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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force										Date: May 2017		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 5: System Development & Demonstration (SDD)					R-1 Program Element (Number/Name) PE 0101125F I Nuclear Weapons Modernization							
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	285.271	204.358	137.909	91.237	0.000	91.237	120.598	36.437	0.000	0.000	0.000	875.810
657007: B61 LIFE EXTENSION PROGRAM	285.271	204.358	137.909	91.237	0.000	91.237	120.598	36.437	0.000	0.000	0.000	875.810
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 and Material Shortage (DMSMS) issues.

This program is in Budget Activity 5, System Development and Demonstration (SDD), because it 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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	
Previous President's Budget	212.121	137.909	150.974	0.000	150.974	
Current President's Budget	204.358	137.909	91.237	0.000	91.237	
Total Adjustments	-7.763	0.000	-59.737	0.000	-59.737	
• 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	-7.763	0.000				
• Other Adjustments	0.000	0.000	-59.737	0.000	-59.737	
Change Summary Explanation						
No significant program changes in FY16 and FY17						
FY18 \$59.7M addressing higher Air Force priorities						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2016	FY 2017	FY 2018
Title: Engineering & Manufacturing Development Contract (B61)				92.722	70.827	25.402
Description: Prime contract to develop, test, integrate and nuclear certify a guided TKA in support of the B61-12 LEP.						
FY 2016 Accomplishments:						
Continued B61-12 TKA development, design, test, integration, qualification and nuclear certification activities in support of the B61-12 LEP. Continued design, integration and testing of the B61-12 system and verification of requirements and validation of TKA performance. Continued flight testing to verify aircraft flight environments in support of weapon development. Continued B61-12 TKA program practices that ensure the following were met: requirements flow down, requirement allocation to hardware and software, requirements compliance matrix, system performance, reliability, maintainability, product assurance, testability, producibility and supportability. Provided support to the DOE flight tests in support of the Baseline Design Review (BDR) for the Bomb Assembly (BA). Provided support to aircraft Operational Flight Plan (OFP) development and integration to deliver the OFP test tapes in support of flight testing. Continued TKA Developmental Test (DT) drops, and preparation work for FY17 System Qualification drops.						
FY 2017 Plans:						
Continues B61-12 TKA development, design, test, integration, qualification and nuclear certification activities in support of the B61-12 LEP. Continues design, integration and testing of the B61-12 system and verification of requirements and validation of TKA performance. Continues flight testing to verify aircraft flight environments in support of weapon development. Continues						

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
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 OFP development and integration to deliver the OFP test tapes in support of flight testing. Continues TKA Developmental Test (DT) drops, and provides support to the FY17 System Qualification drops.				
FY 2018 Plans: Continues B61-12 TKA development, design, test, integration, qualification and nuclear certification activities in support of the B61-12 LEP. Continues design, integration and testing of the B61-12 system and verification of requirements and validation of TKA performance. Continues flight testing to verify 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 flight testing. Continues TKA Developmental Test (DT) drops, and provides support to the FY18 System Qualification drops.				
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.		12.276	15.768	12.158
FY 2016 Accomplishments: Continued B61-12 system qualification plan, warhead component qualification, TKA qualifications, and B61-12 AUR integration activities. Continued support to maintain technical and programmatic schedules and program documents that support the AUR technical integration. Continued to develop warhead-to-TKA interface requirements and design. Continued to provide technical expertise to maintain B61-12 aircraft compatibility with platforms through completion of the test and evaluation program. Continued to develop test assets to support integration efforts at the aircraft system integration laboratories. Included B61-12 AUR technical and programmatic reviews, including design reviews, systems reviews, technical interchange meetings, and test reviews. Also included 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 configurations. Provided AUR integration support to the DOE flight tests in support of the BDR for the BA. Provided for management of system security requirements. Provided AUR integration support to the DOE in preparation for System Qualification drops. Completed joint DoD-DOE acquisition Phase 6.3, Developmental Engineering, and entered Phase 6.4, Production Engineering.				
FY 2017 Plans:				

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>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 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 configurations. Provides for management of system security requirements. Provides AUR integration support to the DOE in support of System Qualification drops. Specifically, provides for design and prototyping of Fault Insertion Device to be used in aircraft software integration laboratories. Additionally, provides for pre-production drawings for peculiar nuclear support equipment.</p> <p>FY 2018 Plans:</p> <p>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 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 configurations. Provides for management of system security requirements. Provides AUR integration support to the DOE in support of System Qualification drops. Efforts culminate in the AUR Final Design Review in 4QFY18.</p>				
<p>Title: Aircraft Integration (B61)</p> <p>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.</p> <p>FY 2016 Accomplishments:</p> <p>Continued meeting participation/membership and integration activities for aircraft. Continued test tapes development and demonstration/validation of the OFP. Continued design compatibility with aircraft. Continued mission planning upgrades. Continued OFP development and integration to deliver the OFP test tapes in support of flight testing. Completed 2nd phase</p>		74.696	33.775	36.394

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C. Accomplishments/Planned Programs (\$ in Millions) of F-15E developmental OFP. Delivered B61-12 AUR flight simulators, which established baseline for B-2 Integration Test Readiness Review. Demonstrated F-16 and PA-200 B61-12 AUR compatibility. FY 2017 Plans: Continues meeting participation/membership and integration activities for aircraft. Continues test tapes development and demonstration/validation of the OFP. Continues design compatibility with aircraft. Continues mission planning upgrades. Continues OFP development and integration to deliver the OFP test tapes in support of flight testing. Delivers B-2 developmental OFP for flight test. Provides production OFP for F-15E flight test. FY 2018 Plans: Continues meeting participation/membership and integration activities for aircraft. Continues test tapes development and demonstration/validation of the OFP. Continues design compatibility with aircraft. Continues mission planning upgrades. Continues OFP development and integration to deliver the OFP test tapes in support of flight testing. Completes B-2 production OFP in 1QFY18. Completes F-15E integration in 3QFY18.		FY 2016	FY 2017	FY 2018
Title: Test Support (B61) 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). FY 2016 Accomplishments: Continued test planning and execution activities to support B61-12 weapon development, AUR technical integration and aircraft integration. Continued flight testing to verify aircraft flight environments and TKA and AUR design verification, including initial TKA DT drops and preparation for AUR System Qualification drops. Continued development and delivery of necessary BAs to accomplish TKA test and trainer activities. Provided support to the DOE flight tests in support of the BDR for the bomb assembly. Tested delivered OFP for F-15E using compatibility test units in ground and captive carry flight test. FY 2017 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, including initial TKA DT drops and preparation for TKA Operational Test (OT) drops and AUR System Qualification drops. Continues development and delivery of necessary BAs to accomplish TKA test and trainer activities. Provides support to the DOE flight tests for the bomb assembly. Plans and executes B61-12 AUR system qualification on F-15E and F-16. FY 2018 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, including initial TKA		24.664	17.539	17.283

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C. Accomplishments/Planned Programs (\$ in Millions)											
DT drops and preparation for TKA Operational Test (OT) drops and AUR System Qualification drops. Continues development and delivery of necessary BAs to accomplish TKA test and trainer activities. Provides support to the DOE flight tests for the bomb assembly. Continues execution of F-15E and F-16 system qualification testing for B61-12 AUR. Starts B-2 planning and execution of B61-12 AUR system qualification testing.								FY 2016	FY 2017	FY 2018	
Accomplishments/Planned Programs Subtotals								204.358	137.909	91.237	
D. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• PAAF: BA01 Line Item # 354040: B61	0.000	0.000	88.307	0.000	88.307	110.084	164.139	18.886	0.000	0.000	381.416
Remarks											
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 will be awarded for production to the EMD contractor. 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 POG. Sandia National Laboratory will conduct the TKA/BA technical integration on behalf of the Air Force.											
F. 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: FY 2018 Air Force												Date: May 2017			
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>			
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
B61 LEP EMD Contracts	C/CPIF	Boeing : St Charles, MO	159.724	87.506	Dec 2015	61.694	Nov 2016	21.491	Jan 2018	0.000		21.491	43.337	373.752	0.000
Subtotal			159.724	87.506		61.694		21.491		0.000		21.491	43.337	373.752	0.000
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
AUR Technical Integration	MIPR	Various : various	29.717	12.276	Jan 2016	15.768	Jan 2017	12.158	Jan 2018	0.000		12.158	7.914	77.833	-
Aircraft Integration	MIPR	Various : various	59.491	74.696	Nov 2015	33.775	Nov 2016	36.394	Nov 2017	0.000		36.394	87.458	291.814	-
Subtotal			89.208	86.972		49.543		48.552		0.000		48.552	95.372	369.647	-
Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Test Support for B61 LEP Development	PO	96 TW : Eglin, FL	18.215	24.664	Dec 2015	17.539	Nov 2016	17.283	Nov 2017	0.000		17.283	16.756	94.457	-
Subtotal			18.215	24.664		17.539		17.283		0.000		17.283	16.756	94.457	-
Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA	Various	various : various	18.124	5.216	Oct 2015	9.133	Oct 2016	3.911	Oct 2017	0.000		3.911	1.570	37.954	-
Subtotal			18.124	5.216		9.133		3.911		0.000		3.911	1.570	37.954	-
Project Cost Totals			285.271	204.358		137.909		91.237		0.000		91.237	157.035	875.810	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force							Date: May 2017			
Appropriation/Budget Activity 3600 / 5				R-1 Program Element (Number/Name) PE 0101125F / Nuclear Weapons Modernization		Project (Number/Name) 657007 / B61 LIFE EXTENSION PROGRAM				
	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract	
Remarks										

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force			Date: May 2017		
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 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
Engineering & Manufacturing Development Phase 1																												
Engineering & Manufacturing Development Phase 2																												
All-Up-Round Developmental/System Qualification Testing																												
Ground Test/WTT/Flight Test																												
CDR																												
Aircraft Integration																												
TKA Milestone C Decision																												
TKA Production																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force			Date: May 2017
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	Start		End	
	Quarter	Year	Quarter	Year
Engineering & Manufacturing Development Phase 1	1	2016	4	2017
Engineering & Manufacturing Development Phase 2	1	2016	2	2019
All-Up-Round Developmental/System Qualification Testing	1	2016	1	2020
Ground Test/WTT/Flight Test	1	2016	4	2020
CDR	2	2016	2	2016
Aircraft Integration	1	2016	2	2020
TKA Milestone C Decision	1	2019	1	2019
TKA Production	1	2019	2	2022

Note

USD AT&L directed B61-12 TKA to enter acquisition process at Milestone B based on maturity of the technology required for this program. Therefore, a separate Technology Development phase is not required. (Source: Materiel Development Decision (MDD) Acquisition Decision Memorandum (ADM), signed 30 April 2012)