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## Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-468



### **B61 Mod 12 Life Extension Program Tailkit Assembly (B61 Mod 12 LEP TKA)**

As of FY 2020 President's Budget

Defense Acquisition Management  
Information Retrieval  
(DAMIR)

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## **Sensitivity Originator**

No originator info Available at this time.

## Common Acronyms and Abbreviations for MDAP Programs

Acq O&M - Acquisition-Related Operations and Maintenance  
ACAT - Acquisition Category  
ADM - Acquisition Decision Memorandum  
APB - Acquisition Program Baseline  
APPN - Appropriation  
APUC - Average Procurement Unit Cost  
\$B - Billions of Dollars  
BA - Budget Authority/Budget Activity  
Blk - Block  
BY - Base Year  
CAPE - Cost Assessment and Program Evaluation  
CARD - Cost Analysis Requirements Description  
CDD - Capability Development Document  
CLIN - Contract Line Item Number  
CPD - Capability Production Document  
CY - Calendar Year  
DAB - Defense Acquisition Board  
DAE - Defense Acquisition Executive  
DAMIR - Defense Acquisition Management Information Retrieval  
DoD - Department of Defense  
DSN - Defense Switched Network  
EMD - Engineering and Manufacturing Development  
EVM - Earned Value Management  
FOC - Full Operational Capability  
FMS - Foreign Military Sales  
FRP - Full Rate Production  
FY - Fiscal Year  
FYDP - Future Years Defense Program  
ICE - Independent Cost Estimate  
IOC - Initial Operational Capability  
Inc - Increment  
JROC - Joint Requirements Oversight Council  
\$K - Thousands of Dollars  
KPP - Key Performance Parameter  
LRIP - Low Rate Initial Production  
\$M - Millions of Dollars  
MDA - Milestone Decision Authority  
MDAP - Major Defense Acquisition Program  
MILCON - Military Construction  
N/A - Not Applicable  
O&M - Operations and Maintenance  
ORD - Operational Requirements Document  
OSD - Office of the Secretary of Defense  
O&S - Operating and Support  
PAUC - Program Acquisition Unit Cost

PB - President's Budget  
PE - Program Element  
PEO - Program Executive Officer  
PM - Program Manager  
POE - Program Office Estimate  
RDT&E - Research, Development, Test, and Evaluation  
SAR - Selected Acquisition Report  
SCP - Service Cost Position  
TBD - To Be Determined  
TY - Then Year  
UCR - Unit Cost Reporting  
U.S. - United States  
USD(AT&L) - Under Secretary of Defense (Acquisition, Technology and Logistics)  
USD(A&S) - Under Secretary of Defense (Acquisition and Sustainment)

## Program Information

**Program Name**

B61 Mod 12 Life Extension Program Tailkit Assembly (B61 Mod 12 LEP TKA)

**DoD Component**

Air Force

## Responsible Office

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**Date Assigned:** June 30, 2016

## References

### **SAR Baseline (Development Estimate)**

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated December 14, 2012

### **Approved APB**

Air Force Acquisition Executive (AFAE) Approved Acquisition Program Baseline (APB) dated February 4, 2019

## Mission and Description

The B61 Mod 12 Life Extension Program Tailkit Assembly (B61 Mod 12 LEP TKA) will consolidate Mods 3, 4, 7 and 10 into a single Mod (B61 Mod 12 LEP TKA) while extending the system's service life. B61 Mod 12 LEP TKA is an air-delivered nuclear gravity weapon providing nuclear capability on existing legacy aircraft and dual capable aircraft. The single variant will operate in two modes, System 1 (analog/ballistic mode) and System 2 (digital/guided mode).

The B61 Mod 12 LEP TKA is the enabler for realizing System 2. This is an Air Force led ACAT IC Program. The DoD responsibility is executed by the Air Force Nuclear Weapons Center (AFNWC). In accordance with the Air Force Materiel Command mission assignment memorandum (dated February 11, 2011) and the National Nuclear Security Administration (NNSA)/AFNWC Memorandum of Understanding (dated June 28, 2012), AFNWC/NDB (Eglin) is responsible for the development, acquisition, and delivery of a guided TKA and AFNWC/NTW (Kirtland) is responsible for All Up Round technical integration, system qualification, Operational Safety, Suitability, and Effectiveness and fielding of the B61 Mod 12 LEP TKA variant.

The Department of Energy(DOE)/NNSA is responsible for the B61 Mod 12 LEP TKA Bomb Assembly and all aspects of the nuclear warhead, including design, manufacture, and portions of sustainment. Funding of these activities will be shared between the DoD and DOE.



## Executive Summary

### Program Highlights Since Last Report

November 2012, in conjunction with the Milestone (MS) B decision, certification was made pursuant to section 2366b of title 10, United States Code. Based on program maturity, the B61 Mod 12 LEP TKA was deemed ready to enter the EMD phase; however, the USD(AT&L) waived four of the 2366b provisions. In July 2014, the program satisfied two of the four waived provisions, (a)(1)(B) and (a)(1)(D) (now (a)(3)(B) and (a)(3)(D), respectively), on the basis that the program was fully funded in the FYDP associated with the FY 2015 PB. In November 2014, the program satisfied the requirement for provision, (a)(2) (now (a)(1)) following completion of the Preliminary Design Review (PDR) and post-PDR assessment (the program demonstrated a high likelihood of accomplishing its intended mission). Based on the maturity of the required technology, USD(AT&L) determined that a Technology Readiness Assessment for the B61 Mod 12 LEP TKA was not needed; however, the Assistant Secretary of Defense for Research and Engineering conducted an independent review and assessment to satisfy the certification requirement for the fourth waived provision, (a)(3)(D) (now (a)(2)). This review was based upon test data from a guided test flight in a relevant environment (with nuclear exposed hardware including Inertial Measurement Unit (IMU) 3.5)). In July 2017 the program satisfied the provision with Guided Test Vehicle (GTV) 7 that successfully demonstrated a system prototype of the TKA in an operational environment. This SAR serves as formal notification that there are no remaining outstanding items for this program's 2366b certification.

On August 20, 2018, USD (A&S) delegated the Milestone Decision Authority (MDA) to the Secretary of the Air Force for the B61 Mod 12 LEP TKA program. Accordingly, the Acquisition Category (ACAT) designation for the program is ACAT- IC. The program received signed MS C ADM authorizing the B61 Mod 12 LEP TKA program to enter into the Production and Deployment phase on October 26, 2018.

- The EMD 1 contract completed October 2017.
- The TKA program began Developmental Test (DT) on August 01, 2017 and completed 31 of 31 Developmental Test/System Qualification flight tests on June 19, 2018. All 31 flight tests have been scored as successful.
- Boeing's Company Funds Request was approved and Boeing is working to procure all material required for Lot 0 Trainers and Lot 1 hardware. The Lot 0 Initial Nuclear Surety Inspection (INSI) Trainers are on contract via Undefined Contract Action signed on July 02, 2018.
- Completed four phased Cyber DT for the TKA and Stand Alone Test Set (SATS) in July 2018. After completion of SATS Phase 3 and 4 Cyber testing the program decided to change the SATS configuration to mitigate the cyber testing findings. The changes to hardware and software are minimal and will be regression tested to ensure the new configuration continues to meet 100% of its performance requirements. Only the cyber-hardened configuration will be Nuclear Certified and produced under the production contract.
- Received signed ADM delegation package on August 20, 2018 for the now ACAT IC B61 Mod 12 LEP TKA Program.
- The signed MS C ADM signed on October 26, 2018 approved the increase of the LRIP quantity set at MS B (250) TKAs and TKA Trainers and increased in a 2017 ADM to include 30 additional TKA Trainers. The LRIP quantity will now also include the 49 TKA Trainers from Lot 2 for a total LRIP quantity of 329 TKAs and TKA Trainers. .
- Received Compatibility certification memo and Nuclear Safety Design Certification memos on October 24, 2018. Also, received the Nuclear Certification Summary on November 01, 2018 certifying the B61 Mod 12 LEP TKA meets all applicable nuclear certification requirements.
- Boeing has delivered 16 Lot 0 INSI Trainer assets all on schedule (two in November 2018; four in December 2018; four in January 2019, two in February 2019; four in March 2019), as of 11 March 2019.
- A successful Operational Test Readiness Review (OTRR) was conducted and the certification memo was signed by the

PEO on February 13, 2019. The TKA has been certified as ready to start Initial Operational Test and Evaluation (IOT&E), Flight Body 3 test asset deliveries remain the pacing item for IOT&E start date (May 2019) (Cyber activities to begin May 2019). Flight test are to begin in August 2019.

There are no significant software-related issues with this program at this time.

History of Significant Developments Since Program Initiation	
History of Significant Developments Since Program Initiation	
Date	Significant Development Description
November 2012	Engineering Manufacturing Development Phase 1 contract.
November 2012	Entered into Milestone (MS) B.
July 2014	Preliminary Design Review.
January 2016	Critical Design Review.
May 2016	The program conducted the B61 Mod 12 LEP TKA Preliminary Design Review and Acceptance Group (PDRAAG).
July 2017	Completed Guided Test Vehicle 7 (supporting MS B Waiver against relevant environment)
August 2017	Started Developmental Testing (DT)
June 2018	Completed DT.
October 2018	Entered into MS C.

## Threshold Breaches

### APB Breaches

<b>Schedule</b>		<input type="checkbox"/>
<b>Performance</b>		<input type="checkbox"/>
<b>Cost</b>	RDT&E	<input type="checkbox"/>
	Procurement	<input type="checkbox"/>
	MILCON	<input type="checkbox"/>
	Acq O&M	<input type="checkbox"/>
<b>O&amp;S Cost</b>		<input type="checkbox"/>
<b>Unit Cost</b>	PAUC	<input type="checkbox"/>
	APUC	<input type="checkbox"/>

### Nunn-McCurdy Breaches

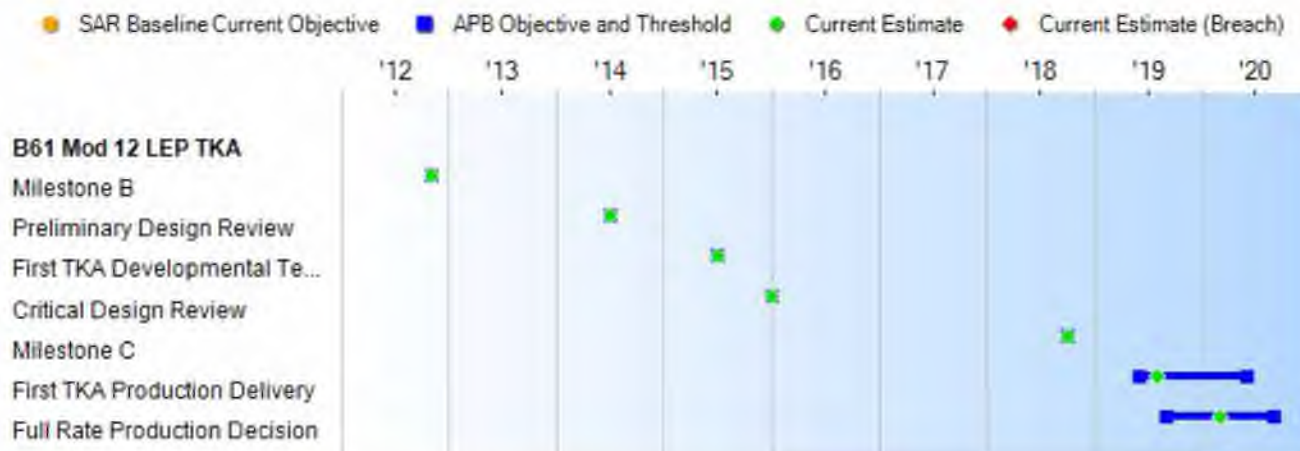
#### Current UCR Baseline

PAUC	None
APUC	None

#### Original UCR Baseline

PAUC	None
APUC	None

### Schedule



Schedule Events				
Events	SAR Baseline Development Estimate	Current APB Production Objective/Threshold	Current Estimate	Current Estimate
Milestone B	Nov 2012	Nov 2012	Nov 2012	Nov 2012
Preliminary Design Review	Jan 2014	Jul 2014	Jul 2014	Jul 2014
First TKA Developmental Test Flight	Nov 2015	Jul 2015	Jul 2015	Jul 2015
Critical Design Review	Oct 2015	Jan 2016	Jan 2016	Jan 2016
Milestone C	Apr 2018	Oct 2018	Oct 2018	Oct 2018
First TKA Production Delivery	Jun 2019	Jun 2019	Jun 2020	Aug 2019
Full Rate Production Decision	Sep 2019	Sep 2019	Sep 2020	Mar 2020

#### Change Explanations

None

#### Acronyms and Abbreviations

DOE - Department of Energy  
 TKA - Tailkit Assembly

## Performance

Performance Characteristics			
SAR Baseline Development Estimate	Current APB Production Objective/Threshold	Demonstrated Performance	Current Estimate
<b>Aircraft Integration (KPP)</b>			
B61-12 TKA, when mated to the B61-12 BA, must be integrated on the F-35A and LRS-B for System 2 guided delivery; F-16C/D (Blk 40-52), F-16 MLU, and PA-200 for System 1 ballistic delivery.	F-35A and B-21 for System 2 guided delivery; F-16C/D (Blk 40-52), F-16 MLU, and PA-200 for System 1 ballistic delivery.	B61-12 TKA, when mated to the B61-12 BA, shall be integrated on B-2A and F-15E aircraft for System 2 guided delivery.	The program demonstrated the KPP Threshold (F-15E & B-2A) conducting numerous contractor risk reduction flights culminating with a successful completion of twenty two (22) Govt Developmental Testing (DT) flight tests and nine (9) System Qualification flight test in Jun 2018.
B61-12 TKA, when mated to the B61-12 BA, must be integrated on the B-2A, F-15E, F-35A and LRS-B for System 2 guided delivery; F-16C/D (Blk 40-52), F-16 MLU, and PA-200 for System 1 ballistic delivery.			
<b>WS3 Vault Compatibility (KPP)</b>			
B61-12 TKA, while mated to the B61-12 BA, must permit the storage of four (4) B61-12 AURs in a single WS3 vault.	B61-12 TKA, while mated to the B61-12 BA, shall permit the storage of four (4) B61-12 AURs in a single WS3 vault.	(T=O) B61-12 TKA, while mated to the B61-12 BA, shall permit the storage of four (4) B61-12 AURs in a single WS3 vault.	The program demonstrated the KPP Objective, "B61-12 TKA, while mated to the B61-12 BA, must permit the storage of four (4) B61-12 AURs in a single WS3 vault." The program verified this utilizing fit checks conducted at Sheppard AFB, TX on April 9, 2013.
B61-12 TKA, while mated to the B61-12 BA, must permit the storage of four (4) B61-12 AURs in a single WS3 vault.			
<b>HEMP Survivability (KSA)</b>			
B61 TKA achieves the accuracy KPP after exposure to the HEMP environment.	N/A	N/A	The program demonstrated the KSA Object/Threshold on 06 July 2017 with the successful completion of Guided Test Vehicle (GTV) 7 flight test utilizing radiation exposed hardware, with a radiation hardened inertial measurement unit. Additionally, the program successfully conducted twenty two (22) Govt Developmental Testing (DT) flight tests and nine (9) System Qualification flight test after being exposed to the HEMP environment in Jun 2018.
B61 TKA achieves the accuracy KPP after exposure to the HEMP environment.			
<b>KPP #5 Nuclear Hardness (Kinetic Survivability)</b>			
N/A	B61-12 TKA shall achieve the	(T=O) B61-12 TKA shall achieve	The program demonstrated the KSA Object/Threshold on 06
N/A			

	accuracy requirements of KPP #2 after exposure to one HEMP event, as defined in MIL-STD 2169C and B61-12 STS.	the accuracy requirements of KPP #2 after exposure to one HEMP event, as defined in MIL-STD 2169C and B61-12 STS.	July 2017 with the successful completion of Guided Test Vehicle (GTV) 7 flight test utilizing radiation exposed hardware, with a radiation hardened inertial measurement unit. Additionally, the program successfully conducted twenty two (22) Govt Developmental Testing (DT) flight tests and nine (9) System Qualification flight test after being exposed to the HEMP environment in Jun 2018.	accuracy requirements of KPP #2 after exposure to one HEMP event, as defined in MIL-STD 2169C and B61-12 STS.
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Classified Performance information is provided in the classified annex to this submission.

#### Requirements Reference

CPD dated October 17, 2018.

#### Change Explanations

None

#### Acronyms and Abbreviations

AUR - All Up Round  
 BA - Bomb Assembly  
 Blk - Block  
 HEMP - High Altitude Electro-Magnetic Pulse  
 MIL-STD - Military Standard  
 MLU - Mid-Life Upgrade  
 O - Objective  
 PA-200 - Panavia Aircraft-200  
 STS - Stockpile to Target Sequence  
 T - Threshold  
 TKA - Tailkit Assembly  
 WS3 - Weapon Storage and Security System

### Track to Budget

#### RDT&E

Appn	BA	PE
Air Force	3600 05	0101125F

Project	Name
657007	B61 LEP

#### Procurement

Appn	BA	PE
Air Force	3011 01	0101125F

Line Item	Name
354040	B61



## Cost and Funding

### Cost Summary

Total Acquisition Cost							
Appropriation	BY 2019 \$M			BY 2019 \$M	TY \$M		
	SAR Baseline Development Estimate	Current APB Production Objective/Threshold		Current Estimate	SAR Baseline Development Estimate	Current APB Production Objective	Current Estimate
RDT&E	1122.8	808.8	889.7	809.5	1090.7	787.1	777.0
Procurement	349.9	343.0	377.3	342.0	361.1	360.1	358.4
Flyaway	--	--	--	342.0	--	--	358.4
Recurring	--	--	--	342.0	--	--	358.4
Non Recurring	--	--	--	0.0	--	--	0.0
Support	--	--	--	0.0	--	--	0.0
Other Support	--	--	--	0.0	--	--	0.0
Initial Spares	--	--	--	0.0	--	--	0.0
MILCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	1472.7	1151.8	N/A	1151.5	1451.8	1147.2	1135.4

#### Current APB Cost Estimate Reference

Milestone C SCP dated October 24, 2018

The Base Year for the program has been updated from FY 2012 to FY 2019 using the following deflators:

Appn Category	Deflation Factor
RDT&E	1.11428265
Procurement	1.11428265

#### Cost Notes

Development and Procurement funding have been re-phased and revised in the Milestone (MS) C SCP dated October 24, 2018. Adjustments reflect the new funding profile. A change in quantity profile is aligned to the October 26, 2018 ADM.

If an Independent Cost Estimate, Component Cost Estimate, or Program Office Estimate has been completed for the program in the previous year, list any program risks identified in the estimates, the potential impacts of the risks on program cost, and approaches to mitigate the risks. The following risk were identified in the SCP dated October 24, 2018.

- EMD Risk: Risk modeled at Low-Moderate to account for any issues associated with IOT&E and schedule delays.
- Prod Risk: Risk adjusted to account for any fidelity of National Nuclear Security Administration's estimating methodology.

Total Quantity			
Quantity	SAR Baseline Development Estimate	Current APB Production	Current Estimate
RDT&E	77	77	77
Procurement	813	813	813
Total	890	890	890

#### Quantity Notes

The October 26, 2018 ADM approved up to an additional 60 TKAs to the program baseline, contingent upon funding of execution, to fulfill the 90/10/2 surveillance requirement as decided at the August 2, 2018 Configuration Steering Board.

**Cost and Funding****Funding Summary**

Appropriation Summary									
FY 2020 President's Budget / December 2018 SAR (TY\$ M)									
Appropriation	Prior	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
RDT&E	658.1	81.6	27.6	9.7	0.0	0.0	0.0	0.0	777.0
Procurement	86.9	152.2	80.8	35.7	2.8	0.0	0.0	0.0	358.4
MILCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2020 Total	745.0	233.8	108.4	45.4	2.8	0.0	0.0	0.0	1135.4
PB 2019 Total	815.3	253.9	146.3	18.7	0.0	0.0	0.0	0.0	1234.2
Delta	-70.3	-20.1	-37.9	26.7	2.8	0.0	0.0	0.0	-98.8

Quantity Summary										
FY 2020 President's Budget / December 2018 SAR (TY\$ M)										
Quantity	Undistributed	Prior	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
Development	77	0	0	0	0	0	0	0	0	77
Production	0	30	250	533	0	0	0	0	0	813
PB 2020 Total	77	30	250	533	0	0	0	0	0	890
PB 2019 Total	77	30	250	533	0	0	0	0	0	890
Delta	0	0	0	0	0	0	0	0	0	0

## Cost and Funding

### Annual Funding By Appropriation

Annual Funding							
3600   RDT&E   Research, Development, Test, and Evaluation, Air Force							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2012	--	--	--	--	--	--	81.6
2013	--	--	--	--	--	--	62.4
2014	--	--	--	--	--	--	33.0
2015	--	--	--	--	--	--	108.3
2016	--	--	--	--	--	--	173.1
2017	--	--	--	--	--	--	118.1
2018	--	--	--	--	--	--	81.6
2019	--	--	--	--	--	--	81.6
2020	--	--	--	--	--	--	27.6
2021	--	--	--	--	--	--	9.7
Subtotal	77	--	--	--	--	--	777.0

Annual Funding 3600   RDT&E   Research, Development, Test, and Evaluation, Air Force							
Fiscal Year	Quantity	BY 2019 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2012	--	--	--	--	--	--	90.3
2013	--	--	--	--	--	--	67.9
2014	--	--	--	--	--	--	35.4
2015	--	--	--	--	--	--	115.1
2016	--	--	--	--	--	--	181.3
2017	--	--	--	--	--	--	121.2
2018	--	--	--	--	--	--	82.0
2019	--	--	--	--	--	--	80.4
2020	--	--	--	--	--	--	26.7
2021	--	--	--	--	--	--	9.2
Subtotal	77	--	--	--	--	--	809.5

Annual Funding							
3011   Procurement   Procurement of Ammunition, Air Force							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2016	--	--	12.0	--	12.0	--	12.0
2017	--	--	--	--	--	--	--
2018	30	74.9	--	--	74.9	--	74.9
2019	250	152.2	--	--	152.2	--	152.2
2020	533	80.8	--	--	80.8	--	80.8
2021	--	--	35.7	--	35.7	--	35.7
2022	--	--	2.8	--	2.8	--	2.8
Subtotal	813	307.9	50.5	--	358.4	--	358.4

Annual Funding							
3011   Procurement   Procurement of Ammunition, Air Force							
Fiscal Year	Quantity	BY 2019 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2016	--	--	12.2	--	12.2	--	12.2
2017	--	--	--	--	--	--	--
2018	30	73.1	--	--	73.1	--	73.1
2019	250	145.6	--	--	145.6	--	145.6
2020	533	75.8	--	--	75.8	--	75.8
2021	--	--	32.8	--	32.8	--	32.8
2022	--	--	2.5	--	2.5	--	2.5
Subtotal	813	294.5	47.5	--	342.0	--	342.0

## Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
<b>Approval Date</b>	11/19/2012	10/26/2018
<b>Approved Quantity</b>	250	329
<b>Reference</b>	Milestone B ADM	Milestone C ADM
<b>Start Year</b>	2018	2018
<b>End Year</b>	2020	2020

The Current Total LRIP Quantity is more than 10% of the total production quantity due to the need to synchronize DoD deliveries with the Department of Energy B61 Mod 12 Bomb Assembly Program and to facilitate an orderly increase in the production rate for the system leading into full-rate production.



## Foreign Military Sales

None

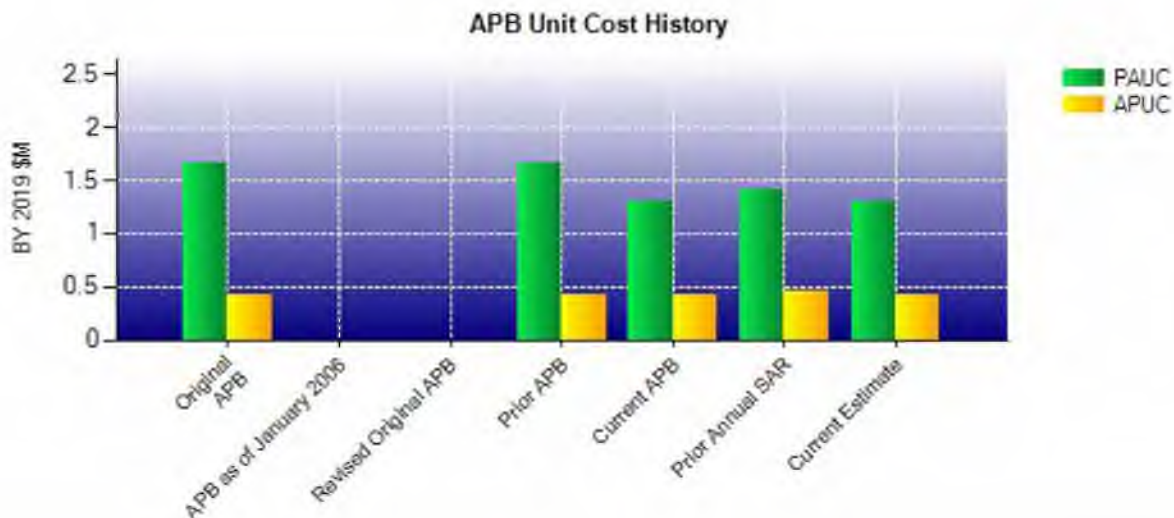
## Nuclear Costs

Nuclear costs related to the B61 Mod 12 LEP TKA program are captured in the Department of Energy Bomb Assembly SAR.

**Unit Cost**

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2019 \$M	BY 2019 \$M	% Change
	Current UCR Baseline (Feb 2019 APB)	Current Estimate (Dec 2018 SAR)	
<b>Program Acquisition Unit Cost</b>			
Cost	1151.8	1151.5	
Quantity	890	890	
Unit Cost	1.294	1.294	0.00
<b>Average Procurement Unit Cost</b>			
Cost	343.0	342.0	
Quantity	813	813	
Unit Cost	0.422	0.421	-0.24
Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2019 \$M	BY 2019 \$M	% Change
	Original UCR Baseline (Dec 2012 APB)	Current Estimate (Dec 2018 SAR)	
<b>Program Acquisition Unit Cost</b>			
Cost	1472.7	1151.5	
Quantity	890	890	
Unit Cost	1.655	1.294	-21.81
<b>Average Procurement Unit Cost</b>			
Cost	349.9	342.0	
Quantity	813	813	
Unit Cost	0.430	0.421	-2.09

Unit Cost Memo



APB Unit Cost History					
Item	Date	BY 2019 \$M		TY \$M	
		PAUC	APUC	PAUC	APUC
Original APB	Dec 2012	1.655	0.430	1.631	0.444
APB as of January 2006	N/A	N/A	N/A	N/A	N/A
Revised Original APB	N/A	N/A	N/A	N/A	N/A
Prior APB	Dec 2012	1.655	0.430	1.631	0.444
Current APB	Feb 2019	1.294	0.422	1.289	0.443
Prior Annual SAR	Dec 2017	1.409	0.467	1.387	0.485
Current Estimate	Dec 2018	1.294	0.421	1.276	0.441

### SAR Unit Cost History

Current SAR Baseline to Current Estimate (TY \$M)									
PAUC Development Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1.631	-0.013	0.000	-0.077	0.000	-0.265	0.000	0.000	-0.355	1.276

Current SAR Baseline to Current Estimate (TY \$M)									
Initial APUC Development Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.444	0.003	0.000	0.000	0.000	-0.007	0.000	0.000	-0.004	0.441

SAR Baseline History				
Item	SAR Planning Estimate	SAR Development Estimate	SAR Production Estimate	Current Estimate
Milestone A	N/A	N/A	N/A	N/A
Milestone B	N/A	Nov 2012	N/A	Nov 2012
Milestone C	N/A	Apr 2018	N/A	Oct 2018
IOC	N/A	N/A	N/A	N/A
Total Cost (TY \$M)	N/A	1451.8	N/A	1135.4
Total Quantity	N/A	890	N/A	890
PAUC	N/A	1.631	N/A	1.276

First Tailkit Assembly (TKA) Production Delivery is used as a surrogate for IOC; the Department of Energy is responsible for production integration of the Bomb Assembly/TKA and subsequent All Up Round deliveries to the field for IOC.

**Cost Variance**

Summary TY \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Development Estimate)	1090.7	361.1	--	1451.8
Previous Changes				
Economic	-13.9	-0.3	--	-14.2
Quantity	--	--	--	--
Schedule	-68.4	+0.2	--	-68.2
Engineering	--	--	--	--
Estimating	-168.4	+33.2	--	-135.2
Other	--	--	--	--
Support	--	--	--	--
<b>Subtotal</b>	<b>-250.7</b>	<b>+33.1</b>	<b>--</b>	<b>-217.6</b>
Current Changes				
Economic	-0.1	+2.7	--	+2.6
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-62.9	-38.5	--	-101.4
Other	--	--	--	--
Support	--	--	--	--
<b>Subtotal</b>	<b>-63.0</b>	<b>-35.8</b>	<b>--</b>	<b>-98.8</b>
Adjustments	--	--	--	--
<b>Total Changes</b>	<b>-313.7</b>	<b>-2.7</b>	<b>--</b>	<b>-316.4</b>
CE - Cost Variance	777.0	358.4	--	1135.4
CE - Cost & Funding	777.0	358.4	--	1135.4

Summary BY 2019 \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Development Estimate)	1122.8	349.9	--	1472.7
Previous Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	-70.1	+1.1	--	-69.0
Engineering	--	--	--	--
Estimating	-178.3	+28.3	--	-150.0
Other	--	--	--	--
Support	--	--	--	--
Subtotal	-248.4	+29.4	--	-219.0
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-64.9	-37.3	--	-102.2
Other	--	--	--	--
Support	--	--	--	--
Subtotal	-64.9	-37.3	--	-102.2
Adjustments	--	--	--	--
Total Changes	-313.3	-7.9	--	-321.2
CE - Cost Variance	809.5	342.0	--	1151.5
CE - Cost & Funding	809.5	342.0	--	1151.5

Previous Estimate: December 2017

RDT&E	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-0.1
Revised estimate due to Air Force higher priorities in FY 2016, FY 2017, and FY 2018. (Estimating)	-41.0	-39.4
Revised estimate due to Congressional rescissions in FY 2017 and FY 2019. (Estimating)	-21.5	-21.3
Revised estimate for Small Business Innovation Research in FY 2018. (Estimating)	-3.2	-3.2
Revised estimate to align with the October 2018 SCP. (Estimating)	+0.5	+0.7
Adjustment for current and prior escalation. (Estimating)	+0.3	+0.3
<b>RDT&amp;E Subtotal</b>	<b>-64.9</b>	<b>-63.0</b>

Procurement	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+2.7
Reduction due to Air Force higher priorities in FY 2016. (Estimating)	-3.1	-3.1
Revised estimate due to Congressional rescissions in FY 2017 and FY 2019.. (Estimating)	-22.3	-23.2
Adjustment to align with the October 2018 Service Cost Position. (Estimating)	-10.2	-10.5
Adjustment for current and prior escalation. (Estimating)	-1.7	-1.7
<b>Procurement Subtotal</b>	<b>-37.3</b>	<b>-35.8</b>

## Contracts

### Contract Identification

**Appropriation:** RDT&E  
**Contract Name:** B61-12 TKA EMD Phase 2  
**Contractor:** Boeing  
**Contractor Location:** Boeing Defense, Space and Security - Weapons and Missile  
 St. Charles, MO 63301  
**Contract Number:** FA2103-16-C-0061  
**Contract Type:** Cost Plus Incentive Fee (CPIF)  
**Award Date:** December 17, 2015  
**Definitization Date:** December 17, 2015

### Contract Price

Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
99.7	N/A	0	125.7	N/A	N/A	130.0	136.5

### Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to additional scope added to the contract.

### Contract Variance

Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (1/31/2019)	+1.6	-0.5
Previous Cumulative Variances	+2.5	-3.2
Net Change	-0.9	+2.7

### Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to increases experienced in the areas of Environmental Testing.

The favorable net change in the schedule variance is due to schedule recovery from delivery delays of various components.



## Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	74	74	77	96.10%
Production	16	16	813	1.97%
Total Program Quantity Delivered	90	90	890	10.11%

Expended and Appropriated (TY \$M)			
Total Acquisition Cost	1135.4	Years Appropriated	8
Expended to Date	631.2	Percent Years Appropriated	72.73%
Percent Expended	55.59%	Appropriated to Date	978.8
Total Funding Years	11	Percent Appropriated	86.21%

The above data is current as of March 11, 2019.

## Operating and Support Cost

### Cost Estimate Details

<b>Date of Estimate:</b>	October 26, 2018
<b>Source of Estimate:</b>	SCP
<b>Quantity to Sustain:</b>	824
<b>Unit of Measure:</b>	Tailkit Assembly (TKA)
<b>Service Life per Unit:</b>	20.00 Years
<b>Fiscal Years in Service:</b>	FY 2019 - FY 2044

- Unit of Measure = Tailkit Assembly (TKA)
- Total Quantity = 824
  - Production quantity: 813
  - Development Trainers: 11
- 77 test assets in RDT&E are expended; not sustained. The 11 development trainers are not included in this number.
- Estimate assumes wooden round -- Production Lifetime Sparing Concept
- Contractor services retained for failure analysis, test support, logistical support, destructive testing, etc.
- Projected contractor labor rates are through FY 2044
  - Used 4% increase in base pay rate to account for differences in contractor inflation versus OSD published inflation
- Continental United States (CONUS) shipping costs for Weapon System Evaluation Program assets paid by the Department of Energy
- Personnel Outside of the CONUS locations exist solely to support this weapon

### Sustainment Strategy

B61 Mod 12 LEP TKA Sustainment Strategy is based on system reliability requirements/projections. Planned Material Availability is sustained through a 20-year service life spares buy that is included in the TKA production quantities. Air Force Materiel Command (AFMC) has determined no organic depot level repair requirements at this time. Organizational/Intermediate level maintenance is limited to replacement, inspection, disassembly/reassembly of TKA from All Up Round (B61-12 All Up Round). A TKA Business Case Analysis was conducted in 2016 to evaluate cost effectiveness of selecting an optional warranty, organic, or Contractor Logistics Support (CLS) based on final reliability projections, test set design, support equipment, and engineering requirements. The results and recommendations of this analysis are reflected in the Life Cycle Sustainment Plan.

### Antecedent Information

No Antecedent

Annual O&S Costs BY2019 \$K		
Cost Element	B61 Mod 12 LEP TKA Average Annual Cost Per Tailkit Assembly (TKA)	No Antecedent (Antecedent)
Unit-Level Manpower	86.159	--
Unit Operations	0.898	--
Maintenance	6.195	--
Sustaining Support	16.032	--
Continuing System Improvements	0.000	--
Indirect Support	44.569	--
Other	0.018	--
<b>Total</b>	<b>153.871</b>	<b>--</b>

Item	Total O&S Cost \$M			
	B61 Mod 12 LEP TKA			No Antecedent (Antecedent)
	Current Production APB Objective/Threshold	Current Estimate		
<b>Base Year</b>	2535.5	2789.1	2535.5	N/A
<b>Then Year</b>	3370.6	N/A	3370.6	N/A

#### Equation to Translate Annual Cost to Total Cost

BY 2019 \$M Average Annual Unitized Cost = (Total O&S Cost/Quantity)/(Service Life plus trainer lead-in time) =  
 (\$2,535.5M BY\$2019/824/20)=\$0.154M BY\$2019/TKA/year

O&S Cost Variance		
Category	BY 2019 \$M	Change Explanations
Prior SAR Total O&S Estimates - Dec 2017 SAR	2283.3	
Programmatic/Planning Factors	389.2	Extended program 4 additional years
Cost Estimating Methodology	-72.8	Inflation/Escalation Updates
Cost Data Update	63.2	Added Operations Manpower Support
Labor Rate	-393.1	Changes in indirect support rates and unit level pay rates
Energy Rate	0.0	
Technical Input	0.0	
Other	265.7	Adjustment for BY12\$ vs BY19\$ for MS-C
<b>Total Changes</b>	<b>252.2</b>	
Current Estimate	2535.5	

#### Disposal Estimate Details

**Date of Estimate:** October 24, 2018  
**Source of Estimate:** SCP  
**Disposal/Demilitarization Total Cost (BY 2019 \$M):** 0.3

\$0.476M in TY dollars