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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2023 Air Force **Date:** April 2022

<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 7: Operational Systems Development</i>	<b>R-1 Program Element (Number/Name)</b> PE 0101213F / <i>Minuteman Squadrons</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	0.000	63.535	113.622	69.650	0.000	69.650	33.005	3.115	3.117	3.123	0.000	289.167
672983: <i>MM Ground and Comm Equipment</i>	0.000	12.043	19.811	6.781	0.000	6.781	0.000	0.000	0.000	0.000	0.000	38.635
672984: <i>MM III Baseline Support</i>	0.000	47.203	90.123	49.414	0.000	49.414	33.005	3.115	3.117	3.123	0.000	229.100
672985: <i>MM Support Equip</i>	0.000	0.000	0.000	13.455	0.000	13.455	0.000	0.000	0.000	0.000	0.000	13.455
672986: <i>MM Crypto Mods</i>	0.000	4.289	3.688	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.977

**Note**

This program, BA 7, PE 0101213F, project 672984, LGM-30G Higher Authority Command Test System (HACTS) 2.0, is a new start.  
 This program, BA 7, PE 0101213F, project 672985, LGM-30G MM III Acquisition of Transportation and Handling and Support Equipment (MATH), is a new start.  
 Project 672984, LGM-30G Arm/Disarm Switch Replacement (ADSR), is expected to complete EMD by 4QFY22.  
 In FY2022 Project 672986, LGM-30G ICBM Cryptography Upgrade II, was completed.

**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 Minuteman III (MM III) operations until replaced by Ground Based Strategic Deterrent (GBSD). Current efforts include development, qualification, integration, and testing of replacement equipment for the LGM-30G Fast Rising B-Plug Service Life Extension Program (FRBP SLEP).

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 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 Flight Test Telemetry and Termination System (FT3) and LGM-30G Higher Authority Command Test System (HACTS) 2.0. 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. Efforts also include any minor needs required to prepare for full acquisition purposes.

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. Efforts include design, development, and testing of support equipment such as MM III Acquisition of Transportation and Handling (T&H) and Support Equipment (MATH) effort. Programs will execute Diminishing Manufacturing

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<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 7: Operational Systems Development</i>	<b>R-1 Program Element (Number/Name)</b> PE 0101213F / <i>Minuteman Squadrons</i>
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Sources and Material Shortages/Program Management Administration support through the ISC 2.0 contract established to support the ICBM enterprise through the life of MM III.

MM Crypto Mods executes United States Strategic Command, Air Force Global Strike Command, and Air Force 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 by 75 days annually and will reduce associated resource costs for 450 LFs and 45 LCCs.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program elements 0605831F and 0605833F. In FY 2021 \$1.100M was expended for civilian pay in this program element, and in FY2022 \$1.100M is forecasted for civilian pay expenses in this program element.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development 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 year.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>
Previous President's Budget	89.306	113.622	0.000	0.000	0.000
Current President's Budget	63.535	113.622	69.650	0.000	69.650
Total Adjustments	-25.771	0.000	69.650	0.000	69.650
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-22.665	0.000			
• SBIR/STTR Transfer	-3.106	0.000			
• Other Adjustments	0.000	0.000	69.650	0.000	69.650

**Change Summary Explanation**

Fiscal Year 2021 funding reflects a Small Business Innovation Research (SBIR) adjustment of -\$3.106 million, a congressionally-approved reprogramming of -\$14.883 million, and a below threshold reprogramming of -\$7.782 million.

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Air Force										<b>Date:</b> April 2022		
<b>Appropriation/Budget Activity</b> 3600 / 7					<b>R-1 Program Element (Number/Name)</b> PE 0101213F / Minuteman Squadrons				<b>Project (Number/Name)</b> 672983 / MM Ground and Comm Equipment			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
672983: MM Ground and Comm Equipment	0.000	12.043	19.811	6.781	0.000	6.781	0.000	0.000	0.000	0.000	0.000	38.635
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 Minuteman III operations until replaced by Ground Based Strategic Deterrent (GBSD). Current efforts include development, qualification, integration, and testing of replacement equipment such as the LGM-30G Fast Rising B-Plug Service Life Extension Program (FRBP SLEP).

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program elements 0605831F and 0605833F. In FY 2021 \$1.100M was expended for civilian pay in this program element, and in FY2022 \$1.100M is forecasted for civilian pay expenses in this program element.

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

	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>
<b>Title:</b> LGM-30G Fast Rising B-Plug Service Life Extension Program (FRBP SLEP)	12.043	19.811	6.781
<b>Description:</b> The FRBP provides security functions for the Personnel Access System (PAS) of the LFs. It is a 14,000 pound cylinder with 12 locking pins used to deny/delay access to intruders during LF maintenance activities.			
This effort includes critical hardware and software modifications to address high obsolescence risk and reliability issues affecting the operational wings.			
<b>FY 2022 Plans:</b>			
• Critical Design Review			
• Component Level Test & Evaluation Execution			
• System Level Test Readiness Review			
<b>FY 2023 Plans:</b>			
• Functional Configuration Audit			
• Systems Integration Test			
• Production Readiness Review			
• Milestone C			
• Production Award			
<b>FY 2022 to FY 2023 Increase/Decrease Statement:</b>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Air Force		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0101213F / <i>Minuteman Squadrons</i>	<b>Project (Number/Name)</b> 672983 / <i>MM Ground and Comm Equipment</i>

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>
Funding decreased due to program transition from Engineering and Manufacturing Development to Production and Deployment.			
<b>Accomplishments/Planned Programs Subtotals</b>	12.043	19.811	6.781

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• MPAF 03 Line Item	47.640	65.690	55.158	-	55.158	37.766	26.555	2.362	9.962	Continuing	Continuing
M30MLG: <i>MM III Modifications</i>											
• MPAF 01 00099L: <i>Missile Replacement Eq-Ballistic</i>	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• MPAF 04 Line Item 00098A: <i>Msl Sprs / Repair Parts (Initial)</i>	60.276	38.645	39.774	-	39.774	46.861	57.212	49.345	50.347	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 modify organic depot capabilities with industry. Industry development for ground and communication equipment efforts will be executed through contracts 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. Nuclear Surety and Vulnerability analysis requirements are covered in the Acquisition Strategy.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force												Date: April 2022				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
3600 / 7				PE 0101213F / Minuteman Squadrons				672983 / MM Ground and Comm Equipment								
<b>Product Development (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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 Fast Rising B-Plug Service Life Extension Program (FRBP SLEP) EMD	C/CPFF	Northrop Grumman : Salt Lake City, UT	0.000	10.461	Dec 2020	16.396	Oct 2021	5.730	Oct 2022	-		5.730	Continuing	Continuing	21.949	
<b>Subtotal</b>			0.000	10.461		16.396		5.730		-		5.730	Continuing	Continuing	N/A	
<b>Test and Evaluation (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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 Fast Rising B-Plug Service Life Extension Program (FRBP SLEP) Test & Evaluation	Various	Various : Various	0.000	0.110	Jan 2021	0.838	Oct 2021	0.200	Oct 2022	-		0.200	Continuing	Continuing	0.000	
<b>Subtotal</b>			0.000	0.110		0.838		0.200		-		0.200	Continuing	Continuing	N/A	
<b>Management Services (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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 Fast Rising B-Plug Service Life Extension Program (FRBP SLEP) A&AS	C/FP	BAE : Layton, UT	0.000	0.733	Nov 2020	0.753	Oct 2021	0.311	Oct 2022	-		0.311	Continuing	Continuing	3.692	
LGM-30G Fast Rising B-Plug Service Life Extension Program (FRBP SLEP) PSC	Various	Various : Various	0.000	0.739	Jan 2021	1.824	Jan 2022	0.540	Jan 2023	-		0.540	Continuing	Continuing	0.000	
<b>Subtotal</b>			0.000	1.472		2.577		0.851		-		0.851	Continuing	Continuing	N/A	
<b>Project Cost Totals</b>			0.000	12.043		19.811		6.781		-		6.781	Continuing	Continuing	N/A	

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis:</b> PB 2023 Air Force	<b>Date:</b> April 2022
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<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0101213F / <i>Minuteman Squadrons</i>	<b>Project (Number/Name)</b> 672983 / <i>MM Ground and Comm Equipment</i>
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	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
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**Remarks**

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2023 Air Force		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0101213F / <i>Minuteman Squadrons</i>	<b>Project (Number/Name)</b> 672983 / <i>MM Ground and Comm Equipment</i>

FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
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

<b><i>MM Ground and Comm Equipment</i></b>	
FRBP SLEP Engineering & Manufacturing Development Phase	
FRBP SLEP Milestone C (Apr 2023)	
FRBP SLEP Production & Deployment Phase	
FRBP SLEP FOC (June 2026)	

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2023 Air Force		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0101213F / <i>Minuteman Squadrons</i>	<b>Project (Number/Name)</b> 672983 / <i>MM Ground and Comm Equipment</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>MM Ground and Comm Equipment</i></b>				
FRBP SLEP Engineering & Manufacturing Development Phase	1	2021	3	2023
FRBP SLEP Milestone C (Apr 2023)	3	2023	3	2023
FRBP SLEP Production & Deployment Phase	3	2023	3	2026
FRBP SLEP FOC (June 2026)	3	2026	3	2026

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Air Force										<b>Date:</b> April 2022		
<b>Appropriation/Budget Activity</b> 3600 / 7					<b>R-1 Program Element (Number/Name)</b> PE 0101213F / <i>Minuteman Squadrons</i>				<b>Project (Number/Name)</b> 672984 / <i>MM III Baseline Support</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
672984: <i>MM III Baseline Support</i>	0.000	47.203	90.123	49.414	0.000	49.414	33.005	3.115	3.117	3.123	0.000	229.100
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

This program, BA 7, PE 0101213F, project 672984, LGM-30G Higher Authority Command Test System (HACTS) 2.0, is a new start.

Project 672984, LGM-30G Arm/Disarm Switch Replacement (ADSR), is expected to complete EMD by 4QFY22.

**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 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 Flight Test Telemetry and Termination System (FT3) and LGM-30G Higher Authority Command Test System (HACTS) 2.0. 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.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program elements 0605831F and 0605833F. In FY 2021 1.100M was expended for civilian pay in this program element, and in FY2022 1.100M is forecasted for civilian pay expenses in this program element.

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

	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>
<b>Title:</b> LGM-30G Arm Disarm Switch Replacement (ADSR)	3.761	0.161	0.000
<p><b>Description:</b> The ADSR program designs, develops, fabricates and tests replacements for the aging Arm/Disarm (A/D) switches currently on the MM III Missile fleet. The A/D switch is responsible for completing or interrupting ordnance electrical circuits. A/D switches are placed at five key locations in the system: Interstage I-II, Stage II Liquid Injection Thrust Vector Control (LITVC) and Roll Control, Interstage II-III, PSRE Staging, and PSRE Isolation Valves. Aging and surveillance is an ongoing study to generate a trade-off curve between reliability/availability and cost.</p> <p>Reliability/availability are monitored by periodic testing to discover unforeseen issues. Because not all existing A/D switches can be repaired/refurbished, the number in inventory will eventually be inadequate to meet the need of the PDM cycle. Supply is estimated to deplete by approximately FY24 with repair/refurbish mitigation. Repair/refurbish is a reliable mitigation plan to</p>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Air Force		<b>Date:</b> April 2022		
<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0101213F / <i>Minuteman Squadrons</i>	<b>Project (Number/Name)</b> 672984 / <i>MM III Baseline Support</i>		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>
<p>meet the ongoing needs of the fleet while a manufacturer is selected and the manufacturing system is selected to develop a replacement A/D switch that meets requirements and production quantities through 2036.</p> <p><b>FY 2022 Plans:</b></p> <ul style="list-style-type: none"> <li>• Conclude qualification testing</li> <li>• Conduct Milestone C</li> </ul> <p><b>FY 2023 Plans:</b></p> <p>N/A</p> <p><b>FY 2022 to FY 2023 Increase/Decrease Statement:</b></p> <p>Funding decreased due to conclusion of Engineering and Manufacturing Development activities and commencement of Production and Deployment.</p>				
<p><b>Title:</b> LGM-30G Flight Test Telemetry and Termination System (FT3)</p> <p><b>Description:</b> The FT3 Program replaces the Mod 7 Instrumentation Wafer and associated Signal Conditioner Monitor Group, and All Ordnance Destruct System (AODS) with a flight test kit. In addition, a replacement of the Launch Support System (LSS) is required to deploy the flight test kit. The flight test kit which consists of the Flight Destruct System (FDS) and a wafer-less Integrated Instrumentation System (IIS), along with an upgraded LSS, will meet 30th Space Wing Range Safety and Air Force Global Strike Command (AFGSC) requirements and resolve obsolescence concerns/issues.</p> <p>The AODS, Mod 7 Instrumentation Wafer, and LSS include many components that are not economically available, are no longer compliant with applicable Range Safety requirements, or are in need of technical modernization. Replacement of the Vandenberg Space Force Base (VSFB) flight test unique equipment is necessary to sustain future AFGSC Operational Test Launches (OTL), supporting USSTRATCOM requirements starting in FY22.</p> <p>The OTLs are critical to validating the continued accuracy and reliability of the MM III ICBM Weapon System until GBSB is fielded by providing valuable data to ensure a safe, secure, and effective nuclear deterrent. The FT3 System of Systems (SoS) will perform the same function as the existing systems with upgraded design features in order to comply with U.S. Space Force Range Safety User Requirements, Range Commander's Council (RCC) 319, Flight Termination Systems Commonality Standard, and RCC-324, Global Positioning and Inertial Measurements Range Safety Tracking Systems' Commonality Standard.</p> <p>As of February 2020, the FT3 Program is executing to a Rapid Fielding plan to meet a requirement to be first launch ready, September 2022. Rapid Fielding requires concurrent activities in order to meet required first launch ready date; failure to be first flight ready in Sep 2022 jeopardizes the MM III OTL schedule. Rapid Fielding execution has increased concurrency of technical milestones, delaying some noncritical activities to post first flight (September 2022).</p>		38.992	89.506	34.539

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<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0101213F / <i>Minuteman Squadrons</i>	<b>Project (Number/Name)</b> 672984 / <i>MM III Baseline Support</i>		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>
<p><b>FY 2022 Plans:</b></p> <ul style="list-style-type: none"> <li>• Complete component level qualification testing</li> <li>• Complete System of Systems Level qualification testing at Utah Lab</li> <li>• Complete System of Systems Level qualification testing at Vandenberg SFB CA</li> <li>• Complete Flight Systems Production Readiness Review</li> <li>• Complete Milestone C</li> <li>• Conduct and close out Systems Verification Review (SVR) #1</li> <li>• Deliver LRIPs 1 and 2 (flight test kits)</li> <li>• Prepare for first flight (7 Sep 2022)</li> </ul> <p><b>FY 2023 Plans:</b></p> <ul style="list-style-type: none"> <li>• Review post flight studies/reports of system performance</li> <li>• Conduct and complete Technical Order Validation/Verification and Type I Training</li> <li>• Complete Full Rate Production Decision Review</li> <li>• Complete Launch Facility 09 installation activities</li> <li>• Complete Missile Alert Facility 01-A Launch Support System (LSS) install</li> <li>• Complete Maintenance Mockup Trainer build and install</li> <li>• Conduct and close out SVR #2 and #3</li> <li>• Take Delivery of LRIPs 3 - 8</li> </ul> <p><b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> Funding decreased due to completion of component, system and system of systems qualifications and completion of Flight Systems Production Readiness Review.</p>				
<p><b>Title:</b> LGM-30G Higher Authority Command Test System (HACTS) 2.0</p> <p><b>Description:</b> The MM HACTS 2.0 program replaces obsolete/unsupportable communication system test equipment located at test facilities. HACTS laptops are past their vendor support life and require battery replacement. Due to its battery being non-user serviceable, the need for battery factory service makes the laptop units candidates for replacement. Although the HACTS laptop processor is "ruggedized", its design life is only approximately four years. The replacement must be compatible with Operating System updates as mandated by the Risk Management Framework. Incorporating the Weapons System Console Equipment Simulator into the HACTS enables a single hardware platform to execute both software functions thus reducing the number of hardware devices the Government must maintain.</p> <p><b>FY 2022 Plans:</b></p>		0.000	0.000	9.875

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Air Force		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0101213F / <i>Minuteman Squadrons</i>	<b>Project (Number/Name)</b> 672984 / <i>MM III Baseline Support</i>

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>
N/A			
<p><b>FY 2023 Plans:</b></p> <ul style="list-style-type: none"> <li>• Complete Milestone B</li> <li>• Award Engineering Manufacturing and Development (EMD) contract</li> </ul> <p><b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> Funding increased due to program initiation and award of Engineering and Manufacturing Development contract.</p>			
<p><b>Title:</b> LGM-30G Baseline Support</p> <p><b>Description:</b> 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><b>FY 2022 Plans:</b></p> <ul style="list-style-type: none"> <li>• Conduct studies of system performance.</li> <li>• Conduct cost trades and acquisition planning activities, up to and including proposal preparation, technology for future capabilities.</li> </ul> <p><b>FY 2023 Plans:</b></p> <ul style="list-style-type: none"> <li>• Conduct studies of system performance.</li> <li>• Conduct cost trades and acquisition planning activities, up to and including proposal preparation, technology for future capabilities.</li> </ul> <p><b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> Funding increased due to increase in number of system performance studies.</p>	4.450	0.456	5.000
<b>Accomplishments/Planned Programs Subtotals</b>	47.203	90.123	49.414

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• MPAF 03 Line Item	0.000	4.534	4.469	-	4.469	0.000	0.000	0.000	0.000	Continuing	Continuing
M30MLG: <i>MM III Modifications</i>											
• MPAF 01 Line Item 00099L:	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
<i>Missile Replacement Eq- Ballistic</i>											
• MPAF 04 Line Item 00098A:	60.276	38.645	39.774	-	39.774	46.861	57.212	49.345	50.347	Continuing	Continuing
<i>Msl Sprs/Repair Parts (Initial)</i>											

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Air Force	<b>Date:</b> April 2022
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<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0101213F / <i>Minuteman Squadrons</i>	<b>Project (Number/Name)</b> 672984 / <i>MM III Baseline Support</i>
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**C. Other Program Funding Summary (\$ in Millions)**

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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**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 modify organic depot capabilities with industry. Industry development for ground and communication equipment efforts will be executed through contracts 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. Nuclear Surety and Vulnerability analysis requirements are covered in the Acquisition Strategy.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force** **Date:** April 2022

<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0101213F / Minuteman Squadrons	<b>Project (Number/Name)</b> 672984 / MM III Baseline Support
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<b>Product Development (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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 Arm Disarm Switch Replacement (ADSR)	C/CPFF	MOOG/ BIONETICS/ EBAD : Moorpark, CA. Blacksburg VA. Heath OH, CA	0.000	3.089	Oct 2020	-		-		-		-	0.000	3.089	8.587
LGM-30G Flight Test Telemetry and Termination System (FT3) TMRR/EMD	C/CPIF	Boeing : Clearfield, UT	0.000	19.227	Dec 2020	75.376	Dec 2021	26.014	Dec 2022	-		26.014	Continuing	Continuing	177.789
LGM-30G Higher Authority Command Test System (HACTS) 2.0	C/CPAF	TBD : TBD	0.000	-		-		9.875	Oct 2022	-		9.875	Continuing	Continuing	-
<b>Subtotal</b>			0.000	22.316		75.376		35.889		-		35.889	Continuing	Continuing	N/A

<b>Support (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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 Arm Disarm Switch Replacement (ADSR) Support	C/Variou	Hill AFB : Clearfield, UT	0.000	0.139	Jan 2021	0.161	Jan 2022	-		-		-	0.000	0.300	-
LGM-30G Flight Test Telemetry and Termination System (FT3) Support	C/Variou	Various : Clearfield, UT	0.000	8.956	Oct 2020	5.599	Nov 2021	3.757	Nov 2022	-		3.757	Continuing	Continuing	-
LGM-30G Baseline Support	C/Variou	Various : Various	0.000	4.450	Mar 2021	0.456	Mar 2022	5.000	Mar 2023	-		5.000	Continuing	Continuing	-
<b>Subtotal</b>			0.000	13.545		6.216		8.757		-		8.757	Continuing	Continuing	N/A

<b>Test and Evaluation (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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) Lead	MIPR	AEDC/TST : AAFB, TN	0.000	0.510	Dec 2020	0.344	Nov 2021	0.099	Nov 2022	-		0.099	Continuing	Continuing	-



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**Exhibit R-4, RDT&E Schedule Profile:** PB 2023 Air Force **Date:** April 2022

<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0101213F / <i>Minuteman Squadrons</i>	<b>Project (Number/Name)</b> 672984 / <i>MM III Baseline Support</i>
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FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
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

<b><i>MM III Baseline Support</i></b>	
ADSR Engineering and Manufacturing Development Phase	
ADSR CDR (Feb 2021)	
ADSR Milestone C (Sep 2022)	
ADSR Production and Deployment Phase	
FT3 Engineering and Manufacturing Development Phase	
FT3 PRR (Feb 2022)	
FT3 Milestone C (Jun 2022)	
FT3 Production and Deployment Phase	
FT3 RAA (May 2022)	
FT3 Operations and Support Phase	
HACTS 2.0 Milestone B (Oct 2022)	
HACTS 2.0 Engineering and Manufacturing Development Phase (Oct 2023)	
HACTS 2.0 Milestone C (Jul 2024)	
HACTS 2.0 Production and Deployment (Jul 2024)	
HACTS 2.0 Full Operational Capability (Jan 2025)	

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2023 Air Force		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0101213F / <i>Minuteman Squadrons</i>	<b>Project (Number/Name)</b> 672984 / <i>MM III Baseline Support</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>MM III Baseline Support</i></b>				
ADSR Engineering and Manufacturing Development Phase	1	2021	4	2022
ADSR CDR (Feb 2021)	2	2021	2	2021
ADSR Milestone C (Sep 2022)	4	2022	4	2022
ADSR Production and Deployment Phase	4	2022	4	2023
FT3 Engineering and Manufacturing Development Phase	1	2021	3	2024
FT3 PRR (Feb 2022)	2	2022	2	2022
FT3 Milestone C (Jun 2022)	3	2022	3	2022
FT3 Production and Deployment Phase	3	2022	3	2024
FT3 RAA (May 2022)	3	2022	3	2022
FT3 Operations and Support Phase	2	2023	4	2027
HACTS 2.0 Milestone B (Oct 2022)	1	2023	1	2023
HACTS 2.0 Engineering and Manufacturing Development Phase (Oct 2023)	1	2023	3	2024
HACTS 2.0 Milestone C (Jul 2024)	4	2024	4	2024
HACTS 2.0 Production and Deployment (Jul 2024)	4	2024	1	2025
HACTS 2.0 Full Operational Capability (Jan 2025)	2	2025	2	2025

**Note**

FT3 Program:

- FT3 Acquisition Strategy drives an overlap in the EMD and P&D phases. FT3 uses RDT&E to fund LRIP units. As the program consumes the flight test units, the program replaces those units through replenishment spares. The order of replenishment spares overlaps EMD to deliver spares at a rate that keeps pace with consumption.
- P&D Phase ends when the last of the eight LRIPs have been delivered and the EMD contract ends, 3QFY24
- O&S Phase begins when FT3 systems sustainment activities begin, 2QFY23
- Sustainment includes LSS and associated FT3 support equipment (3400) through the life of MMIII OTL

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2023 Air Force **Date:** April 2022

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

- Plan is to purchase up to 24 replenishment spares (up to 4 per year through 2030) which will support the MMIII OTL mission

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Air Force										<b>Date:</b> April 2022		
<b>Appropriation/Budget Activity</b> 3600 / 7					<b>R-1 Program Element (Number/Name)</b> PE 0101213F / <i>Minuteman Squadrons</i>				<b>Project (Number/Name)</b> 672985 / <i>MM Support Equip</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
672985: <i>MM Support Equip</i>	0.000	0.000	0.000	13.455	0.000	13.455	0.000	0.000	0.000	0.000	0.000	13.455
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

This program, BA 7, PE 0101213F, project 672985, LGM-30G MM III Acquisition of Transportation and Handling and Support Equipment (MATH), 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 Ground Based Strategic Deterrent (GBSD). Efforts include design, development, and testing of support equipment such as LGM-30G MM III Acquisition of Transportation & Handling (T&H) and Support Equipment (MATH) effort.

This program element may include necessary emergent or unanticipated civilian pay expenses required to manage, execute, and deliver Minuteman Squadron for emergent or unanticipated weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605833F or 0605831F. In FY 2021 \$1.100M was expended for civilian pay expenses in this program element, and in FY2022 \$1.100M is forecasted for civilian pay expenses in this program element.

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

	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>
<b>Title:</b> LGM-30G MM III Acquisition of Transportation and Handling and Support Equipment (MATH)	-	0.000	13.455
<b>Description:</b> The MATH program ensures the sustainment of the MM III and concurrent transition to GBSD through 2036 without any disruption to the nuclear deterrence mission. The current T&H and support equipment will not sustain MM III through end of life. Current T&H and support equipment technical data packages (TDP) are out of date; several items have obsolescence issues. Engineering is needed to provide adequate and complete technical data to support acquisition of MM III T&H and support equipment. Items include the following:  a. Missile Transport (MT) tractor and trailer; b. Propulsion System Rocket Engine (PSRE) tractor and trailer; c. Rocket motor semi-trailer; d. Operational Missile Carriage, all three stages; e. Support Equipment.  MATH engineering efforts will include a Critical Design Review (CDR) to evaluate the proposed TDP and first article testing to validate the TDPs. Technical support documents will be updated as necessary.  <b>FY 2022 Plans:</b>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Air Force		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0101213F / <i>Minuteman Squadrons</i>	<b>Project (Number/Name)</b> 672985 / <i>MM Support Equip</i>

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>
N/A			
<b><i>FY 2023 Plans:</i></b>			
<ul style="list-style-type: none"> <li>• Initiate program at Milestone B</li> <li>• Award Engineering and Manufacturing Development contract</li> <li>• Update Technical Data Package</li> <li>• Complete Critical Design Review (CDR)</li> </ul>			
<b><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i></b>			
Funding increased due to program initiation.			
<b>Accomplishments/Planned Programs Subtotals</b>	-	0.000	13.455

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• MPAF 03 Line Item	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
M30MLG: <i>MM III Modifications</i>											
• MPAF 01 Line Item 00099L:	73.474	57.793	55.650	-	55.650	70.896	66.382	54.186	58.428	Continuing	Continuing
<i>Missile Replacement Eq- Ballistic</i>											
• MPAF 04 Line Item 00098A:	60.276	38.645	39.774	-	39.774	46.861	57.212	49.345	50.347	Continuing	Continuing
<i>Msl Spares/Repair Parts (Initial)</i>											

**Remarks**

**D. Acquisition Strategy**

Support and test equipment efforts are reviewed to determine the best method for execution including vendor qualification and procurement with no development required; develop and/or modify 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 Contract (FISAC) or competitive source selections. Nuclear Surety Cross Check Analysis (NSCCA) and Independent Verification and Validation (IV&V) efforts are conducted separately. Nuclear Surety and Vulnerability analysis requirements are covered in the Acquisition Strategy.

The MATH program intends to conduct minimal necessary Engineering and Manufacturing Development (EMD) design work to develop up-to-date Technical Data Packages immediately followed by Production and Deployment (P&D). MATH will prioritize warfighter needs and accelerate design work on individual equipment items as necessary.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force** **Date:** April 2022

<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0101213F / Minuteman Squadrons	<b>Project (Number/Name)</b> 672985 / MM Support Equip
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<b>Product Development (\$ in Millions)</b>				<b>FY 2021</b>		<b>FY 2022</b>		<b>FY 2023 Base</b>		<b>FY 2023 OCO</b>		<b>FY 2023 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
MM III Transportation/ Handling and Support Equipment MATH (Missile Transporter)	TBD	TBD : TBD	0.000	-		-		0.100	Feb 2023	-		0.100	Continuing	Continuing	-
MM III Transportation/ Handling and Support Equipment MATH (Carriage)	TBD	TBD : TBD	0.000	-		-		0.100	Feb 2023	-		0.100	Continuing	Continuing	-
MM III Transportation/ Handling and Support Equipment MATH (PSRE)	TBD	TBD : TBD	0.000	-		-		6.744	Feb 2023	-		6.744	Continuing	Continuing	-
MM III Transportation/ Handling and Support Equipment MATH (Rocket Motor Semitrailer)	TBD	TBD : TBD	0.000	-		-		5.893	Feb 2023	-		5.893	Continuing	Continuing	-
MM III Transportation/ Handling and Support Equipment MATH (Support Equipment)	TBD	TBD : TBD	0.000	-		-		0.100	Feb 2023	-		0.100	Continuing	Continuing	-
<b>Subtotal</b>			0.000	-		-		12.937		-		12.937	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				<b>FY 2021</b>		<b>FY 2022</b>		<b>FY 2023 Base</b>		<b>FY 2023 OCO</b>		<b>FY 2023 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
MM III Transportation/ Handling and Support Equipment MATH PSC	TBD	TBD : TBD	0.000	-		-		0.273	Feb 2023	-		0.273	0.000	0.273	-
MM III Transportation/ Handling and Support Equipment MATH A&AS	C/FFP	TBD : TBD	0.000	-		-		0.245	Feb 2023	-		0.245	0.000	0.245	-
<b>Subtotal</b>			0.000	-		-		0.518		-		0.518	0.000	0.518	N/A





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**Exhibit R-4A, RDT&E Schedule Details:** PB 2023 Air Force **Date:** April 2022

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

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>MM Support Equipment</i></b>				
MATH Milestone B (Feb 2023)	2	2023	2	2023
MATH Engineering and Manufacturing Development Phase	2	2023	4	2024
MATH Milestone C (Sep 2024)	4	2024	4	2024
MATH Production and Deployment Phase	1	2025	4	2027
MATH FOC (Mar 2026)	4	2027	4	2027

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Air Force										<b>Date:</b> April 2022		
<b>Appropriation/Budget Activity</b> 3600 / 7					<b>R-1 Program Element (Number/Name)</b> PE 0101213F / Minuteman Squadrons				<b>Project (Number/Name)</b> 672986 / MM Crypto Mods			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
672986: MM Crypto Mods	0.000	4.289	3.688	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.977
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

In FY2022 Project 672986, LGM-30G ICBM Cryptography Upgrade II, was completed.

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

MM Crypto Mods executes United States Strategic Command, Air Force Global Strike Command, and Air Force 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 by 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)**

	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>
<b>Title:</b> LGM-30G ICBM Cryptography Upgrade II (ICU II)	4.289	3.688	0.000
<b>Description:</b> ICU II completes design and development, and implements KS-60 remote key/code change, irreversible transformation capabilities, and prevents continuous signal lockout.			
<b>FY 2022 Plans:</b> • Continue Guided Missile Launcher Electronic Circuit (GMLEC) interface modification efforts			
<b>FY 2023 Plans:</b> N/A			
<b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> Funding decreased due to completion of Guided Missile Launcher Electronic Circuit (GMLEC) interface modification efforts.			
<b>Accomplishments/Planned Programs Subtotals</b>	4.289	3.688	0.000

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

<b>Line Item</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• MPAF 03 Line Item	33.337	10.782	7.054	-	7.054	0.000	0.000	0.000	0.000	Continuing	Continuing
M30MLG: MM III Modifications											

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Air Force	<b>Date:</b> April 2022
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<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0101213F / <i>Minuteman Squadrons</i>	<b>Project (Number/Name)</b> 672986 / <i>MM Crypto Mods</i>
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**C. Other Program Funding Summary (\$ in Millions)**

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• MPAF 04 Line Item 00098A: <i>Msl Spares/Repair Parts (Initial)</i>	60.276	38.645	39.774	-	39.774	46.861	57.212	49.345	50.347	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 Safety Cross Check Analysis/Performance Analysis and Technical Evaluation (NSCCA/PATE) Independent Validation & Verification (IV&V). This contract is driven by critical nuclear safety requirements to perform an independent assessment of all modifications to nuclear-certified software. The Support Equipment effort includes EMD development of Depot Support Equipment, Guided Missile Launch Electronic Circuit (GMLEC) interface modification, and Acoustic Microscope System. Nuclear Safety and Vulnerability analysis requirements are covered in the Acquisition Strategy.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force** **Date:** April 2022

<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0101213F / Minuteman Squadrons	<b>Project (Number/Name)</b> 672986 / MM Crypto Mods
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<b>Product Development (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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 ICBM Cryptography Upgrade II EMD	C/CPIF	Northrop Grumman : Clearfield, UT	0.000	-		-		-		-		-	0.000	0.000	160.400
LGM-30G ICBM Cryptography Upgrade II Support Equipment development	C/CPFF	Northrop Grumman : Clearfield, UT	0.000	-		-		-		-		-	0.000	0.000	29.300
LGM-30G ICBM Cryptography Upgrade II Support GMLEC	C/CPFF	Northrop Grumman : Clearfield, UT	0.000	3.544	Jan 2021	2.805	Jan 2022	-		-		-	0.000	6.349	8.367
<b>Subtotal</b>			0.000	3.544		2.805		-		-		-	0.000	6.349	N/A

<b>Support (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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 ICBM Cryptography Upgrade II Nuclear Safety Support (NSCCA/IV&V)	C/CPFF	Northrop Grumman : Clearfield, UT	0.000	-		-		-		-		-	0.000	0.000	7.400
LGM-30G ICBM Cryptography SIBR & FFRDC Support	Various	Various : Various	0.000	0.000	Jan 2021	0.223	Jan 2022	-		-		-	0.000	0.223	-
<b>Subtotal</b>			0.000	0.000		0.223		-		-		-	0.000	0.223	N/A

<b>Test and Evaluation (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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 ICBM Cryptography Upgrade II LDTO	PO	AEDC/TSTS : Arnold AFB, TN	0.000	0.000	Nov 2020	0.051	Nov 2021	-		-		-	0.000	0.051	-
<b>Subtotal</b>			0.000	0.000		0.051		-		-		-	0.000	0.051	N/A



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**Exhibit R-4, RDT&E Schedule Profile:** PB 2023 Air Force **Date:** April 2022

<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0101213F / <i>Minuteman Squadrons</i>	<b>Project (Number/Name)</b> 672986 / <i>MM Crypto Mods</i>
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FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
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

<b><i>MM Crypto Mods</i></b>	
ICU II Engineering and Manufacturing Development Phase (GMLEC)	
ICU II Production and Deployment Phase	
ICU II Required Assets Available (RAA) for Initial Operational Capability (IOC) (Jun 2022)	
ICU II Required Assets Available (RAA) for Full Operational Capability (FOC) (Jan 2024)	

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2023 Air Force **Date:** April 2022

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

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>MM Crypto Mods</i></b>				
ICU II Engineering and Manufacturing Development Phase (GMLEC)	1	2021	1	2023
ICU II Production and Deployment Phase	1	2021	2	2024
ICU II Required Assets Available (RAA) for Initial Operational Capability (IOC) (Jun 2022)	3	2022	3	2022
ICU II Required Assets Available (RAA) for Full Operational Capability (FOC) (Jan 2024)	2	2024	2	2024