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Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Air Force **Date:** February 2015

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604851F / <i>Intercontinental Ballistic Missile - EMD</i>
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COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
Total Program Element	-	118.504	-	-	-	-	-	-	-	-	-	118.504
655037: <i>Support Equipment</i>	-	82.988	-	-	-	-	-	-	-	-	-	82.988
655081: <i>ICBM Crypto</i>	-	35.516	-	-	-	-	-	-	-	-	-	35.516

Note

In FY 2015, Project 655037, Support Equipment, efforts were transferred to PE 0101213F, Minuteman Squadrons, Project 672985, MM Support Equip, and Project 672984, MM III Baseline Support in order to consolidate ICBM investment activities under a common PE.

In FY 2015, Project 655081, ICBM Crypto, efforts were transferred to PE 0101213F, Minuteman Squadrons, Project 672986, MM Crypto Mods in order to consolidate ICBM investment activities under a common PE.

A. Mission Description and Budget Item Justification

Intercontinental Ballistic Missile (ICBM) Engineering and Manufacturing Development (EMD) efforts will ensure the extension of the operational life of the Minuteman III ICBM weapon system through 2030.

The Support Equipment program designs, develops, and tests replacement of obsolete/non-serviceable weapon system support and flight test equipment. The efforts include design, development, and testing of support equipment such as Reentry Field Support Equipment (RFSE), Code System Media (CSM), Payload Transporter Replacement (PTR), Higher Authority Command/Rapid Message Processing Element (HAC/RMPE) Message Generator, Strategic Targeting Application Computer System (STACS), and Transporter Erector Replacement Program (TERP). In FY15, efforts listed above in PE 0604851F, Intercontinental Ballistic Missile - EMD, Project 655037, Support Equipment were included in PE 0101213F, Minuteman Squadrons, Project 672985, MM Support Equip.

Efforts also include the design, development, and testing of replacement flight test equipment necessary to conduct Operational Test Launches (OTLs) and ICBM Fuze Modernization flight tests such as the Instrumentation Wafer Replacement Program (IWRP). OTLs are required by USSTRATCOM and the Department of Energy to determine continuing reliability and effectiveness of the ICBM weapon system. Beginning in FY 2016, IWRP efforts previously included in PE 0604851F, Intercontinental Ballistic Missile - EMD, Project 655037, Support Equipment were combined with the Flight Destruct System and Launch Support System and included in PE 0101213F, Minuteman Squadrons, Project 672984, MM III Baseline Support as the Flight Test Telemetry and Termination System (FT3).

Intercontinental Ballistic Missile (ICBM) Cryptography Upgrade Increment II (ICU II) executes USSTRATCOM, Air Force Global Strike Command (AFGSC), and Nuclear Weapon Safety Center (NWSC) requirements by implementing the KS-60 capabilities of remote key/code change and irreversible transformation as mandated in the approved Capabilities Development Document (CDD) dated 4 January 2005 and addresses Nuclear Weapon System Safety Group Operational Safety Review (NWSSG OSR) requirements 98-2, 00-1 and 02-2. It also incorporates continuous signal lockout capabilities to prevent the widespread loss of status monitoring. These features will greatly increase security during code changes by reducing the frequency of open sites 75 days annually and will reduce associated resource costs for 450 launch

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facilities (LF) and 45 launch control centers (LCC). In FY 2015, ICU II effort previously included in PE 0604851, Intercontinental Ballistic Missile - EMD, Project 655081, ICBM Crypto were included in PE 0101213F, Minuteman Squadrons, Project 672986, MM Crypto Mods.

This program is Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full-rate production.

B. Program Change Summary (\$ in Millions)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Previous President's Budget	112.760	-	0.001	-	0.001
Current President's Budget	118.504	-	-	-	-
Total Adjustments	5.744	-	-0.001	-	-0.001
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	5.744	-			
• SBIR/STTR Transfer	-	-			
• Other Adjustments	-	-	-0.001	-	-0.001

Change Summary Explanation

FY 2014 reflects an increase of \$5.744M for Payload Transporter Replacement.

FY 2016 reflects a decrease of \$0.001M to correct an administrative error.

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Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604851F / <i>Intercontinental Ballistic Missile - EMD</i>	Project (Number/Name) 655037 / <i>Support Equipment</i>
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COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
655037: <i>Support Equipment</i>	-	82.988	-	-	-	-	-	-	-	-	-	82.988
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2015, Project 655037, Support Equipment, efforts were transferred to PE 0101213F, Minuteman Squadrons, Project 672985, MM Support Equip, and Project 672984, MM III Baseline Support in order to consolidate ICBM investment activities under a common PE.

A. Mission Description and Budget Item Justification

The Support Equipment program designs, develops, and tests replacement of obsolete/non-serviceable weapon system support and flight test equipment. The efforts include design, development, and testing of support equipment such as Reentry Field Support Equipment (RFSE), Code System Media (CSM), Payload Transporter Replacement (PTR), Higher Authority Command/Rapid Message Processing Element (HAC/RMPE) Message Generator, Strategic Targeting Application Computer System (STACS), and Transporter Erector Replacement Program (TERP). In FY15, efforts listed above in PE 0604851F, Intercontinental Ballistic Missile - EMD, Project 655037, Support Equipment were included in PE 0101213F, Minuteman Squadrons, Project 672985, MM Support Equip.

Efforts also include the design, development, and testing of replacement flight test equipment necessary to conduct Operational Test Launches (OTLs) and ICBM Fuze Modernization flight tests such as the Instrumentation Wafer Replacement Program (IWRP) and the Signal Conditioner Monitor (SCM) replacement program. OTLs are required by USSTRATCOM and the Department of Energy to determine continuing reliability and effectiveness of the ICBM weapon system. In FY 2015, IWRP and SCM efforts previously included in PE 0604851F, Intercontinental Ballistic Missile - EMD, Project 655037, Support Equipment were combined into one program and included in PE 0101213F, Minuteman Squadrons, Project 672984, MM III Baseline Support as the Instrumentation Wafer Replacement Program.

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

	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Title: Reentry Field Support Equipment (RFSE)	33.421	-	-	-	-
Description: Design and develop the RFSE to replace the current reentry system test set. RFSE will increase the Mean Time Between Failure, eliminate unneeded Mk12 functions, and add new Mk21 functions. It will provide capability to meet Department of Energy mandated Limited Life Component warhead swaps and to test electrical continuity during buildup of Minuteman III reentry systems.					
FY 2014 Accomplishments:					
- Continued design, development, fabrication and testing of RFSE units.					
- Conducted Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA).					

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
<p>- Delivered first Engineering and Manufacturing Development unit.</p> <p>FY 2015 Plans: Reflected in PE 0101213F, Minuteman Squadrons, Project 672985, MM Support Equip.</p> <p>FY 2016 Base Plans: Reflected in PE 0101213F, Minuteman Squadrons, Project 672985, MM Support Equip.</p> <p>FY 2016 OCO Plans: N/A</p>					
<p>Title: Code System Media (CSM)</p> <p>Description: The CSM program supports the replacement of obsolete tape cartridges with more modern and available magnetic media. Segment #1, responsible for providing software to accept National Security Agency (NSA) codes, Operations Plan (OPLAN) changes and software updates on compact disk (CD), has been completed. Segment #2 will provide software and hardware necessary to import all other data on CD and produce Wing Codes Processing System products on CD. Segment #2 will also replace the Cartridge Transfer Unit (CTU) with the Data Transfer Unit (DTU). CSM effectively supports the replacement of aging media required to transport and handle mission essential codes and data throughout the ICBM weapon system. The shelf life of the current stock of DC300 tape cartridges and 9-track tapes expires in 2015. CSM delivers the capability to load codes/software on Minuteman III ICBMs through 2030 and is critical to code change activities.</p> <p>FY 2014 Accomplishments:</p> <ul style="list-style-type: none"> - Continued design, development, fabrication and testing of CSM software. - Conducted Segment #2 configuration audits. - Received deployment authorization for Segment #2. - Continued NSCCA activities and design, development, and testing of DTU. <p>FY 2015 Plans: Reflected in PE 0101213F, Minuteman Squadrons, Project 672985, MM Support Equip.</p> <p>FY 2016 Base Plans: Reflected in PE 0101213F, Minuteman Squadrons, Project 672985, MM Support Equip.</p> <p>FY 2016 OCO Plans:</p>	10.826	-	-	-	-

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Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604851F / <i>Intercontinental Ballistic Missile - EMD</i>	Project (Number/Name) 655037 / <i>Support Equipment</i>			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
N/A					
<p>Title: Payload Transporter Replacement (PTR)</p> <p>Description: Designs and develops the capabilities necessary to replace the current Payload Transporter (PT) tractor and trailer, mitigating emerging threat technologies and methods. The PT emplaces, extracts, and transports the Minuteman III Reentry System (RS), Propulsion System Rocket Engine (PSRE), and Missile Guidance Set (MGS). The new PT design increases safety and security during transport activities and improves maintenance operations.</p> <p>FY 2014 Accomplishments:</p> <ul style="list-style-type: none"> - Continued design, development, fabrication and testing of PTR. - Conducted a successful Critical Design Review (CDR) for the tractor and trailer components. <p>FY 2015 Plans:</p> <p>Reflected in PE 0101213F, Minuteman Squadrons, Project 672985, MM Support Equip.</p> <p>FY 2016 Base Plans:</p> <p>Reflected in PE 0101213F, Minuteman Squadrons, Project 672985, MM Support Equip.</p> <p>FY 2016 OCO Plans:</p> <p>N/A</p>	16.813	-	-	-	-
<p>Title: Higher Authority Command/Rapid Message Processing Element (HAC/RMPE) Message Generator</p> <p>Description: Designs and develops the replacement for the Higher Authority Command/Rapid Message Processing Element (HAC/RMPE) Message Generator due to obsolescence and unavailability for repair. The Message Generator is required to test and maintain the HAC/RMPE capability to receive, process and handle command and emergency action messages for MM III command and control. This program will replace the test support equipment with a modern, sustainable common platform and standard interfaces.</p> <p>FY 2014 Accomplishments:</p> <ul style="list-style-type: none"> - Completed design, development, fabrication and testing of HAC/RMPE Message Generator. - Conducted a Test Readiness Review (TRR), Formal Qualification Test (FQT), and FCA/PCA. <p>FY 2015 Plans:</p>	1.000	-	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)					
Reflected in PE 0101213F, Minuteman Squadrons, Project 672985, MM Support Equip.					
FY 2016 Base Plans: Reflected in PE 0101213F, Minuteman Squadrons, Project 672985, MM Support Equip.					
FY 2016 OCO Plans: N/A					
Title: Strategic Targeting Applications Computer System (STACS)					
Description: Design and develop a replacement for the STACS hardware, software and tape cartridge media which are becoming obsolete and unsupported. STACS will provide new targeting computer equipment and software, and CD media for data import and export. STACS enables USSTRATCOM required OPLAN changes and updates to ICBM missile wings for execution.					
FY 2014 Accomplishments: - Continued design and development activities. - Conducted a successful CDR.					
FY 2015 Plans: Reflected in PE 0101213F, Minuteman Squadrons, Project 672985, MM Support Equip.					
FY 2016 Base Plans: Reflected in PE 0101213F, Minuteman Squadrons, Project 672985, MM Support Equip.					
FY 2016 OCO Plans: N/A					
Title: Transporter Erector Replacement Program (TERP)					
Description: Design and develop the capabilities necessary to replace the current transporter erector (TE). The TE is used to emplace, extract and transport MM III boosters to and from the launch facilities. TERP will update existing drawings, specifications and technical orders to eliminate parts obsolescence and address intended usage through 2030 and will qualify the new system prior to production.					
FY 2014 Accomplishments: - Continued design, development, fabrication and testing of replacement TE.					
	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
	4.300	-	-	-	-
	14.081	-	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
- Conducted successful CDR and began first article build. FY 2015 Plans: Reflected in PE 0101213F, Minuteman Squadrons, Project 672985, MM Support Equip. FY 2016 Base Plans: Reflected in PE 0101213F, Minuteman Squadrons, Project 672985, MM Support Equip. FY 2016 OCO Plans: N/A					
Title: Instrumentation Wafer Replacement Program (IWRP) Description: Design and develop a replacement for the Mod 7 Instrumentation Wafer and associated signal conditioner monitor. The instrumentation wafer transmits missile performance telemetry and position data and receives command destruct messages during missile flight tests and evaluations. The Signal Conditioner Monitor (SCM), Missile Discrete Monitor and associated cabling capture Reentry System performance data during OTLs IWRP is needed to mitigate the risk of postponing MM III test launches due to parts obsolescence, asset depletion, 30th Space Wing Range Safety requirement deficiencies, and multiple failures of the Mod 7 Instrumentation Wafer System. FY 2014 Accomplishments: - Began design, development, fabrication and test of the replacement wafer, determined specific Commercial Off-the-Shelf components and reviewed all Range Safety requirements. - Began design, development, fabrication and test of the SCM replacement components. FY 2015 Plans: Reflected in PE 0101213F, Minuteman Squadrons, Project 672984, MM III Baseline Support. FY 2016 Base Plans: Reflected in PE 0101213F, Minuteman Squadrons, Project 672985, MM Support Equip. FY 2016 OCO Plans: N/A	2.547	-	-	-	-
Accomplishments/Planned Programs Subtotals	82.988	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Air Force		Date: February 2015
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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2014	FY 2015	FY 2016	FY 2016	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	Cost To	
			Base	OCO	Total					Complete	Total Cost
• RDTE: BA07: 0101213F: <i>Minuteman Squadrons</i>	-	52.985	32.484	-	32.484	25.324	26.656	15.172	-	-	152.893
• MPAF: BA05: Line Item # 00099L: <i>Missile Replacement Equipment - Ballistic</i>	-	65.568	72.583	-	72.583	54.744	57.770	42.213	31.590	Continuing	Continuing
• MPAF: BA03: Line Item # M30MLG: <i>Minuteman Modification</i>	-	-	7.689	-	7.689	41.674	3.247	-	-	-	-

Remarks

Project 655037, Support Equipment, is related to the majority of RDT&E and MPAF funding in Other Program Funding Summary. Small portion of funding pertains to the other programs that were included as part of the new bundling of efforts with the IWRP effort in the FY16 PB.

D. Acquisition Strategy

Support and test equipment replacement efforts are reviewed to determine the best method for execution including vendor qualification and procurement with no development required, develop and/or modification with organic depot capabilities or development with industry. Industry development efforts started before FY13 are predominately executed through the ICBM Prime Integration Contract (IPIC) using Cost Plus Incentive Fee (CPIF) contract addendums. Industry development efforts starting in FY13 will be executed through contracts available under the Future ICBM Acquisition and Sustainment Contract (FISAC) or competitive source selections. NSCCA and IV&V efforts are contracted separately under a Cost Plus Award Fee (CPAF) Contract.

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 2016 Air Force **Date:** February 2015

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Product Development (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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			
ICBM Prime Integration Contract	SS/CPIF	Northrop Grumman Mission Systems : Clearfield, UT	-	57.691	Apr 2014	-		-		-		-	Continuing	Continuing	-
TERP EMD	C/CPIF	DRS Environmental Systems, Inc. : Florence, KY	-	12.784	Dec 2013	-		-		-		-	Continuing	Continuing	-
Subtotal			-	70.475		-		-		-		-	-	-	-

Support (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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			
Nuclear Surety Cross-Check Analysis	SS/CPAF	Northrop Grumman IT : Mclean, VA	-	1.845	Feb 2014	-		-		-		-	Continuing	Continuing	-
Financial Management/ Cost Estimation	C/CPFF	Tecolote : Salt Lake City, UT	-	1.071	Mar 2015	-		-		-		-	Continuing	Continuing	-
Subtotal			-	2.916		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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			
Independent Validation and Verification	SS/CPAF	Northrop Grumman IT : Mclean, VA	-	0.249	Dec 2013	-		-		-		-	Continuing	Continuing	-
Subtotal			-	0.249		-		-		-		-	-	-	-

Management Services (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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			
PMA - Contractor Support	Various	Various : ,	-	8.929	Jul 2014	-		-		-		-	Continuing	Continuing	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2016 Air Force **Date:** February 2015

Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604851F / <i>Intercontinental Ballistic Missile - EMD</i>	Project (Number/Name) 655037 / <i>Support Equipment</i>
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	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	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
HAC/RMPE FCA/PCA			■																									
STACS Engineering and Manufacturing Development Phase	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
STACS FCA/PCA (Aug 2014)				■																								
STACS FOC (Feb 2015)							■																					
TERP Engineering and Manufacturing Development Phase	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
TERP CDR (Feb 2014)		■																										
TERP FCA (Mar 2015)							■																					
TERP Milestone C (May 2015)								■																				
TERP PCA (Jun 2015)								■																				
TERP Production and Deployment Phase								■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
TERP IOC (Feb 2016)												■																
TERP FOC (Aug 2019)																											■	
IWRP PDR (Nov 2015)													■															
IWRP Milestone B (Feb 2016)														■														
IWRP Engineering and Manufacturing Development Phase														■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
IWRP CDR (Feb 2017)																												
IWRP Milestone C (Sep 2017)																												
IWRP Production and Deployment Phase																												
IWRP FCA (Mar 2018)																												
IWRP PCA (Aug 2018)																												
IWRP IOC (Sep 2019)																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Air Force		Date: February 2015
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
CSM Engineering and Manufacturing Development Phase	1	2014	4	2015
CSM FCA (Nov 2013)	1	2014	1	2014
CSM Milestone C (May 2015)	3	2015	3	2015
CSM Production and Deployment Phase	3	2015	3	2016
CSM IOC (Nov 2015)	1	2016	1	2016
CSM FOC (May 2016)	3	2016	3	2016
RFSE Engineering and Manufacturing Development Phase	1	2014	2	2016
RFSE FCA (May 2014)	3	2014	3	2014
RFSE PCA (Aug 2014)	4	2014	4	2014
RFSE Milestone C (Jun 2015)	3	2015	3	2015
RFSE Production and Deployment Phase	2	2015	2	2017
RFSE IOC (May 2016)	3	2016	3	2016
RFSE FOC (Feb 2017)	3	2017	3	2017
PTR Engineering and Manufacturing Development Phase	1	2014	4	2016
PTR Tractor CDR (Feb 2014)	2	2014	2	2014
PTR Trailer CDR (Aug 2014)	4	2014	4	2014
PTR FCA (Feb 2016)	2	2016	2	2016
PTR Milestone C (May 2016)	3	2016	3	2016
PTR PCA (Jun 2016)	3	2016	3	2016
PTR Production and Deployment Phase	3	2016	4	2020
PTR IOC (Aug 2017)	4	2017	4	2017
PTR FOC (Sep 2020)	4	2020	4	2020

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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Air Force **Date:** February 2015

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Events	Start		End	
	Quarter	Year	Quarter	Year
HAC/RMPE FCA/PCA	3	2014	3	2014
STACS Engineering and Manufacturing Development Phase	1	2014	2	2015
STACS FCA/PCA (Aug 2014)	4	2014	4	2014
STACS FOC (Feb 2015)	2	2015	2	2015
TERP Engineering and Manufacturing Development Phase	1	2014	4	2015
TERP CDR (Feb 2014)	2	2014	2	2014
TERP FCA (Mar 2015)	2	2015	2	2015
TERP Milestone C (May 2015)	3	2015	3	2015
TERP PCA (Jun 2015)	3	2015	3	2015
TERP Production and Deployment Phase	3	2015	4	2019
TERP IOC (Feb 2016)	2	2016	2	2016
TERP FOC (Aug 2019)	4	2019	4	2019
IWRP PDR (Nov 2015)	1	2016	1	2016
IWRP Milestone B (Feb 2016)	2	2016	2	2016
IWRP Engineering and Manufacturing Development Phase	2	2016	2	2019
IWRP CDR (Feb 2017)	2	2017	2	2017
IWRP Milestone C (Sep 2017)	4	2017	4	2017
IWRP Production and Deployment Phase	4	2017	4	2020
IWRP FCA (Mar 2018)	2	2018	2	2018
IWRP PCA (Aug 2018)	4	2018	4	2018
IWRP IOC (Sep 2019)	4	2019	4	2019

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COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
655081: <i>ICBM Crypto</i>	-	35.516	-	-	-	-	-	-	-	-	-	35.516
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2015, Project 655081, ICBM Crypto, efforts were transferred to PE 0101213F, Minuteman Squadrons, Project 672986, MM Crypto Mods in order to consolidate ICBM investment activities under a common PE.

A. Mission Description and Budget Item Justification

Intercontinental Ballistic Missile (ICBM) Cryptography Upgrade Increment II (ICU II) executes USSTRATCOM, Air Force Global Strike Command (AFGSC), and Nuclear Weapon Safety Center (NWSC) requirements by implementing the KS-60 capabilities of remote key/code change and irreversible transformation as mandated in the approved Capabilities Development Document (CDD) dated 4 January 2005 and addresses Nuclear Weapon System Safety Group Operational Safety Review (NWSSG OSR) requirements 98-2, 00-1 and 02-2. It also incorporates continuous signal lockout capabilities to prevent the widespread loss of status monitoring. These features will greatly increase security during code changes by reducing the frequency of open sites 75 days annually and will reduce associated resource costs for 450 launch facilities (LFs) and 45 launch control centers (LCCs).

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

	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Title: ICBM Crypto Upgrade Increment II (ICU II)	35.516	-	-	-	-
Description: ICBM Cryptography Upgrade II completes design and development, implements KS-60 remote key/code change, irreversible transformation capabilities, and prevents continuous signal lockout.					
FY 2014 Accomplishments:					
- Continued A4 Drawer development and conducted the Critical Design Review (CDR) and Test Readiness Review (TRR).					
- Began qualification testing of the system and continued software development.					
- Conducted hardware and software Developmental Test and Evaluation and continued development of trainer modifications.					
- Completed NSCCA/PATE activities for nuclear surety and safety.					
FY 2015 Plans:					
Reflected in PE 0101213F, Minuteman Squadrons, Project 672986, MM Crypto Mods.					
FY 2016 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Air Force		Date: February 2015
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604851F / <i>Intercontinental Ballistic Missile - EMD</i>	Project (Number/Name) 655081 / <i>ICBM Crypto</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Reflected in PE 0101213F, Minuteman Squadrons, Project 672986, MM Crypto Mods. <i>FY 2016 OCO Plans:</i> N/A					
Accomplishments/Planned Programs Subtotals	35.516	-	-	-	-

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
• RDTE: BA 07: PE 0101213F: <i>Minuteman Squadrons</i>	-	36.672	32.845	-	32.845	-	-	-	-	-	-
• MPAF: BA 03: Line Item # M30MLG: <i>Minuteman III Modifications</i>	-	-	-	-	-	53.820	7.516	20.192	17.701	-	-
• MPAF: BA 05: Line Item # M30MLG2: <i>Minuteman III Support Equipment</i>	-	-	-	-	-	1.849	5.774	0.189	-	-	-

Remarks
Project 6055081, ICBM Crypto, is related to the RDT&E and MPAF funding in Other Program Funding Summary.

D. Acquisition Strategy
The ICBM Cryptography Upgrade (ICU) II Program utilizes the ICBM Prime Integration Contract (IPIC), which was competitively awarded, for the design and development of the ICU II capability. The contract type of the ICU II Engineering and Manufacturing Development (EMD) Contract is Cost Plus Incentive Fee. Also, ICU II EMD uses a separate contract for Nuclear Surety Cross Check Analysis/Performance Analysis and Technical Evaluation (NSCCA/PATE) Independent Validation & Verification (IV&V). The contract type is Cost Plus Fixed Fee. This contract is driven by critical nuclear surety requirements to perform an independent assessment of all modifications to nuclear-certified software.

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 2016 Air Force												Date: February 2015				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
3600 / 5				PE 0604851F / Intercontinental Ballistic Missile - EMD				655081 / ICBM Crypto								
Product Development (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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	
ICBM Prime Integration Contract	SS/CPPIF	Northrop Grumman : Clearfield, UT	-	32.085	Apr 2014	-		-		-		-	Continuing	Continuing	-	
Subtotal			-	32.085		-		-		-		-	-	-	-	
Support (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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	
Engineering Support	MIPR	Navy Crane : Crane, IN	-	1.318	Dec 2013	-		-		-		-	Continuing	Continuing	-	
Cost Estimation	C/CPFF	Tecolote : Salt Lake City, UT	-	0.200	Mar 2014	-		-		-		-	Continuing	Continuing	-	
Subtotal			-	1.518		-		-		-		-	-	-	-	
Test and Evaluation (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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	
NSCCA/PATE	C/CPFF	Northrop Grumman : Clearfield, UT	-	1.080	Jun 2014	-		-		-		-	Continuing	Continuing	-	
Hardness Test	Various	Various :	-	0.146	Aug 2014	-		-		-		-	Continuing	Continuing	-	
Subtotal			-	1.226		-		-		-		-	-	-	-	
Management Services (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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	
PMA - Government Costs	Various	ICBM Program Office : Hill AFB, UT	-	0.687	Jan 2014	-		-		-		-	Continuing	Continuing	-	
Subtotal			-	0.687		-		-		-		-	-	-	-	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Air Force							Date: February 2015				
Appropriation/Budget Activity 3600 / 5			R-1 Program Element (Number/Name) PE 0604851F / <i>Intercontinental Ballistic Missile - EMD</i>				Project (Number/Name) 655081 / <i>ICBM Crypto</i>				
	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals	-	35.516	-	-	-	-	-	-	-		

Remarks

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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Air Force		Date: February 2015
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604851F / <i>Intercontinental Ballistic Missile - EMD</i>	Project (Number/Name) 655081 / <i>ICBM Crypto</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
ICU II Engineering and Manufacturing Development Phase	1	2014	4	2017
ICU II CDR - A4 Drawer (Apr 2014)	3	2014	3	2014
ICU II TRR - FPGA (Nov 2014)	1	2015	1	2015
ICU II Weapon System Test I - Software (May 2015)	3	2015	3	2015
ICU II TRR - ASIC (Feb 2016)	2	2016	2	2016
ICU II Weapon System Test II (May 2016)	3	2016	3	2016
ICU II Milestone C (Jun 2017)	3	2017	3	2017
ICU II Production and Deployment Phase	3	2017	2	2020
ICU II FCA/PCA (Aug 2017)	4	2017	4	2017
ICU II IOC (May 2018)	3	2018	3	2018
ICU II FOC (Jun 2020)	3	2020	3	2020