.075	4.149	2.524	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program ensures a responsive design and development engineering infrastructure to address emerging issues and technology insertion/technology application on legacy Intercontinental Ballistic Missile (ICBM), future strategic systems/capability beyond the Ground Based Strategic Deterrent (GBSD) baseline, and other common strategic deterrent mission areas to develop enhanced multi-use capabilities. The ICBM Dem/Val program will provide technology maturation and risk reduction activities to support Minuteman (MM) III sustainment, MM III to GBSD transition, and future ICBM systems development. ICBM Dem/Val conducts advanced component development and prototyping to validate emerging strategic missile technologies and future upgrades to the baseline Ground Based Strategic Deterrent, currently in development through a low risk, technologically-mature acquisition strategy. Efforts will identify methods to improve system performance, develop potential future RV designs, mitigate evolving threats, reduce life cycle costs, develop/expand modeling/simulation and experimental platforms for weapon qualification activities, improve nuclear safety and surety, and ensure both viability and durability of strategic missile systems.

Budget increase from FY19 to FY20 largely due to \$9.5M mark in FY19 for 'unjustified growth.' Average funding for ICBM Dem/Val between 1995 to 2018 was \$51.020M per year for the purpose of developing technologies, reducing lifecycle costs, reducing risk to the ICBM weapon system, and maintaining industry base. After ramping down to avoid duplication of effort with GBSD between FY16-18, ICBM Dem/Val began expanding efforts again in FY19.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver ICBM Dem/Val capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605833F, and 0605898F.

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Appropriation/Budget Activity		R-1 Program Element (Number/Name)				
3600: Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0603851F I Intercontinental Ballistic Missile - Dem/Val				
As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is \$14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.						
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.						
B. Program Change Summary (\$ in Millions)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget		10.736	41.856	44.109	0.000	44.109
Current President's Budget		27.424	32.356	44.109	0.000	44.109
Total Adjustments		16.688	-9.500	0.000	0.000	0.000
• Congressional General Reductions		0.000	0.000			
• Congressional Directed Reductions		0.000	-9.500			
• Congressional Rescissions		0.000	0.000			
• Congressional Adds		20.000	0.000			
• Congressional Directed Transfers		0.000	0.000			
• Reprogrammings		0.000	0.000			
• SBIR/STTR Transfer		-1.001	0.000			
• Other Adjustments		-2.311	0.000	0.000	0.000	0.000
Congressional Add Details (\$ in Millions, and Includes General Reductions)						
Project: 641022: ICBM Reentry Vehicle Applications Congressional Add: Program increase					FY 2018	FY 2019
					20.000	0.000
					20.000	0.000
Congressional Add Subtotals for Project: 641022					20.000	0.000
Congressional Add Totals for all Projects					20.000	0.000
Change Summary Explanation						
FY 2018 funding reflects a Congressional Add of \$20.000 million for the Rocket System Launch Program (RSLP).						
FY 2018 funding reflects a \$2.311 million adjustment for Federally Funded Research and Development Centers (FFRDC) and a Small Business Innovation Research (SBIR) adjustment of \$1.001 million.						
FY 2019 funding reflects a Congressionally directed reduction of \$9.500 million for "unjustified growth."						

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force										Date: February 2019		
Appropriation/Budget Activity 3600 / 4					R-1 Program Element (Number/Name) PE 0603851F / Intercontinental Ballistic Missile - Dem/Val				Project (Number/Name) 641020 / ICBM Guidance Applications			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
641020: ICBM Guidance Applications	-	0.486	5.659	5.184	0.000	5.184	7.887	8.155	8.395	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Guidance Applications Program (GAP) ensures the development of strategic capability in response to the Nuclear Posture Review, recommendations of the United States Strategic Command (USSTRATCOM) Strategic Advisory Group, USSTRATCOM Commander Guidance, and the Defense Science Board Task Force on Nuclear Deterrence. The program studies and assesses both legacy and future (non-GBSD baseline) ICBM Guidance System technology applications. Efforts are focused on current and future requirements and technologies, reduced life cycle costs, and increased nuclear surety and safety. Activities leverage the efforts of the Science and Technology community and are coordinated with the Navy strategic applications program to enhance synergy and avoid duplication. Key elements include developing responsive technologies with common applications for future strategic guidance capabilities. This program also includes any needed nuclear surety and certification and system vulnerability assessments.

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

	FY 2018	FY 2019	FY 2020
Title: Guidance Applications Program	0.486	5.659	5.184
Description: Develop and mature advanced technologies and concepts to support future requirements.			
FY 2019 Plans:			
<ul style="list-style-type: none"> • Continue the evaluation and testing of strategic and space guidance-related commodities within market for potential use in a future (non-GBSD baseline) strategic guidance system; coordinate with the Navy strategic applications program. • Continue development of a Micro-Electro Mechanical System for potential insertion into the Path Length Module. • Expand the Strategic Guidance Hardware independent validation & verification capability to include multi-G force environment and other various environments; perform Guidance analyses and Guidance technology studies. • Identify emerging technologies for future strategic grade gyros and accelerometers to ensure appropriate test capability development. • Rapidly respond to evolving warfighter priorities and emerging requirements. 			
FY 2020 Plans:			
<ul style="list-style-type: none"> • Continue the evaluation and testing of strategic and space guidance-related commodities within market for potential use in a future (non-GBSD baseline) strategic guidance system; coordinate with the Navy strategic applications program. • Continue development of a Micro-Electro Mechanical System for potential insertion into the Path Length Module. • Continue expanding the Strategic Guidance Hardware independent validation & verification capability to include multi-G force environment and other various environments; perform Guidance analyses and Guidance technology studies. 			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force										Date: February 2019		
Appropriation/Budget Activity 3600 / 4				R-1 Program Element (Number/Name) PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>				Project (Number/Name) 641020 / <i>ICBM Guidance Applications</i>				
B. Accomplishments/Planned Programs (\$ in Millions)										FY 2018	FY 2019	FY 2020
<ul style="list-style-type: none"> Continue evaluating emerging technologies for future strategic grade gyros and accelerometers to ensure appropriate test capability development. Rapidly respond to evolving warfighter priorities and emerging requirements. 												
FY 2019 to FY 2020 Increase/Decrease Statement: Decrease due to ramp-down towards completion of Micro-Electronic Mechanical Path Length Module effort.												
Accomplishments/Planned Programs Subtotals										0.486	5.659	5.184
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost	
• RDTE 04 PE 0605230F: <i>GBSD</i>	221.536	414.441	570.373	-	570.373	1,527.545	2,540.300	3,039.900	3,078.800	Continuing	Continuing	
Remarks												
D. Acquisition Strategy Accomplish studies, analyses, concept development and engineering; efforts will be conducted using contracting strategies deemed most appropriate, generally using competitive contracts and/or other obligating documentation considered most appropriate by obligating and performing agencies involved. Current effort deliverables to include strategic grade guidance prototypes to support multiple ongoing Air Force initiatives.												
E. Performance Metrics Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.												

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force												Date: February 2019			
Appropriation/Budget Activity 3600 / 4						R-1 Program Element (Number/Name) PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>						Project (Number/Name) 641020 / <i>ICBM Guidance Applications</i>			

Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
GAP Micro-Electronic Module System	Various	Various : Various	-	0.214	Jan 2018	2.047	Jan 2019	0.569	Jan 2020	-		0.569	Continuing	Continuing	-
GAP Emerging Strategic Instrument	Various	Various : Various	-	0.237	Jan 2018	3.392	Jan 2019	4.410	Jan 2020	-		4.410	Continuing	Continuing	-
Subtotal			-	0.451		5.439		4.979		-		4.979	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
GAP, Program Management Administrative Support Services	C/Various	Various : Various	-	0.035	Jan 2018	0.220	Jan 2019	0.205	Jan 2020	-		0.205	Continuing	Continuing	-
Subtotal			-	0.035		0.220		0.205		-		0.205	Continuing	Continuing	N/A

			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	0.486		5.659		5.184		-		5.184	Continuing	Continuing	N/A

Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force										Date: February 2019																			
Appropriation/Budget Activity 3600 / 4										R-1 Program Element (Number/Name) PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>										Project (Number/Name) 641020 / <i>ICBM Guidance Applications</i>									

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
GAP																												
GAP Micro-Electronic Module System																												
GAP Emerging Strategic Instrument Technology Requirements																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	Project (Number/Name) 641020 / <i>ICBM Guidance Applications</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
GAP				
GAP Micro-Electronic Module System	2	2018	2	2020
GAP Emerging Strategic Instrument Technology Requirements	2	2018	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force										Date: February 2019		
Appropriation/Budget Activity 3600 / 4					R-1 Program Element (Number/Name) PE 0603851F / Intercontinental Ballistic Missile - Dem/Val				Project (Number/Name) 641021 / ICBM Propulsion Applications			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
641021: ICBM Propulsion Applications	-	0.323	9.701	6.849	0.000	6.849	6.967	7.111	7.241	7.372	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The Propulsion Applications Program (PAP) develops and assesses strategic propulsion system technology applications for both legacy and future (non-GBSD baseline) systems through projects exploring improvements and/or alternatives to current propulsion systems, conducting studies assessing application of new technologies to meet future common propulsion systems requirements, and assessing opportunities for applying common materials and technology between the ICBM, submarine-launched ballistic missile (SLBM) propulsion systems, and other rocket motor propulsion capabilities. Efforts are focused on current and future requirements and technologies, reduced life cycle costs, and increased nuclear surety, safety, certification and system vulnerability assessments.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2018	FY 2019	FY 2020	
Title: Propulsion Applications Program									0.323	9.701	6.849	
Description: Assess, develop, evaluate, and demonstrate common solid and liquid propulsion technology and manufacturing leading up to a static fire and test of strategic propulsion systems; develop capability and explore improvements to current and future propulsion systems; and support the research and development industrial base and critical infrastructure.												
FY 2019 Plans:												
• Complete trade studies and risk reduction of components and subsystem propulsion technologies for future ICBM program insertion.												
• Initiate propellant studies to develop propellant formulations for future ICBM program insertion.												
• Initiate propulsion systems studies to develop alternative propulsion systems for future ICBM program insertion.												
• Initiate sensor technology study to develop and enhance propulsion systems management.												
• Rapidly respond to evolving warfighter priorities and emerging requirements.												
• Complete Propulsion Nuclear Environment Study.												
FY 2020 Plans:												
• Continue propellant studies to develop propellant formulations for future ICBM program insertion.												
• Continue propulsion systems studies to develop alternative propulsion systems for future ICBM program insertion.												
• Continue sensor technology study to develop and enhance propulsion systems management.												
• Rapidly respond to evolving warfighter priorities and emerging requirements.												
FY 2019 to FY 2020 Increase/Decrease Statement:												

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force										Date: February 2019		
Appropriation/Budget Activity 3600 / 4				R-1 Program Element (Number/Name) PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>				Project (Number/Name) 641021 / <i>ICBM Propulsion Applications</i>				
B. Accomplishments/Planned Programs (\$ in Millions)										FY 2018	FY 2019	FY 2020
Decrease due to completion of trade studies and risk reduction of components and subsystem propulsion technologies.												
Accomplishments/Planned Programs Subtotals										0.323	9.701	6.849
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost	
• RDTE 04 PE 0605230F: <i>GBSD</i>	221.536	414.441	570.373	-	570.373	1,527.545	2,540.300	3,039.900	3,078.800	Continuing	Continuing	
Remarks												
D. Acquisition Strategy												
Studies, analyses, limited engineering, hardware development and/or testing will be accomplished; efforts will be conducted using contracting strategies deemed most appropriate, generally using competitive contracts and/or other obligating documentation considered most appropriate by obligating and performing agencies involved. Current effort deliverables include alternate propulsion technology prototypes and low toxic hazard propellants that can be utilized in a variety of Air Force applications.												
E. Performance Metrics												
Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.												

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force												Date: February 2019			
Appropriation/Budget Activity 3600 / 4						R-1 Program Element (Number/Name) PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>				Project (Number/Name) 641021 / <i>ICBM Propulsion Applications</i>					
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
PAP Trade Studies/Risk Reduction	MIPR	SNL : Kirtland AFB, NM	-	0.138	Jan 2018	-		-		-		-	Continuing	Continuing	-
PAP Propulsion Technology HPM Parametric Study	MIPR	SNL : Albuquerque, NM	-	0.103	Oct 2017	-		-		-		-	Continuing	Continuing	-
PAP Propulsion Nuclear Environment Study	MIPR	SNL : Albuquerque, NM	-	0.064	Oct 2017	-		-		-		-	Continuing	Continuing	-
PAP Propellant Studies	Various	Various : Various	-	-		1.900	Jan 2019	2.866	Jan 2020	-		2.866	Continuing	Continuing	-
PAP Alternate Propulsion Systems Studies	Various	Various : Various	-	-		2.400	Apr 2019	1.500	Apr 2020	-		1.500	Continuing	Continuing	-
PAP Sensor Technology Studies	Various	Various : Various	-	-		5.000	Jan 2019	2.200	Jan 2020	-		2.200	Continuing	Continuing	-
Subtotal			-	0.305		9.300		6.566		-		6.566	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
PAP Program Management Administration	Various	Various : Various	-	0.018	Jan 2018	0.401	Jan 2019	0.283	Jan 2020	-		0.283	Continuing	Continuing	-
Subtotal			-	0.018		0.401		0.283		-		0.283	Continuing	Continuing	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	0.323		9.701		6.849		-		6.849	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force																Date: February 2019			
Appropriation/Budget Activity 3600 / 4								R-1 Program Element (Number/Name) PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>								Project (Number/Name) 641021 / <i>ICBM Propulsion Applications</i>			

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
PAP																												
PAP Trade Studies/Risk Reduction																												
PAP Propulsion Technology HPM Parametric Study																												
PAP Propulsion Nuclear Environment Study																												
PAP Propellant Studies																												
PAP Alternate Propulsion Systems Studies																												
PAP Sensor Technology Studies																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	Project (Number/Name) 641021 / <i>ICBM Propulsion Applications</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
PAP				
PAP Trade Studies/Risk Reduction	1	2018	2	2019
PAP Propulsion Technology HPM Parametric Study	1	2018	2	2019
PAP Propulsion Nuclear Environment Study	1	2018	2	2019
PAP Propellant Studies	2	2019	2	2021
PAP Alternate Propulsion Systems Studies	3	2019	3	2022
PAP Sensor Technology Studies	2	2019	2	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force										Date: February 2019		
Appropriation/Budget Activity 3600 / 4					R-1 Program Element (Number/Name) PE 0603851F / Intercontinental Ballistic Missile - Dem/Val				Project (Number/Name) 641022 / ICBM Reentry Vehicle Applications			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
641022: ICBM Reentry Vehicle Applications	-	24.543	12.720	24.439	0.000	24.439	39.776	40.186	40.554	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Reentry Vehicle Applications Program (RVAP) ensures the ICBM force is equipped with the safest, most reliable, most survivable Reentry Systems, and explores options for common, multi-mission capabilities. The program enables a responsive engineering infrastructure by developing modeling/simulation and ground and flight test platforms to support Reentry System qualifications. The program ensures the availability of long-lead components and materials while identifying life cycle cost reduction methods. In addition, the program matures and tests advanced Reentry System technologies and designs to meet future requirements. This includes studying and assessing technology applications relevant to Mk12A, Mk21, Mk21A and future ICBM Reentry Systems. The program leverages investments by the Science & Technology community and Navy reentry systems applications program. Testing may occur on a space available basis on Air Force and Navy Force Development Evaluation (FDE) flights.

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

	FY 2018	FY 2019	FY 2020
Title: Reentry Vehicle Applications Program	4.543	12.720	24.439
Description: Mature, evaluate, and test reentry system materials, technologies, and vehicles including modeling/simulation, and ground and flight test platforms for use in current and future strategic applications.			
FY 2019 Plans: <ul style="list-style-type: none"> • Continue and initiate new risk reduction studies for RV nosetips to mature and evaluate future heatshield development, carbon phenolic replacements, modeling and simulation programs, manufacturing capabilities, reentry system technologies, threat development analysis and countermeasure technologies/strategies, and inform future RV capabilities. • Complete thermal protection system testing and studies. • Conduct materials development, prototyping, and test. • Develop new modeling/simulation and flight test platforms for future weapon qualification activities. • Continue supporting the Joint Technology Demonstrator. • Continue supporting the Air Force and NNSA Demonstrator Initiative. • Develop advanced sensors for surveillance and flight test diagnostics. • Continue study for future RV concepts. • Continue materials test platform on orbital vehicle. • Continue and initiate new aeroshell modification and development studies. 			

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B. Accomplishments/Planned Programs (\$ in Millions)										FY 2018	FY 2019	FY 2020
<ul style="list-style-type: none"> • Rapidly respond to evolving warfighter priorities and emerging requirements. <p>FY 2020 Plans:</p> <ul style="list-style-type: none"> • Continue and initiate new risk reduction studies for RV nosetips to mature and evaluate future heatshield development, carbon phenolic replacements, modeling and simulation programs, manufacturing capabilities, reentry system technologies, threat development analysis and countermeasure technologies/strategies, and inform future RV capabilities. • Conduct materials development, prototyping, and test. • Develop new modeling/simulation and flight test platforms for future weapon qualification activities. • Continue supporting the Joint Technology Demonstrator. • Continue supporting the Air Force and NNSA Demonstrator Initiative. • Develop advanced sensors for surveillance and flight test diagnostics. • Continue study for future RV concepts. • Continue materials test platform on orbital vehicle. • Continue aeroshell modification and development studies. • Rapidly respond to evolving warfighter priorities and emerging requirements. <p>FY 2019 to FY 2020 Increase/Decrease Statement: Increase due to nosetip materials, prototyping, and sensors studies effort ramp up.</p>												
Accomplishments/Planned Programs Subtotals										4.543	12.720	24.439
										FY 2018	FY 2019	
Congressional Add: Program increase										20.000	0.000	
FY 2018 Accomplishments: Conducted propulsion and solid rocket motor studies (RSLP)												
FY 2019 Plans: N/A												
Congressional Adds Subtotals										20.000	0.000	
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost	
• RDTE 04 PE 0605230F: <i>GBSD</i>	221.536	414.441	570.373	-	570.373	1,527.545	2,540.300	3,039.900	3,078.800	Continuing	Continuing	
Remarks												

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Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	Project (Number/Name) 641022 / <i>ICBM Reentry Vehicle Applications</i>

D. Acquisition Strategy

Studies, analyses, limited engineering, and pre-prototype hardware development will be accomplished; efforts will be conducted using contracting strategies deemed most appropriate, generally using competitive contracts and/or other obligating documentation considered most appropriate by obligating and performing agencies involved. Current effort deliverables include various technologies for ICBM re-entry vehicles including nosetip materials, modeling and simulation software, alternate high temperature materials, and methodologies for modifying aeroshells.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force												Date: February 2019			
Appropriation/Budget Activity 3600 / 4						R-1 Program Element (Number/Name) PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>						Project (Number/Name) 641022 / <i>ICBM Reentry Vehicle Applications</i>			
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
RVAP Support	C/FFP	BAE Systems : Clearfield, UT	-	0.143	Mar 2018	0.515	Mar 2019	1.000	Mar 2020	-		1.000	Continuing	Continuing	-
Subtotal			-	0.143		0.515		1.000		-		1.000	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Propulsion and Solid Rocket Motor Studies (RSLP)	MIPR	AFRL; RSLP : Albuquerque, NM	-	20.000	Jan 2019	-		-		-		-	Continuing	Continuing	-
RVAP Joint Technology Demonstrator	MIPR	SNL and LLNL : Various	-	1.000	Jan 2018	2.300	Jan 2019	1.663	Jan 2020	-		1.663	Continuing	Continuing	-
RVAP TPS Testing and Analysis	Various	Various : Various	-	0.088	Jan 2018	-		-		-		-	Continuing	Continuing	-
RVAP Flight Materials Test Platform	MIPR	SAF/FMBIB : Various	-	0.500	Jul 2018	0.500	Jul 2019	0.500	Jul 2020	-		0.500	Continuing	Continuing	-
RVAP Modeling and Simulation Programs	Various	Various : Various	-	-		0.300	Feb 2019	0.460	Feb 2020	-		0.460	Continuing	Continuing	-
RVAP Nosetip Studies	Various	Various : Various	-	0.454	Apr 2018	2.000	Apr 2019	4.605	Apr 2020	-		4.605	Continuing	Continuing	-
RVAP Advanced Concept Studies	Various	Various : Various	-	0.087	Nov 2017	2.655	Jan 2019	5.365	Jan 2020	-		5.365	Continuing	Continuing	-
RVAP Air Force and NNSA Demonstrator Initiative	MIPR	SNL and LLNL : Various	-	1.312	Jan 2018	2.500	Jan 2019	8.198	Jan 2020	-		8.198	Continuing	Continuing	-
RVAP Aeroshell Studies	Various	Various : Various	-	0.502	Jan 2018	0.950	Jan 2019	1.535	Jan 2020	-		1.535	Continuing	Continuing	-
RVAP Sensors Studies	Various	Various : Various	-	0.295	Jan 2018	0.500	Jan 2019	0.588		-		0.588	Continuing	Continuing	-
Subtotal			-	24.238		11.705		22.914		-		22.914	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force												Date: February 2019			
Appropriation/Budget Activity 3600 / 4						R-1 Program Element (Number/Name) PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>						Project (Number/Name) 641022 / <i>ICBM Reentry Vehicle Applications</i>			
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
RVAP Program Management Administration	Various	Various : Various	-	0.162	Jan 2018	0.500	Jan 2019	0.525	Jan 2020	-		0.525	Continuing	Continuing	-
Subtotal			-	0.162		0.500		0.525		-		0.525	Continuing	Continuing	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	24.543		12.720		24.439		-		24.439	Continuing	Continuing	N/A
Remarks Due to limited funding in FY19, some requirements were deferred to FY20 causing a dramatic ramp-up in FY20 efforts.															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force			Date: February 2019		
Appropriation/Budget Activity 3600 / 4		R-1 Program Element (Number/Name) PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>			Project (Number/Name) 641022 / <i>ICBM Reentry Vehicle Applications</i>

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
RVAP																												
Propulsion and Rocket Motor Studies																												
RVAP Joint Technology Demonstrator																												
RVAP TPS Testing and Analysis																												
RVAP Flight Materials Test Platform																												
RVAP Modeling and Simulation Programs																												
RVAP Nosetip Studies																												
RVAP Advanced Concept Studies																												
RVAP Air Force and NNSA Demonstrator Initiative																												
RVAP Aeroshell Studies																												
RVAP Sensors Studies																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	Project (Number/Name) 641022 / <i>ICBM Reentry Vehicle Applications</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
RVAP				
Propulsion and Rocket Motor Studies	2	2018	4	2019
RVAP Joint Technology Demonstrator	1	2018	3	2021
RVAP TPS Testing and Analysis	1	2018	2	2019
RVAP Flight Materials Test Platform	4	2018	4	2022
RVAP Modeling and Simulation Programs	2	2019	4	2023
RVAP Nosetip Studies	3	2018	4	2022
RVAP Advanced Concept Studies	1	2018	2	2021
RVAP Air Force and NNSA Demonstrator Initiative	2	2018	4	2023
RVAP Aeroshell Studies	1	2018	4	2024
RVAP Sensors Studies	2	2018	4	2019

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force										Date: February 2019		
Appropriation/Budget Activity 3600 / 4					R-1 Program Element (Number/Name) PE 0603851F / Intercontinental Ballistic Missile - Dem/Val				Project (Number/Name) 641024 / ICBM Command & Control (C2) Applications			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
641024: ICBM Command & Control (C2) Applications	-	0.971	1.365	3.713	0.000	3.713	6.960	7.417	7.826	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The Command and Control Applications Program (C2AP) supports ICBM weapon system connectivity to the President and National Command Authorities. C2AP studies and assesses both legacy and future (non-GBSD baseline) C2 System technology applications. C2AP evaluates and develops assured, survivable, and secure communications and battlespace awareness between the missile Launch Control Centers and Launch Facilities essential for mission execution. Efforts include identifying and developing current and future technologies, as well as concepts that exploit state-of-the-art communications and information transfer techniques to both current and future ICBM systems. Products include studies, demonstrations and tests such as ICBM Weapon System C2 (WSC2) architectures, networks, and systems to meet nuclear command and control requirements.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2018	FY 2019	FY 2020	
Title: Command and Control Application Program									0.971	1.365	3.713	
Description: Examine and develop concepts for transforming ICBM WSC2 to meet current and future requirements.												
FY 2019 Plans:												
• Complete Electronic Technical Orders prototype for ICBM platforms.												
• Continue Battlespace Awareness studies.												
• Rapidly respond to evolving warfighter priorities and emerging requirements.												
FY 2020 Plans:												
• Initiate high frequency radio study to meet current and future system requirements.												
• Initiate cyber studies of technologies to improve weapon system command and control systems management.												
• Continue Battlespace Awareness studies.												
• Rapidly respond to evolving warfighter priorities and emerging requirements.												
FY 2019 to FY 2020 Increase/Decrease Statement:												
Increase due to beginning high-frequency and cyber studies.												
Accomplishments/Planned Programs Subtotals									0.971	1.365	3.713	

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	Project (Number/Name) 641024 / <i>ICBM Command & Control (C2) Applications</i>	

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u> <u>Base</u>	<u>FY 2020</u> <u>OCO</u>	<u>FY 2020</u> <u>Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• RDTE 04 PE 0605230F: <i>GBSD</i>	221.536	414.441	570.373	-	570.373	1,527.545	2,540.300	3,039.900	3,078.800	Continuing	Continuing

Remarks

D. Acquisition Strategy

Studies, analyses, limited engineering, will be accomplished; efforts will be conducted using contracting strategies deemed most appropriate, generally using competitive contracts and/or other obligating documentation considered most appropriate by obligating and performing agencies involved. Current effort deliverables to include electronic technical order prototype and validation of a Navy-developed system for ICBM battlespace awareness needs.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force												Date: February 2019			
Appropriation/Budget Activity 3600 / 4						R-1 Program Element (Number/Name) PE 0603851F / Intercontinental Ballistic Missile - Dem/Val				Project (Number/Name) 641024 / ICBM Command & Control (C2) Applications					
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
C2AP Electronic Technical Orders	C/CPFF	Johns Hopkins - APL : Laurel, MD	-	0.634	May 2018	0.260	May 2019	-		-		-	Continuing	Continuing	-
C2AP Battlespace Awareness Studies	Various	Various : Various	-	0.273	Jan 2018	0.995	Jan 2019	0.605	Jan 2020	-		0.605	Continuing	Continuing	-
C2AP High Frequency Radio Technology Study	TBD	TBD : TBD	-	-		-		1.500	Jan 2020	-		1.500	Continuing	Continuing	-
C2AP Cyber Technologies Study	TBD	TBD : TBD	-	-		-		1.313	Jan 2020	-		1.313	Continuing	Continuing	-
Subtotal			-	0.907		1.255		3.418		-		3.418	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
C2AP Program Management	C/FFP	Various : Various	-	0.064	Jan 2018	0.110	Jan 2019	0.295	Jan 2020	-		0.295	Continuing	Continuing	-
Subtotal			-	0.064		0.110		0.295		-		0.295	Continuing	Continuing	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	0.971		1.365		3.713		-		3.713	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force										Date: February 2019			
Appropriation/Budget Activity 3600 / 4					R-1 Program Element (Number/Name) PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>					Project (Number/Name) 641024 / <i>ICBM Command & Control (C2) Applications</i>			

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
C2AP																												
C2AP Electronic Technical Orders																												
C2AP Battlespace Awareness Studies																												
C2AP High Frequency Radio Technology Study																												
C2AP Cyber Technologies																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	Project (Number/Name) 641024 / <i>ICBM Command & Control (C2) Applications</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
C2AP				
C2AP Electronic Technical Orders	3	2018	3	2019
C2AP Battlespace Awareness Studies	2	2018	2	2020
C2AP High Frequency Radio Technology Study	2	2020	3	2022
C2AP Cyber Technologies	2	2020	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force										Date: February 2019		
Appropriation/Budget Activity 3600 / 4					R-1 Program Element (Number/Name) PE 0603851F / Intercontinental Ballistic Missile - Dem/Val				Project (Number/Name) 644209 / Long Range Planning (LRP)			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
644209: Long Range Planning (LRP)	-	1.101	2.911	3.924	0.000	3.924	3.992	4.075	4.149	2.524	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
Long Range Planning (LRP) effort identifies and analyzes potential modifications to current and future Intercontinental Ballistic Missile (ICBM) Weapon Systems required to meet objectives relative to long-term sustainment, technology insertion, battle space awareness, employment, force structure and future systems. The studies will focus on system supportability, operability, reliability, innovation and maintainability. Options/concepts generated by these studies are evaluated for feasibility, system impacts, and cost. The LRP also lays the groundwork for analysis supporting future weapon systems development and deployment. Pre-milestone activities may be conducted for current or future ICBM weapon systems to include entry criteria for milestone activities.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2018	FY 2019	FY 2020	
Title: Long Range Planning									1.101	2.911	3.924	
Description: Analyze, study and plan current and future ICBM activities to meet requirements for long-term sustainment, technology insertion, employment force structure and future systems.												
FY 2019 Plans:												
• Complete sensor array detection study.												
• Continue to develop designs and production concepts for trusted strategic radiation-hardened advanced microelectronics.												
• Continue Virtual Instructor Prototype for ICBM Platforms.												
• Rapidly respond to evolving warfighter priorities and emerging requirements.												
FY 2020 Plans:												
• Continue to develop designs and production concepts for trusted strategic radiation-hardened advanced microelectronics.												
• Complete Virtual Instructor Prototype for ICBM Platforms.												
• Rapidly respond to evolving warfighter priorities and emerging requirements.												
FY 2019 to FY 2020 Increase/Decrease Statement:												
Increase due to ramp up of trusted strategic radiation-hardened advanced microelectronics effort.												
Accomplishments/Planned Programs Subtotals									1.101	2.911	3.924	

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force										Date: February 2019		
Appropriation/Budget Activity 3600 / 4				R-1 Program Element (Number/Name) PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>				Project (Number/Name) 644209 / <i>Long Range Planning (LRP)</i>				
C. Other Program Funding Summary (\$ in Millions)												
	<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u> <u>Base</u>	<u>FY 2020</u> <u>OCO</u>	<u>FY 2020</u> <u>Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
	• RDTE 04 PE 0605230F: <i>GBSD</i>	221.536	414.441	570.373	-	570.373	1,527.545	2,540.300	3,039.900	3,078.800	Continuing	Continuing
Remarks												
D. Acquisition Strategy												
Analysis will be accomplished; efforts will be conducted using contracting strategies deemed most appropriate, generally using competitive contracts and/or other obligating documentation considered most appropriate by obligating and performing agencies involved.												
E. Performance Metrics												
Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.												

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force												Date: February 2019			
Appropriation/Budget Activity 3600 / 4						R-1 Program Element (Number/Name) PE 0603851F / Intercontinental Ballistic Missile - Dem/Val				Project (Number/Name) 644209 / Long Range Planning (LRP)					
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
LRP Sensor Array Detection Study	Various	Various : Various	-	0.116	Nov 2017	-		-		-		-	Continuing	Continuing	-
LRP Virtual Instructor Prototype	C/CPFF	Johns Hopkins - APL : Laurel, MD	-	0.388	Apr 2018	0.649	Apr 2019	-		-		-	Continuing	Continuing	-
LRP Radiation-Hardened Advanced Microelectronics	Various	Various : Various	-	0.520	Jan 2018	2.030	Jan 2019	3.674	Jan 2020	-		3.674	Continuing	Continuing	-
Subtotal			-	1.024		2.679		3.674		-		3.674	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
LRP Program Management	Various	Various : Various	-	0.077	Jan 2018	0.232	Jan 2019	0.250	Jan 2020	-		0.250	Continuing	Continuing	-
Subtotal			-	0.077		0.232		0.250		-		0.250	Continuing	Continuing	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	1.101		2.911		3.924		-		3.924	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force																Date: February 2019			
Appropriation/Budget Activity 3600 / 4								R-1 Program Element (Number/Name) PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>								Project (Number/Name) 644209 / <i>Long Range Planning (LRP)</i>			

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
LRP																												
LRP Sensor Array Detection Study																												
LRP VIPr Prototype Development																												
LRP Radiation-Hardened Advanced Microelectronics																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	Project (Number/Name) 644209 / <i>Long Range Planning (LRP)</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
LRP				
LRP Sensor Array Detection Study	1	2018	2	2019
LRP VIPr Prototype Development	3	2018	1	2020
LRP Radiation-Hardened Advanced Microelectronics	2	2018	4	2023