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**Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Air Force** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	30.388	39.765	108.663	0.000	108.663	72.604	67.655	64.922	66.071	Continuing	Continuing
641020: <i>ICBM Guidance Applications</i>	-	2.589	5.251	25.226	0.000	25.226	14.730	12.714	12.756	12.982	Continuing	Continuing
641021: <i>ICBM Propulsion Applications</i>	-	8.868	6.910	15.437	0.000	15.437	10.797	11.771	6.899	7.020	Continuing	Continuing
641022: <i>ICBM Reentry Vehicle Applications</i>	-	6.144	11.367	36.840	0.000	36.840	21.965	18.547	19.576	19.923	Continuing	Continuing
641024: <i>ICBM Command &amp; Control (C2) Applications</i>	-	3.970	14.764	26.362	0.000	26.362	22.664	21.691	21.739	22.124	Continuing	Continuing
641025: <i>Ground Based Strategic Deterrence (GBSD)</i>	-	7.858	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
644209: <i>Long Range Planning (LRP)</i>	-	0.959	1.473	4.798	0.000	4.798	2.448	2.932	3.952	4.022	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 within the current Intercontinental Ballistic Missile (ICBM), future strategic systems/capability including the Ground Based Strategic Deterrent (GBSD), and other common strategic mission areas, where appropriate, to develop enhanced multi-use capabilities. The ICBM Dem/Val Program will provide technology maturation and risk reduction activities to support the Minuteman (MM) III to GBSD transition and beyond. Efforts identify methods to reduce life cycle costs, improve nuclear safety and surety, and ensure strategic missile viability.

In FY16, GBSD efforts were transferred to PE 0605230F, Ground Based Strategic Deterrent, Project 641025.

BA4 - This program 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.

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<b>Appropriation/Budget Activity</b>	<b>R-1 Program Element (Number/Name)</b>
3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
Previous President's Budget	30.885	39.765	83.660	0.000	83.660
Current President's Budget	30.388	39.765	108.663	0.000	108.663
Total Adjustments	-0.497	0.000	25.003	0.000	25.003
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.392	0.000			
• SBIR/STTR Transfer	-0.889	0.000			
• Other Adjustments	0.000	0.000	25.003	0.000	25.003

**Change Summary Explanation**

FY 2015 funding reflects an overall decrease of \$0.497M; \$0.392M added for GBSD Survivability/Vulnerability Information Assessment Center (SURVIAC) Studies and assessments and a \$0.889M reduction for SBIR/STTR

FY 2017 funding reflects a net increase of \$25.003M to mature technologies for future use in ICBM systems.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Air Force										<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 3600 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>			<b>Project (Number/Name)</b> 641020 / <i>ICBM Guidance Applications</i>				
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
641020: <i>ICBM Guidance Applications</i>	-	2.589	5.251	25.226	0.000	25.226	14.730	12.714	12.756	12.982	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. 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.

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

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
<b>Title:</b> Guidance Applications Program	2.589	5.251	25.226	0.000	25.226
<b>Description:</b> Develop and mature, in coordination with the Navy, advanced technologies and concepts to support future requirements.					
<b>FY 2015 Accomplishments:</b>					
- Completed the first year for Concept, Design & Architecture - Guidance (CDAG). Critical Technology Elements/sensors were evaluated and a modeling and simulation capability was developed to examine future guidance instrument candidates					
- Began assessing the readiness of Strategic Resonating Beam Accelerometers (SRBAs) for potential use in a GBSD system					
- Completed assessment of strategic radiation hardened parts and the feasibility of a consolidated AF/Navy Parts Library					
<b>FY 2016 Plans:</b>					
- Continue efforts to evaluate guidance technologies and assess technical/manufacturing capabilities for a future ICBM system. This includes progress testing for a non-destructive capability that augments flight test.					
- Continue to assess SRBAs as a potential GBSD system instrument					
- Continue to assess various sensor GBSD candidates, such as, Hemispheric Resonating Gyroscopes, Strategic Fiber-Optic Gyroscopes, and Alternate-Pendulous Integrating Gyroscopic Accelerometer (Alt-PIGA).					
<b>FY 2017 Base Plans:</b>					

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**Exhibit R-2A, RDT&E Project Justification:** PB 2017 Air Force **Date:** February 2016

<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	<b>Project (Number/Name)</b> 641020 / <i>ICBM Guidance Applications</i>
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**B. Accomplishments/Planned Programs (\$ in Millions)**

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<ul style="list-style-type: none"> <li>- Continue evaluation and testing of strategic guidance commodities for use in a future strategic guidance system, and leveraging from the Navy Trident Life Extension Program</li> <li>- Develop risk reduction initiatives associated with micro-electronic/electronic component technologies and commodities for future ICBM applications and/or obsolescence occurrences. Further progress testing for a non-destructive capability that augments flight test.</li> <li>- Independently validate and verify military parts suppliers (especially those with a single supplier) for their adherence to strategic radiation and other missile environments that are historically challenging.</li> <li>- Assess market for alternate vendors and electronic wafer technologies for fabrication of radiation hardened integrated circuits. Effort will include the military supplier base for products such as Metal-Oxide-semiconductor Field-effect Transistor (MOSFETs), Application Specific Integrated Circuits (ASICs), and memory.</li> <li>- Test analysis effort designed to augment flight test programs for performance assessment and anomaly investigation by conducting non-destructive, operationally dynamic testing, including a full range of critical missile environments</li> </ul> <p><b>FY 2017 OCO Plans:</b> N/A</p>					
<b>Accomplishments/Planned Programs Subtotals</b>	2.589	5.251	25.226	0.000	25.226

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

<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017 Base</u>	<u>FY 2017 OCO</u>	<u>FY 2017 Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• RDTE: BA04: PE 0605230F: <i>GBSD</i>	0.000	75.166	113.919	0.000	113.919	293.959	321.054	1,034.249	1,576.429	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 MIPRs.

**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 2017 Air Force** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	<b>Project (Number/Name)</b> 641020 / <i>ICBM Guidance Applications</i>
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<b>Product Development (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
GAP Strategic Instrument Technology Readiness	C/CPFF	Draper Labs : Various*	-	2.534	Apr 2015	4.000	Jan 2016	7.641	Jan 2017	0.000		7.641	Continuing	Continuing	TBD
<b>Subtotal</b>			-	2.534		4.000		7.641		0.000		7.641	-	-	-

**Remarks**  
\*Cambridge, MA and Washington D.C.

<b>Support (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
<b>Subtotal</b>			-	-		-		-		-		-	-	-	-

<b>Test and Evaluation (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Non-Destructive Test Capability	C/Variou	Various : Various	-	0.000		0.791	Feb 2016	15.481	Jan 2017	0.000		15.481	Continuing	Continuing	-
<b>Subtotal</b>			-	0.000		0.791		15.481		0.000		15.481	-	-	-

<b>Management Services (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
GAP Program Management Administration	C/Variou	Various : Various	-	0.055	Jan 2015	0.460	Jan 2016	2.104	Jan 2017	0.000		2.104	Continuing	Continuing	TBD
<b>Subtotal</b>			-	0.055		0.460		2.104		0.000		2.104	-	-	-

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Air Force** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	<b>Project (Number/Name)</b> 641020 / <i>ICBM Guidance Applications</i>
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<b>Management Services (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

**Remarks**  
Costs and services in support of program office management and administration processes such as: program oversight, resource justification, budget and programming, milestone and scheduling--PMA costs.

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	-	2.589	5.251	25.226	0.000	25.226	-	-	-

**Remarks**



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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Air Force		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	<b>Project (Number/Name)</b> 641020 / <i>ICBM Guidance Applications</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Concept Design and Architecture	1	2015	2	2016
Strategic Instrument/Component Technology Readiness	1	2015	4	2021
Testing Capabilities Non-Destructive	2	2016	4	2021

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Air Force										<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 3600 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>				<b>Project (Number/Name)</b> 641021 / <i>ICBM Propulsion Applications</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
641021: <i>ICBM Propulsion Applications</i>	-	8.868	6.910	15.437	0.000	15.437	10.797	11.771	6.899	7.020	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

The Propulsion Applications Program (PAP) develops strategic propulsion capability 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, 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 and safety.

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

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
<b>Title:</b> Propulsion Applications Program	8.868	6.910	15.437	0.000	15.437
<b>Description:</b> 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.					
<b>FY 2015 Accomplishments:</b> - Assessed Advanced Ordnance, Thrust Termination, Stage Separation, Thrust Vector Control and Post Boost technology development to support future strategic system requirements - Integrated, analyzed and demonstrated medium class sized motors with advanced technology as candidates to meet future SRM requirements					
<b>FY 2016 Plans:</b> - Continue assessment and demonstration of Post Boost, Thrust Vector Control and other advanced propulsion technologies - Perform Medium Class Stage III Sea level Static Fire Test to provide valid technological candidates for future SRM requirements					
<b>FY 2017 Base Plans:</b> - Initiate trade studies and risk reduction of components and subsystem propulsion technologies for future ICBM program insertion					

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Air Force		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	<b>Project (Number/Name)</b> 641021 / <i>ICBM Propulsion Applications</i>

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
- Continue assessment and demonstration of existing Post Boost, Thrust Vector Control, and other advanced propulsion technology programs  <i>FY 2017 OCO Plans:</i> N/A					
<b>Accomplishments/Planned Programs Subtotals</b>	8.868	6.910	15.437	0.000	15.437

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017 Base</u>	<u>FY 2017 OCO</u>	<u>FY 2017 Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• RDTE: BA04: PE 0605230F: <i>GBSD</i>	0.000	75.166	113.919	0.000	113.919	293.959	321.054	1,034.249	1,576.429	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.

**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 2017 Air Force** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	<b>Project (Number/Name)</b> 641021 / <i>ICBM Propulsion Applications</i>
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<b>Product Development (\$ in Millions)</b>				<b>FY 2015</b>		<b>FY 2016</b>		<b>FY 2017 Base</b>		<b>FY 2017 OCO</b>		<b>FY 2017 Total</b>			<b>Target Value of Contract</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>	
PAP Propulsion and Solid Rocket Motor Studies	MIPR	AFRL : Various	-	0.770	Jun 2015	0.730	Feb 2016	2.830	Jan 2017	0.000		2.830	Continuing	Continuing	TBD
PAP Thrust Vector Control Study	C/CPFF	Moog : East Aurora, NY	-	1.067	Apr 2015	0.305	Apr 2016	1.513	Oct 2016	0.000		1.513	Continuing	Continuing	TBD
PAP Thrust Vector Control Study 2	C/CPFF	Honeywell : Tempe, AZ	-	0.000		0.800	Jan 2016	0.753	Oct 2016	0.000		0.753	Continuing	Continuing	-
PAP Post Boost Study 1	C/CPFF	Moog : East Aurora, NY	-	0.668	Jun 2015	0.644	Apr 2016	0.335	Oct 2016	0.000		0.335	Continuing	Continuing	TBD
PAP Post Boost Study 2	C/CPFF	Orbital ATK : Elkton, MD	-	1.252	Jun 2015	1.100	Mar 2016	0.628	Oct 2016	0.000		0.628	Continuing	Continuing	TBD
PAP Post Boost Study 3	C/CPFF	Aerojet Rocketdyne : Sacramento, CA	-	0.998	Jun 2015	0.742	May 2016	0.774	Oct 2016	0.000		0.774	Continuing	Continuing	TBD
PAP Advanced Ordnance and Stage Separation Studies	C/Variou	Various* : Various*	-	0.782	Jun 2015	0.143	Apr 2016	0.000		0.000		0.000	Continuing	Continuing	TBD
PAP Trade Studies/Risk Reduction	C/TBD	TBD : TBD	-	0.000		0.000		5.817	Mar 2017	0.000		5.817	Continuing	Continuing	TBD
PAP Medium Class Stage III**	C/CPFF	Various*** : Various***	-	0.000		0.000		0.000		0.000		0.000	Continuing	Continuing	-
<b>Subtotal</b>			-	5.537		4.464		12.650		0.000		12.650	-	-	-

**Remarks**  
 \*Advanced Ordnance -- Orbital ATK: Corinne, UT -- CPFF; Ensign-Bickford Aerospace & Defense (EBAD): Simsbury, CT -- FFP  
 \*Stage Separation -- EBAD: Simsbury, CT -- FFP; Systema: Kirkland, WA -- FFP  
 \*\*Medium Class Stage III -- FY14 funded (\$24.122M) activities ongoing through FY16  
 \*\*\*Medium Class Stage III -- Orbital ATK: Corinne, UT; Aerojet Rocketdyne: Sacramento, CA

<b>Support (\$ in Millions)</b>				<b>FY 2015</b>		<b>FY 2016</b>		<b>FY 2017 Base</b>		<b>FY 2017 OCO</b>		<b>FY 2017 Total</b>			<b>Target Value of Contract</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>	
PAP Integration Support	C/Variou	BAE Systems : Clearfield, UT	-	1.359	Jul 2015	2.007	Jul 2016	1.452	Jul 2017	0.000		1.452	Continuing	Continuing	TBD

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Air Force** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	<b>Project (Number/Name)</b> 641021 / <i>ICBM Propulsion Applications</i>
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<b>Support (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
<b>Subtotal</b>				-	1.359	2.007		1.452		0.000		1.452	-	-	-

<b>Test and Evaluation (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
<b>Subtotal</b>				-	-	-		-		-		-	-	-	-

<b>Management Services (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PAP Program Management Administration	Various	Various : Various	-	1.972	Jan 2015	0.439	Jan 2016	1.335	Jan 2017	0.000		1.335	Continuing	Continuing	TBD
<b>Subtotal</b>				-	1.972	0.439		1.335		0.000		1.335	-	-	-

**Remarks**  
Costs and services in support of program office management and administration processes such as: program oversight, resource justification, budget and programming, milestone and scheduling--PMA costs.

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	-	8.868	6.910	15.437	0.000	15.437	-	-	-

**Remarks**



**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Air Force		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	<b>Project (Number/Name)</b> 641021 / <i>ICBM Propulsion Applications</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Thrust Vector Control Study	3	2015	3	2017
Advanced Ordnance and Stage Separation Studies	3	2015	3	2016
Post Boost Studies	3	2015	4	2017
Medium Class Stage III	1	2015	1	2017
Trade Studies/Risk Reduction	2	2017	4	2019
Propulsion Modularity Updates	1	2020	4	2021

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Air Force										<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 3600 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>				<b>Project (Number/Name)</b> 641022 / <i>ICBM Reentry Vehicle Applications</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
641022: <i>ICBM Reentry Vehicle Applications</i>	-	6.144	11.367	36.840	0.000	36.840	21.965	18.547	19.576	19.923	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 Reentry Systems, and explores options for common, multi-mission capabilities. The program enables a responsive engineering infrastructure to support Reentry Systems beyond their original design life by addressing system issues and ensuring the availability of long-lead components and materials while identifying life cycle cost reduction methods. In addition, the program develops and tests advanced Reentry System technologies to meet future requirements. 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)**

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
<b>Title:</b> Reentry Vehicle Applications Program	6.144	11.367	36.840	0.000	36.840
<b>Description:</b> Mature, evaluate, and test reentry system materials and technologies for use in current and future strategic applications.					
<b>FY 2015 Accomplishments:</b> - Assessed, developed, and evaluated Countermeasure Studies, Multiple Independently-Targeted RV (MIRV)/ Shroud and Thermal Protection System (TPS) Material Development.					
<b>FY 2016 Plans:</b> - Continue to mature and evaluate Countermeasure Studies, MIRV/Shroud and TPS Material Development. - Develop TPS material and perform ground testing. - Initiate tradespace studies between all reentry system elements and their effects on a future integrated weapon system.					
<b>FY 2017 Base Plans:</b> - Complete Countermeasure Studies I & II, MIRV/Shroud, and TPS studies. - Initiate studies to mature and evaluate future countermeasures, heatshield development, carbon phenolic replacements, modeling and simulation programs, manufacturing capabilities, reentry system technologies, threat development analysis and countermeasure technology strategies, and inform future weapon development. - Conduct materials development, prototyping, and testing.					

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Air Force		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	<b>Project (Number/Name)</b> 641022 / <i>ICBM Reentry Vehicle Applications</i>

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
- Continue to determine tradespace between all reentry system elements and their effects on the integrated weapon system.  <b>FY 2017 OCO Plans:</b> N/A					
<b>Accomplishments/Planned Programs Subtotals</b>	6.144	11.367	36.840	0.000	36.840

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017 Base</u>	<u>FY 2017 OCO</u>	<u>FY 2017 Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• RDTE: BA04: PE 0605230F: <i>GBSD</i>	0.000	75.166	113.919	0.000	113.919	293.959	321.054	1,034.249	1,576.429	Continuing	Continuing

**Remarks**

**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.

**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 2017 Air Force** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	<b>Project (Number/Name)</b> 641022 / <i>ICBM Reentry Vehicle Applications</i>
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<b>Product Development (\$ in Millions)</b>				<b>FY 2015</b>		<b>FY 2016</b>		<b>FY 2017 Base</b>		<b>FY 2017 OCO</b>		<b>FY 2017 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>
RVAP Countermeasure Study I	C/CPFF	Textron Corp : Wilmington, MA	-	1.340	Apr 2015	2.139	Apr 2016	1.434	Dec 2016	0.000		1.434	Continuing	Continuing	TBD
RVAP Countermeasure Study II	C/CPFF	Lockheed Martin : King of Prussia, PA	-	1.381	Apr 2015	1.500	Apr 2016	1.191	Dec 2016	0.000		1.191	Continuing	Continuing	TBD
RVAP TPS Materials	C/CPFF	Intermat : Biddeford, ME	-	0.900	Jun 2015	0.375	Jun 2016	1.084	Jun 2017	0.000		1.084	Continuing	Continuing	TBD
RVAP Mk21 MIRV/Shroud	C/CPFF	Lockheed Martin : King of Prussia, PA	-	1.000	May 2015	2.499	May 2016	1.249	May 2017	0.000		1.249	Continuing	Continuing	TBD
RVAP Modeling and Simulation Programs	C/TBD	TBD : TBD	-	0.000		0.000		2.500	Feb 2017	0.000		2.500	Continuing	Continuing	TBD
RVAP Manufacturing Capabilities Study	C/TBD	TBD : TBD	-	0.000		0.000		7.000	Nov 2016	0.000		7.000	Continuing	Continuing	TBD
RVAP Future Vehicles Studies	C/TBD	TBD : TBD	-	0.000		0.000		5.670	Feb 2017	0.000		5.670	Continuing	Continuing	-
<b>Subtotal</b>			-	4.621		6.513		20.128		0.000		20.128	-	-	-

<b>Support (\$ in Millions)</b>				<b>FY 2015</b>		<b>FY 2016</b>		<b>FY 2017 Base</b>		<b>FY 2017 OCO</b>		<b>FY 2017 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>
RVAP Support	C/FFP	BAE Systems : Clearfield, UT	-	0.210	Mar 2015	0.210	Mar 2016	0.630	Mar 2017	0.000		0.630	Continuing	Continuing	TBD
RVAP FFRDC Support and Analysis I	MIPR	MIT Lincoln Labs : Hanscom, MA	-	0.603	Sep 2015	1.400	Apr 2016	1.750	Apr 2017	0.000		1.750	Continuing	Continuing	TBD
RVAP FFRDC Support and Analysis II	MIPR	Sandia National Labs : Albuquerque, NM	-	0.600	Sep 2015	1.400	Mar 2016	3.150	Mar 2016	0.000		3.150	Continuing	Continuing	TBD
RVAP FFRDC Support and Analysis III	MIPR	Lawrence Livermore : Livermore, CA	-	0.000		0.501	Jan 2016	1.750	Jan 2017	0.000		1.750	Continuing	Continuing	TBD
<b>Subtotal</b>			-	1.413		3.511		7.280		0.000		7.280	-	-	-

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Air Force** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	<b>Project (Number/Name)</b> 641022 / <i>ICBM Reentry Vehicle Applications</i>
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<b>Test and Evaluation (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
RVAP TPS Testing and Analysis	Various	TBD : TBD	-	0.000		0.500	Jan 2016	0.779	Jul 2017	0.000		0.779	Continuing	Continuing	TBD
RVAP Flight Testing	Various	TBD : TBD	-	0.000		0.000		5.528	Oct 2016	0.000		5.528	Continuing	Continuing	-
<b>Subtotal</b>			-	0.000		0.500		6.307		0.000		6.307	-	-	-

<b>Management Services (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
RVAP Program Management Administration	Various	Various : Various	-	0.110	Apr 2015	0.843	Jan 2016	3.125	Jan 2017	0.000		3.125	Continuing	Continuing	TBD
<b>Subtotal</b>			-	0.110		0.843		3.125		0.000		3.125	-	-	-

**Remarks**  
 Costs and services in support of program office management and administration processes such as: program oversight, resource justification, budget and programming, milestone and scheduling--PMA costs.

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	-	6.144	11.367	36.840	0.000	36.840	-	-	-

**Remarks**

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2017 Air Force		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	<b>Project (Number/Name)</b> 641022 / <i>ICBM Reentry Vehicle Applications</i>

	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	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
Countermeasure Studies I & II																												
MIRV/Shroud																												
TPS Materials																												
FFRDC Analysis and Testing																												
TPS Testing and Analysis																												
Manufacturing Capabilities Study																												
Modeling and Simulation Programs																												
Flight Testing																												
Future Vehicles Studies																												
Countermeasure Studies																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Air Force		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	<b>Project (Number/Name)</b> 641022 / <i>ICBM Reentry Vehicle Applications</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Countermeasure Studies I & II	3	2015	3	2017
MIRV/Shroud	3	2015	3	2017
TPS Materials	3	2015	3	2018
FFRDC Analysis and Testing	4	2015	4	2019
TPS Testing and Analysis	2	2016	2	2019
Manufacturing Capabilities Study	1	2017	3	2018
Modeling and Simulation Programs	2	2017	2	2018
Flight Testing	1	2017	1	2019
Future Vehicles Studies	2	2017	2	2019
Countermeasure Studies	4	2018	4	2021

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Air Force										<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 3600 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>			<b>Project (Number/Name)</b> 641024 / <i>ICBM Command &amp; Control (C2) Applications</i>				
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
641024: <i>ICBM Command &amp; Control (C2) Applications</i>	-	3.970	14.764	26.362	0.000	26.362	22.664	21.691	21.739	22.124	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 evaluates and develops assured, survivable, and secure communications and battlespace awareness between the missile Launch Control Centers (LCCs) and Launch Facilities (LFs) 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)**

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
<b>Title:</b> Command and Control Application Program	3.970	14.764	26.362	0.000	26.362
<b>Description:</b> Examine and develop concepts for transforming ICBM WSC2 to meet current and future requirements.					
<b>FY 2015 Accomplishments:</b> - Initiated studies to identify, assess, and preserve unique strategic C2 skills and technologies to meet current and future requirements. - Began development of a WSC2 laboratory to facilitate development and testing of future WSC2 architectures.					
<b>FY 2016 Plans:</b> - Continue studies to identify, assess, and preserve unique strategic command and control skills and technologies to meet current and future system requirements. - Continue development of WSC2 laboratory to facilitate development and testing of future WSC2 architectures.					
<b>FY 2017 Base Plans:</b> - Support ongoing development efforts for the WSC2 laboratory to facilitate development and testing of potential future WSC2 architectures, to include software development, cyber security testing, and preparation for Nuclear Surety Certification activities.					

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**Exhibit R-2A, RDT&E Project Justification:** PB 2017 Air Force **Date:** February 2016

<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	<b>Project (Number/Name)</b> 641024 / <i>ICBM Command &amp; Control (C2) Applications</i>
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Continue studies to identify, assess, and preserve unique strategic command and control skills and technologies to meet current and future system requirements.  <b>FY 2017 OCO Plans:</b> N/A					
<b>Accomplishments/Planned Programs Subtotals</b>	3.970	14.764	26.362	0.000	26.362

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017 Base</u>	<u>FY 2017 OCO</u>	<u>FY 2017 Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• RDTE: BA04: PE 0605230F: <i>GBSD</i>	0.000	75.166	113.919	0.000	113.919	293.959	321.054	1,034.249	1,576.429	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

A technology development strategy will be developed during the MSA phase.

**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 2017 Air Force												Date: February 2016			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)						Project (Number/Name)					
3600 / 4				PE 0603851F / Intercontinental Ballistic Missile - Dem/Val						641024 / ICBM Command & Control (C2) Applications					
<b>Product Development (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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 Studies	C/CPPF	Various : Pittsfield, MA	-	1.571	Mar 2015	0.074	Jan 2016	4.681	Mar 2017	0.000		4.681	Continuing	Continuing	TBD
C2AP Weapon System Command & Control Laboratory	SS/FFP	Various : Rockville, MD	-	1.900	Jun 2015	13.178	Feb 2016	14.806	Feb 2017	0.000		14.806	Continuing	Continuing	TBD
<b>Subtotal</b>			-	3.471		13.252		19.487		0.000		19.487	-	-	-
<b>Support (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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 Technical Services	C/FFP	BAE Systems : Clearfield, UT	-	0.210	Jul 2015	0.231	Jul 2016	0.360	Jul 2017	0.000		0.360	Continuing	Continuing	TBD
C2AP FFRDC Support	SS/FFP	Aerospace Corp : Los Angeles, CA	-	0.192	Mar 2015	0.369	Feb 2016	1.475	Feb 2017	0.000		1.475	Continuing	Continuing	TBD
<b>Subtotal</b>			-	0.402		0.600		1.835		0.000		1.835	-	-	-
<b>Test and Evaluation (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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 Lab Testing	C/FFP	Various : TBD	-	0.000		0.000		4.025	Mar 2017	0.000		4.025	Continuing	Continuing	-
<b>Subtotal</b>			-	0.000		0.000		4.025		0.000		4.025	-	-	-
<b>Management Services (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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 Administration	C/FFP	Various : Various	-	0.097	Jan 2015	0.912	Jan 2016	1.015	Jan 2017	0.000		1.015	Continuing	Continuing	-



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<b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2017 Air Force</b>		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	<b>Project (Number/Name)</b> 641024 / <i>ICBM Command &amp; Control (C2) Applications</i>

	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	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 Studies	[REDACTED]																											
C2AP Weapon System Command & Control Laboratory	[REDACTED]																											
C2AP Lab Testing	[REDACTED]												[REDACTED]															

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Air Force		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	<b>Project (Number/Name)</b> 641024 / <i>ICBM Command &amp; Control (C2) Applications</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
C2AP Studies	3	2015	2	2021
C2AP Weapon System Command & Control Laboratory	3	2015	4	2021
C2AP Lab Testing	2	2017	4	2021

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Air Force										<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 3600 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>			<b>Project (Number/Name)</b> 641025 / <i>Ground Based Strategic Deterrence (GBSD)</i>				
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
641025: <i>Ground Based Strategic Deterrence (GBSD)</i>	-	7.858	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

Ground Based Strategic Deterrence (GBSD) identifies viable concepts and materiel solutions in support of the Air Force's strategic deterrence and global strike capabilities. Funding supports pre-Milestone A activities, to include an Analysis of Alternatives (AoA) and associated concept refinement activities of potential materiel solutions. This effort will explore materiel technology alternatives at the system and sub-system levels and during the Materiel Solution Analysis (MSA) Phase leading to a Milestone-A decision.

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

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
<b>Title:</b> Ground Based Strategic Deterrent	7.858	0.000	0.000	0.000	0.000
<b>Description:</b> Perform Pre-Milestone A activities to identify potential materiel solutions for a future GBSD.					
<b>FY 2015 Accomplishments:</b> - Continued concept refinement, technology analyses, modeling and simulation support, engineering studies, program cost, schedule estimation, acquisition strategy development, risk reduction efforts, and initial requirements definition. - Completed Milestone A preparation to include development of Milestone A exit strategy and Technology Maturation and Risk Reduction phase entrance documentation.					
<b>FY 2016 Plans:</b> • Reflected in PE 0605230F, Ground Based Strategic Deterrent, Project 641025.					
<b>FY 2017 Base Plans:</b> N/A					
<b>FY 2017 OCO Plans:</b> N/A					
<b>Accomplishments/Planned Programs Subtotals</b>	7.858	0.000	0.000	0.000	0.000

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Air Force		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	<b>Project (Number/Name)</b> 641025 / <i>Ground Based Strategic Deterrence (GBSD)</i>

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

<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u> <u>Base</u>	<u>FY 2017</u> <u>OCO</u>	<u>FY 2017</u> <u>Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• RDTE: BA04: PE 0605230F: <i>GBSD</i>	0.000	75.166	113.919	0.000	113.919	293.959	321.054	1,034.249	1,576.429	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

Multiple contracts may be awarded to refine materiel solution concepts. A technology development strategy will be developed during the MSA phase.

**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 2017 Air Force												Date: February 2016				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
3600 / 4				PE 0603851F / Intercontinental Ballistic Missile - Dem/Val				641025 / Ground Based Strategic Deterrence (GBSD)								
<b>Product Development (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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	
GBSD SURVIAC Studies	C/FFP	Booz Allen Hamilton : Colorado Springs, CO	-	0.384	Mar 2015	0.000		0.000		0.000		0.000	Continuing	Continuing	TBD	
<b>Subtotal</b>			-	0.384		0.000		0.000		0.000		0.000	-	-	-	
<b>Support (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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	
GBSD Integration Support	C/FFP	BAE Systems : Clearfield, UT	-	4.305	Mar 2015	0.000		0.000		0.000		0.000	Continuing	Continuing	TBD	
GBSD FFRDC Support	SS/FFP	Aerospace Corp : Los Angeles, CA	-	1.919	Feb 2016	0.000		0.000		0.000		0.000	Continuing	Continuing	TBD	
<b>Subtotal</b>			-	6.224		0.000		0.000		0.000		0.000	-	-	-	
<b>Test and Evaluation (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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	
GBSD Test and Assessments	Various	Various : Various	-	1.044	Jul 2015	0.000		0.000		0.000		0.000	Continuing	Continuing	TBD	
<b>Subtotal</b>			-	1.044		0.000		0.000		0.000		0.000	-	-	-	
<b>Management Services (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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	
GBSD Program Management Administration	C/FFP	Various : Various	-	0.206	Oct 2014	0.000		0.000		0.000		0.000	Continuing	Continuing	TBD	
<b>Subtotal</b>			-	0.206		0.000		0.000		0.000		0.000	-	-	-	

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Air Force** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	<b>Project (Number/Name)</b> 641025 / <i>Ground Based Strategic Deterrence (GBSD)</i>
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<b>Management Services (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

**Remarks**  
 Costs and services in support of program office management and administration processes such as: program oversight, resource justification, budget and programming, milestone and scheduling--PMA costs.

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	-	7.858	0.000	0.000	0.000	0.000	-	-	-

**Remarks**

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2017 Air Force		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	<b>Project (Number/Name)</b> 641025 / <i>Ground Based Strategic Deterrence (GBSD)</i>

	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	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
GBSD Integration Support	[REDACTED]																											
GBSD SURVIAC Studies	[REDACTED]																											

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Air Force		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	<b>Project (Number/Name)</b> 641025 / <i>Ground Based Strategic Deterrence (GBSD)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
GBSD Integration Support	1	2015	4	2015
GBSD SURVIAC Studies	2	2015	1	2016

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Air Force										<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 3600 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>				<b>Project (Number/Name)</b> 644209 / <i>Long Range Planning (LRP)</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
644209: <i>Long Range Planning (LRP)</i>	-	0.959	1.473	4.798	0.000	4.798	2.448	2.932	3.952	4.022	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)**

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
<b>Title:</b> Long Range Planning	0.959	1.473	4.798	0.000	4.798
<b>Description:</b> Analyze, study and plan current and future ICBM activities to meet requirements for long-term sustainment, technology insertion, employment force structure and future systems.					
<b>FY 2015 Accomplishments:</b> - Initiated Industrial Base Assessment and Launch Facility (LF) assessments. - Initiated LF and Water Intrusion Study Assessments to examine infrastructure conditions, water intrusion, corrosion and explore mitigation opportunities.					
<b>FY 2016 Plans:</b> - Continue LF Assessments/Water Intrusion Study - Initiate a LF deep dive analysis and assessment to inform future Launch -- Control Center (LCC) and Missile Alert Facility (MAF) requirements - Initiate effort to examine and test potential Launch Systems (LS) security enhancements.					
<b>FY 2017 Base Plans:</b> - Continue LF deep dive analysis and assessment to inform future LCC and MAF requirements - Continue examining and testing potential for LS security - Continue Long Range Planning studies to assess current and future ICBM support systems					
<b>FY 2017 OCO Plans:</b>					

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Air Force		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	<b>Project (Number/Name)</b> 644209 / <i>Long Range Planning (LRP)</i>

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
N/A					
<b>Accomplishments/Planned Programs Subtotals</b>	0.959	1.473	4.798	0.000	4.798

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• RDTE: BA04: PE 0605230F: <i>GBSD</i>	0.000	75.166	113.919	0.000	113.919	293.959	321.054	1,034.249	1,576.429	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

Analysis will be accomplished; efforts will be conducted using contracting strategies deemed most appropriate, generally using competitive contracts.

**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 2017 Air Force												Date: February 2016				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)					Project (Number/Name)							
3600 / 4				PE 0603851F / Intercontinental Ballistic Missile - Dem/Val					644209 / Long Range Planning (LRP)							
<b>Product Development (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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 Studies	C/FFP	BAE Systems : Clearfield, UT	-	0.415	May 2015	0.290	Mar 2016	3.117	Apr 2017	0.000		3.117	Continuing	Continuing	-	
LRP Water Intrusion Study/LF Assessment	C/Various	BAE/ISC : Cheyenne, WY	-	0.257	Aug 2015	0.603	Dec 2015	0.000		0.000		0.000	Continuing	Continuing	-	
<b>Subtotal</b>			-	0.672		0.893		3.117		0.000		3.117	-	-	-	
<b>Support (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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 Integration Support	C/FFP	BAE Systems : Clearfield, UT	-	0.210	Jul 2015	0.210	Jul 2016	0.210	Jul 2017	0.000		0.210	Continuing	Continuing	TBD	
<b>Subtotal</b>			-	0.210		0.210		0.210		0.000		0.210	-	-	-	
<b>Test and Evaluation (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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	
Launch Systems Tests	C/TBD	AFRL : TBD	-	0.000		0.253	Apr 2016	1.087	Apr 2017	0.000		1.087	Continuing	Continuing	-	
<b>Subtotal</b>			-	0.000		0.253		1.087		0.000		1.087	-	-	-	
<b>Management Services (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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 Administration	Various	Various : Various	-	0.077	Jan 2015	0.117	Jan 2016	0.384	Jan 2017	0.000		0.384	Continuing	Continuing	-	
<b>Subtotal</b>			-	0.077		0.117		0.384		0.000		0.384	-	-	-	

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Air Force** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	<b>Project (Number/Name)</b> 644209 / <i>Long Range Planning (LRP)</i>
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<b>Management Services (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

**Remarks**  
Costs and Services in support of program office management and administration processes such as: program oversight, resource justification, budget and programming, milestone and schedule tracking --PMA costs.

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	-	0.959	1.473	4.798	0.000	4.798	-	-	-

**Remarks**

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2017 Air Force		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	<b>Project (Number/Name)</b> 644209 / <i>Long Range Planning (LRP)</i>

	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	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
Industrial Base Assessment																												
Water Intrusion Study/LF Assessment																												
Long Range Planning Studies																												
Launch Systems Tests																												
ICBM Transition Studies																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Air Force		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603851F / <i>Intercontinental Ballistic Missile - Dem/Val</i>	<b>Project (Number/Name)</b> 644209 / <i>Long Range Planning (LRP)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Industrial Base Assessment	3	2015	1	2016
Water Intrusion Study/LF Assessment	4	2015	4	2016
Long Range Planning Studies	2	2015	4	2018
Launch Systems Tests	3	2016	4	2018
ICBM Transition Studies	1	2019	4	2021