Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force												Date: March 2024
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604933F / *ICBM Fuze Modernization*							
COST ($ in Millions)	**Prior Years**	**FY 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**Cost To Complete**	**Total Cost**
Total Program Element	1,248.544	97.499	71.732	10.408	0.000	10.408	0.000	0.000	0.000	0.000	0.000	1,428.183
655082: *ICBM FUZE SUPPORT*	1,248.544	97.499	71.732	10.408	0.000	10.408	0.000	0.000	0.000	0.000	0.000	1,428.183
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Program MDAP/MAIS Code: 0498												

A. Mission Description and Budget Item Justification

The Intercontinental Ballistic Missile (ICBM) Fuze Modernization Program is designing and producing a functionally equivalent replacement for the current Mk21 fuze that will provide a 20-year threshold, 30-year objective design life. Currently available Mk21/W87-0 fuze quantities do not meet United States Strategic Command (USSTRATCOM) requirements and the current fuze is three times beyond its original ten year design life. The program will provide needed MMIII weapon system modifications, system testing, support/test equipment, data and training required to accommodate, field, and support the new Mk21 replacement fuze along with the W87-0 warhead as defined in the Air Force Global Strike Command (AFGSC) Requirements Traceability Memo dated 2 December 2013. In addition, the Joint Requirements Oversight Council (JROC) signed the program's JROC Memorandum validating the operational requirement for the program on 6 December 2016. A replacement Mk21/W87-0 fuze is urgently required to meet warfighter requirements and to ensure operational capability. The Mk21 reentry vehicle and fuze is designed to be deployed on the current Minuteman III (MMIII) and LGM-35A Sentinel weapon systems.

The US Air Force (USAF) will develop the modernized Mk21 fuze using the Department of Energy National Nuclear Security Administration (DOE/NNSA) complex and a weapons system integration contractor. The DOE/NNSA complex consists of Sandia National Labs-California (SNL-CA), Sandia National Labs-New Mexico (SNL-NM) and Kansas City National Security Campus (KCNSC). The ICBM Fuze Modernization program will leverage technologies, parts, components, and development/production capabilities resulting from extensive fuze work performed by the US Navy (USN) and DOE/NNSA on the Mk5/W88 Alt 370 Fuze program. The Radar Module remains entirely common with Mk5/W88 Alt 370, while the Pathlength Module and Thermal Battery Assembly designs and qualification activities remain highly leveraged and only contain minor differences from USN counterparts. Significant design aspects of the Missile Interface Controller Module, Launch Safety Device, and the Terminal Protection Device are also similar to USN counterparts. The Firing Set Interface Module shares common technology with the Mk5/W88 Alt 370 Firing Set.

The ICBM Fuze Modernization Program replacement fuze is designed to integrate into the MMIII and the LGM-35A Sentinel weapon systems, to include support/test equipment, data, flight test hardware, and training materials. The program will also conduct required system testing (including ground and flight tests). The program is coordinating Mk21 fuze replacement development efforts with the DOE/NNSA to synchronize USAF arming and fuze development activities with DOE/NNSA warhead requirements. When prudent, the program will conduct trade studies and initiate conceptual designs to address operational system issues and meet future requirements.

The Fiscal Year 2025 budget request continues cooperative efforts with the USN to leverage common components; conduct qualification tests; and continue development of lab, ground, and flight test assets. This program also includes any needed nuclear surety and certification and system vulnerability assessments.

Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604933F / *ICBM Fuze Modernization*

As a cooperative USAF, USN and DOE/NNSA acquisition, the USAF is executing the program using Department of Defense (DoD) Manual 5030.55 Joint Nuclear Weapons Life Cycle Activities (Phase 6.X process) while using the DOD 5000-series instructions to meet Major Defense Acquisition Program (MDAP) statutory and regulatory requirements. The DOE/NNSA phase 6.X process is an iterative process that drives overlap and concurrency between activities and events that occur during the Engineering and Manufacturing Development (EMD) and Production and Deployment phases of the DoD 5000 Series Instruction.

This program entered Phase 6.4 Production Engineering of the Phase 6.X process in Jan 2019. The program received Milestone C approval in October 2021. The program will conduct production engineering tasks required to progress to the DOE/NNSA Phase 6.5 and DoD Full Rate Production Decision Review (FRPDR) in May 2024.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, and 0606398F. In FY2023 0.000M was expended for civilian pay expenses in this program element, and in FY2024 0.000M is forecasted for civilian pay expenses in this program element.

FY24 RDT&E funding for PE 64933F, ICBM Fuze Modernization, is in compliance with budgeted end items per the approved test strategy and FY23 Omnibus, Sec. 8059.

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

B. Program Change Summary ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	98.376	71.732	10.390	0.000	10.390
Current President's Budget	97.499	71.732	10.408	0.000	10.408
Total Adjustments	-0.877	0.000	0.018	0.000	0.018
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.877	0.000			
• Other Adjustments	0.000	0.000	0.018	0.000	0.018

Change Summary Explanation

No significant changes

Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604933F / *ICBM Fuze Modernization*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: Fuze Design and Development ***Description:*** Design and develop the replacement Mk21 fuze required to support the ICBM W87-0 warhead. Coordinate design and development efforts with the ICBM weapon system integrator and support flight testing. ***FY 2024 Plans:*** • Conduct Flight Test Unit 4 (FTU-4) Operational Test • Conduct AFA Qualification Evaluation Review • Analyze FTU-4 data and author FTU-4 Test Report • Complete DoD Independent Peer Review • Conduct Full Rate Production Decision Review • Conduct Fuze Mod Digital Model Development • Conduct entrance criteria and garner approval to enter DOE/NNSA Phase 6.5 Low Scale Production Phase • Conduct required qualification activities and garner First Production Unit approval • Further develop analytical, information technology, and data management capabilities ***FY 2025 Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding decreased due to transition from development to production efforts in FY24	78.199	59.782	0.000
Title: Weapon System Integration/Systems Engineering ***Description:*** Integrate the replacement Mk21 fuze into the Mk21 W87-0 Reentry Vehicle. Validate designs through ground tests on an Integrated Test Bed (ITB). Plan and conduct necessary ground and flight testing. Coordinate design, development and test efforts. ***FY 2024 Plans:*** • Complete Nuclear Certification efforts including Basic Nuclear Safety Assessment Report and Nuclear Surety Evaluation Report • Complete ICBM Compatibility Certification Report • Support FTU-4 data analysis and reporting • Perform Phase IV of comparative analysis between current Fuze and Modernized Fuze • Conduct Fuze Mod Digital Model Development • Conduct various task team support • Complete Survivability Task Team (STT) efforts • Conduct Red Team Performance Assessment of SNL Radar	19.300	11.950	10.408

Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604933F / *ICBM Fuze Modernization*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
• Develop SDR tester capability			
FY 2025 Plans: • Finalize comparative analysis • Continue Fuze Mod Digital Model Development • Complete USSTRATCOM Survivability Certification • Continue Red Team Performance Assessment of SNL Radar			
FY 2024 to FY 2025 Increase/Decrease Statement: Funding decreased due to transition from development to production efforts			
Accomplishments/Planned Programs Subtotals	97.499	71.732	10.408

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• MPAF 03 Line Item M30FLH: *ICBM Fuze Mod*	137.364	158.789	144.375	-	144.375	123.564	110.274	100.274	0.728	1.673	777.041

Remarks

E. Acquisition Strategy

The ICBM Fuze Modernization program is executing a full cost reimbursable Strategic Partnership Project (SPP) with the DOE/NNSA complex using SNL-CA as the design agent and KCNSC as the production agent. The program is a collaborative effort with the USN reducing total program cost and development time by leveraging commonality between the ICBM and Submarine Launched Ballistic Missile fuze components. The USN Mk5/W88 Alt 370 fuze is being developed first, with the USAF Mk21 replacement fuze effort following. Both services participate in all design and development efforts to ensure maximum use of common components, subassemblies and technologies. Both services are using DOE/NNSA SNL-CA to perform fuze design and development. The USAF, as lead systems integrator for the Mk21 replacement fuze, competed a separate weapon system integration contract for integration support to assist the government with MMIII unique modifications and fuze integration efforts. Both services are using KCNSC to produce fuzes.

The program completed a Milestone C decision in October 2021 and is forecasted to complete a Full Rate Production Decision in 3QFY2024.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604933F / *ICBM Fuze Modernization*	**Project (Number/Name)** 655082 / *ICBM FUZE SUPPORT*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Fuze Preliminary Design Development	MIPR	Sandia National Labs : Albuquerque, NM	700.080	40.300	Nov 2022	13.200	Nov 2023	0.000	Nov 2024	-		0.000	0.000	753.580	753.580
Fuze EMD	Various	Various : Various	16.934	0.500	Nov 2022	2.770	Nov 2023	2.300	Nov 2024	-		2.300	0.000	22.504	22.504
Fuze Engineering Change Orders	Various	Various : Various	14.544	0.880	Nov 2022	1.562	Nov 2023	7.708	Nov 2024	-		7.708	0.000	24.694	24.673
Fuze National Security Campus (formerly Kansas City Plant)	MIPR	National Security Campus : Kansas City, MO	284.054	27.634	Nov 2022	37.410	Nov 2023	0.000	Nov 2024	-		0.000	0.000	349.098	349.098
Fuze Weapon System Integration - ICBM Prime	C/CPAF	Northrop Grumman : Clearfield, UT	25.937	-		-		-		-		-	0.000	25.937	25.937
Fuze Weapon System Integration - RS/RV Sub-System Contract (SSC)	C/CPAF	Lockheed Martin : Valley Forge, UT	84.691	-		-		-		-		-	0.000	84.691	84.691
Fuze Weapon System Integration Contract (WSIC)	C/CPFF	Lockheed Martin : Valley Forge, PA	44.228	17.344	Jan 2023	11.950	Jan 2024	-		-		-	0.000	73.522	76.151
		Subtotal	1,170.468	86.658		66.892		10.008		-		10.008	0.000	1,334.026	N/A

Remarks

FY22 prior years amount includes a 15.8M decrease due to an Above Threshold Reprogramming (ATR) to the Mk21A Reentry Vehicle Program (PE 0101328F).

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Fuze Engineering Support - BAH	C/FP	Booz Allen Hamilton : Clearfield, UT	2.757	-		-		-		-		-	0.000	2.757	2.757
Fuze Engineering Support - ISC Support 1.0	C/FFP	BAE : Clearfield, UT	20.006	4.374	Nov 2022	1.620	Nov 2023	-		-		-	0.000	26.000	26.000
Fuze Engineering Support - ISC Support 2.0	C/TBD	TBD : TBD	0.000	-		0.000	Nov 2023	-		-		-	0.000	0.000	0.000
		Subtotal	22.763	4.374		1.620		-		-		-	0.000	28.757	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force			Date: March 2024
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604933F / *ICBM Fuze Modernization*	Project (Number/Name) 655082 / *ICBM FUZE SUPPORT*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Fuze Lead Project Office Support	MIPR	AFNWC : Albuquerque, NM	10.480	-		-		-		-		-	0.000	10.480	10.480
Fuze Finite Element Model Validation	C/CPFF	LMTF : Little Mountain, UT	1.843	-		-		-		-		-	0.000	1.843	1.843
Fuze Flight Test Support and Evaluation	Various	Various : Various	10.669	-		-		-		-		-	0.000	10.669	10.669
		Subtotal	22.992	-		-		-		-		-	0.000	22.992	N/A

Remarks

The design agent, Sandia National Laboratories (listed as Fuze Preliminary Design Development in the R-3 Development section), is executing the test and evaluation efforts within the main design effort. There are no discretely funded test and evaluation efforts outside of the design agent's activities.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Fuze Cost and Financial Management	C/FFP	Tecolote : Salt Lake City, UT	5.157	-		-		-		-		-	0.000	5.157	5.157
Fuze FFRDC Support	MIPR	Aerospace : Los Angeles, CA	8.828	-		0.780	Nov 2023	-		-		-	0.000	9.608	9.608
Fuze Program Support	C/FFP	BAE : Clearfield, UT	1.285	-		-		-		-		-	0.000	1.285	1.285
Fuze Program Support Costs	Various	Various : Various	17.051	6.467	Nov 2022	2.440	Nov 2023	0.400	Nov 2024	-		0.400	0.000	26.358	26.358
		Subtotal	32.321	6.467		3.220		0.400		-		0.400	0.000	42.408	N/A

	Prior Years	FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,248.544	97.499		71.732		10.408		-		10.408	0.000	1,428.183	N/A

Remarks

Prior year RDT&E includes $10.037M in PE 0604222F FY11 and $39.536M in PE 0604851F FY12

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604933F / *ICBM Fuze Modernization*	**Project (Number/Name)** 655082 / *ICBM FUZE SUPPORT*

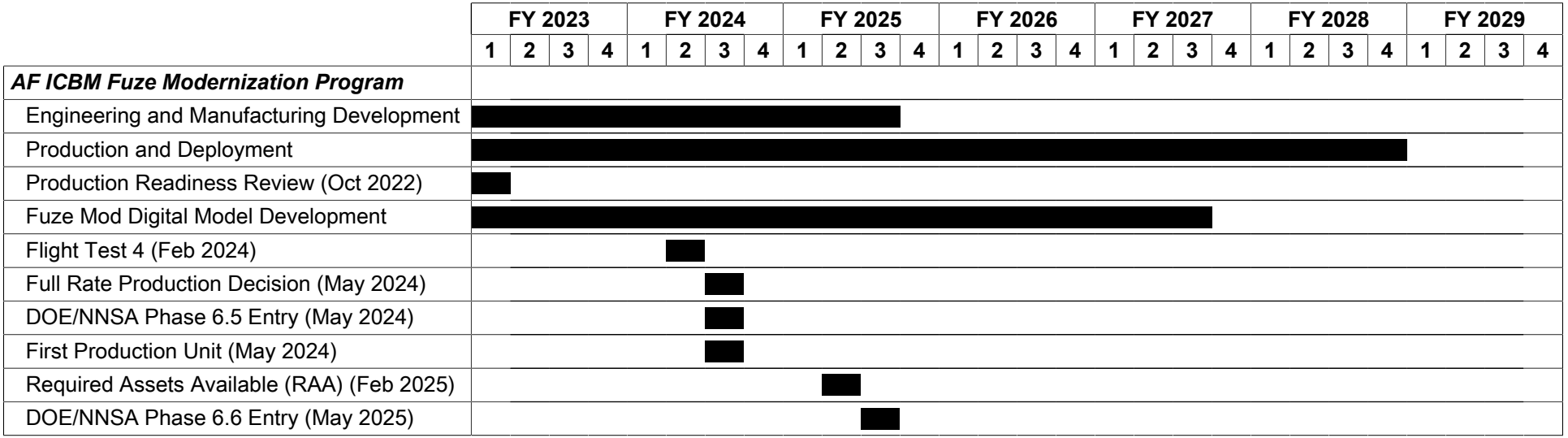

Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604933F / *ICBM Fuze Modernization*	**Project (Number/Name)** 655082 / *ICBM FUZE SUPPORT*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AF ICBM Fuze Modernization Program				
Engineering and Manufacturing Development	1	2023	3	2025
Production and Deployment	1	2023	4	2028
Production Readiness Review (Oct 2022)	1	2023	1	2023
Fuze Mod Digital Model Development	1	2023	3	2027
Flight Test 4 (Feb 2024)	2	2024	2	2024
Full Rate Production Decision (May 2024)	3	2024	3	2024
DOE/NNSA Phase 6.5 Entry (May 2024)	3	2024	3	2024
First Production Unit (May 2024)	3	2024	3	2024
Required Assets Available (RAA) (Feb 2025)	2	2025	2	2025
DOE/NNSA Phase 6.6 Entry (May 2025)	3	2025	3	2025

Note

The ICBM Fuze Mod Program discovered the need to de-couple Milestone C and Full Rate Production (FRP) Decision from Phase 6.5 and Phase 6.6 entries respectively. At the time of the initial baseline in 2014, Phase 6.5 and Phase 6.6 were selected as the surrogates for the DoD milestones. Since that time differences between the DOE Phase 6.x process and the DoDI 5000 Series Instruction, as it relates to funding of Title 10 programs, drove a de-coupling of these milestones into the Acquisition Program Baseline. This program is still being managed according to the Phase 6.x process but Milestone C and FRP decisions have been added as milestones that will be accomplished to satisfy statutory requirements of a Major Defense acquisition program. Required Assets Available (RAA) has been identified as an adequate substitute for Initial Operating Capability (IOC).