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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force **Date:** February 2020

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0101125F / <i>Nuclear Weapons Modernization</i>
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	658.281	42.001	27.564	9.683	0.000	9.683	0.000	0.000	0.000	0.000	0.000	737.529
657007: <i>B61 LIFE EXTENSION PROGRAM</i>	658.281	42.001	27.564	9.683	0.000	9.683	0.000	0.000	0.000	0.000	0.000	737.529
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Program MDAP/MAIS Code: 468

A. Mission Description and Budget Item Justification

The purpose of this program element is to conduct and support United States Air Force (USAF) and Joint Department of Defense (DoD) / Department of Energy (DOE) acquisition activities for the modernization of nuclear weapons.

B61-12 Life Extension Program (LEP): The B61-12 LEP will integrate DOE efforts to extend the service life of the warhead with DoD efforts to develop a guided Tail Kit Assembly (TKA) required to maintain current B61 mission characteristics. Programmatic integration of the Air Force-led, joint DoD-DOE program is accomplished through the B61 LEP Project Officers Group (POG) and its subgroups. In accordance with Air Force Materiel Command mission assignment memo (dated 17 Feb 11) and National Nuclear Security Administration (NNSA)-Air Force Nuclear Weapons Center (AFNWC) Memorandum of Understanding (MOU dated 28 Jun 12), the USAF is responsible for development, acquisition and delivery of a guided TKA and All Up Round (AUR) technical integration, system qualification and fielding of the B61-12 variant on multiple platforms.

Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortage (DMSMS) issues.

This program element includes necessary civilian pay expenses required to manage, execute, and deliver B-61 weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F or 0605833F.

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.

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B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	
Previous President's Budget	81.592	27.564	9.700	0.000	9.700	
Current President's Budget	42.001	27.564	9.683	0.000	9.683	
Total Adjustments	-39.591	0.000	-0.017	0.000	-0.017	
• 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	-36.485	0.000				
• SBIR/STTR Transfer	-3.106	0.000				
• Other Adjustments	0.000	0.000	-0.017	0.000	-0.017	
Change Summary Explanation						
FY 2019 Reprogramming Actions (all reductions): \$26.485M FY19 Omnibus ATR to higher Air Force priorities; \$5.00M BTR to MM III; \$5.00M BTR to LRSO.						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2019	FY 2020	FY 2021
Title: Engineering & Manufacturing Development Contract (B61)				18.816	18.092	0.092
Description: Prime contract to develop, test, integrate and nuclear certify a guided TKA in support of the B61-12 LEP.						
FY 2020 Plans: Continues B61-12 TKA test, integration, qualification and nuclear certification activities in support of the B61-12 LEP. Continues integration and testing of the B61-12 system, verification of requirements and validation of TKA performance. Continues all-up round system and IOT&E flight testing to validate aircraft flight environments in support of weapon development. Continues B61-12 TKA program practices that ensure the following are met: requirements flow down, requirement allocation to hardware and software, requirements compliance matrix, system performance, reliability, maintainability, product assurance, testability, producibility and supportability. Provides support to aircraft Operational Flight Plan (OFP) development and integration to deliver the OFP test tapes in support of IOT&E.						
FY 2021 Plans:						

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
Finalizes B61-12 TKA program practices to ensure the following are met: requirements flow down, requirement allocation to hardware and software, requirements compliance matrix, system performance, reliability, maintainability, product assurance, testability, producibility and supportability. FY 2020 to FY 2021 Increase/Decrease Statement: Funding decreased due to conclusion of Engineering & Manufacturing Development.				
Title: All Up Round (AUR) Technical Integration (B61) Description: Covers all system engineering tasks in support of AUR technical integration, qualification & fielding, including program support to the B61 LEP POG. FY 2020 Plans: Continues B61-12 system qualification plan, warhead component qualification, TKA qualifications, and B61-12 AUR integration activities. Continues support to maintain technical and programmatic schedules and program documents that support the AUR technical integration. Continues maintenance of warhead-to-TKA interface requirements and design. Continues to provide technical expertise to maintain B61-12 aircraft compatibility with platforms through completion of the test and evaluation program. Continues to develop test assets to support integration and sustainment efforts at the aircraft system integration laboratories. Includes B61-12 AUR technical and programmatic reviews, including design reviews, systems reviews, technical interchange meetings, and test reviews. Also includes test assessments to validate modeling and simulation results in support of system qualification; configuration management of B61-12 AUR drawings, interface control documents, and system specifications; and support of trainers and other USAF-owned, DOE-designed configurations such as the Code Management System and ancillary equipment. Provides for management of system security requirements. Provides AUR integration support to the DOE in support of System Qualification drops. Efforts support the AUR Design Review and Acceptance Group (DRAAG). FY 2021 Plans: Finalizes B61-12 system qualification plan, warhead component qualification, TKA qualifications, and B61-12 AUR integration activities, along with any support to maintain technical and programmatic schedules. FY 2020 to FY 2021 Increase/Decrease Statement: Decrease due to conclusion of AUR Technical Integration.		3.400	0.901	0.100
Title: Aircraft Integration (B61) Description: B61-12 activities associated with integration on threshold aircraft, including mission planning system upgrades to accommodate the new weapon variant. Also includes activities related to weapon design compatibility with both threshold and objective aircraft.		14.737	1.858	9.391

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
<p>FY 2020 Plans: Continues aircraft F-15E integration activities and phases out B-2 integration to support B61-12 AUR technical integration and aircraft integration. Integration activities include verifications for TKA and AUR design verification. Continues integration of B-2, F-15E, F-16 system qualification testing for B61-12 AUR and B-2 mission planning.</p> <p>FY 2021 Plans: Finalizes aircraft F-15E integration activities to support B61-12 AUR technical integration and aircraft integration. Integration activities include verifications for TKA and AUR design verification. Continues integration of B-2, F-15E, F-16 system qualification testing for B61-12 AUR and B-2 mission planning.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Increase reflects PMA to support end of EMD, since there is not a separate section on the R-2 to capture this.</p>			
<p>Title: Test Support (B61)</p> <p>Description: Test activities and support for TKA design validation & verification and nuclear certification, as well as B61-12 AUR system qualification (includes design and operational certification activities).</p> <p>FY 2020 Plans: Continues test planning and execution activities to support B61-12 weapon development, AUR technical integration and aircraft integration. Continues flight testing to verify aircraft flight environments and TKA and AUR design verification during IOT&E and AUR System Qualification drops. Continues development and delivery of necessary BAs to accomplish TKA test and trainer activities. Continues providing support to the DOE flight tests for the bomb assembly. Continues execution of B-2, F-15E, F-16 system qualification testing for B61-12 AUR and B-2 mission planning.</p> <p>FY 2021 Plans: Continues test planning and execution activities to support B61-12 weapon development, AUR technical integration and aircraft integration.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Decrease due to end of test activities.</p>	5.048	6.713	0.100
Accomplishments/Planned Programs Subtotals	42.001	27.564	9.683

D. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2019	FY 2020	FY 2021	FY 2021	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Cost To	Total Cost
			Base	OCO	Total					Complete	
• PAAF 01 354040: B61	140.323	80.773	35.634	-	35.634	2.797	0.000	0.000	-	0.000	259.527

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D. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks
For Appn PAAF, PE/Line Item 354040, the correct amount for FY19 is \$140.323M (annotated above). The amount shown in the 354040 B61 Procurement Document (\$152.223M) is not correct, as it does not take into account an \$11.9M Congressional mark.

E. Acquisition Strategy

The Milestone Decision Authority directed a three-fold competitive acquisition strategy at the 30 April 2012 Materiel Development Decision. 1) A single prime contractor was chosen to develop the B61-12 TKA through Engineering Manufacturing and Development (EMD) using full and open competition. EMD consists of two phases; 2) the prime contractor is to maintain competition at the subcomponent level; and 3) a sole source contract was awarded for production to the EMD contractor.

MS-C in 1QFY19 approved entry into Low Rate Initial Production/Lot 1 and the purchase of both long-lead items and life-of-type buys supporting Lot 2 Advanced Procurement for Full Rate Production.

B61-12 AUR integration, qualification and acceptance will be conducted through the joint DoD-DOE/NNSA Phase 6.X process and managed through the B61 LEP Project Officers Group (POG). Sandia National Laboratory will conduct the TKA/BA technical integration on behalf of the Air Force.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force **Date:** February 2020

Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0101125F / Nuclear Weapons Modernization	Project (Number/Name) 657007 / B61 LIFE EXTENSION PROGRAM
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Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
B61 LEP EMD Contracts	C/CPIF	Boeing : St Charles, MO	311.490	12.036	Feb 2019	12.611	Nov 2019	0.092	Oct 2020	-		0.092	0.000	336.229	0.000
Subtotal			311.490	12.036		12.611		0.092		-		0.092	0.000	336.229	N/A

Remarks
 FY20 EMD contract cost decrease due to ramp down of program testing.
 FY21 EMD contract cost decrease due to conclusion of program testing.
 EMD Phase II Period of Performance ends June 2020.

Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
AUR Technical Integration	MIPR	Various : various	67.734	3.400	Feb 2019	0.901	Jun 2020	0.100	Apr 2021	-		0.100	0.000	72.135	-
Aircraft Integration	MIPR	Various : various	171.759	14.737	Aug 2019	1.858	Feb 2020	7.391	Feb 2021	-		7.391	0.000	195.745	-
Subtotal			239.493	18.137		2.759		7.491		-		7.491	0.000	267.880	N/A

Remarks
 FY20 & FY21 AUR Technical Integration cost decrease due to adjusted program schedule and ramp down/conclusion of integration activities.
 FY20 & FY21 Aircraft Integration cost aligns with program schedule and requirements in aircraft integration activities.

Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Test Support for B61 LEP Development	PO	96 TW : Eglin, FL	63.287	0.548	Aug 2019	0.553	Mar 2020	0.100	Mar 2021	-		0.100	0.000	64.488	-
526.1 Assets	MIPR	Various : Various	5.940	4.500	Apr 2019	6.160	Mar 2020	-		-		-	0.000	16.600	-
Subtotal			69.227	5.048		6.713		0.100		-		0.100	0.000	81.088	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force **Date:** February 2020

Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0101125F / <i>Nuclear Weapons Modernization</i>	Project (Number/Name) 657007 / <i>B61 LIFE EXTENSION PROGRAM</i>
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Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks
 FY20 526.1 Assets cost increase aligns with program schedule and rephase of dollars. Upon inception, funds were provided in FY19; funds realigned for better programmatic execution.
 FY21 Test Support cost decrease aligns with program schedule and conclusion of test activities.

Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	Various	various : various	38.071	6.780	Mar 2019	5.481	Jan 2020	2.000	Jan 2021	-		2.000	0.000	52.332	-
Subtotal			38.071	6.780		5.481		2.000		-		2.000	0.000	52.332	N/A

Remarks
 FY20 PMA cost decrease aligns with program schedule and ramp down in integration and test activities.
 FY21 PMA dollars positioned for SBIR, MDAP, taxes, and corporate bills.

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	658.281	42.001	27.564	9.683	-	9.683	0.000	737.529	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0101125F / <i>Nuclear Weapons Modernization</i>	Project (Number/Name) 657007 / <i>B61 LIFE EXTENSION PROGRAM</i>

FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
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

<i>B61 LIFE EXTENSION PROGRAM</i>																												
Engineering & Manufacturing Development Phase 1																												
Engineering & Manufacturing Development Phase 2																												
All-Up-Round Developmental/System Qualification Testing																												
Ground Test/WTT/Flight Test																												
Aircraft Integration																												
TKA Milestone C Decision																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0101125F / <i>Nuclear Weapons Modernization</i>	Project (Number/Name) 657007 / <i>B61 LIFE EXTENSION PROGRAM</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>B61 LIFE EXTENSION PROGRAM</i>				
Engineering & Manufacturing Development Phase 1	1	2019	1	2019
Engineering & Manufacturing Development Phase 2	1	2019	3	2020
All-Up-Round Developmental/System Qualification Testing	1	2019	4	2020
Ground Test/WTT/Flight Test	1	2019	4	2020
Aircraft Integration	1	2019	4	2021
TKA Milestone C Decision	1	2019	1	2019

Note

Engineering & Manufacturing Development Phase 2 has been extended to April 2020 in order to award debit/credit proposal.