RCS: DD-A&T(Q&A)823-437

AH-64E Apache New Build (AH-64E New Build)

As of FY 2021 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

Table of Contents

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
AH-64E Apache New Build (AH-64E New Build)

DoD Component
Army

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References

SAR Baseline (Production Estimate)

Defense Acquisition Executive (DAE) Approved Acqusition Program Baseline (APB) dated December 16, 2010

Approved APB

Component Acquisition Executive (CAE) Approved Acquisition Program Baseline (APB) dated July 2, 2013

Mission and Description

The AH-64E Apache New Build (AH-64E New Build), hereinafter referred to as AH-64E, is the heavy attack and reconnaissance helicopter of the U.S Army. It is a twin engine, four-blade, tandem seat, attack helicopter with 30-millimeter ammunition, 2.75-inch rockets, laser and radio frequency Hellfire missiles. The AH-64E is the Army's network-centric, multirole weapon supporting the Multi-Domain Battlefield. It provides the capability to simultaneously conduct (or quickly transition between) movement to contact, security, and or attack missions to provide reach, lethality, protection, and mission command as part of the Joint/Combined Arms Team. The AH-64E enables the Joint Air/Ground Maneuver Team to dominate the battlespace by providing air-to-ground synergy through real-time Intelligence, Surveillance, and Reconnaissance (ISR) information and responsive precision fires. The AH-64E is an Apache Attack Helicopter modified as required to effectively and efficiently integrate the Longbow Apache well into the 21st century by providing improvements to make it relevant in Multi-Domain operations. It provides a significantly enhanced warfighting capability over the AH-64A and AH-64D. It is capable of day or night employment in adverse weather and obscurants, and can effectively engage and destroy advanced threat weapon systems on the multi-domain battlefield.

Tactically, the AH-64E provides significant war fighting advantages over the original AH-64D and multiplies the combat effectiveness of the entire fleet. It is fully capable of employing the Longbow Fire Control Radar mission kit, the Modernized Target Acquisition Designation System/Modernized Pilot Night Vision System, the Longbow Hellfire missiles and future improved munitions in addition to the normal complement of AH-64D munitions. Additionally, the AH-64E includes upgraded engines, debuts evolutionary transmission technology and incorporates significant improvements to its main rotor system, which increases power and provides substantial performance gains.

The AH-64E is fully network-centric capable with current digitized forces and enables Multi-Domain operations. This enables interoperability with current and future Tactical Operations Center and Army Battle Command System forces. In addition, this reduces the logistics footprint, enhances deployability, reduces O&S costs, improves AH-64D flight performance and provides a means to effectively utilize already funded technology insertions. The AH-64E has a fully compatible and rapidly re-configurable open system architecture mission processor design, enabling rapid integration of future communication systems and minimizing obsolescence. The Multi-Domain concept drives the demand for network-centric interdependence and Joint integration across the force to new levels. The AH-64E meets these challenges by providing and integrating Command and Control, ISR, and communications connectivity for attack/reconnaissance aviation within Brigade Combat Teams, Divisions, and Corps.

Executive Summary

Program Highlights Since Last Report

The AH-64E program meets all Key Performance Parameters and remains on cost, schedule, and performance. On November 19, 2019, the Secretary of the Army / Chief of Staff of the Army (SA/CSA) made a decision not to certify the AH-64E programs until the Strap Pack Product Improvement (SPPI) effort is complete, defined as when the Original Equipment Manufacturer (OEM) completes design and qualification and the Army issues a fielding Air Worthiness Release (AWR). SPPI is a PEO implemented long term solution for the AH-64E fleet that replaces the legacy strap pack with Fail Safe Collar on the fleet today. SPPI is on schedule; environmental testing is on-going. AWR expected 3rd quarter FY 2020.

September 11, 2019: The Follow-On Operational Test and Evaluation 2 (FOT&E 2) report was received from Army Test and Evaluation Command (ATEC). The report determined that the version 6 AH-64E is more effective, more suitable, and is incrementally more survivable than the version 4 AH-64E. The report from ATEC supports a conditional materiel release and recommends version 6 AH-64E capabilities be cut-in the AH-64E production line.

August 20, 2019: FY 2019 National Defense Appropriations Act plus up of six additional aircraft was awarded.

June 2019: FOT&E 2 was completed on June 14, 2019. The event included operations at Ft. Hood, TX and Eglin Air Force Base (AFB) and concluded with an adversarial assessment at Redstone Arsenal. The final test report for the event was received on September 11, 2019.

May 21, 2019: Failsafe collar fielding is complete.

Note: It is important to understand that the Remanufacture and New Build aircraft are procured using the same contracts, built on the same production line and delivered in the same configuration with the same capabilities.

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**
June 2014	Definitized and awarded Boeing Company FRP contract for Lots 3 and 4. This contract supports production of ten AH-64E Apache New Build helicopters. This production activity supported completion of fielding the second and third units equipped, as well as augmentation of the training fleet.
August 2014	AH-64E Capability Version 4 Follow-on Operational Test & Evaluation successfully concluded on time at Eglin Air Force Base, Florida. This capability is scheduled to be in production Lot 5 in FY 2015
September 2014	Awarded seven additional New Build aircraft as an undefinitized contract action.
November 2014	The First Unit Equipped, 1-229 Attack Reconnaissance Battalion (ARB), successfully completed the first operational combat deployment of the AH-64E.
December 2014	Apache PM initiated the required processes for necessary approvals to enter a multi-year contract to support production from FY 2017 to FY 2021. The Army Acquisition Executive signed the justification and approval.
December 2014	Apache PM delivered ten AH-64E New Build Attack Helicopters of the 56 Army Acquisition Objective.
August 2015	Completed Manned/Unmanned Teaming Expanded capabilities competition and awarded contract. Fire Control Radar Maritime Mode Testing occurred from August through September 2015 at Joint Base Little Creek, Virginia.
September 2015	Apache PM completed fielding to the 2-17 Cavalry (3-101 Attack Reconnaissance Battalion (ARB)), the Army's 4th Unit Equipped with the AH-64E Apaches. Apache PM assisted and managed transfer of 20 AH-64D aircraft from Germany and Forces Command to a new AH-64 unit, the 1-25 ARB in Fort Wainwright, Alaska. Apache PM identified and provided a materiel solution to support Apache AH-64D and AH-64E helicopters for first time stationing in an arctic environment.
February 2016	The first production Lot 5 AH-64E rolled off the Apache line at the Boeing facility in Mesa, Arizona. This aircraft marked the first production AH-64E with Version 4 capability.
April 2016	Definitized the FRP Contract for Lot 3 - Lot 4 New Build aircraft, Quantity of seven aircraft.
January 2017	Apache PM completed fielding of six AH-64E aircraft to Fort Rucker, Alabama.
March 2017	Awarded AH-64E Apache Multi-Year Contract for Lot 7 through Lot 11 for a total of 244 Remanufactured aircraft, providing options to procure additional Remanufacture and New Build aircraft each year.
May 2017	Completed fielding to the 1-227th ARB, Fort Hood, Texas.
May 2017	Army memo increased the AH-64E Apache helicopter AAO by 77 aircraft from 690 to 767 aircraft. The Authorized Procurement Objective remains at 634 Remanufacture aircraft and 56 New Build aircraft.
June 2017	Apache PM fielded nine AH-64E aircraft to Fort Rucker, Alabama.
August 2017	Contract modification of $202.2M awarded on the AH-64E Apache Multi-Year contract for the purchase of AH-64E New Build aircraft.

December 2017	Completed fielding of 24 AH-64E Apache aircraft to Fort Carson, Colorado.
January 2018	Begin fielding to 1-6 Cavalry Regiment, Fort Riley, Kansas.
March 2018	Army Contracting Command (ACC) sent a letter to Boeing rejecting the acceptance of all U.S. AH-64E aircraft until the redesigned Strap Pack is fielded and additional criteria are met.
May 2018	Army adjusted the Army Acquisition Objective from 767 to 812 and the Army Procurement Objective to 791 for the AH-64E Apache Helicopter.
June 2018	Began fielding the redesigned strap pack to 1-149 Texas National Guard (NG) in Houston, Texas.
August 2018	Since Boeing has met the conditions to restart, PM Apache resumed inductions and acceptance ofAH-64E Apache Remanufacture and New Build aircraft. The next New Build aircraft are on track for delivery in January 2020.
August 2018	PM Apache, in coordination with ACC, executed a modification to fully fund 31 FY 2018 AH-64E Apache New Build aircraft and funds FY 2019 Advance Procurement for 12 FY 2019 AH-64E Apache New Build aircraft. Total contract obligated is $507,099,999.78. The FY 2019 Defense Appropriations Act includes funding for five additional New Build aircraft in FY 2019.
September 2018	Teams completed retrofit of the redesigned strap pack to all Category 1 Severe Coastal units (Texas NG, Missouri NG, Hawaii NG, Joint Base Lewis-McCord, Korea, and Hunter Army Airfield, Georgia). Retrofit shifted to Category 2 Deployed/Deploying units.
October 2018	FY 2019 Defense Appropriations Act increased funding adding six additional helicopters for a total of 18 AH- 64E Apaches for FY 2019.
November 2018	The Army stopped fielding of the redesigned strap pack and began legacy strap pack collar retrofit starting with severe coastal units. All severe coastal units will have fail safe collars installed by April 2019 and the entire Army fleet by July 2019. The Army will continue holding the contractor accountable to address quality issues.

Threshold Breaches

APB Breaches		
Schedule		☐
Performance		☐
Cost	RDT&E	☐
	Procurement	☐
	MILCON	☐
	Acq O&M	☐
O&S Cost		☐
Unit Cost	PAUC	☐
	APUC	☐

Nunn-McCurdy Breaches		
Current UCR Baseline		
	PAUC	None
	APUC	None
Original UCR Baseline		
	PAUC	None
	APUC	None

Schedule

Schedule Events				
Events	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate
Milestone C	Jul 2010	Jul 2010	Jan 2011	Sep 2010
Initial Operational Test and Evaluation (IOT&E)	Mar 2012	N/A	N/A	Mar 2012
Full Rate Production (FRP)	Jul 2012	Jul 2012	Mar 2013	Mar 2013
First Unit Equipped (FUE)	Nov 2012	N/A	N/A	May 2013
Initial Operational Capability (IOC)	May 2013	N/A	N/A	Nov 2013

Change Explanations

None

Performance

Performance Characteristics					
SAR Baseline Production Estimate	**Current APB Production Objective/Threshold**		**Demonstrated Performance**	**Current Estimate**	
Net Ready					
Fully support execution of all operational activities.	Fully support execution of all operational activities.	Fully support execution of joint critical operational activities	Met Threshold	Fully support execution of all operational activities.	
Performance					
6000' PA, 95F OGE Hover (lbs/payload)					
4,100	4,100	3,400	Met Threshold	3,400	
Mission Reliability					
MTBF (M) hrs					
Lot 1					
22	22	15.3	Met Objective	38.8	(Ch-1)
Lot 4					
22	22	17	Met Objective	38.8	(Ch-1)
MR for 3.5 hr. Flight (%)					
85	85	80	Met Objective	91.3	(Ch-1)
Survivability					
Safe operation (minutes)					
30	30	30	Met Objective	30	
Survive Band IV MANPADS IR Missile Engagement					
IAW JROCM 086-10	IAW JROCM 086-10	IAW JROCM 086-10	Met Objective	IAW JROCM 086-10	
Force Protection					
Crewstation armor Survivability (mm)					
IAW JROCM 086-10	IAW JROCM 086-10	IAW JROCM 086-10	Met Objective	IAW JROCM 086-10	
Crewstation armor barrier survivability					
IAW JROCM 086-10	IAW JROCM 086-10	IAW JROCM 086-10	Met Objective	IAW JROCM 086-10	

Requirements Reference
CPD dated June 1, 2010

Change Explanations

(Ch-1) The current estimate for MTBF (M) Lot 1, Lot 4, and MR for 3.5 hr. Flight (%) changed from 24.5, 24.5 and 86.7 respectively to 38.8, 38.8, and 91.3 respectively due to the 2018 estimate lacking sufficient scored field data to support a separate New Build aircraft estimate. By the December 2019 SAR submission the level of scored field data for New Build systems had reached a sufficient level to establish an accurate New Build current estimate that does not include Remanufacture data.

Notes

Net Ready KPP compliance is achieved by meeting the information exchange capabilities required by the Integrated Architectures Operational View-1 and is demonstrated by completing Joint Interoperability Certification, Army Interoperability Certification and DoD Information Assurance and Accreditation Process.

Mission Reliability based on Reliability, Availability, and Maintainability data derived from performance of fielded aircraft and scored aircraft data from testing.

Materiel Availability = Operational Availability (Fully Mission Capable Time plus Partially Mission Capable Time)

The cumulative Operational Availability rate of fielded AH-64E aircraft as of the December reporting period for aircraft engaged in combat operations is 80%.

Acronyms and Abbreviations

% - Percent
' - feet
F - Fahrenheit
hr - hour
hrs - hours
IAW - In Accordance With
IR - Infrared
JROCM - Joint Requirements Oversight Council Memorandum
lbs - pounds
MANPADS - Man Portable Air Defense Systems
mm - millimeter
MR - Mission Reliability
MTBF (M) - Mean Time Between Failure (Mission)
OGE - Out of Ground Effect
PA - Pressure Altitude

Track to Budget

Procurement			
Appn		BA	PE
Army	2031	01	0210100A

Line Item	Name
A05133	AH-64 Apache Block IIIB New Build

Cost and Funding

Cost Summary

Total Acquisition Cost							
Appropriation	BY 2010 $M			BY 2010 $M	TY $M		
	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate	SAR Baseline Production Estimate	Current APB Production Objective	Current Estimate
RDT&E	0.0	0.0	--	0.0	0.0	0.0	0.0
Flyaway	--	--	--	0.0	--	--	0.0
Recurring	--	--	--	0.0	--	--	0.0
Non Recurring	--	--	--	0.0	--	--	0.0
Support	--	--	--	0.0	--	--	0.0
Procurement	2307.0	2003.3	2203.6	2132.5	2510.4	2562.6	2472.7
Flyaway	--	--	--	2018.5	--	--	2340.7
Recurring	--	--	--	2009.8	--	--	2330.7
Non Recurring	--	--	--	8.7	--	--	10.0
Support	--	--	--	114.0	--	--	132.0
Other Support	--	--	--	89.5	--	--	103.9
Initial Spares	--	--	--	24.5	--	--	28.1
MILCON	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
Total	2307.0	2003.3	N/A	2132.5	2510.4	2562.6	2472.7

Cost Notes

No revised cost estimate for the program was completed in the previous year.

Total Quantity			
Quantity	SAR Baseline Production Estimate	Current APB Production	Current Estimate
RDT&E	0	0	0
Procurement	56	56	79
Total	56	56	79

Cost and Funding

Funding Summary

Appropriation Summary									
FY 2021 President's Budget / December 2019 SAR (TY$ M)									
Appropriation	Prior	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	To Complete	Total
RDT&E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Procurement	2403.5	0.0	69.2	0.0	0.0	0.0	0.0	0.0	2472.7
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 2021 Total	2403.5	0.0	69.2	0.0	0.0	0.0	0.0	0.0	2472.7
PB 2020 Total	2404.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2404.3
Delta	-0.8	0.0	69.2	0.0	0.0	0.0	0.0	0.0	68.4

Quantity Summary										
FY 2021 President's Budget / December 2019 SAR (TY$ M)										
Quantity	Undistributed	Prior	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	To Complete	Total
Development	0	0	0	0	0	0	0	0	0	0
Production	0	77	0	2	0	0	0	0	0	79
PB 2021 Total	0	77	0	2	0	0	0	0	0	79
PB 2020 Total	0	74	0	0	0	0	0	0	0	74
Delta	0	3	0	2	0	0	0	0	0	5

Cost and Funding

Annual Funding By Appropriation

Annual Funding 2031 | Procurement | Aircraft Procurement, Army							
Fiscal Year	Quantity	TY $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2012	--	71.6	--	--	71.6	--	71.6
2013	13	294.6	--	--	294.6	30.6	325.2
2014	4	142.0	--	--	142.0	--	142.0
2015	--	--	--	--	--	--	--
2016	--	--	--	--	--	--	--
2017	8	301.3	--	10.0	311.3	19.6	330.9
2018	34	975.6	--	--	975.6	47.7	1023.3
2019	18	481.9	--	--	481.9	28.6	510.5
2020	--	--	--	--	--	--	--
2021	2	63.7	--	--	63.7	5.5	69.2
Subtotal	79	2330.7	--	10.0	2340.7	132.0	2472.7

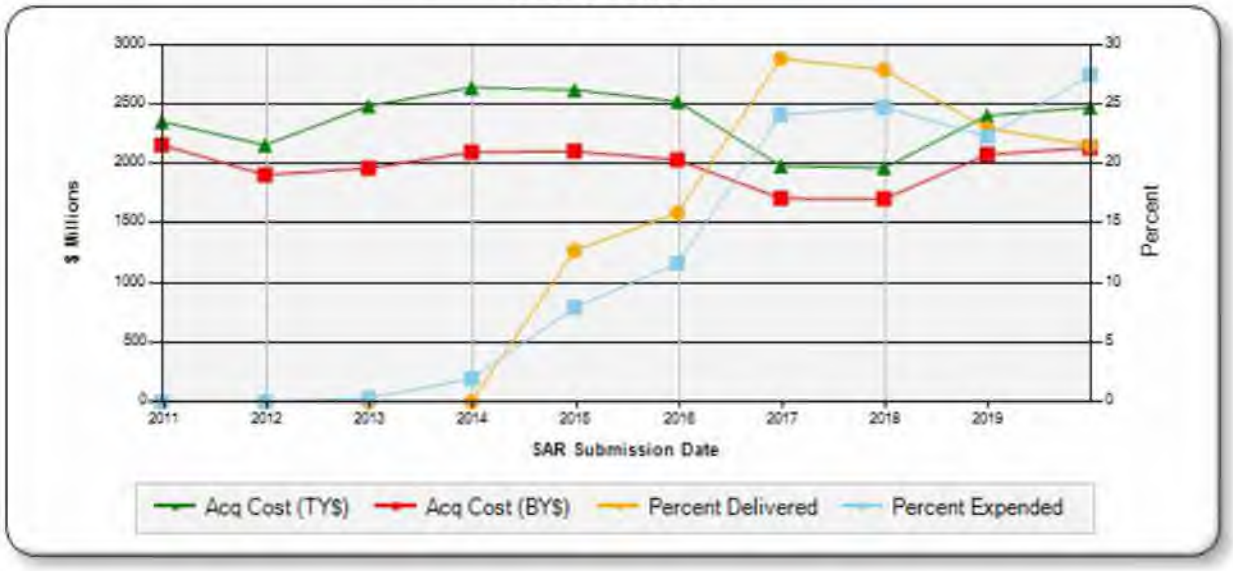
Annual Funding 2031 | Procurement | Aircraft Procurement, Army							
Fiscal Year	Quantity	BY 2010 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2012	--	67.3	--	--	67.3	--	67.3
2013	13	272.2	--	--	272.2	28.3	300.5
2014	4	129.2	--	--	129.2	--	129.2
2015	--	--	--	--	--	--	--
2016	--	--	--	--	--	--	--
2017	8	261.1	--	8.7	269.8	17.0	286.8
2018	34	828.6	--	--	828.6	40.5	869.1
2019	18	400.5	--	--	400.5	23.8	424.3
2020	--	--	--	--	--	--	--
2021	2	50.9	--	--	50.9	4.4	55.3
Subtotal	79	2009.8	--	8.7	2018.5	114.0	2132.5

Cost Quantity Information 2031 | Procurement | Aircraft Procurement, Army		
Fiscal Year	**Quantity**	**End Item Recurring Flyaway (Aligned With Quantity) BY 2010 $M**
2012	--	--
2013	13	326.3
2014	4	137.5
2015	--	--
2016	--	--
2017	8	224.3
2018	34	839.4
2019	18	430.2
2020	--	--
2021	2	52.1
Subtotal	79	2009.8

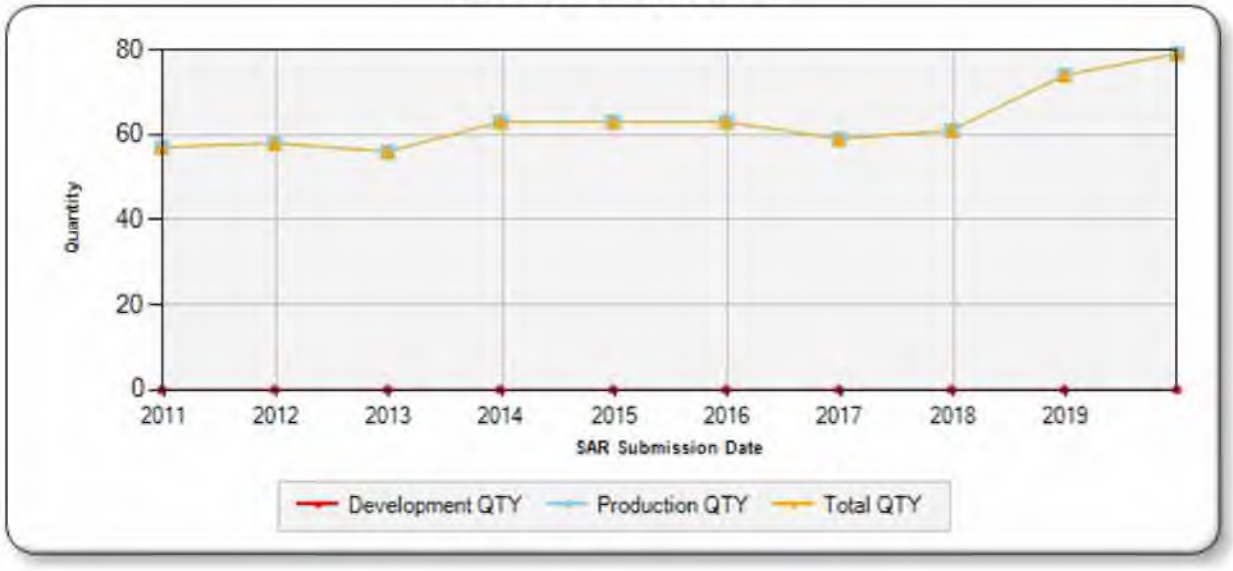
Charts

AH-64E New Build first began SAR reporting in December 2010

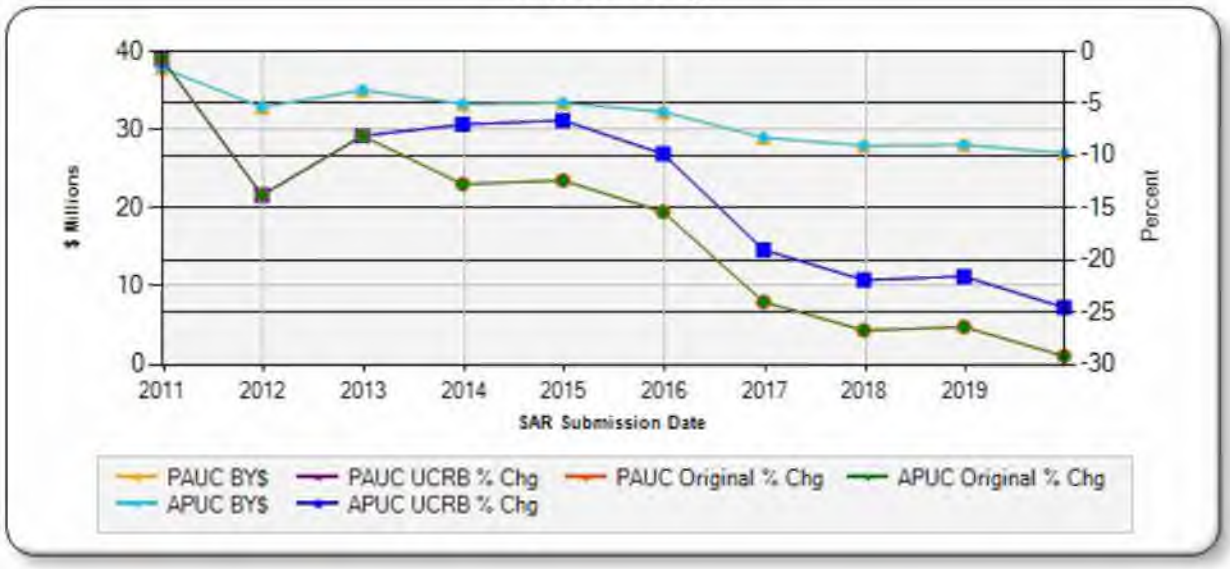
Program Acquisition Cost - AH-64E New Build
Base Year 2010 $M



Quantity - AH-64E New Build



Unit Cost - AH-64E New Build
Base Year 2010 $M



Risks

Significant Schedule and Technical Risks

Significant Schedule and Technical Risks	
Full Rate Production (August 2012)	
1.	Architecture Shortfalls – Refined hardware and software requirements coupled with Commercial-Off-The-Shelf (COTS) obsolescence necessitate computer / electronic tech refresh to meet Lot 4 - Lot 6 functionality.
2.	Main Transmission – Financial issues at Northstar Aerostar (Apache Block III (AB3) main transmission supplier) created a temporary trough in transmission supply, resulting in up to seven aircraft without transmissions. The AB3 prime contractor took measures to sustain AB3 production and revitalize Northstar's supply base. The PM closely monitored this plan and full recovery established in December 2012 with no critical fielding impacts expected. The PM will continue to closely monitor this plan.
3.	Net Ready – The AB3 Link 16 solution changed from a Joint Tactical Radio System (JTRS) Joint Program Office (JPO) Government Furnished Equipment radio to a Non-Developmental Item (NDI) radio. The AB3 PM is solely managing Link 16 for Lots 4 - Lot 5. A planned NDI competition for a Lot 6 Link 16 solution will be managed by the JTRS JPO. If the competitive procurement does not meet the Lot 6 timeline there will be a Link 16 capability fielding gap.
Milestone B (July 2006)	
1.	Insufficient fidelity of Lot 6 functionality requirements
2.	Reliability KPP
3.	Performance KPP
4.	Net Ready KPP
Milestone C (September 2010)	
1.	Architecture Shortfalls – Refined hardware and software requirements coupled with COTS obsolescence necessitate computer / electronic tech refresh to meet Lot 4 - Lot 6 functionality.
2.	LRIP Production – Boeing has not manufactured an AB3 aircraft and is using a subcontractor for pre-modification for the first time. Unforeseen production variables (new subcontractors and components) could cause schedule and delivery delays.
3.	Net Ready – AB3 PM is dependent on performance of the JTRS program to achieve Net Ready KPP. JTRS is the preferred solution to meet the Link 16 requirement at Lot 4 and Wideband Networking Waveform / Soldier Radio Waveform at Lot 6. Further delays to the JTRS program could prohibit AB3 from meeting the Net Ready KPP.
4.	Reliability – Limited flight test hours on AB3 aircraft at Limited User Test and Initial Operational Test and Evaluation does not allow for a traditional reliability demonstration in which the test unit is in the final configuration and tested for a statistically significant number of flight hours. This could result in an inability to demonstrate acceptable mission reliability to support the FRP Decision.
Current Estimate (December 2019)	
1.	The AH-64E program meets all Key Performance Parameters and remains on schedule and affordable. The program currently remains on schedule to deliver IAW the HQDA fielding plan. The AH-64E Apache program will not be re-certified until the Strap Pack Product Improvement (SPPI) is complete, which is when Boeing completes design, qualification, and the Army issues a fielding Air Worthiness Release for the Strap Pack Product Improvement (SPPI) effort, 2QTRFY20. The Apache Project Office continues to implement the

Quality Campaign Plan which is the program's strategy to improve existing deficiencies including a path forward for Critical Safety Item program compliance, improved supply chain quality management, increased Government audits and oversight, and multiple efforts to increase product reliability / reduce Soldier burden.

Risks

Risk and Sensitivity Analysis

Risks and Sensitivity Analysis	
Current Baseline Estimate (July 2013)	
1.	Apache completed a FRP Decision in August 2012 and an OSD CAPE ICE was prepared. This was the first time actuals from the AB3 production line were incorporated into the ICE. Material, labor, prime contractor rates and factors decreased from the Revised Original Baseline completed in December 2010.
Original Baseline Estimate (December 2010)	
1.	A successful Milestone C was completed on September 27, 2010, authorizing LRIP and advance procurement actions for FRP. Milestone C separated the Apache program into the Remanufacture and New Build programs with separate APBs. The Apache OSD CAPE ICE was used to establish the APB. The most significant cost drivers in the Apache estimate are material, labor and prime contractor labor and overhead rates and factors.
Revised Original Estimate (N/A)	
None	
Current Procurement Cost (December 2019)	
1.	The current Apache program office estimate is based upon the 2012 OSD CAPE Estimate and adjusted for fact of life changes and updated actuals of the current New Build production line and option pricing on the Multi-Year contract. The Apache Current Estimate cost model reflects a 50% Confidence Level estimate through its use of actual costs. The most significant cost drivers in the Apache estimate remain the material and labor. The Apache program assumed the risk of procuring radios, which were to be provided by JPO JTRS. The Apache program signed a five year Multi-Year contract from FY 2017 to FY 2021.

Low Rate Initial Production

There is no LRIP for this program.

Foreign Military Sales

Country	Date of Sale	Quantity	Total Cost $M	Description
United Arab Emirates	1/9/2018	10	286.0	Fully Implemented
India	10/8/2015	22	36.1	Fully Implemented and Direct Commercial Sales
Saudi Arabia	9/15/2015	12	408.3	Fully Implemented
Saudi Arabia	9/15/2015	12	498.8	Fully Implemented
Qatar	8/10/2014	24	869.1	Fully Implemented
Indonesia	8/26/2013	8	281.1	Fully Implemented
Korea	5/2/2013	36	1065.8	Fully Implemented

Notes

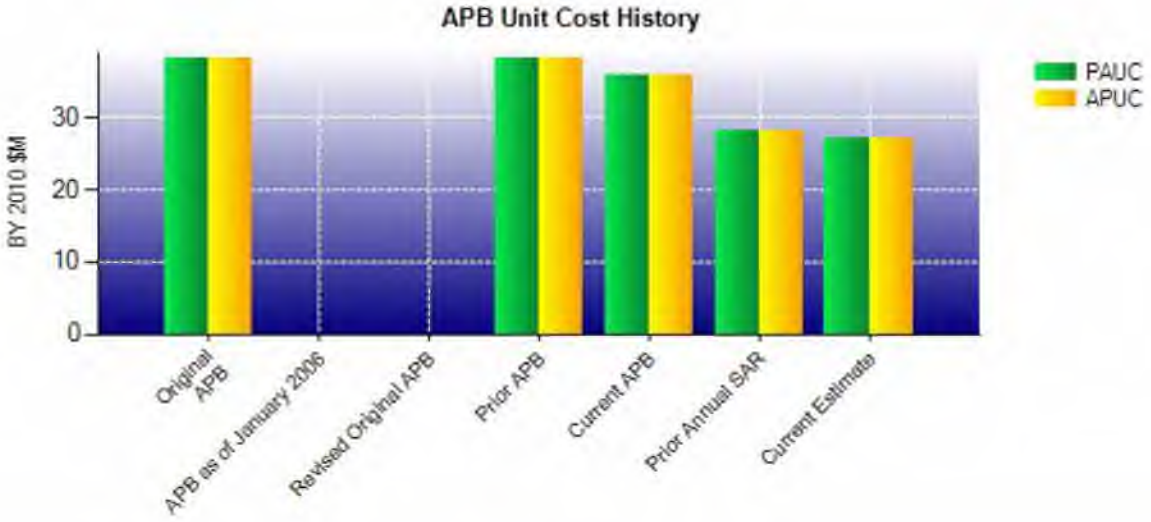
Nuclear Costs

None

Unit Cost

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2010 $M Current UCR Baseline (Jul 2013 APB)	BY 2010 $M Current Estimate (Dec 2019 SAR)	% Change
Program Acquisition Unit Cost			
Cost	2003.3	2132.5	
Quantity	56	79	
Unit Cost	35.773	26.994	-24.54
Average Procurement Unit Cost			
Cost	2003.3	2132.5	
Quantity	56	79	
Unit Cost	35.773	26.994	-24.54

Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2010 $M Original UCR Baseline (Dec 2010 APB)	BY 2010 $M Current Estimate (Dec 2019 SAR)	% Change
Program Acquisition Unit Cost			
Cost	2134.6	2132.5	
Quantity	56	79	
Unit Cost	38.118	26.994	-29.18
Average Procurement Unit Cost			
Cost	2134.6	2132.5	
Quantity	56	79	
Unit Cost	38.118	26.994	-29.18



APB Unit Cost History					
Item	Date	BY 2010 $M		TY $M	
		PAUC	APUC	PAUC	APUC
Original APB	Dec 2010	38.118	38.118	41.539	41.539
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 2010	38.118	38.118	41.539	41.539
Current APB	Jul 2013	35.773	35.773	45.761	45.761
Prior Annual SAR	Dec 2018	28.059	28.059	32.491	32.491
Current Estimate	Dec 2019	26.994	26.994	31.300	31.300

SAR Unit Cost History

Current SAR Baseline to Current Estimate (TY $M)									
PAUC Production Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
44.829	0.184	3.489	2.397	0.000	-17.714	0.000	-1.885	-13.529	31.300

Current SAR Baseline to Current Estimate (TY $M)									
Initial APUC Production Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
44.829	0.184	3.489	2.397	0.000	-17.714	0.000	-1.885	-13.529	31.300

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	N/A	N/A	N/A
Milestone C	N/A	N/A	Jul 2010	Sep 2010
IOC	N/A	N/A	May 2013	Nov 2013
Total Cost (TY $M)	N/A	N/A	2510.4	2472.7
Total Quantity	N/A	N/A	56	79
PAUC	N/A	N/A	44.829	31.300

Cost Variance

Summary TY $M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	--	2510.4	--	2510.4
Previous Changes				
Economic	--	+16.1	--	+16.1
Quantity	--	+1022.3	--	+1022.3
Schedule	--	+170.3	--	+170.3
Engineering	--	--	--	--
Estimating	--	-1160.4	--	-1160.4
Other	--	--	--	--
Support	--	-154.4	--	-154.4
Subtotal	--	-106.1	--	-106.1
Current Changes				
Economic	--	-1.6	--	-1.6
Quantity	--	+284.4	--	+284.4
Schedule	--	+19.1	--	+19.1
Engineering	--	--	--	--
Estimating	--	-239.0	--	-239.0
Other	--	--	--	--
Support	--	+5.5	--	+5.5
Subtotal	--	+68.4	--	+68.4
Total Changes	--	-37.7	--	-37.7
Current Estimate	--	2472.7	--	2472.7

Summary BY 2010 $M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	--	2307.0	--	2307.0
Previous Changes				
Economic	--	--	--	--
Quantity	--	+819.0	--	+819.0
Schedule	--	+100.2	--	+100.2
Engineering	--	--	--	--
Estimating	--	-1006.1	--	-1006.1
Other	--	--	--	--
Support	--	-143.7	--	-143.7
Subtotal	--	-230.6	--	-230.6
Current Changes				
Economic	--	--	--	--
Quantity	--	+232.6	--	+232.6
Schedule	--	+17.3	--	+17.3
Engineering	--	--	--	--
Estimating	--	-198.5	--	-198.5
Other	--	--	--	--
Support	--	+4.7	--	+4.7
Subtotal	--	+56.1	--	+56.1
Total Changes	--	-174.5	--	-174.5
Current Estimate	--	2132.5	--	2132.5

Previous Estimate: December 2018

Procurement	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-1.6
Total Quantity variance resulting from an increase of five AH-64E New Build aircraft from 74 to 79. (Subtotal)	+132.2	+161.6
Quantity variance resulting from an increase of five AH-64E New Build aircraft from 74 to 79. (Quantity)	(+232.6)	(+284.4)
Allocation to Schedule resulting from Quantity change. (Schedule) (QR)	(+17.3)	(+21.2)
Allocation to Estimating resulting from Quantity change. (Estimating) (QR)	(-117.7)	(-144.0)
Acceleration of procurement buy profile in FY 2018. (Schedule)	0.0	-2.1
Revised estimate to reflect additional aircraft procurement. (Estimating) (QR)	-80.8	-95.1
Revised estimate to reflect updated cost estimating methodology. (Estimating)	-1.1	-1.4
Adjustment for current and prior escalation. (Estimating)	+1.1	+1.4
Revised estimate to reflect FY 2017 actuals. (Estimating)	0.0	+0.1
Adjustment for current and prior escalation. (Support)	+0.3	+0.2
Increase in Other Support due to increased quantities. (Support) (QR)	+3.8	+4.6
Increase in Initial Spares due to increased quantities. (Support) (QR)	+0.6	+0.7
Procurement Subtotal	+56.1	+68.4

(QR) Quantity Related

Contracts

Contract Identification

Appropriation: Procurement
Contract Name: AH-64E Apache Multi-Year Contract
Contractor: The Boeing Company
Contractor Location: 5000 E McDowell Road
Mesa, AZ 85215-9707
Contract Number: W58RGZ-16-C-0023
Contract Type: Firm Fixed Price (FFP)
Award Date: March 15, 2017
Definitization Date: March 15, 2017

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
430.9	N/A	22	992.6	N/A	60	992.6	992.6

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to Original Target Price basis of 22 aircraft. The Current Target Price is based on a quantity of 60 aircraft.

Cost and Schedule Variance Explanations

Cost and Schedule Variance reporting is not required on this (FFP) contract.

Contract Identification

Appropriation: Procurement
Contract Name: MTADS/PNVS Production Services IDIQ
Contractor: Lockheed Martin
Contractor Location: MP-263
5600 W Sand Lake Road
Orlando, FL 32819-8907
Contract Number: W53P1J-17-D-0043
Contract Type: Firm Fixed Price (FFP)
Award Date: April 28, 2017
Definitization Date: April 28, 2017

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
33.9	N/A	8	298.6	N/A	62	4656.0	4656.0

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to multiple Task Orders/Delivery Orders (TO/DO) awarded with New Build funding since the initial contract award.

Cost and Schedule Variance Explanations

Cost and Schedule Variance reporting is not required on this (FFP) contract.

Notes

Quantities are reflective of complete Modernized Target Acquisition Designation Sight (MTADS) /Pilot Night Vision Sensor (PNVS) systems, but multiple Line Replaceable Units / Line Replaceable Modules are contained within a MTADS/PNVS system.

Contract Identification

Appropriation: Procurement
Contract Name: REU/MMA Production & Services IDIQ
Contractor: Longbow Limited Liability (LBL)
Contractor Location: 5600 Sand Lake Road
Orlando, FL
Contract Number: W52P1J-16-D-0055
Contract Type: Firm Fixed Price (FFP), Cost Plus Fixed Fee (CPFF)
Award Date: August 18, 2016
Definitization Date: June 07, 2018

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
1.9	N/A	3	19.9	N/A	26	931.2	931.2

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to only one Task Order/Delivery Order (TO/DO) that was awarded with the initial contract. The current contract price includes multiple TO/DO which were awarded.

Cost and Schedule Variance Explanations

Cost and Schedule Variance reporting is not required on this (FFP/CPFF) contract.

General Contract Variance Explanation

Cost and schedule variances are not reported for this contract, because the cost or incentive portion does not meet the threshold requirements for earned value management reporting.

Contract Identification

Appropriation: Procurement
Contract Name: MUMT Production & Services IDIQ
Contractor: L3 Communication Systems - West
Contractor Location: UT
Contract Number: W52P1J-17-D-0070
Contract Type: Firm Fixed Price (FFP), Cost Plus Fixed Fee (CPFF)
Award Date: August 31, 2017
Definitization Date: August 31, 2017

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
2.8	N/A	9	44.2	N/A	186	226.6	226.6

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to only one Task Order/Delivery Order (TO/DO) that was awarded with the initial contract. The current contract price includes multiple TO/DO which were awarded.

Cost and Schedule Variance Explanations

Cost and Schedule Variance reporting is not required on this (FFP/CPFF) contract.

General Contract Variance Explanation

Cost and schedule variances are not reported for this contract, because the cost or incentive portion does not meet the threshold requirements for earned value management reporting.

Contract Identification

Appropriation: Procurement
Contract Name: EI2 Camera Production
Contractor: Intevac Photonics
Contractor Location: 3560 Bassett St.
Santa Clara, CA 95054-2704
Contract Number: W58RGZ-15-C-0052
Contract Type: Firm Fixed Price (FFP)
Award Date: June 12, 2015
Definitization Date: June 12, 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
0.5	N/A	N/A	3.5	N/A	62	32.5	32.5

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to additional quantities being placed on contract.

Cost and Schedule Variance Explanations

Cost and Schedule Variance reporting is not required on this (FFP) contract.

Contract Identification

Appropriation: Procurement
Contract Name: MRFI Production & Services IDIQ
Contractor: Lockheed Martin Rotary and Mission Systems
Contractor Location: Owego, NY
Contract Number: W52P1J-18-D-0061
Contract Type: Firm Fixed Price (FFP)
Award Date: July 29, 2019
Definitization Date: July 29, 2019

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
1.8	N/A	2	8.3	N/A	17	249.5	249.5

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to additional quantities being placed on contract.

Cost and Schedule Variance Explanations

Cost and Schedule Variance reporting is not required on this (FFP) contract.

Contract Identification

Appropriation: Procurement
Contract Name: M-RFI Lot 1 Production
Contractor: Lockheed Martin
Contractor Location: 1801 NY-17C
Owego, NY 13827
Contract Number: W52P1J-16-C-0007
Contract Type: Firm Fixed Price (FFP)
Award Date: May 31, 2016
Definitization Date: May 31, 2016

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
2.2	N/A	N/A	2.2	N/A	N/A	85.1	85.1

Cost and Schedule Variance Explanations

Cost and Schedule Variance reporting is not required on this (FFP) contract.

Notes

This contract is more than 90% complete; therefore, this is the final report for this contract.

Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	0	0	0	--
Production	17	17	79	21.52%
Total Program Quantity Delivered	17	17	79	21.52%

Expended and Appropriated (TY $M)			
Total Acquisition Cost	2472.7	Years Appropriated	9
Expended to Date	678.6	Percent Years Appropriated	90.00%
Percent Expended	27.44%	Appropriated to Date	2403.5
Total Funding Years	10	Percent Appropriated	97.20%

The above data is current as of February 10, 2020.

Operating and Support Cost

Cost Estimate Details

Date of Estimate:	January 13, 2020
Source of Estimate:	POE
Quantity to Sustain:	79
Unit of Measure:	Aircraft
Service Life per Unit:	20.00 Years
Fiscal Years in Service:	FY 2013 - FY 2046

The O&S cost estimate is based upon the OSD CAPE ICE dated August 15, 2012. The estimate was last updated on January 13, 2020 for fact-of-life changes.

Sustainment Strategy

The AH-64E Apache is maintained in a two level maintenance system (field and depot) by a mix of Soldier and civilian maintainers. The strategy assumes the fielding of 79 New Build aircraft, each flying 238.8 hours per year. Aircraft are logistically supported by a mix of organic supply and Contractor Performance Based Logistics activities.

Antecedent Information

The antecedent to the AH-64E Apache is the AH-64D Longbow. The AH-64D Longbow will be in service until 2031. There are currently 355 AH-64D Longbow aircraft in operation.

As of the Milestone C estimate updated January 15, 2013, the AH-64D Longbow was estimated to have a total of 14,847 Fleet Years of operational tempo.

14,847 Fleet Years x $3,420K per operation hour = $50,776.7M (BY 2010 $M); $58,146.7M (TY)

Annual O&S Costs BY2010 $M		
Cost Element	**AH-64E New Build Average Annual Cost Per Aircraft**	**Longbow Apache (Antecedent) Average Annual Cost Per Aircraft**
Unit-Level Manpower	0.967	1.538
Unit Operations	0.136	0.205
Maintenance	0.608	1.148
Sustaining Support	0.257	0.355
Continuing System Improvements	0.057	0.073
Indirect Support	0.031	0.101
Other	0.000	0.000
Total	2.056	3.420

Item	Total O&S Cost $M			
	AH-64E New Build			Longbow Apache (Antecedent)
	Current Production APB Objective/Threshold		Current Estimate	
Base Year	3538.1	3891.9	3248.0	50776.7
Then Year	0.0	N/A	4512.7	N/A

The AH-64E New Build estimate updated to reflect fact-of-life changes to the Apache AH-64E support program as of January 13, 2020.

Equation to Translate Annual Cost to Total Cost

79 Helicopters x 20 Years Operational Life x $2,056K Unitized Cost = $3,248M (BY 2010 $M)

The discrepancy in the reported cost and the equation is due to rounding.

O&S Cost Variance		
Category	**BY 2010 $M**	**Change Explanations**
Prior SAR Total O&S Estimates - Dec 2018 SAR	4102.6	
Programmatic/Planning Factors	278.7	Increase in New Build Procurement quantity.
Cost Estimating Methodology	0.0	
Cost Data Update	-97.2	Updated spares, reparables, and POL with latest actuals.
Labor Rate	-1036.1	Army Military-Civilian Costing System Manpower Cost factors changed.
Energy Rate	0.0	
Technical Input	0.0	
Other	0.0	
Total Changes	-854.6	
Current Estimate	3248.0	

The large reduction in labor cost shown in the Apache Operating & Support costs is the result of the changes to the Army Military & Civilian Costing System (AMCOS) model implemented this spring. The decrease in training is the most drastic in some aviation specialties including AH-64E pilots. This difference is a result of several items: averaging of training across 3 years of data to stabilize training attendee spikes we see in the ATRRS data (data showing who attended which courses); the replacement of amortization with cross grade level averaging which reduces the variability that continuation rates (probability of someone continuing from one year to the next) had on the model's costs, most notably training elements; elimination of variable weighing (training for specific MOSes were given a greater weight in the model then courses attributable to an entire pay plan or group (CMF); and finally adjustments were made so that the total training expenditures calculated in AMCOS (attendee driven) lined up with the President's Budget submission (budget data). With the introduction of weapon system cost detail in the spring 2018 release AMCOS analysts started to notice increased variability because of the lower level the model is calculating cost at. The cost changes in this release are driven by the changes noted above to deliver a more consistent and accurate cost estimate in the model going forward.

Disposal Estimate Details

Date of Estimate:	August 15, 2012
Source of Estimate:	CAPE ICE
Disposal/Demilitarization Total Cost (BY 2010 $M):	46.0

Total Disposal Costs for both the AH-64E Remanufacture and AH-64E New Build aircraft is $46.03M (BY 2010 $M) in accordance with the OSD CAPE ICE dated August 15, 2012.