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

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</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	-	116.344	166.729	182.958	0.000	182.958	186.857	89.260	84.520	79.857	Continuing	Continuing
672983: <i>MM Ground and Comm Equipment</i>	-	7.622	66.159	114.039	0.000	114.039	134.569	62.856	72.441	73.726	Continuing	Continuing
672984: <i>MM III Baseline Support</i>	-	21.751	51.173	40.205	0.000	40.205	26.400	15.027	0.000	0.000	Continuing	Continuing
672985: <i>MM Support Equip</i>	-	29.177	16.552	28.714	0.000	28.714	25.888	11.377	12.079	6.131	Continuing	Continuing
672986: <i>MM Crypto Mods</i>	-	39.589	32.845	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
672987: <i>MM Ops Equip</i>	-	18.205	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Note
 This program, BA 07 PE 0101213F, project 672985, LGM-30G Control Monitor Procedure Trainer Upgrade (CMPT) - FY17 New Start, is a new start.
 This program, BA 07 PE 0101213F, project 672985, LGM-30G G6B4 Build Equipment Replacement (G6B4 BER) - FY17 New Start, is a new start.
 This program, BA 07 PE 0101213F, project 672985, LGM-30G Pendulous Integrating Gyroscopic Accelerometer Build Equipment Replacement (PIGA BER) - FY17 New Start, is a new start.

A. Mission Description and Budget Item Justification

The MM Ground and Comm Equipment program replaces obsolete/unsupportable ground-based weapon system equipment located at Launch Control Centers (LCCs) and Launch Facilities (LFs) necessary to continue MM III operations through 2030. Current efforts include development, qualification, integration, and testing of replacement equipment such as the LGM-30G Air Launch Control System Replacement (ALCS), LGM-30G Automatic Switching Unit (ASU), LGM-30G Fast Rising B-Plug Phase II (FRBP II), LGM-30G Launch Control Center Break-In-Kit (LCCB), LGM-30G Launch Control Center Block Upgrade (LCCBU), and LGM-30G Remote Visual Assessment Phase II (RVA II).

MM III Baseline Support program replaces or upgrades obsolete/unsupportable flight test unique equipment installed on the missile during flight test, used to test MM III systems on the ground, or located at test facilities to collect, process, and analyze test data. Flight test equipment supports test and evaluation of newly developed or modified MM III capabilities and conduct of MM III Operational Test Launches (OTLs) to determine ICBM force readiness, reliability and capability shortfalls. Efforts include development, qualification, integration and testing of replacement equipment such as LGM-30G Cadmium Replacement Support Equipment Program (CaDRP), LGM-30G Flight Test Telemetry and Termination System (FT3), LGM-30G Ground Test Upgrade (GTU), and LGM-30G Squadron Data Simulator (SDS). As other similar equipment is identified for replacement, it will be added to this program. MM III Baseline Support also provides for other MM III unique government costs, studies of system performance, contract closeout costs, cost trades and acquisition planning activities, up to and including proposal preparation, for future capabilities.

MM Support Equipment program designs, develops, and tests replacement of obsolete/non-serviceable weapon system support equipment. Current efforts include design, development, and testing of support equipment such as LGM-30G Alignment Set Test Set (ASTS), LGM-30G Control Monitor Procedure Trainer Upgrade (CMPT), LGM-30G Code System Media (CSM), LGM-30G G6B4 Build Equipment Replacement (G6B4 BER), LGM-30G Performance Assessment Data System

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Communications Equipment Interface Unit (PADS CEIU), LGM-30G Pendulous Integrating Gyroscopic Accelerometer Build Equipment Replacement (PIGA BER), LGM-30G Payload Transporter Replacement (PTR), LGM-30G Reentry Field Support Equipment (RFSE), LGM-30G Reentry Support Equipment Replacement Program (RSERP), LGM-30G Strategic Targeting and Applications Computer System (STACS), and LGM-30G Transporter Erector Replacement Program (TERP). As other similar equipment is identified for replacement, it will be added to this program.

MM Crypto Mods executes USSTRATCOM, Air Force Global Strike Command, and Nuclear Weapon Safety Center requirements by implementing the KS-60 capabilities in the LGM-30G ICBM Cryptography Upgrade II (ICU II) of remote key/code change and irreversible transformations mandated in the approved Capabilities Development Document (dated 4 Jan 05) and addresses Nuclear Weapon System Safety Group Operational Safety Review requirements 98-2, 00-1 and 02-2. As other similar equipment is identified for replacement, it will be added to this program.

MM Operational Equipment program efforts identify viable concepts and material solutions in support of the Air Force's Ground Based Strategic Deterrent. Funding supports design, development, test, integration and replacement of weapon system equipment including flight systems; Nuclear Command, Control and Communications (NC3); launch and control facilities; and Security/Ground Equipment upgrades. Efforts within the MM Operational Equipment program will ensure MM III operations through 2030 as well as support future Ground Based Strategic Deterrent (GBSD) requirements. Guidance Modernization Program (GMP) and Solid Rocket Motor Modernization (SRMM) were transferred into PE 0605230F, Ground Based Strategic Deterrent, Project 641025. As other similar equipment is identified for replacement, it will be added to this program.

This program is in Budget Activity 7, Operational System Development, because this budget activity includes developmental efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal years.

B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	139.109	178.929	193.228	0.000	193.228
Current President's Budget	116.344	166.729	182.958	0.000	182.958
Total Adjustments	-22.765	-12.200	-10.270	0.000	-10.270
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-12.200			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-22.274	0.000			
• SBIR/STTR Transfer	-0.491	0.000			
• Other Adjustments	0.000	0.000	-10.270	0.000	-10.270

Change Summary Explanation

FY 2015 funding reflects \$22.274M reprogrammed to higher Air Force priorities, and \$2.994M realigned to accelerate Squadron Data Simulator (\$1.763M) and Alignment Set Test Station (\$1.231M) New Starts into FY 2015.

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FY 2016 funding reflects a Congressional Directed Reduction for Project 672983, MM Ground and Comm Equipment, for the ALCS-R (-\$12.200M).

FY 2017 funding reflects an increase for Project 672985, MM Support Equipment, for the G6B4 BER, PIGA BER and CMPT new start programs (+\$3.453M); a decrease for Project 672984, MM Baseline Support, for under-execution (-\$3.00M); a decrease for Project 672983, MM Ground and Comm Equipment, for under-execution (-\$9.00M); and a decrease across all projects for inflation adjustments (-\$1.723M).

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force										Date: February 2016		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>				Project (Number/Name) 672983 / <i>MM Ground and Comm Equipment</i>			
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
672983: <i>MM Ground and Comm Equipment</i>	-	7.622	66.159	114.039	0.000	114.039	134.569	62.856	72.441	73.726	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The MM Ground and Comm Equipment program replaces obsolete/unsupportable ground-based weapon system equipment located at Launch Control Centers (LCCs) and Launch Facilities (LFs) necessary to continue MM III operations through 2030. These programs will also implement processes, procedures and data systems to mitigate the transition risk from MM III to GBSD. Current efforts include development, qualification, integration, and testing of replacement equipment such as the LGM-30G Air Launch Control System Replacement (ALCS), LGM-30G Automatic Switching Unit (ASU), LGM-30G Fast Rising B-Plug Phase II (FRBP II), LGM-30G Launch Control Center Break-In-Kit (LCCB), LGM-30G Launch Control Center Block Upgrade (LCCBU), and LGM-30G Remote Visual Assessment Phase II (RVA II).

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

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: LGM-30G Air Launch Control System Replacement (ALCS)	6.398	46.934	65.887	0.000	65.887
<p>Description: ALCS-R will replace the legacy nuclear command and control system that provides the capability to launch MM III ICBMs from an airborne platform (Navy E-6B). The system consists of an Ultra High Frequency (UHF) radio and MM III interface at each LF, and a suite of launch equipment and cryptographic equipment that generates and transmits commands from the E-6B. ALCS-R is dependent on the Strategic Air Command Code Processing System for codes data supplied to airborne equipment, and the Navy E-6B UHF Command, Control, and Communication data path to transmit signals to the LFs. The approved acquisition strategy will recapitalize ALCS equipment in a single increment to support continued MM III operations by 2024 and resolve critical sustainment and cryptographic sunset issues. ALCS-R will be designed to support transition into the Ground Based Strategic Deterrent (GBSD) airborne survivable launch platform capability maximizing investment across both weapon systems.</p> <p>FY 2015 Accomplishments:</p> <ul style="list-style-type: none"> • Completed Materiel Development Decision for ALCS Replacement and directed to enter pre-Milestone B. • Generated an ALCS draft Capabilities Development Document • Developed acquisition documentation, to include Acquisition Strategy Document, Source Selection Plan, Request for Proposal, and technical requirement documents. <p>FY 2016 Plans:</p> <ul style="list-style-type: none"> • Initiate a source selection to award multiple Technology Maturation and Risk Reduction (TMRR) contracts. 					

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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672983 / <i>MM Ground and Comm Equipment</i>

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"> Acquire test equipment to install in the ICBM System Directorate's NC2 lab to enable low risk weapon system integration, reduce risk for GBSD commonality, and provide a first ever, end-to-end test capability for the ALCS system Maturing design and building the ALCS-R System Integration Lab <p>FY 2017 Base Plans:</p> <ul style="list-style-type: none"> Award up to two TMRR contracts. Manage contractors through System Functional Review. Contractors begin full system prototype development, to include: launch facility ground equipment, E-6B airborne equipment, and NC2 cryptographic solution Complete SIL development at the ICBMSD NC2 lab Finalizing acquisition documentation required for the Development RFP Review Milestone <p>FY 2017 OCO Plans: N/A</p>					
<p>Title: LGM-30G Automatic Switching Unit (ASU)</p> <p>Description: The ASU program will replace the current Minuteman ASU, Diesel Electric Unit (DEU) and Minuteman Power Processor (MPP). The ASU is controlled by the MPP, which contains software and electronics to measure incoming and standby power characteristics. The DEU provides standby power in the event of a loss of the primary power source. Current equipment and lack of repair/reprogram capability causes inadvertent source transfers by the MPP. Technical data does not exist for repair or reprogramming of the MPP making it unsupported. The ASU contacts have exceeded their service life, and unnecessary source transfers stress mission critical components. The increased power transfers have increased the use and accelerated the wear on the DEU.</p> <p>FY 2015 Accomplishments:</p> <ul style="list-style-type: none"> Awarded A&AS contract to conduct pre-award TMRR activities such as technical requirements, RFP, and Milestone B documents <p>FY 2016 Plans:</p> <ul style="list-style-type: none"> Award TMRR development contract, conduct a systems requirement review and hold a preliminary design review Conduct Milestone B <p>FY 2017 Base Plans:</p> <ul style="list-style-type: none"> Complete testing, finalize design, and validate installation through integration testing 	0.659	2.781	11.096	0.000	11.096

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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"> • Validate, verify, and publish technical data and drawings • Complete physical and functional configuration audits • Prepare a technical data package for production <p>FY 2017 OCO Plans: N/A</p>					
<p>Title: LGM-30G Fast Rising B-Plug Phase II (FRBP II)</p> <p>Description: The Fast Rising B-Plug (FRBP) is a security element that delays access to the Launch Facility. It is a 14,000 pound rising door that obstructs the Personnel Access Shaft (PAS). The current setup can experience Uncommanded Raises (UCR) due to single point failures and transient voltages in the system. The Fast Rising B-Plug Phase II (FRBP II) program will update hardware and software to reduce susceptibility for UCRs, improve maintainability and address obsolescence issues.</p> <p>FY 2015 Accomplishments: N/A</p> <p>FY 2016 Plans:</p> <ul style="list-style-type: none"> • Begin design, development, and fabrication of FRBP II. • Conduct a successful Milestone B <p>FY 2017 Base Plans:</p> <ul style="list-style-type: none"> • Continue design, development, and fabrication of FRBP II • Conduct Preliminary Design Review and Critical Design Review <p>FY 2017 OCO Plans: N/A</p>	0.000	4.629	4.994	0.000	4.994
<p>Title: LGM-30G Launch Control Center Break-In-Kit (LCCB)</p> <p>Description: The LCC Break-in-Kit (LCCB) program will develop a kit that will enable personnel to extract incapacitated missile combat crew members in the event the LCC crew becomes unresponsive and cannot open the LCC Blast Door. The LCCB is a new capability and has not been previously fielded.</p> <p>FY 2015 Accomplishments: N/A</p> <p>FY 2016 Plans:</p>	0.000	0.793	1.702	0.000	1.702

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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"> • Begin design, development, fabrication, and prototype construction of LCC Break-in-Kits • Conduct a successful Preliminary Design Review (PDR) / Critical Design Review (CDR) • Prepare and conduct successful Milestone B <p>FY 2017 Base Plans:</p> <ul style="list-style-type: none"> • Conduct a successful Test Readiness Review (TRR), Production Readiness Review (PRR), and Functional / Physical Configuration Audit (FCA/PCA) • Conduct a successful Milestone C and begin production <p>FY 2017 OCO Plans: N/A</p>					
<p>Title: Launch Control Center (LCC) Block Upgrade (LCCBU)</p> <p>Description: The Launch Control Center (LCC) Block Upgrade (LCCBU) program will address several elements within the LCC that are experiencing supportability issues and impacting voice communications in the MM missile fields. The LCCBU program is a single modification effort that replaces five components. Components will be procured as a single modification kit and installed as a single kit at each LCC. It will consist of five primary replacement efforts:</p> <ol style="list-style-type: none"> 1) Journal Memory Loader (JML) - replaces the JML with a modern data storage solution which will increase the available memory required to support annual software changes and mitigate Floppy Disk obsolescence concerns. 2) Floppy Disk Drive (FDD) - replaces the legacy FDDs which are no longer manufactured with a modern, supportable hardware solution. 3) Voice Communications Control Panel (VCCP) - replaces the current deficient equipment to provide the voice communications quality required to perform the ICBM mission and may require additional components to resolve voice communication degradations. 4) Weapon System Control Console (WSCC) Printer - replaces the current printer that is no longer produced and is unsupported due to aging hardware and a lack of qualified vendors for replacement/repair components. 5) Oxygen Regeneration Unit (ORU) - replaces the current unsupported system to provide the crew with breathable air during periods when the LCC is locked down. <p>All LCCBU efforts will support the 45 operational LCCs and additional support equipment/test/maintenance locations.</p>	0.565	5.698	22.880	0.000	22.880

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

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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>
• MPAF: BA 03: Line Item # M30MLG: <i>Minuteman III Modifications</i>	0.000	6.351	1.024	0.000	1.024	32.981	57.429	53.533	71.923	Continuing	Continuing
• MPAF: BA 04: Line Item #000999: <i>Replen Spares/Repair Parts</i>	0.000	0.000	0.033	0.000	0.033	1.856	0.055	0.151	0.203	Continuing	Continuing

Remarks

D. Acquisition Strategy

Ground and Communication 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 for Ground and Communication equipment efforts will be executed through contracts available under the Future ICBM Sustainment and Acquisition Construct (FISAC) or competitive source selections. Nuclear Surety Cross Check Analysis (NSCCA) and Independent Verification and Validation (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 2017 Air Force **Date:** February 2016

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / Minuteman Squadrons	Project (Number/Name) 672983 / MM Ground and Comm Equipment
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Product Development (\$ in Millions)				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			
LGM-30G Airborne Launch Control System (ALCS-R) TMRR	C/TBD	TBD : TBD	-	0.000		35.442	Apr 2016	49.306	Jan 2017	0.000		49.306	Continuing	Continuing	TBD
LGM-30G ALCS SIL	MIPR	Aerospace : El Segundo, CA	-	2.876	Mar 2015	2.312	Jan 2016	5.699	Jan 2017	0.000		5.699	Continuing	Continuing	TBD
LGM-30G Automatic Switching Unit (ASU) TMRR/EMD	C/CPIF	Northrop Grumman : Salt Lake City, UT	-	0.000		1.731	Mar 2016	8.546	Apr 2017	0.000		8.546	Continuing	Continuing	TBD
LGM-30G Fast Rising B-Plug Phase II EMD	TBD	TBD : TBD	-	0.000		4.088	Sep 2016	4.138	Apr 2017	0.000		4.138	Continuing	Continuing	TBD
LGM-30G Launch Control Center Break-In-Kit EMD	C/CPFF	TBD : TBD	-	0.000		0.335	Apr 2016	0.905	Apr 2017	0.000		0.905	Continuing	Continuing	TBD
LGM-30G Launch Control Center Block Upgrade TMRR/EMD	C/CPIF	Northrop Grumman : Salt Lake City, UT	-	0.565	Sep 2015	5.159	Mar 2016	22.564	Apr 2017	0.000		22.564	Continuing	Continuing	TBD
LGM-30G Remote Visual Assessment Phase II (RVA II) EMD	C/TBD	TBD : TBD	-	0.000		4.549	Jun 2016	6.323	Feb 2017	0.000		6.323	Continuing	Continuing	TBD
Subtotal			-	3.441		53.616		97.481		0.000		97.481	-	-	-

Support (\$ in Millions)				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			
LGM-30G Airborne Launch Control System Replacement (ALCS)	MIPR	MITRE : Bedford, MA	-	1.523	Mar 2015	2.792	Jan 2016	2.867	Jan 2017	0.000		2.867	Continuing	Continuing	TBD
LGM-30G Automatic Switching Unit A&AS Support	C/FP	BAE : Layton, UT	-	0.089	Jul 2015	0.550	Oct 2015	0.550	Oct 2016	0.000		0.550	Continuing	Continuing	TBD
LGM-30G Remote Visual Assessment II (RVA II) A&AS Support	C/FP	BAE : Layton, UT	-	0.000		0.296	Feb 2016	0.484	Oct 2016	0.000		0.484	Continuing	Continuing	TBD
Subtotal			-	1.612		3.638		3.901		0.000		3.901	-	-	-

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / Minuteman Squadrons	Project (Number/Name) 672983 / MM Ground and Comm Equipment
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Test and Evaluation (\$ in Millions)				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			
Subtotal			-	-	-	-	-	-	-	-	-	-	-	-	-

Management Services (\$ in Millions)				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			
LGM-30G Air Launch Control System Replacement (ALCS) FFRDC	MIPR	Aerospace : El Segundo, CA	-	0.384	Mar 2015	1.682	Jan 2016	1.656	Jan 2017	0.000		1.656	Continuing	Continuing	TBD
LGM-30G Air Launch Control System Replacement (ALCS) PMA	Various	Various : TBD	-	1.615	May 2015	4.706	Mar 2016	6.359	Jan 2017	0.000		6.359	Continuing	Continuing	TBD
LGM-30G Automatic Switching Unit PMA	Various	Various : TBD	-	0.570	Jul 2015	0.500	Nov 2015	2.000	Nov 2016	0.000		2.000	Continuing	Continuing	TBD
LGM-30G Fast Rising B-Plug Phase II PMA	Various	Various : TBD	-	0.000		0.541	Feb 2016	0.856	Feb 2017	0.000		0.856	Continuing	Continuing	TBD
LGM-30G Launch Control Center Break-In-Kit PMA	Various	Various : TBD	-	0.000		0.458	Apr 2016	0.797	Apr 2017	0.000		0.797	Continuing	Continuing	TBD
LGM-30G Launch Control Center Block Upgrade (LCCBU) PMA	Various	Various : TBD	-	0.000		0.539	Feb 2016	0.316	Feb 2017	0.000		0.316	Continuing	Continuing	TBD
LGM-30G Remote Visual Assessment Phase II (RVA II) PMA	Various	Various : TBD	-	0.000		0.479	Feb 2016	0.673	Feb 2017	0.000		0.673	Continuing	Continuing	TBD
Subtotal			-	2.569		8.905		12.657		0.000		12.657	-	-	-

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		-	7.622	66.159	114.039	0.000	-	-	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672983 / <i>MM Ground and Comm Equipment</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
ALCS Requirements Development	██████████																											
ALCS Technology Maturation and Risk Reduction Phase									██████████																			
ALCS PDR (Apr 2018)													████															
ALCS Milestone B (Dec 2019)																	████											
ALCS Engineering and Manufacturing Development Phase																	████████████████████											
ALCS CDR (Aug 2020)																					████							
ASU Technology Maturation and Risk Reduction phase					██████████																							
ASU PDR (Dec 2016)									████																			
ASU Milestone B (Jan 2017)									████																			
ASU Engineering and Manufacturing Development Phase					████████████████████																							
ASU CDR (Sep 2017)									████																			
ASU Milestone C (Dec 2018)													████															
ASU Production and Deployment Phase																	████████████████████											
FRBP II Milestone B (August 2016)					████																							
FRBP II Engineering and Manufacturing Development Phase					████████████████████																							
FRBP II PDR/CDR (Jun 2017)									████																			
FRBP II Milestone C (Feb 2019)																	████											
FRBP II Production and Deployment Phase																	████████████████████											
FRBP II IOC (Jun 2019)																	████											
LCCB Milestone B (Mar 2016)					████																							
LCCB Engineering and Manufacturing Development Phase					████████████████████																							

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Air Force **Date:** February 2016

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / Minuteman Squadrons	Project (Number/Name) 672983 / MM Ground and Comm Equipment
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	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
LCCB PDR/CDR (Sep 2016)																												
LCCB Milestone C (Sep 2017)																												
LCCB Production and Deployment Phase																												
LCCB IOC (Aug 2018)																												
LCCBU Technology Maturation & Risk Reduction Phase																												
LCCBU PDR (Apr 2017)																												
LCCBU Milestone B (Apr 2017)																												
LCCBU Engineering and Manufacturing Development Phase																												
LCCBU CDR (Sep 2017)																												
LCCBU Milestone C (Jul 2018)																												
LCCBU Production and Deployment Phase																												
LCCBU IOC (Mar 2019)																												
LCCBU FOC (Sep 2019)																												
RVA II PDR (Mar 2016)																												
RVA II Milestone B (Feb 2016)																												
RVA II Engineering and Manufacturing Development Phase																												
RVA II CDR (Mar 2017)																												
RVA II Milestone C (Sep 2017)																												
RVA II Production and Deployment Phase																												
RVA II IOC (Feb 2019)																												
RVA II FOC (Feb 2021)																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672983 / <i>MM Ground and Comm Equipment</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
ALCS Requirements Development	2	2015	1	2017
ALCS Technology Maturation and Risk Reduction Phase	2	2017	1	2020
ALCS PDR (Apr 2018)	3	2018	3	2018
ALCS Milestone B (Dec 2019)	1	2020	1	2020
ALCS Engineering and Manufacturing Development Phase	2	2020	4	2021
ALCS CDR (Aug 2020)	4	2020	4	2020
ASU Technology Maturation and Risk Reduction phase	4	2015	2	2016
ASU PDR (Dec 2016)	1	2017	1	2017
ASU Milestone B (Jan 2017)	2	2017	2	2017
ASU Engineering and Manufacturing Development Phase	3	2016	1	2019
ASU CDR (Sep 2017)	4	2017	4	2017
ASU Milestone C (Dec 2018)	1	2019	1	2019
ASU Production and Deployment Phase	2	2019	4	2021
FRBP II Milestone B (August 2016)	4	2016	4	2016
FRBP II Engineering and Manufacturing Development Phase	4	2016	2	2019
FRBP II PDR/CDR (Jun 2017)	3	2017	3	2017
FRBP II Milestone C (Feb 2019)	2	2019	2	2019
FRBP II Production and Deployment Phase	2	2019	4	2021
FRBP II IOC (Jun 2019)	3	2019	3	2019
LCCB Milestone B (Mar 2016)	2	2016	2	2016
LCCB Engineering and Manufacturing Development Phase	2	2016	4	2017
LCCB PDR/CDR (Sep 2016)	4	2016	4	2016
LCCB Milestone C (Sep 2017)	4	2017	4	2017

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Air Force **Date:** February 2016

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672983 / <i>MM Ground and Comm Equipment</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
LCCB Production and Deployment Phase	4	2017	1	2019
LCCB IOC (Aug 2018)	4	2018	4	2018
LCCBU Technology Maturation & Risk Reduction Phase	4	2015	3	2017
LCCBU PDR (Apr 2017)	3	2017	3	2017
LCCBU Milestone B (Apr 2017)	3	2017	3	2017
LCCBU Engineering and Manufacturing Development Phase	3	2017	3	2018
LCCBU CDR (Sep 2017)	4	2017	4	2017
LCCBU Milestone C (Jul 2018)	4	2018	4	2018
LCCBU Production and Deployment Phase	4	2018	4	2019
LCCBU IOC (Mar 2019)	2	2019	2	2019
LCCBU FOC (Sep 2019)	4	2019	4	2019
RVA II PDR (Mar 2016)	2	2016	2	2016
RVA II Milestone B (Feb 2016)	2	2016	2	2016
RVA II Engineering and Manufacturing Development Phase	2	2016	4	2017
RVA II CDR (Mar 2017)	2	2017	2	2017
RVA II Milestone C (Sep 2017)	4	2017	4	2017
RVA II Production and Deployment Phase	2	2018	2	2021
RVA II IOC (Feb 2019)	2	2019	2	2019
RVA II FOC (Feb 2021)	2	2021	2	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force										Date: February 2016		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>				Project (Number/Name) 672984 / <i>MM III Baseline Support</i>			
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
672984: <i>MM III Baseline Support</i>	-	21.751	51.173	40.205	0.000	40.205	26.400	15.027	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

MM III Baseline Support program replaces or upgrades obsolete/unsupportable flight test unique equipment installed on the missile during flight test, used to test MM III systems on the ground, or located at test facilities to collect, process, and analyze test data. Flight test equipment supports test and evaluation of newly developed or modified MM III capabilities, and MM III Operational Test Launches (OTLs) to determine ICBM force readiness, reliability and capability shortfalls. Efforts include development, qualification, integration and testing of replacement equipment such as LGM-30G Cadmium Replacement Support Equipment Program (CaDRP), LGM-30G Flight Test Telemetry and Termination System (FT3), LGM-30G Ground Test Upgrade (GTU), and LGM-30G Squadron Data Simulator (SDS). These programs will also implement processes, procedures and data systems to mitigate the transition risk from MM III to GBSD. As other similar equipment is identified for replacement, it will be added to this program. MM III Baseline Support also provides for other MM III unique government costs, studies of system performance, contract closeout costs, cost trades and acquisition planning activities, up to and including proposal preparation, for future capabilities.

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

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: LGM-30G Cadmium Replacement Program	0.000	2.683	3.136	0.000	3.136
<p>Description: Cadmium plating is used in the LF and LCC Motor Generators. Motor generator parts are coated with the material to inhibit corrosion, ensure a low electrical signature (bonding and grounding) and aide in the ability to withstand a nuclear environment. Cadmium is one of the EPA-17 chemicals selected for reduction. Executive Directive 13148 and FAR part 23.703 states, "eliminate or reduce the generation of hazardous waste and the need for special material processing." CaDRP will provide a cadmium replacement coating with the same properties for corrosion inhibiting, bonding and grounding, and nuclear event survivability to meet these directives. Process must meet the weapon system parameters for form, fit, function, system safety, and hardness</p> <p>FY 2015 Accomplishments: N/A</p> <p>FY 2016 Plans:</p> <ul style="list-style-type: none"> • Begin the development of replacement for Cadmium (CaD) plating material • Analyze/test and provide engineering and administrative support • Prepare and conduct successful Milestone B <p>FY 2017 Base Plans:</p> <ul style="list-style-type: none"> • Complete the development of CaD replacement plating material and portable plating unit 					

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force	Date: February 2016
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672984 / <i>MM III Baseline Support</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
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<ul style="list-style-type: none"> • Qualify and test the AFRL Zinc-Nickel (Zi-Ni) plating material for the MM-III Motor Generators and complete the development of the prototype portable Zi-Ni plating unit • Analyze/test designs, provide engineering and administrative support • Complete Critical Design Review and conduct verification testing • Prepare and conduct successful Milestone C <p>FY 2017 OCO Plans: N/A</p>					
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<p>Title: LGM-30G Flight Test Telemetry and Termination System (FT3)</p> <p>Description: FT3 designs, develops, fabricates and tests replacements for the Mod 7 Instrumentation Wafer, associated Signal Conditioner Monitor Group (SCMG), as well as the Flight Destruct System (FDS) and the Launch Safety System (LSS). This will replace the unsupported instrumentation wafer and FDS that do not meet current Range Safety Standards. The Mod 7 instrumentation wafer transmits missile performance telemetry and position data and receives command destruct messages during MM III OTLs and developmental flight test evaluations. The SCMG and associated cabling capture Reentry System performance data during OTLs and developmental flight tests. FT3 will replace the current MM III OTL flight destruct capability used in the event of a flight anomaly where it would be necessary to destroy the missile. LSS replaces the current unique, specialized test system at Vandenberg AFB used to monitor and control test launch flights and ground support equipment. The current LSS is over 15-years old and experiencing major supportability issues. LSS failure trends are increasing due to hardware aging and obsolescence creating a need for workarounds, waivers and contractor intervention. A new Instrumentation Wafer and FDS are required to continue OTLs through 2030. A new LSS is required to field the Instrumentation Wafer and the FDS.</p> <p>FY 2015 Accomplishments:</p> <ul style="list-style-type: none"> • Conducted Systems Requirements Analysis in preparation for Systems Requirement Review (SRR) • Determined specific COTS components and began review of all Range Safety requirements <p>FY 2016 Plans:</p> <ul style="list-style-type: none"> • Conduct SRR • Conduct Milestone B to gain entry into EMD phase • Conduct the Preliminary Design Review • Design, develop, fabricate and test prototypes of the IIS, FDS and LSS • Conduct system design and integrate/ verify at component and system level through ground testing 	15.885	28.484	16.940	0.000	16.940
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Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force **Date:** February 2016

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672984 / <i>MM III Baseline Support</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"> • Prepare for Critical Design Review (CDR) <p>FY 2017 Base Plans:</p> <ul style="list-style-type: none"> • Conduct CDR • Build qualification hardware and conduct qualification testing • Prepare for Production Readiness Review • Begin long-lead procurement activities <p>FY 2017 OCO Plans: N/A</p>					
<p>Title: LGM-30G Baseline Support</p> <p>Description: This program provides for other MM III unique government costs, studies of system performance, contract closeout costs, cost trades, and acquisition planning activities, up to and including proposal preparation, for future capabilities.</p> <p>FY 2015 Accomplishments:</p> <ul style="list-style-type: none"> • Conducted studies of system performance, cost trades and acquisition planning activities, up to and including proposal preparation, for future capabilities. • Paid contract closeout costs. <p>FY 2016 Plans:</p> <ul style="list-style-type: none"> • Conduct studies of system performance. • Pay contract closeout costs. • Conduct cost trades and acquisition planning activities, up to and including proposal preparation, for future capabilities. <p>FY 2017 Base Plans:</p> <ul style="list-style-type: none"> • Conduct studies of system performance. • Pay contract closeout costs. • Conduct cost trades and acquisition planning activities, up to and including proposal preparation, for future capabilities. <p>FY 2017 OCO Plans: N/A</p>	0.503	0.500	0.100	0.000	0.100
<p>Title: LGM-30G Ground Test Upgrade (GTU)</p>	3.600	4.820	3.530	0.000	3.530

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force	Date: February 2016
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
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<p>Description: GTU will design a replacement for the Simulated Electronic Launch Minuteman (SELM) and Guided Missile Launcher Electronic Circuit (GMLEC) test sets, and the Re-entry System Simulator. Modifications being added include RS Fuze Simulator, SELM Enhancements, and A4 drawer interface change. GTU enables operational checkout and test of LFs up to the point of actual MM III launch. The program will address parts obsolescence and combine SELM/GMLEC test sets into one using the same interfaces and cables.</p> <p>FY 2015 Accomplishments:</p> <ul style="list-style-type: none"> • Awarded TMRR contract to Ground Subsystems Support Contract (GSSC) • Completed System Requirement Review (SRR) • Awarded task order for nuclear surety Independent Verification and Validation (IV&V)/Performance Analysis and Technical Evaluation (PATE) <p>FY 2016 Plans:</p> <ul style="list-style-type: none"> • Complete TMRR phase with an approved PDR and continue into EMD • Begin design, development, fabrication and testing of replacement equipment for GTU • Prepare and conduct successful Milestone B <p>FY 2017 Base Plans:</p> <ul style="list-style-type: none"> • Conduct Critical Design Review (CDR) • Continue with EMD phase of the program <p>FY 2017 OCO Plans: N/A</p>					
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<p>Title: LGM-30G Squadron Data Simulator (SDS)</p> <p>Description: Design and develop the SDS to replace the current test set. SDS will increase the mean time between failure, improve user interface, and meet DoD Cyber Security requirements. Additionally, this modeling and simulation tool is used to replicate the message traffic for a selectable number of Launch Control Centers and Launch Facilities within an ICBM squadron.</p> <p>FY 2015 Accomplishments:</p> <ul style="list-style-type: none"> • Award base period contract and begin Technology Maturation and Risk Reduction (TMRR) Phase <p>FY 2016 Plans:</p> <ul style="list-style-type: none"> • Continue Technology Maturation and Risk Reduction (TMRR) Phase 	1.763	14.686	16.499	0.000	16.499
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Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force		Date: February 2016
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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"> Continue design, development, verification of SDS requirements, and conduct Preliminary Design Review (PDR) Conduct a Milestone B Complete Critical Design Review, and prepare for verification testing <p>FY 2017 Base Plans:</p> <ul style="list-style-type: none"> Continue the Engineering and Manufacturing Development phase. Complete test readiness review, qualification testing, weapon system testing, electromagnetic interference testing, functional configuration audit and physical configuration audit Prepare and conduct successful Milestone C <p>FY 2017 OCO Plans: N/A</p>					
Accomplishments/Planned Programs Subtotals	21.751	51.173	40.205	0.000	40.205

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>
• MPAF: BA 03: Line Item #M30MLG: <i>Minuteman III Modifications</i>	0.000	7.689	22.870	0.000	22.870	22.953	0.052	0.053	0.000	Continuing	Continuing
• MPAF: BA 01: Line Item #00099L: <i>Missile Replacement Eq-Ballistic</i>	0.000	0.000	0.000	0.000	0.000	4.820	4.406	0.000	0.000	Continuing	Continuing
• MPAF: BA 04: Line Item #000999: <i>Replen Spares/Repair Parts</i>	0.000	0.000	0.805	0.000	0.805	0.000	0.000	0.000	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

Baseline Support 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 for Baseline Support equipment efforts will be executed through contracts available under the Future ICBM Sustainment and Acquisition Construct (FISAC) or competitive source selections. Nuclear Surety Cross Check Analysis (NSCCA) and Independent Verification and Validation (IV&V) efforts are contracted separately under a Cost Plus Award Fee (CPAF) Contract.

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

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Product Development (\$ in Millions)				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			
LGM-30G Cadmium Replacement Program EMD	C/CPFF	TBD : TBD	-	0.000		2.163	Apr 2016	2.752	Jan 2017	0.000		2.752	Continuing	Continuing	TBD
LGM-30G Ground Test Upgrade (GTU) TMRR/EMD	C/CPAF	Northrop Grumman Technical Services : Clearfield, UT	-	2.741	Mar 2015	3.616	Mar 2016	2.202	Mar 2017	0.000		2.202	Continuing	Continuing	TBD
LGM-30G Flight Test Telemetry and Termination System (FT3) TMRR/EMD	C/CPIF	Boeing : Clearfield, UT	-	13.512	Oct 2015	23.716	Oct 2016	15.720	Oct 2017	0.000		15.720	Continuing	Continuing	TBD
LGM-30G Squadron Data Simulator (SDS) TMRR/EMD	C/CPFF	Lockheed Martin : TBD	-	1.693	Sep 2015	14.485	Apr 2016	14.802	Apr 2017	0.000		14.802	Continuing	Continuing	TBD
Subtotal			-	17.946		43.980		35.476		0.000		35.476	-	-	-

Support (\$ in Millions)				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			
LGM-30G Flight Test Telemetry and Termination System (FT3)	C/Variou	Boeing : Clearfield, UT	-	1.367	Oct 2015	0.600	Oct 2016	0.600	Oct 2017	0.000		0.600	Continuing	Continuing	TBD
LGM-30G Baseline Support	Variou	Variou : TBD	-	0.503	Mar 2015	0.500	Mar 2016	0.100	Mar 2017	0.000		0.100	Continuing	Continuing	TBD
Subtotal			-	1.870		1.100		0.700		0.000		0.700	-	-	-

Test and Evaluation (\$ in Millions)				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			
LGM-30G Flight Test Telemetry and Termination System (FT3)	C/CPIF	Boeing : Clearfield, UT	-	0.000		1.640	Oct 2016	0.000		0.000		0.000	Continuing	Continuing	TBD

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / Minuteman Squadrons	Project (Number/Name) 672984 / MM III Baseline Support
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Test and Evaluation (\$ in Millions)				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			
LGM-30G Ground Test Upgrades NSCCA-PATE / IV&V	C/CPFF	Northrop Grumman Information Technology : Clearfield, UT	-	0.251	Jun 2015	0.491	Jan 2016	0.209	Jan 2017	0.000		0.209	Continuing	Continuing	TBD
LGM-30G Squadron Data Simulator (SDS)	TBD	TBD : TBD	-	0.000		0.000		1.492	Jan 2017	0.000		1.492	Continuing	Continuing	-
Subtotal			-	0.251		2.131		1.701		0.000		1.701	-	-	-

Management Services (\$ in Millions)				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			
LGM-30G Cadmium Replacement Support Equipment Program (CaDRP) PMA	C/FFP	BAE Systems : Clearfield, UT	-	0.000		0.520	Jan 2016	0.384	Jan 2017	0.000		0.384	Continuing	Continuing	TBD
LGM-30G Flight Test Telemetry and Termination System (FT3) PMA	C/CPIF	Boeing : Clearfield, UT	-	1.006	Oct 2015	2.528	Oct 2016	0.620	Oct 2017	0.000		0.620	Continuing	Continuing	TBD
LGM-30G Ground Test Upgrades A&AS	C/FFP	BAE System : Clearfield, UT	-	0.223	Jun 2015	0.378	Jun 2016	0.549	Jun 2017	0.000		0.549	Continuing	Continuing	TBD
LGM-30G Ground Test Upgrades PMA	Various	Various : Various : TBD	-	0.385	Mar 2015	0.335	Mar 2016	0.570	Mar 2017	0.000		0.570	Continuing	Continuing	TBD
LGM-30G Squadron Data Simulator PMA	Various	Various : Various : TBD	-	0.070	Sep 2015	0.201	Apr 2016	0.205	Apr 2017	0.000		0.205	Continuing	Continuing	TBD
Subtotal			-	1.684		3.962		2.328		0.000		2.328	-	-	-

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		-	21.751	51.173	40.205	0.000	40.205	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Air Force **Date:** February 2016

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	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
FT3 CDR (May 2017)											■																	
FT3 Milestone C (May 2018)															■													
FT3 Production and Deployment Phase															■	■	■	■	■	■	■	■	■	■	■	■	■	■
FT3 IOC (May 2019)																												
FT3 FOC (Jun 2021)																												■
SDS Technology Maturation and Risk Reduction Phase																												
SDS PDR (Apr 2016)																												
SDS Milestone B (Jun 2016)																												
SDS Engineering and Manufacturing Development Phase																												
SDS CDR (Sep 2016)																												
SDS Milestone C (Dec 2017)																												
SDS Production and Deployment Phase																												
SDS FOC (Apr 2019)																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Air Force **Date:** February 2016

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672984 / <i>MM III Baseline Support</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
CaDRP Milestone B (Mar 2016)	2	2016	2	2016
CaDRP Engineering and Manufacturing Development Phase	3	2016	4	2017
CaDRP CDR (Oct 2016)	1	2017	1	2017
CaDRP Production and Deployment Phase	4	2017	4	2019
CaDRP Milestone C (Jul 2017)	4	2017	4	2017
CaDRP IOC (Jan 2019)	2	2019	2	2019
CaDRP FOC (Apr 2019)	3	2019	3	2019
GTU Technology Maturation and Risk Reduction Phase	2	2015	4	2016
GTU PDR (Aug 2016)	4	2016	4	2016
GTU Milestone B (Sep 2016)	4	2016	4	2016
GTU Engineering and Manufacturing Development Phase	4	2016	4	2018
GTU CDR (Mar 2017)	2	2017	2	2017
GTU Milestone C (Sep 2018)	4	2018	4	2018
GTU Production and Deployment Phase	4	2018	2	2020
GTU IOC (Aug 2019)	4	2019	4	2019
GTU FOC (Jan 2020)	2	2020	2	2020
FT3 Technology Maturation and Risk Reduction Phase	2	2015	3	2016
FT3 PDR (Apr 2016)	3	2016	3	2016
FT3 Milestone B (May 2016)	3	2016	3	2016
FT3 Engineering and Manufacturing Development Phase	3	2016	3	2019
FT3 Long Lead Procurement	3	2016	3	2018
FT3 CDR (May 2017)	3	2017	3	2017
FT3 Milestone C (May 2018)	3	2018	3	2018

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Air Force **Date:** February 2016

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672984 / <i>MM III Baseline Support</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
FT3 Production and Deployment Phase	3	2018	3	2021
FT3 IOC (May 2019)	3	2019	3	2019
FT3 FOC (Jun 2021)	3	2021	3	2021
SDS Technology Maturation and Risk Reduction Phase	4	2015	4	2016
SDS PDR (Apr 2016)	3	2016	3	2016
SDS Milestone B (Jun 2016)	3	2016	3	2016
SDS Engineering and Manufacturing Development Phase	3	2016	2	2018
SDS CDR (Sep 2016)	4	2016	4	2016
SDS Milestone C (Dec 2017)	1	2018	1	2018
SDS Production and Deployment Phase	2	2018	3	2019
SDS FOC (Apr 2019)	3	2019	3	2019

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force										Date: February 2016		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>				Project (Number/Name) 672985 / <i>MM Support Equip</i>			
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
672985: <i>MM Support Equip</i>	-	29.177	16.552	28.714	0.000	28.714	25.888	11.377	12.079	6.131	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 07 PE 0101213F, project 672985, LGM-30G Control Monitor Procedure Trainer Upgrade (CMPT) - FY17 New Start, is a new start.
 This program, BA 07 PE 0101213F, project 672985, LGM-30G G6B4 Build Equipment Replacement (G6B4 BER) - FY17 New Start, is a new start.
 This program, BA 07 PE 0101213F, project 672985, LGM-30G Pendulous Integrating Gyroscopic Accelerometer Build Equipment Replacement (PIGA BER) - FY17 New Start, is a new start.

A. Mission Description and Budget Item Justification

MM Support Equipment program designs, develops, and tests replacement of obsolete/non-serviceable weapon system support equipment. These programs will also implement processes, procedures and data systems to mitigate the transition risk from MM III to GBSD. Current efforts include design, development, and testing of support equipment such as LGM-30G Alignment Set Test Set (ASTS), LGM-30G Control Monitor Procedure Trainer Upgrade (CMPT), LGM-30G Code System Media (CSM), LGM-30G G6B4 Build Equipment Replacement (G6B4 BER), LGM-30G Performance Assessment Data System Communications Equipment Interface Unit (PADS CEIU), LGM-30G Pendulous Integrating Gyroscopic Accelerometer Build Equipment Replacement (PIGA BER), LGM-30G Payload Transporter Replacement (PTR), LGM-30G Reentry Field Support Equipment (RFSE), LGM-30G Reentry Support Equipment Replacement Program (RSERP), LGM-30G Strategic Targeting and Applications Computer System (STACS), and LGM-30G Transporter Erector Replacement Program (TERP).

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

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: LGM-30G Control Monitor Procedure Trainer Upgrade (CMPT) - FY17 New Start	0.000	0.000	0.645	0.000	0.645
Description: CMPT replaces the classroom trainer supporting start-up and shut-down of the MM III LF and missile, computer memory loading operations, and maintenance procedures. The program will update software, outdated operating systems, and obsolete/unsupportable hardware (desktop computers, motherboards, simulated programmer group, drivers, simulated cable sets, tape sets, and other miscellaneous parts) located at each Missile Wing and Vandenberg AFB necessary to continue the training capability of the CMPTs through 2030.					
FY 2015 Accomplishments: N/A					
FY 2016 Plans: N/A					
FY 2017 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force			Date: February 2016		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672985 / <i>MM Support Equip</i>			
B. Accomplishments/Planned Programs (\$ in Millions)					
<ul style="list-style-type: none"> • Conduct Source Selection and initiate EMD contract award actions to validate the design of new software and begin code development • Prepare and conduct successful Preliminary Design Review and Milestone B 					
FY 2017 OCO Plans: N/A					
Title: LGM-30G Code System Media (CSM)					
Description: The CSM program supports the replacement of obsolete tape cartridges with more modern and available magnetic media required to transport and handle mission essential codes and data throughout the ICBM weapon system. Segment #1 completed in Sep 2011 and provided software to accept National Security Agency (NSA) codes, Operations Plan (OPLAN) changes and software updates on compact disk (CD). Segment #2 completed in Oct 2013 and provided software and hardware necessary to import all other data on CD and produce Wing Codes Processing System products on CD. Finally, the program will replace the Cartridge Tape Unit (CTU) with a Data Transfer Unit (DTU). The shelf life of the current stock of DC300 tape cartridges used by the CTUs and 9-track tapes will age out by 2017. The DTU provides the capability to load codes/software on Minuteman III ICBMs through 2030 and is critical to code change activities to secure the nuclear ICBMs.					
FY 2015 Accomplishments:					
<ul style="list-style-type: none"> • Completed Test Readiness Review and system qualification testing of Data Transfer Unit (DTU) engineering prototypes. • Certified design readiness for Full Rate Production decision • Verified and delivered technical data to accompany First Article Test and Evaluations. • Conducted a Milestone C 					
FY 2016 Plans: N/A					
FY 2017 Base Plans: N/A					
FY 2017 OCO Plans: N/A					
Title: LGM-30G Reentry Field Support Equipment (RFSE)					
Description: Design and develop 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					
	1.398	0.000	0.000	0.000	0.000
	4.905	0.000	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force			Date: February 2016		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672985 / <i>MM Support Equip</i>			
B. Accomplishments/Planned Programs (\$ in Millions)					
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 2015 Accomplishments:					
<ul style="list-style-type: none"> • Completed design, development, fabrication and testing of RFSE units. • Prepared and conducted successful Milestone C 					
FY 2016 Plans:					
N/A					
FY 2017 Base Plans:					
N/A					
FY 2017 OCO Plans:					
N/A					
Title: LGM-30G Strategic Targeting and 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 2015 Accomplishments:					
<ul style="list-style-type: none"> • Completed design and development activities. • Completed certification and delivered the STACS replacement to reach FOC. 					
FY 2016 Plans:					
N/A					
FY 2017 Base Plans:					
N/A					
FY 2017 OCO Plans:					
N/A					
Title: LGM-30G 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 Minuteman III boosters to and from the launch facilities. TERP					
	0.629	0.000	0.000	0.000	0.000
	9.429	1.000	0.100	0.000	0.100

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force	Date: February 2016
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672985 / <i>MM Support Equip</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
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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 2015 Accomplishments:**
- Completed design, development, fabrication and testing of replacement TE.
 - Completed first article production, Test Readiness Review, and system qualification testing.
 - Planned redesign effort to address tractor failures identified during testing.

- FY 2016 Plans:**
- Complete tractor redesign, development, fabrication.
 - Conduct delta CDR for tractor redesign.

- FY 2017 Base Plans:**
- Complete delta Test Readiness Review, delta system qualification testing, and tractor redesign qualification testing.
 - Verification and delivery of tech data to accompany First Article Test and Evaluations accomplished.
 - Certify design readiness for Full Rate Production decision.
 - Conduct a successful Milestone C.

FY 2017 OCO Plans:
N/A

Title: LGM-30G Reentry Support Equipment Replacement Program (RSERP)	3.926	9.377	18.491	0.000	18.491
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Description: Design, develop, fabricate and test the RSERP to modify or replace the over 30 year old suite of test equipment necessary to continue checkout, screening, repair, and refurbishment of Mk12A/Mk21 Arming Fuzing Assemblies.

- FY 2015 Accomplishments:**
- Began the design, development, fabrication, and test of RSERP.

- FY 2016 Plans:**
- Continue to design, develop and fabricate the test program sets.
 - Conduct the Preliminary Design Review and Critical Design Review for the Automatic Test Equipment.

- FY 2017 Base Plans:**
- Prepare and conduct successful Milestone B
 - Begin to design, develop and fabricate System and Line Replaceable Unit (LRU) test program sets.

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force	Date: February 2016
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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"> • Conduct the Preliminary Design Review and Critical Design Review for the System and LRU test program sets. <p>FY 2017 OCO Plans: N/A</p>					
<p>Title: LGM-30G Payload Transporter Replacement (PTR)</p> <p>Description: Designs and develops the capabilities necessary to replace the current Payload Transporter tractor and trailer, mitigating emerging threat technologies and methods. The PTR replaces, extracts, and transports the MM III reentry system, propulsion system rocket engine, and missile guidance set. The new PTR design increases safety and security during transport activities and improves maintenance operations.</p> <p>FY 2015 Accomplishments:</p> <ul style="list-style-type: none"> • Continued development and completed fabrication of PTR. • Conducted system level Critical Design Review • Began fabrication of two PTR prototypes. • Finalized qualification test plans and procedures <p>FY 2016 Plans:</p> <ul style="list-style-type: none"> • Completed fabrication of two PTR prototypes. • Conducted Test Readiness Review • Complete system qualification testing. • Complete FCA/PCA. • Certify design readiness for Full Rate Production decisions. • Verification and delivery of tech data to accompany First Article Test and Evaluations. • Conduct a successful Milestone C. • Obtain nuclear design certification. <p>FY 2017 Base Plans: N/A</p> <p>FY 2017 OCO Plans: N/A</p>	7.659	4.000	0.000	0.000	0.000
<p>Title: LGM-30G Performance Assessment Data System Communications Equipment Interface Unit (PADS CEIU)</p> <p>Description: Designs and develops the capabilities to replace the current Performance Assessment Data System (PADS) Communications Equipment Interface Unit (CEIU) mitigating obsolescence and upgrading</p>	0.000	0.675	4.605	0.000	4.605

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
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<p>the system to transmit over the internet using Internet Protocols (IP). The system transmits MM III Inertial Measurement Unit (IMU) Performance Data (IPD) from Launch Control Centers to the PADS located at the support base. The new system will use the more reliable and secure IP transmission method. The update effort consists of rewriting the CEIU imbedded software to a robust language using secure coding practices, and change the CEIU design from telephone to IP transmission. In addition, the PADS interfacing system is to be updated to interface with the updated CEIU design.</p> <p>FY 2015 Accomplishments: N/A</p> <p>FY 2016 Plans:</p> <ul style="list-style-type: none"> • Conduct a preliminary design review (PDR) • Prepared for and conduct a successful Milestone B • Begin Engineering Manufacturing Development phase <p>FY 2017 Base Plans:</p> <ul style="list-style-type: none"> • Conduct a Critical Design review (CDR). • Prepare for Test Readiness Review (TRR). <p>FY 2017 OCO Plans: N/A</p>					
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<p>Title: LGM-30G G6B4 Build Equipment Replacement (G6B4 BER) - FY17 New Start</p> <p>Description: This effort will replace five unique pieces of equipment (stations) used in the repair and testing of the G6B4 Gyro. The G6B4 Gyro is a complex part required in the stabilization and guidance of the MM III. The five work stations to be replaced are the Hydrogen Fill station, Milling and Welding station, Balance station, Bearing Alignment station, and the power and cooling system for the "F" Coefficient station. Current equipment is over twenty years old and is becoming unsustainable. The program will address parts obsolescence and improve the reliability of the work stations critical to guidance set repair.</p> <p>FY 2015 Accomplishments: N/A</p> <p>FY 2016 Plans: N/A</p> <p>FY 2017 Base Plans:</p>	0.000	0.000	0.958	0.000	0.958
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Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force **Date:** February 2016

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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"> • Begin evaluation and replacement planning of the Milling and Welding station, Hydrogen Fill station, Balance station, Bearing Alignment station, and the GFS power, cooling and hydrolic station • Conduct Preliminary Design Review and Milestone B • Purchase COTS items for all 5 test stations • Begin working updates for the integration of the COTS items <p>FY 2017 OCO Plans: N/A</p>					
<p>Title: LGM-30G Alignment Set Test Set (ASTS)</p> <p>Description: The ASTS is a one of a kind station built for the repair and calibration of the Alignment Set on a MM III guidance platform. ASTS completes the design, development, fabrication and installation of two operational systems and support equipment along with a Level III data package and source data as required for Technical Order (TO) creation.</p> <p>FY 2015 Accomplishments:</p> <ul style="list-style-type: none"> • Conducted acquisition strategy review • Received new start approval for program resumption • Prepared and conducted successful Milestone B <p>FY 2016 Plans:</p> <ul style="list-style-type: none"> • Resume program effort following restructure and re-baseline • Perform re-calibration of hardware on engineering development unit • Resume software development effort for ASTS software suite • Conduct software integration testing on EDU • Resume assembly of production representative prototype unit (PRPU) • Conduct confidence testing/integration efforts and perform accuracy verification testing on PRPU <p>FY 2017 Base Plans:</p> <ul style="list-style-type: none"> • Complete Test Readiness Review and qualification and acceptance testing on PRPU • Complete the build and testing of second PRPU unit • Prepare and conduct successful Milestone C <p>FY 2017 OCO Plans:</p>	1.231	1.500	1.307	0.000	1.307

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
Title: LGM-30G Pendulous Integrating Gyroscopic Accelerometer Build Equipment Replacement (PIGA BER) - FY17 New Start	0.000	0.000	2.608	0.000	2.608
Description: The Missile Guidance Set (MGS) repair is dependent on the proper functioning of the PIGA build equipment. The PIGA build and test equipment used at the repair facility is well over twenty years old and is becoming unsustainable due to obsolescence issues. This program will modify or replace two Digital Pickoff Alignment stations, two Electrical Alignment stations, two Alignment Test stations, one Torque Test station, one Temperature Probe Calibration station, two Fill stations and one Slip Ring/Module Test station.					
FY 2015 Accomplishments: N/A					
FY 2016 Plans: N/A					
FY 2017 Base Plans: <ul style="list-style-type: none"> • Begin evaluation of the seven PIGA Test and Repair stations • Conduct Preliminary Design Review • Purchase COTS items for all 7 test stations • Begin drawing updates for the integration of the COTS items • Prepare and conduct successful Milestone B 					
FY 2017 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	29.177	16.552	28.714	0.000	28.714

C. Other Program Funding Summary (\$ in Millions)	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
• MPAF: BA03: Line Item # M30MLG: <i>MM III Modifications</i>	0.000	0.000	0.000	0.000	0.000	1.807	0.000	0.526	0.000	Continuing	Continuing
• MPAF: BA01: Line Item# 00099L: <i>Missile Replacement Eq-Ballistic</i>	12.926	78.576	56.016	0.000	56.016	51.884	44.017	53.231	50.674	Continuing	Continuing
• MPAF: BA04: Line Item #000999: <i>Replen Spares/Repair Parts</i>	11.029	0.000	3.413	0.000	3.413	0.202	0.094	0.024	0.000	Continuing	Continuing

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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>
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Remarks

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 for support equipment will be executed through contracts available under the Future ICBM Sustainment and Acquisition Construct (FISAC) or competitive source selections. Nuclear Surety Cross Check Analysis (NSCCA) and Independent Verification and Validation (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 2017 Air Force **Date:** February 2016

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / Minuteman Squadrons	Project (Number/Name) 672985 / MM Support Equip
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Product Development (\$ in Millions)				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
LGM-30G Control Monitor Procedure Trainer Upgrade (CMPT) EMD	C/FFP	TBD : TBD	-	0.000		0.000		0.447	May 2017	0.000		0.447	Continuing	Continuing	TBD
LGM-30G Code System Media (CSM)	C/CPIF	Northrop Grumman : Salt Lake City, UT	-	0.427	Mar 2015	0.000		0.000		0.000		0.000	Continuing	Continuing	TBD
LGM-30G Pendulous Integrating Gyroscopic Accelerometer Build Equipment Replacement (PIGA BER) EMD	TBD	TBD : TBD	-	0.000		0.000		2.371	Jan 2017	0.000		2.371	Continuing	Continuing	TBD
LGM-30G Reentry Field Support Equipment (RFSE) EMD	C/CPIF	Northrop Grumman : Salt Lake City, UT	-	2.282	Oct 2014	0.000		0.000		0.000		0.000	Continuing	Continuing	TBD
LGM-30G Reentry Support Equipment Replacement Program (RSERP) TPS	C/CPIF	TBD : TBD	-	0.000		5.676	Mar 2016	14.414	Mar 2017	0.000		14.414	Continuing	Continuing	-
LGM-30G Reentry Support Equipment Replacement Program (RSERP)	MIPR	VDATS Program Office : Warner Robins, GA	-	0.958	Jan 2016	0.000		0.000		0.000		0.000	Continuing	Continuing	TBD
LGM-30G Transporter Erector Replacement Program (TERP) EMD	C/FPIF	DRS Environmental Systems : Cincinnati, OH	-	7.131	Feb 2015	0.800	Jan 2017	0.100	Feb 2017	0.000		0.100	Continuing	Continuing	TBD
LGM-30G Transporter Erector Replacement Program (TERP) GFE	MIPR	414th Supply Chain : Hill AFB, UT	-	0.880	Aug 2015	0.000		0.000		0.000		0.000	Continuing	Continuing	TBD
LGM-30G Strategic Targeting and Applications Computer System (STACS) EMD	C/CPFF	Northrop Grumman : Salt Lake City, UT	-	0.466	Jan 2015	0.000		0.000		0.000		0.000	Continuing	Continuing	TBD
LGM-30G Payload Transporter Replacement (PTR) EMD	C/CPIF	Northrop Grumman : Salt Lake City, UT	-	6.355	Feb 2015	2.854	Feb 2016	0.000		0.000		0.000	Continuing	Continuing	TBD
LGM-30G Performance Assessment Data System Communications	SS/CPIF	Boeing : Layton, UT	-	0.000		0.573	Apr 2016	4.092	Apr 2017	0.000		4.092	Continuing	Continuing	TBD

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

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Product Development (\$ in Millions)				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			
Equipment Interface Unit (PADS CEIU) Software Development															
LGM-30G G6B4 Build Equipment Replacement (G6B4 BER) EMD	TBD	TBD : TBD	-	0.000		0.000		0.849	Jan 2017	0.000		0.849	Continuing	Continuing	TBD
LGM-30G Alignment Set Test Set (ASTS) Engineering Development	SS/CPAF	Boeing : Heath, OH	-	1.231	Nov 2015	1.480	Nov 2016	1.287	Jan 2017	0.000		1.287	Continuing	Continuing	TBD
Subtotal			-	19.730		11.383		23.560		0.000		23.560	-	-	-

Support (\$ in Millions)				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			
LGM-30G Control Monitor Procedure Trainer Upgrade (CMPT) Integrated Support Contractor (ISC)	C/FP	BAE Systems : Layton, UT	-	0.000		0.000		0.143	Jul 2017	0.000		0.143	Continuing	Continuing	TBD
LGM-30G Reentry Field Support Equipment (RFSE) Integration Support	C/FP	BAE Systems : Layton, UT	-	0.200	Jan 2015	0.000		0.000		0.000		0.000	Continuing	Continuing	TBD
LGM-30G Reentry Support Equipment Replacement Program (RSERP) ISC	C/FP	BAE Systems : Layton, UT	-	0.425	Aug 2015	1.286	Aug 2016	3.475	Aug 2017	0.000		3.475	Continuing	Continuing	TBD
Subtotal			-	0.625		1.286		3.618		0.000		3.618	-	-	-

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

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Test and Evaluation (\$ in Millions)				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			
LGM-30G Code System Media NSCCA-PATE	C/CPFF	Northrop Grumman Information : Clearfield, UT	-	0.181	Feb 2015	0.000		0.000		0.000		0.000	Continuing	Continuing	-
LGM-30G Reentry Support Equipment Replacement Program (RSERP) IV&V	TBD	TBD : TBD	-	0.000		1.227	Jul 2016	0.000		0.000		0.000	Continuing	Continuing	TBD
LGM-30G Strategic Targeting and Applications Computer System (STACS) NSCCA/PATE	C/CPFF	Northrop Grumman : Clearfield, UT	-	0.156	Nov 2014	0.000		0.000		0.000		0.000	Continuing	Continuing	-
Subtotal			-	0.337		1.227		0.000		0.000		0.000	-	-	-

Management Services (\$ in Millions)				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			
LGM-30G Control Monitor Procedure Trainer Upgrade (CMPT) PMA	Various	Various : TBD	-	0.000		0.000		0.055	May 2017	0.000		0.055	Continuing	Continuing	TBD
LGM-30G Code System Media (CSM) Eng Support	MIPR	Aerospace Research : El Segundo, CA	-	0.768	Mar 2015	0.000		0.000		0.000		0.000	Continuing	Continuing	TBD
LGM-30G Code System Media (CSM) PMA	Various	Various : TBD	-	0.022	Mar 2015	0.000		0.000		0.000		0.000	Continuing	Continuing	TBD
LGM-30G Reentry Support Equipment Replacement Program (RSERP) PMA	C/FP	BAE Systems : Layton, UT	-	2.543	Aug 2015	1.188	Aug 2016	0.602	Aug 2017	0.000		0.602	Continuing	Continuing	TBD
LGM-30G Transporter Erector Replacement Program (TERP) PMA	Various	Various : TBD	-	1.418	Feb 2015	0.200	Feb 2016	0.000		0.000		0.000	Continuing	Continuing	TBD
LGM-30G Pendulous Integrating Gyroscopic Accelerometer Build	TBD	TBD : TBD	-	0.000		0.000		0.237	Jan 2017	0.000		0.237	Continuing	Continuing	TBD

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / Minuteman Squadrons	Project (Number/Name) 672985 / MM Support Equip
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Management Services (\$ in Millions)				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			
Equipment Replacement (PIGA BER) PMA															
LGM-30G G6B4 Build Equipment Replacement (G6B4 BER) PMA	TBD	TBD : TBD	-	0.000		0.000		0.109	Feb 2017	0.000		0.109	Continuing	Continuing	TBD
LGM-30G Performance Assessment Data System Communications Equipment Interface Unit (PADS CEIU) PMA	TBD	TBD : TBD	-	0.000		0.102	Apr 2016	0.513	Apr 2017	0.000		0.513	Continuing	Continuing	TBD
LGM-30G Payload Transporter Replacement (PTR) PMA	Various	Various : TBD	-	0.904	Feb 2015	0.920	Feb 2016	0.000		0.000		0.000	Continuing	Continuing	TBD
LGM-30G Payload Transporter Replacement (PTR) FFRDC	MIPR	Sandia National Laboratories : Albuquerque, NM	-	0.400	Apr 2015	0.226	Apr 2016	0.000		0.000		0.000	Continuing	Continuing	TBD
LGM-30G Reentry Field Support Equipment (RFSE) PMA	C/CPAF	BAE Systems : Layton, UT	-	2.423	Jan 2015	0.000		0.000		0.000		0.000	Continuing	Continuing	TBD
LGM-30G Strategic Targeting and Applications Computer System (STACS) PMA	Various	Various : TBD	-	0.007	Feb 2015	0.000		0.000		0.000		0.000	Continuing	Continuing	TBD
LGM-30G Alignment Set Test Set (ASTS) PMA	TBD	TBD : TBD	-	0.000		0.020	Feb 2016	0.020	Feb 2017	0.000		0.020	Continuing	Continuing	-
Subtotal			-	8.485		2.656		1.536		0.000		1.536	-	-	-

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	29.177	16.552	28.714	0.000	28.714	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Air Force **Date:** February 2016

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672985 / <i>MM Support Equip</i>
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	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
CMPT Milestone B (Feb 2017)										■																		
CMPT Engineering and Manufacturing Development Phase										■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
CMPT PDR (June 2017)											■																	
CMPT CDR (May 2018)														■														
CMPT Milestone C (Dec 2019)																												
CMPT Production and Deployment Phase																												
CMPT IOC (Dec 2019)																												
CMPT FOC (Apr 2020)																												
CSM Engineering and Manufacturing Development Phase	■	■	■	■																								
CSM Milestone C (Jul 2015)				■																								
CSM Production and Deployment Phase				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
CSM IOC (Nov 2015)					■	■																						
CSM FOC (Jun 2016)											■																	
RFSE Engineering and Manufacturing Development Phase	■	■	■	■																								
RFSE Milestone C (Mar 2015)		■																										
RFSE IOC (Jun 2017)																												
RFSE FOC (Aug 2019)																												
RFSE Production & Deployment Phase				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
PTR Engineering and Manufacturing Development Phase	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
PTR Milestone C (Jul 2016)																												
PTR Production and Deployment Phase																												
PTR IOC (Jul 2017)																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Air Force **Date:** February 2016

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / Minuteman Squadrons	Project (Number/Name) 672985 / MM Support Equip
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	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
PADS CEIU PDR (Dec 2016)																												
PADS CEIU CDR (Aug 2017)																												
PADS CEIU Milestone C (May 2018)																												
PADS CEIU Production and Deployment Phase																												
PADS CEIU IOC (Jan 2019)																												
PADS CEIU FOC (Sep 2019)																												
PIGA BER Milestone B ()																												
PIGA BER EMD Phase																												
PIGA BER PDR ()																												
PIGA BER CDR (Jun 2018)																												
PIGA BER Milestone C ()																												
PIGA BER Production and Deployment Phase																												
PIGA BER IOC (Jul 2020)																												
PIGA BER FOC (Mar 2021)																												
G6B4 BER Milestone B (Oct 2016)																												
G6B4 BER Engineering and Manufacturing Development Phase																												
G6B4 BER PDR (Mar 2017)																												
G6B4 BER CDR (Oct 2017)																												
G6B4 Milestone C (Apr 2019)																												
G6B4 BER Production & Deployment Phase																												
G6B4 BER IOC (Oct 2020)																												
G6B4 BER FOC (MAR 2021)																												
ASTS MS B Review / Program Restart (Jul 2015)																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Air Force **Date:** February 2016

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672985 / <i>MM Support Equip</i>
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	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				
ASTS Engineering and Manufacturing Development Phase																																
ASTS MS C (Apr 2017)																																
ASTS Production and Deployment Phase																																
ASTS IOC/FOC (Mar 2018)																																

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Air Force **Date:** February 2016

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672985 / <i>MM Support Equip</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
CMPT Milestone B (Feb 2017)	2	2017	2	2017
CMPT Engineering and Manufacturing Development Phase	2	2017	1	2020
CMPT PDR (June 2017)	3	2017	3	2017
CMPT CDR (May 2018)	3	2018	3	2018
CMPT Milestone C (Dec 2019)	1	2020	1	2020
CMPT Production and Deployment Phase	2	2020	3	2020
CMPT IOC (Dec 2019)	1	2020	1	2020
CMPT FOC (Apr 2020)	3	2020	3	2020
CSM Engineering and Manufacturing Development Phase	1	2015	3	2015
CSM Milestone C (Jul 2015)	4	2015	4	2015
CSM Production and Deployment Phase	4	2015	2	2017
CSM IOC (Nov 2015)	1	2016	1	2016
CSM FOC (Jun 2016)	1	2017	1	2017
RFSE Engineering and Manufacturing Development Phase	1	2015	4	2015
RFSE Milestone C (Mar 2015)	2	2015	2	2015
RFSE IOC (Jun 2017)	3	2018	3	2018
RFSE FOC (Aug 2019)	4	2019	4	2019
RFSE Production & Deployment Phase	4	2015	4	2019
PTR Engineering and Manufacturing Development Phase	1	2015	4	2016
PTR Milestone C (Jul 2016)	4	2016	4	2016
PTR Production and Deployment Phase	4	2016	1	2021
PTR IOC (Jul 2017)	4	2017	4	2017
PTR FOC (Dec 2020)	1	2021	1	2021

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Air Force **Date:** February 2016

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672985 / <i>MM Support Equip</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
STACS Engineering and Manufacturing Development Phase	1	2015	2	2015
STACS FOC (Mar 2015)	2	2015	2	2015
TERP Engineering and Manufacturing Development Phase	1	2015	3	2017
TERP Milestone C (Apr 2017)	3	2017	3	2017
TERP Production and Deployment Phase	3	2017	1	2020
TERP IOC (Apr 2018)	3	2018	3	2018
TERP FOC (Sep 2019)	4	2019	4	2019
RSERP TMRR Phase	1	2015	1	2017
RSERP Milestone B (Nov 2016)	1	2017	1	2017
RSERP Engineering and Manufacturing Development Phase	1	2017	4	2018
RSERP System PDR (Oct 2016)	1	2017	1	2017
RSERP Line Replaceable Unit (LRU) PDR (Jan 2017)	2	2017	2	2017
RSERP System CDR (Apr 2017)	3	2017	3	2017
RSERP LRU CDR (Jun 2017)	3	2017	3	2017
RSERP Milestone C (Mar 2018)	2	2018	2	2018
RSERP Automated Test Equipment Long Lead Procurement	3	2016	4	2017
RSERP Production and Deployment Phase	2	2018	4	2019
RSERP IOC (Dec 2018)	1	2019	1	2019
RSERP FOC (Aug 2019)	4	2019	4	2019
PADS CEIU Milestone B (Mar 2016)	2	2016	2	2016
PADS CEIU Engineering and Manufacturing Development Phase	3	2016	3	2018
PADS CEIU PDR (Dec 2016)	1	2017	1	2017
PADS CEIU CDR (Aug 2017)	4	2017	4	2017
PADS CEIU Milestone C (May 2018)	3	2018	3	2018
PADS CEIU Production and Deployment Phase	3	2018	4	2019
PADS CEIU IOC (Jan 2019)	2	2019	2	2019

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Air Force **Date:** February 2016

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672985 / <i>MM Support Equip</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
PADS CEIU FOC (Sep 2019)	4	2019	4	2019
PIGA BER Milestone B ()	2	2017	2	2017
PIGA BER EMD Phase	2	2017	2	2021
PIGA BER PDR ()	2	2017	2	2017
PIGA BER CDR (Jun 2018)	3	2018	3	2018
PIGA BER Milestone C ()	3	2019	3	2019
PIGA BER Production and Deployment Phase	3	2019	2	2021
PIGA BER IOC (Jul 2020)	4	2020	4	2020
PIGA BER FOC (Mar 2021)	2	2021	2	2021
G6B4 BER Milestone B (Oct 2016)	1	2017	1	2017
G6B4 BER Engineering and Manufacturing Development Phase	1	2017	2	2020
G6B4 BER PDR (Mar 2017)	2	2017	2	2017
G6B4 BER CDR (Oct 2017)	1	2018	1	2018
G6B4 Milestone C (Apr 2019)	3	2019	3	2019
G6B4 BER Production & Deployment Phase	3	2019	2	2021
G6B4 BER IOC (Oct 2020)	1	2021	1	2021
G6B4 BER FOC (MAR 2021)	2	2021	2	2021
ASTS MS B Review / Program Restart (Jul 2015)	4	2015	4	2015
ASTS Engineering and Manufacturing Development Phase	4	2015	3	2017
ASTS MS C (Apr 2017)	3	2017	3	2017
ASTS Production and Deployment Phase	3	2017	2	2018
ASTS IOC/FOC (Mar 2018)	2	2018	2	2018

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force										Date: February 2016		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>				Project (Number/Name) 672986 / <i>MM Crypto Mods</i>			
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
672986: <i>MM Crypto Mods</i>	-	39.589	32.845	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

MM Crypto Mods executes USSTRATCOM, Air Force Global Strike Command, and Nuclear Weapon Safety Center requirements by implementing the KS-60 capabilities in LGM-30G ICBM Cryptography Upgrade II (ICU II) of remote key/code change and irreversible transformation as mandated in the approved Capabilities Development Document (dated 4 Jan 05) and addresses Nuclear Weapon System Safety Group Operational Safety Review 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 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: LGM-30G ICBM Cryptography Upgrade II (ICU II)	39.589	32.845	0.000	0.000	0.000
Description: ICU II completes design and development, implements KS-60 remote key/code change, irreversible transformation capabilities, and prevents continuous signal lockout.					
FY 2015 Accomplishments:					
<ul style="list-style-type: none"> • Completed A4 Drawer qualification and weapon system testing with preliminary central processor. • Finalized code and fabricated final central processor design. 					
FY 2016 Plans:					
<ul style="list-style-type: none"> • Weapon system testing with final central processor, nuclear certification for A4 Drawer. • Finish development, testing, certification of related system software. • Begin contract effort to develop Support Equipment (SE) and package manufactured processors for safe storage. • Prepare and conduct successful Milestone C. 					
FY 2017 Base Plans:					
N/A					
FY 2017 OCO Plans:					
N/A					
Accomplishments/Planned Programs Subtotals	39.589	32.845	0.000	0.000	0.000

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672986 / <i>MM Crypto Mods</i>
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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>
• MPAF: BA 03: Line Item# M30MLG: <i>MM III Modifications</i>	0.000	0.000	30.636	0.000	30.636	32.036	24.093	3.039	0.175	Continuing	Continuing
• MPAF: BA 04: Line Item #000999: <i>Replen Spares/Repair Parts</i>	0.000	0.000	2.367	0.000	2.367	5.671	0.000	0.024	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

LGM-30G ICBM Cryptography Upgrade II (ICU II) Program utilizes the ICBM Prime Integration Contract (IPIC) services of Northrop Grumman (NG), which were 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, awarded to NG Technical Services. This contract is driven by critical nuclear surety requirements to perform an independent assessment of all modifications to nuclear-certified software. The FY16 Pre-Production contract will be awarded on the Ground Systems Sustainment Contract (GSSC).

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 / 7				PE 0101213F / Minuteman Squadrons				672986 / MM Crypto Mods							
Product Development (\$ in Millions)				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
LGM-30G ICBM Cryptography Upgrade II EMD	C/CPIF	Northrop Grumman : Clearfield, UT	-	28.744	Feb 2015	26.086	Sep 2016	0.000		0.000		0.000	Continuing	Continuing	TBD
Subtotal			-	28.744		26.086		0.000		0.000		0.000	-	-	-
Support (\$ in Millions)				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
LGM-30G ICBM Cryptography Upgrade II Nuclear Surety Support (NSCCA)	C/CPIF	Northrop Grumman : Clearfield, UT	-	3.491	Jun 2015	1.487	Nov 2015	0.000		0.000		0.000	Continuing	Continuing	TBD
LGM-30G ICBM Cryptography Upgrade II Inter-DoD	MIPR	Navy Crane : Crane, IN	-	2.466	Feb 2015	1.552	Nov 2015	0.000		0.000		0.000	Continuing	Continuing	TBD
Subtotal			-	5.957		3.039		0.000		0.000		0.000	-	-	-
Test and Evaluation (\$ in Millions)				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
Subtotal			-	-		-		-		-		-	-	-	-
Management Services (\$ in Millions)				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
LGM-30G ICBM Cryptography Upgrade II PMA	Various	Various : TBD	-	4.888	Jun 2015	3.720	Sep 2016	0.000		0.000		0.000	Continuing	Continuing	TBD
Subtotal			-	4.888		3.720		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			
Appropriation/Budget Activity 3600 / 7			R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>			Project (Number/Name) 672986 / <i>MM Crypto Mods</i>				
	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals	-	39.589	32.845	0.000	0.000	0.000	-	-	-	

Remarks

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Air Force **Date:** February 2016

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672986 / <i>MM Crypto Mods</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
ICU II Engineering and Manufacturing Development Phase	1	2015	4	2016
ICU II Milestone C (Mar 2017)	2	2017	2	2017

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force										Date: February 2016		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>				Project (Number/Name) 672987 / <i>MM Ops Equip</i>			
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
672987: <i>MM Ops Equip</i>	-	18.205	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2016, Project 672987, MM Ops Equipment, the two ongoing efforts were transferred into PE 0605230F, Ground Based Strategic Deterrent (GBSD), Project 641025. The efforts transferred were the Solid Rocket Motor Modernization (SRMM) and Guidance Modernization Program (GMP).

A. Mission Description and Budget Item Justification

MM Operational Equipment program efforts will identify viable concepts and materiel solutions in support of the Air Force's GBSD. Funding supports design, development, test, integration and replacement of weapon system equipment including flight systems, Nuclear Command, Control and Communications (NC3), launch and control facilities, and Security/Ground Equipment upgrades. Efforts within the MM Operational Equipment program will ensure MM III operation through 2030 as well as support future GBSD requirements. MM Operational Equipment also provides for other unique government costs, studies, cost trades and acquisition planning activities for future GBSD requirements. In support of the future flight systems, the GMP effort will further define requirements, explore available technologies and architectures, select the most promising technology and architecture for development, and prepare acquisition plans. Efforts under the ICBM Demonstration and Validation Guidance Application Program (GAP), PE 0603851F, ICBM Dem/Val, will be leveraged to inform these efforts. Also in support of the future flight systems, the SRMM effort will define operational requirements, investigate available technologies and prepare an acquisition strategy for SRMM development. SRMM will design and replace the existing solid rocket motors with a qualified modern design. This effort, coupled with ICBM Demonstration and Validation Propulsion Application Program (PAP), PE 0603851F, ICBM Dem/Val, will support development of requirements and an implementation timeline for the SRMM program.

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

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Guidance Modernization Program (GMP)	17.624	0.000	0.000	0.000	0.000
Description: GMP effort will provide modifications or replacements for the current MM III guidance subsystem necessary to ensure operations through 2030 and to support future GBSD requirements.					
FY 2015 Accomplishments:					
<ul style="list-style-type: none"> • Continued technology assessment and development initiated under Dem/Val GAP • Established contracts with multiple contractors with promising technology and architectures relevant for a guidance replacement • Continued efforts to mature technologies, define requirements and modular architectures • Prepared acquisition strategies and plans for a GBSD Milestone A decision point • Began development of enhanced ground test capability and identify flight system integration requirements 					
FY 2016 Plans:					

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672987 / <i>MM Ops Equip</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"> • Reflected in PE 0605230F, Ground Based Strategic Deterrent, Project 641025 <p>FY 2017 Base Plans:</p> <ul style="list-style-type: none"> • Reflected in PE 0605230F, Ground Based Strategic Deterrent, Project 641025 <p>FY 2017 OCO Plans: N/A</p>					
<p>Title: Solid Rocket Motor Modernization (SRMM)</p> <p>Description: SRMM effort will provide modifications or replacements for the current MM III booster subsystem necessary to ensure operations through 2030 and to support future GBSD requirements.</p> <p>FY 2015 Accomplishments:</p> <ul style="list-style-type: none"> • Continued technology assessment and development initiated under Dem/Val PAP. • Prepared acquisition strategies and plans for a GBSD Milestone A decision point. <p>FY 2016 Plans:</p> <ul style="list-style-type: none"> • Reflected in PE 0605230F, Ground Based Strategic Deterrent, Project 641025 <p>FY 2017 Base Plans:</p> <ul style="list-style-type: none"> • Reflected in PE 0605230F, Ground Based Strategic Deterrent, Project 641025 <p>FY 2017 OCO Plans: N/A</p>	0.581	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	18.205	0.000	0.000	0.000	0.000

C. Other Program Funding Summary (\$ in Millions)											
Line Item	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
• RDTE: BA04: PE 0605230F: <i>Ground Based Strategic Deterrent</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
GMP prepared for Milestone A efforts by acquiring data and information from studies and market research performed throughout FY14/15 utilizing both Dem/Val GAP and GMP funding. Contracts were competitively awarded as Cost Plus Fixed Fee, and MIPRs were submitted through the Navy to leverage resources and knowledge.

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force	Date: February 2016
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
3600 / 7	PE 0101213F / <i>Minuteman Squadrons</i>	672987 / <i>MM Ops Equip</i>

SRMM prepared for Milestone A efforts by acquiring data and information from studies and market research performed throughout FY14/15 utilizing both Dem/Val PAP and SRMM funding. The studies identified technologies needing continuous attention during the GBSD Program (TMRR & EMD). Results from the studies informed GBSD of potential risks, including technology and manufacturing readiness challenges. Contracts were competitively awarded as Cost Plus Fixed Fee to leverage resources and knowledge.

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 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / Minuteman Squadrons	Project (Number/Name) 672987 / MM Ops Equip
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Product Development (\$ in Millions)				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			
Guidance Modernization Program Instrument Technology Advancement	C/CPFF	Various : Various, UT	-	8.888	Mar 2015	0.000		0.000		0.000		0.000	Continuing	Continuing	TBD
Subtotal			-	8.888		0.000		0.000		0.000		0.000	-	-	-

Support (\$ in Millions)				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			
Solid Rocket Motor Modernization Technical Engineering Services	C/FP	BAE : Hill AFB, UT	-	0.581	Apr 2015	0.000		0.000		0.000		0.000	Continuing	Continuing	TBD
Guidance Modernization Program Technical Engineering Services	C/FP	BAE : Hill AFB, UT	-	4.867	Jul 2015	0.000		0.000		0.000		0.000	Continuing	Continuing	TBD
Subtotal			-	5.448		0.000		0.000		0.000		0.000	-	-	-

Test and Evaluation (\$ in Millions)				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			
Guidance Modernization Program EGT	C/FP	BAE : Clearfield, UT	-	3.496	May 2015	0.000		0.000		0.000		0.000	Continuing	Continuing	TBD
Subtotal			-	3.496		0.000		0.000		0.000		0.000	-	-	-

Management Services (\$ in Millions)				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			
PMA	C/Various	Various : Hill, AFB, UT	-	0.373	Jun 2016	0.000		0.000		0.000		0.000	Continuing	Continuing	TBD
Subtotal			-	0.373		0.000		0.000		0.000		0.000	-	-	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Air Force **Date:** February 2016

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672987 / <i>MM Ops Equip</i>
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	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
Guidance Materiel Solution Analysis Phase																												
SRM Materiel Solution Analysis Phase																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Air Force **Date:** February 2016

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101213F / <i>Minuteman Squadrons</i>	Project (Number/Name) 672987 / <i>MM Ops Equip</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Guidance Materiel Solution Analysis Phase	1	2015	2	2016
SRM Materiel Solution Analysis Phase	1	2015	2	2016