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RCS: DD-A&T(Q&A)823-277



Airborne Warning and Control System Block 40/45 Upgrade (AWACS Blk 40/45 Upgrade)

As of FY 2021 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

UNCLASSIFIED

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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

Airborne Warning and Control System Block 40/45 Upgrade (AWACS Blk 40/45 Upgrade)

DoD Component

Air Force

Responsible Office

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Date Assigned: February 4, 2015

References

SAR Baseline (Production Estimate)

Air Force Acquisition Executive (AFAE) Approved Acquisition Program Baseline (APB) dated May 1, 2013

Approved APB

Air Force Acquisition Executive (AFAE) Approved Acquisition Program Baseline (APB) dated April 8, 2019

Mission and Description

The Airborne Warning and Control System (AWACS) provides a highly mobile, flexible, survivable theater Battle Management (BM), Wide Area Surveillance, and Command and Control (C2) capability. It is capable of detecting, identifying, and tracking airborne and maritime targets at extended ranges as well as identifying air/ground emitters. AWACS can relay "big picture" information to C2 agencies and friendly aircraft. AWACS provides worldwide response to situations requiring immediate on-scene C2/BM using embedded real-time surveillance for employment of US and allied combat air forces. AWACS is critical to gaining and maintaining battle-space air superiority. AWACS coordinates with both tactical and C2 assets in theater to execute the air mission.

The AWACS Block 40/45 Upgrade program is the largest modification in U.S. AWACS history and represents the critical foundation and baseline system required for all future AWACS enterprise modifications including net-centric operations. The AWACS Block 40/45 Upgrade provides a single target/single track capability with an improved human-machine interface for time-critical targeting designed to increase combat effectiveness and reduce fratricide. The AWACS Block 40/45 Upgrade program includes an upgrade to Electronic Support Measures sensor data processing; Multi-Source Integration; a Data Link Infrastructure with prioritized data link bandwidth management for Link 16/Link 11; new battle management tools; capability to parse, allow user access to, and integrate Air Control Order/Air Tasking Order data; enhanced mission and console recording capabilities; and an update to a low-bandwidth internet chat capability (Secure Iridium Chat).

Executive Summary

Program Highlights Since Last Report

The FY 2020 PB included the removal of Advanced Battle Management System funding out of the E-3 portfolio, which caused a \$34M disconnect in FY 2020 in the AWACS Block 40/45 Upgrade. FY 2020 PB added an additional \$34M in FY 2021 - FY 2022 for Block 40/45. FY 2023 - FY 2024 has disconnects which are being resolved in the FY 2021 PB.

Additional key software deficiencies were identified during Operational Test and Evaluation (OT&E) and needed to be resolved prior to follow-on OT&E. The program successfully completed Developmental Test/Operational Test for Mission Computing Software 12.3 in October of 2019. All key deficiencies are planned to be resolved no later than the delivery of Mission Computing Software 12.5 in Fourth Quarter FY 2020. Final Operational Test and Evaluation completion has been moved to First Quarter FY 2022 to allow additional Operational Test.

History of Significant Developments Since Program Initiation

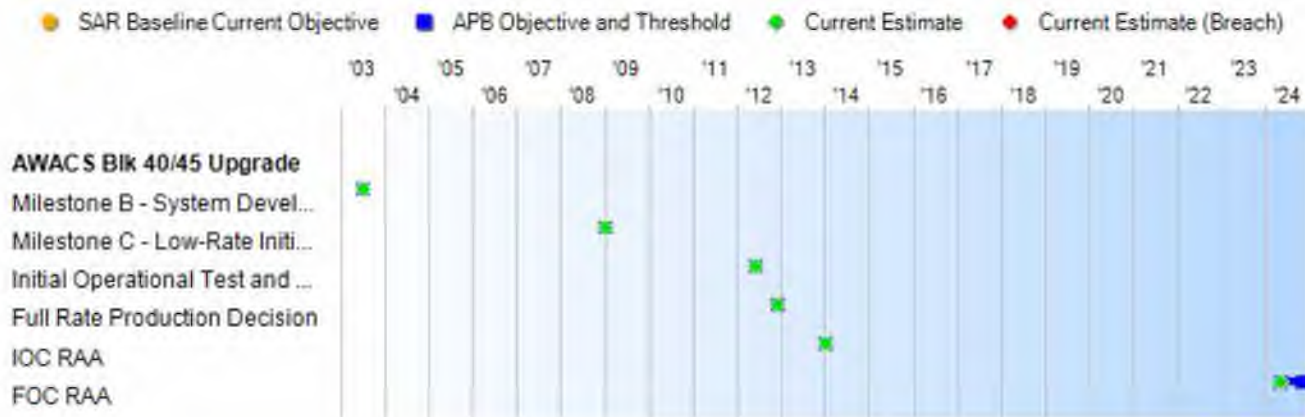
History of Significant Developments Since Program Initiation	
Date	Significant Development Description
July 2003	Milestone B - System Development and Demonstration
January 2009	Milestone C - Low-Rate Initial Production
June 2012	Initial Operational Test and Evaluation Complete.
December 2012	Full Rate Production Decision
February 2013	Completed Avionics Integration Support Facility partial E-3G software maintenance capability upgrade
December 2013	Awarded the Full Rate Production options contract to Boeing
January 2014	IOC Required Asset Available
June 2014	Completed and delivered the sixth and final LRIP E-3G modification
June 2015	Cost Analysis Requirement document was signed by POE; seven modified aircraft delivered to 552nd Air Control Wing and four aircraft were inducted for modification.
1st Quarter FY 2016	Program office is correcting software deficiencies related to the Passive Detection System , Maritime Mode Tracking / Surveillance, and Identification Friend or Foe .These issues resulted in a delay to Follow-On Test & Evaluation until the issues are resolved.
1st Quarter FY 2017	Request for Additional Appropriations in FY 2017 included \$21.8M in FY 2017 3010 funding to address emergency warfighting readiness requirements. The funding begins to restore procurement funds for the Block 40/45 buy back of kits for seven operational aircraft and provides increased capability improvements to the end user.
June 2018	A revised SCP was required due to an increase in the fleet size from 24 aircraft to 31 aircraft. The Program Deviation Report was signed by the MDA in June 2018 directing an update to the Air Force Cost Analysis Agency SCP and APB due to an increase of the seven additional aircraft.

Threshold Breaches

APB Breaches		
Schedule		<input type="checkbox"/>
Performance		<input type="checkbox"/>
Cost	RDT&E	<input type="checkbox"/>
	Procurement	<input type="checkbox"/>
	MILCON	<input type="checkbox"/>
	Acq O&M	<input type="checkbox"/>
O&S Cost		<input type="checkbox"/>
Unit Cost	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 Production Estimate	Current APB Production Objective/Threshold		Current Estimate
Milestone B - System Development and Demonstration	Jul 2003	Jul 2003	Jul 2003	Jul 2003
Milestone C - Low-Rate Initial Production	Jan 2009	Jan 2009	Jan 2009	Jan 2009
Initial Operational Test and Evaluation Complete (IOT&E)	Jun 2012	Jun 2012	Jun 2012	Jun 2012
Full Rate Production Decision	Dec 2012	Dec 2012	Dec 2012	Dec 2012
IOC RAA	Apr 2014	Jan 2014	Jan 2014	Jan 2014
FOC RAA	Aug 2020	May 2024	Nov 2024	May 2024

Change Explanations

None

Notes

(1) IOC RAA was declared by the PM on January 7, 2014. On July 28, 2014, ACC declared IOC. IOC RAA was defined as the delivery of five Block 40/45 modified aircraft, Ground Systems, Initial Spares, Training Materials, Technical Orders Documentation, and Required Logistics Support.

(2) FOC RAA is the date all Block 40/45 E-3 Airborne Warning and Control System aircraft and associated ground systems are delivered to ACC. The FY19 APB updated the aircraft fleet size to 31.

Acronyms and Abbreviations

ACC - Air Combat Command

RAA - Required Assets Available

Performance

Performance Characteristics				
SAR Baseline Production Estimate	Current APB Production Objective/Threshold	Demonstrated Performance	Current Estimate	
Multi-Source Integration				
(Objective = Threshold) All target data shall be correlated, fused, and integrated into a single track	(Objective = Threshold) All target data shall be correlated, fused, and integrated into a single track	All target data shall be correlated, fused, and integrated into a single track	The Beyond LRIP report confirms the system meets required threshold performance.	The Beyond LRIP report confirms the system meets required threshold performance.
Net Ready				
System must fully support execution of all activities identified in joint and system integrated architectures. 1) DISR mandated GIG IT standards and profiles identified in the TV-1. 2) DISR mandated GIG KIPs identified in the KIP declaration table. 3) Net-Centric Operations and Warfare Reference Model Enterprise Services. 4) IA requirements and issuance of an ATO by the DAA. 5) Operationally-effective information exchanges and mission critical performance specified in the applicable joint and system integrated architecture views.	System must fully support execution of all activities identified in joint and system integrated architectures. 1) DISR mandated GIG IT standards and profiles identified in the TV-1. 2) DISR mandated GIG KIPs identified in the KIP declaration table. 3) Net-Centric Operations and Warfare Reference Model Enterprise Services. 4) IA requirements and issuance of an ATO by the AO. 5) Operationally-effective information exchanges and mission critical performance specified in the applicable joint and system integrated architecture views.	System must fully support execution of joint critical activities identified in joint and system integrated architectures. System must satisfy the technical requirements for future transition to Net-Centric operations to include: 1) DISR mandated GIG IT standards and profiles identified in the TV-1; 2) DISR mandated GIG KIPs identified in the KIP declaration table; 3) Net-Centric Operations and Warfare Reference Model Enterprise Services; 4) IA requirements and issuance of an IATO by the AO; 5) Operationally-effective information exchanges and mission critical performance specified in the applicable joint and system integrated architecture views.	Per Joint Interoperability Test Command letter dated October 25, 2012, "The AWACS Block 40/45 Upgrade, V10.1.20i meets the joint critical interoperability requirements in the Joint Staff-certified AWACS Block 40/45 Upgrade Program ISP, 17 October 2011". Air Force C2 Platform Information Technology DAA issued an IATO on January 11, 2012. Subsequent IATOs and ATOs have been introduced for each software version afterwards.	Each version/release of Block 40/45 continues to be approved for use by an IATO or ATO.

Classified Performance information is provided in the classified annex to this submission.

Requirements Reference

ORD (Combat Air Forces 010-02-I/II) dated June 16, 2009 (in lieu of CPD)

Change Explanations

None

Acronyms and Abbreviations

AO - Authorizing Official
ATO - Approval to Operate
DAA - Designated Approving Authority
DISR - Department of Defense Information Technology Standards Registry
GIG - Global Information Grid
IA - Information Assurance
IATO - Interim Approval to Operate
IT - Information Technology
KIP - Key Interface Profile
TV-1 - Technical View 1

Track to Budget

RDT&E

Appn	BA	PE	
Air Force	3600	07	0207417F
Project	Name		
67411L	Airborne Warning and Control Systems		
			(Sunk)

Procurement

Appn	BA	PE	
Air Force	3010	06	0207417F
Line Item	Name		
000999	Initial Spares		
			(Sunk)
Air Force	3010	05	0207417F
Line Item	Name		
E00300	E-3		
			(Sunk)
E34045	Airborne Warning and Control Systems		

Notes

The Procurement funding for the AWACS Block 40/45 Upgrade program is located in modification number 50001T.

Cost and Funding

Cost Summary

Total Acquisition Cost						
Appropriation	BY 2012 \$M			BY 2012 \$M	TY \$M	
	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate	SAR Baseline Production Estimate	Current APB Production Objective
RDT&E	1319.0	1272.7	1400.0	1272.7	1192.2	1145.9
Procurement	1503.4	1519.9	1671.9	1510.1	1615.4	1649.1
Flyaway	--	--	--	1456.7	--	--
Recurring	--	--	--	1064.0	--	--
Non Recurring	--	--	--	392.7	--	--
Support	--	--	--	53.4	--	--
Other Support	--	--	--	0.0	--	--
Initial Spares	--	--	--	53.4	--	--
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	2822.4	2792.6	N/A	2782.8	2807.6	2795.0

Current APB Cost Estimate Reference

AWACS Block 40/45 delta SCP Update dated October 02, 2018

Cost Notes

FY 2015 Air Force direction was to divest the fleet size from 31 aircraft to 24 aircraft; however, recent FY 2017 - FY 2019 budgetary actions have restored the required funding to return the fleet to 31 aircraft and provide out-year support.

The Airborne Warning and Control System (AWACS) Block 40/45 Upgrade Program is currently approved and funded for a fleet size of 31 aircraft.

The Block 40/45 Service Cost Position dated October 02, 2018 was based on the OSD 2017 inflation table. The APB Change 2 uses the 2018 OSD inflation table. Therefore, the BY values under Procurement do not match.

Total Quantity			
Quantity	SAR Baseline Production Estimate	Current APB Production	Current Estimate
RDT&E	0	0	0
Procurement	31	31	31
Total	31	31	31

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	1145.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1145.9
Procurement	1508.6	32.8	53.4	42.4	0.0	0.0	0.0	0.0	1637.2
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	2654.5	32.8	53.4	42.4	0.0	0.0	0.0	0.0	2783.1
PB 2020 Total	2624.8	36.0	46.1	42.5	0.0	0.0	0.0	0.0	2749.4
Delta	29.7	-3.2	7.3	-0.1	0.0	0.0	0.0	0.0	33.7

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	31	0	0	0	0	0	0	0	31
PB 2021 Total	0	31	0	0	0	0	0	0	0	31
PB 2020 Total	0	31	0	0	0	0	0	0	0	31
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
1999	--	--	--	--	--	--	0.9
2000	--	--	--	--	--	--	14.2
2001	--	--	--	--	--	--	10.1
2002	--	--	--	--	--	--	17.8
2003	--	--	--	--	--	--	116.0
2004	--	--	--	--	--	--	193.0
2005	--	--	--	--	--	--	243.7
2006	--	--	--	--	--	--	106.3
2007	--	--	--	--	--	--	127.9
2008	--	--	--	--	--	--	90.7
2009	--	--	--	--	--	--	69.9
2010	--	--	--	--	--	--	50.1
2011	--	--	--	--	--	--	85.1
2012	--	--	--	--	--	--	5.8
2013	--	--	--	--	--	--	3.1
2014	--	--	--	--	--	--	11.3
Subtotal	--	--	--	--	--	--	1145.9

Annual Funding							
3600 RDT&E Research, Development, Test, and Evaluation, Air Force							
Fiscal Year	Quantity	BY 2012 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
1999	--	--	--	--	--	--	1.1
2000	--	--	--	--	--	--	17.6
2001	--	--	--	--	--	--	12.4
2002	--	--	--	--	--	--	21.6
2003	--	--	--	--	--	--	138.6
2004	--	--	--	--	--	--	224.9
2005	--	--	--	--	--	--	276.9
2006	--	--	--	--	--	--	117.2
2007	--	--	--	--	--	--	137.4
2008	--	--	--	--	--	--	95.5
2009	--	--	--	--	--	--	72.7
2010	--	--	--	--	--	--	51.4
2011	--	--	--	--	--	--	85.8
2012	--	--	--	--	--	--	5.7
2013	--	--	--	--	--	--	3.0
2014	--	--	--	--	--	--	10.9
Subtotal	--	--	--	--	--	--	1272.7

Annual Funding 3010 Procurement Aircraft Procurement, 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
2008	--	2.2	0.2	--	2.4	--	2.4
2009	1	37.8	19.2	1.2	58.2	2.9	61.1
2010	2	40.3	6.0	12.0	58.3	0.8	59.1
2011	3	133.3	3.9	25.3	162.5	5.7	168.2
2012	5	106.7	7.7	3.8	118.2	0.3	118.5
2013	--	62.0	9.9	65.6	137.5	9.6	147.1
2014	2	61.6	6.3	34.2	102.1	3.7	105.8
2015	7	119.0	30.7	31.4	181.1	--	181.1
2016	--	30.5	16.0	109.0	155.5	--	155.5
2017	4	145.0	55.4	62.0	262.4	18.0	280.4
2018	7	78.5	11.3	52.9	142.7	--	142.7
2019	--	44.6	14.7	9.9	69.2	17.5	86.7
2020	--	--	28.0	4.8	32.8	--	32.8
2021	--	39.2	5.4	8.8	53.4	--	53.4
2022	--	29.1	5.3	8.0	42.4	--	42.4
Subtotal	31	929.8	220.0	428.9	1578.7	58.5	1637.2

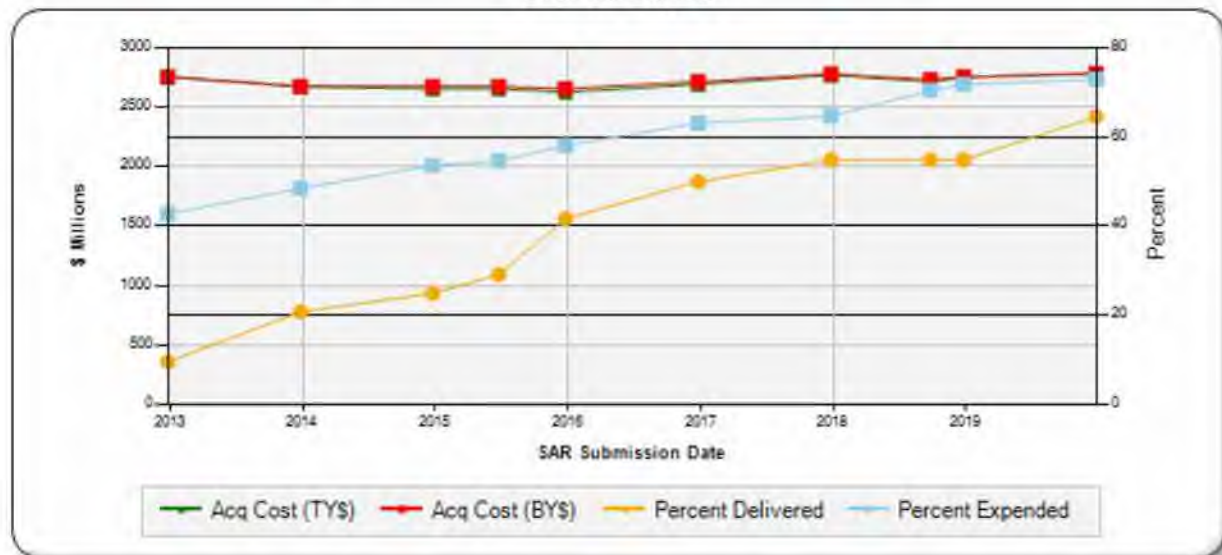
Annual Funding 3010 Procurement Aircraft Procurement, Air Force							
Fiscal Year	Quantity	BY 2012 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2008	--	2.3	0.2	--	2.5	--	2.5
2009	1	38.7	19.6	1.2	59.5	3.0	62.5
2010	2	40.5	6.0	12.0	58.5	0.8	59.3
2011	3	131.7	3.9	25.0	160.6	5.6	166.2
2012	5	103.9	7.5	3.7	115.1	0.3	115.4
2013	--	59.2	9.4	62.5	131.1	9.2	140.3
2014	2	57.9	5.9	32.2	96.0	3.5	99.5
2015	7	110.4	28.5	29.1	168.0	--	168.0
2016	--	27.8	14.6	99.2	141.6	--	141.6
2017	4	129.4	49.4	55.4	234.2	16.1	250.3
2018	7	68.5	9.9	46.2	124.6	--	124.6
2019	--	38.2	12.6	8.5	59.3	14.9	74.2
2020	--	--	23.5	4.0	27.5	--	27.5
2021	--	32.3	4.4	7.3	44.0	--	44.0
2022	--	23.5	4.3	6.4	34.2	--	34.2
Subtotal	31	864.3	199.7	392.7	1456.7	53.4	1510.1

Cost Quantity Information		
3010 Procurement Aircraft Procurement, Air Force		
Fiscal Year	Quantity	End Item Recurring Flyaway (Aligned With Quantity) BY 2012 \$M
2008	--	--
2009	1	41.0
2010	2	40.5
2011	3	131.7
2012	5	103.9
2013	--	--
2014	2	117.1
2015	7	138.2
2016	--	--
2017	4	129.4
2018	7	162.5
2019	--	--
2020	--	--
2021	--	--
2022	--	--
Subtotal	31	864.3

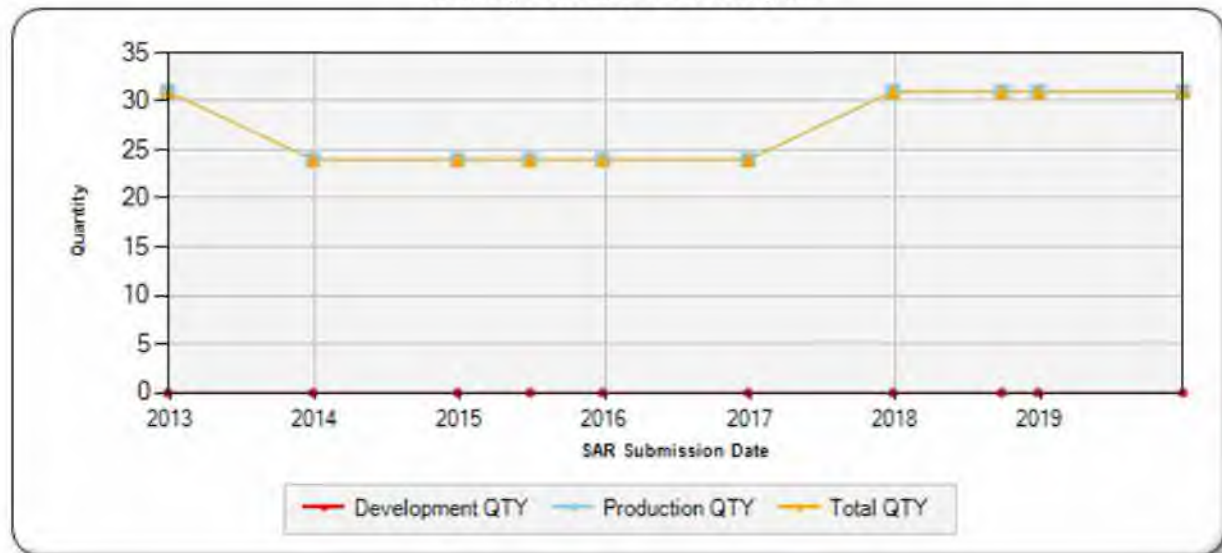
Charts

AWACS Blk 40/45 Upgrade first began SAR reporting in December 2012

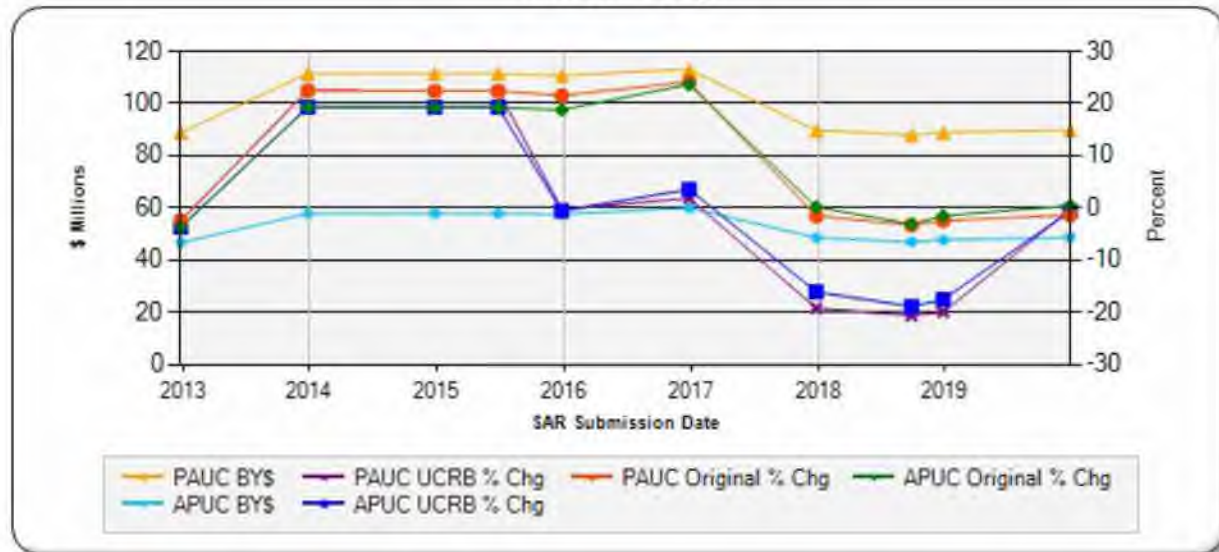
Program Acquisition Cost - AWACS Blk 40/45 Upgrade
Base Year 2012 \$M



Quantity - AWACS Blk 40/45 Upgrade



Unit Cost - AWACS Blk 40/45 Upgrade
Base Year 2012 \$M



Risks

Significant Schedule and Technical Risks

Significant Schedule and Technical Risks	
Current Estimate (December 2019)	
1.	DMS 4.0 Kit Delivery to the Depot for P21
2.	Type-1 Encryptor Driving a New Hardware Modification Post DMS 4.0
3.	Additional DR findings on Software
4.	C2 AO approval of DMS 4.0 Single Layer of Encryption

Risks

Risk and Sensitivity Analysis

Risks and Sensitivity Analysis	
Current Baseline Estimate (April 2019)	
1.	Production APB (April 2019): Total Acquisition Cost (BY12 \$M) - \$2,795.0M (Qty 31); PAUC (BY12 \$M) - \$90.084M (Qty 31); APUC (BY12 \$M) - \$49.029M (Qty 31) Risks - SCP updated APB for Qty increase of 7 planes. FOC now 2024 with one final DMS configuration. PAUC and APUC decreased due to restoration of original quantities procured. Cost estimate based on LRIP and FRP data.
Original Baseline Estimate (May 2013)	
1.	Production APB (May 2013): Total Acquisition Cost (BY12 \$M) - \$2,822.4M (Qty 31); PAUC (BY12 \$M) - \$91.045M (Qty 31); APUC (BY12 \$M) - \$48.497M (Qty 31) Risks - Blk 40/45 cost/schedule baseline (APB) established to support IOC. Assumed 31 planes, FOC in 2024, and one DMS configuration at FOC. Cost estimate/SCP based on data from LRIP and similar Mod programs.
Revised Original Estimate (N/A)	
None	
Current Procurement Cost (December 2019)	
1.	Total Acquisition Cost (BY12 \$M) - \$2,785.7M (Qty 31); PAUC (BY12 \$M) - \$89.861M (Qty 31); APUC (BY12 \$M) - \$48.806M (Qty 31) Risks – 2018 SCP update to APB restored Qty of seven (7) planes as a result, FOC shifted to 2024. SCP includes conversion of remaining DMS 3 aircraft to DMS 4 to establish single configuration for the entire fleet. DMS 4.0 NRE effort more extensive than previously estimated. Cyber Security issues impacting schedule and cost. Installs more costly as some mod schedules are disconnected from PDM cycles.

Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	11/24/2008	11/24/2008
Approved Quantity	6	6
Reference	Milestone C ADM	Milestone C ADM
Start Year	2009	2009
End Year	2014	2015

The Current Total LRIP Quantity is more than 10% of the total production quantity due to operational requirements.

Notes

Air Combat Command identified a requirement for five AWACS Block 40/45 Upgrade aircraft for IOC declaration. The program office requested an LRIP quantity of six to utilize the first modified aircraft as a risk reduction asset to streamline the process of combining a major upgrade with Programmed Depot Maintenance. In addition, the first aircraft was required to support production qualification testing.

The Start Year indicated specifies the year that the LRIP contract (Delivery Order 23) was awarded. The program procured one 40/45 shipset in FY 2009, two 40/45 shipsets in FY 2010 and three 40/45 shipsets in FY 2011. The Current End Year indicated above specifies the completion of the contract Period of Performance (PoP).

The PoP was extended to July 2015 to complete the provisioning effort.

Foreign Military Sales

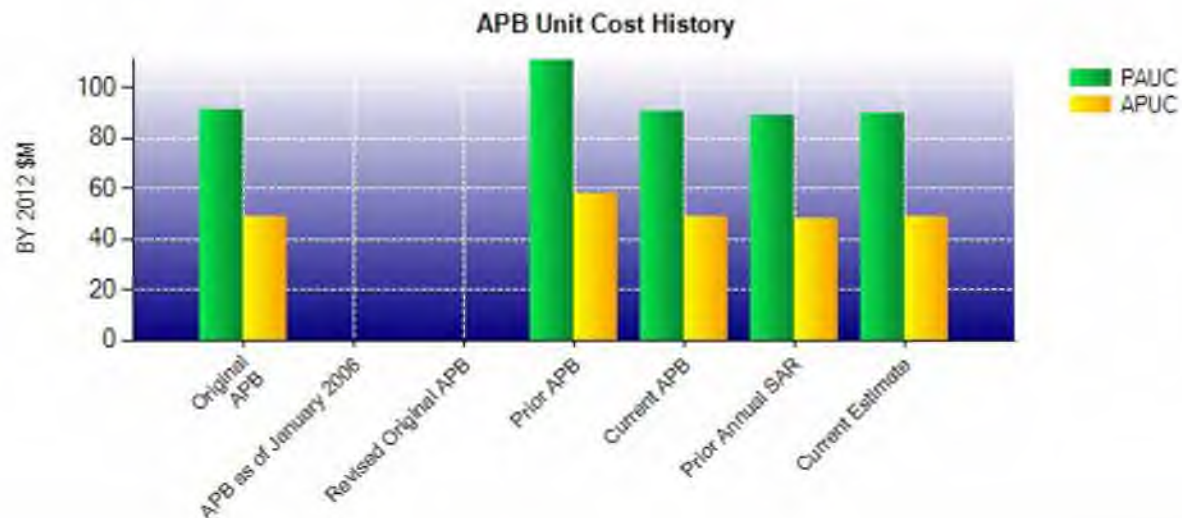
None

Nuclear Costs

None

Unit Cost

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2012 \$M	BY 2012 \$M	% Change
	Current UCR Baseline (Apr 2019 APB)	Current Estimate (Dec 2019 SAR)	
Program Acquisition Unit Cost			
Cost	2792.6	2782.8	
Quantity	31	31	
Unit Cost	90.084	89.768	-0.35
Average Procurement Unit Cost			
Cost	1519.9	1510.1	
Quantity	31	31	
Unit Cost	49.029	48.713	-0.64
Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2012 \$M	BY 2012 \$M	% Change
	Original UCR Baseline (May 2013 APB)	Current Estimate (Dec 2019 SAR)	
Program Acquisition Unit Cost			
Cost	2822.4	2782.8	
Quantity	31	31	
Unit Cost	91.045	89.768	-1.40
Average Procurement Unit Cost			
Cost	1503.4	1510.1	
Quantity	31	31	
Unit Cost	48.497	48.713	+0.45



APB Unit Cost History					
Item	Date	BY 2012 \$M		TY \$M	
		PAUC	APUC	PAUC	APUC
Original APB	May 2013	91.045	48.497	90.568	52.110
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	Oct 2015	110.933	57.908	110.100	62.354
Current APB	Apr 2019	90.084	49.029	90.161	53.197
Prior Annual SAR	Dec 2018	88.810	47.755	88.690	51.726
Current Estimate	Dec 2019	89.768	48.713	89.777	52.813

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	
90.568	-0.142	-1.424	-0.806	0.000	1.116	0.000	0.465	-0.791	89.777

Current SAR Baseline to Current Estimate (TY \$M)									
Initial APUC Production Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
52.110	-0.165	-1.423	-0.268	0.000	2.094	0.000	0.465	0.703	52.813

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	Jul 2003	Jul 2003
Milestone C	N/A	N/A	Jan 2009	Jan 2009
IOC	N/A	N/A	Apr 2014	Jan 2014
Total Cost (TY \$M)	N/A	N/A	2807.6	2783.1
Total Quantity	N/A	N/A	31	31
PAUC	N/A	N/A	90.568	89.777

Cost Variance

Summary TY \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	1192.2	1615.4	--	2807.6
Previous Changes				
Economic	+0.7	-4.7	--	-4.0
Quantity	--	-44.1	--	-44.1
Schedule	-16.7	-8.3	--	-25.0
Engineering	--	--	--	--
Estimating	-30.3	+32.0	--	+1.7
Other	--	--	--	--
Support	--	+13.2	--	+13.2
Subtotal	-46.3	-11.9	--	-58.2
Current Changes				
Economic	--	-0.4	--	-0.4
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	+32.9	--	+32.9
Other	--	--	--	--
Support	--	+1.2	--	+1.2
Subtotal	--	+33.7	--	+33.7
Total Changes	-46.3	+21.8	--	-24.5
Current Estimate	1145.9	1637.2	--	2783.1

Summary BY 2012 \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	1319.0	1503.4	--	2822.4
Previous Changes				
Economic	--	--	--	--
Quantity	--	-37.9	--	-37.9
Schedule	-17.9	-8.0	--	-25.9
Engineering	--	--	--	--
Estimating	-28.4	+12.1	--	-16.3
Other	--	--	--	--
Support	--	+10.8	--	+10.8
Subtotal	-46.3	-23.0	--	-69.3
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	+28.7	--	+28.7
Other	--	--	--	--
Support	--	+1.0	--	+1.0
Subtotal	--	+29.7	--	+29.7
Total Changes	-46.3	+6.7	--	-39.6
Current Estimate	1272.7	1510.1	--	2782.8

Previous Estimate: December 2018

Procurement	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-0.4
Reprogramming action moved FY 2019 Funding program authority from E-3 DRAGON to Airborne Warning and Control System (AWACS) Block 40/45 for execution. (Estimating)	+15.4	+17.2
Adjustment for current and prior escalation. (Estimating)	+0.4	+0.3
Additional Funding in FY 2021 - FY 2024 to align to the FY 2021 PB. (Estimating)	+6.0	+7.2
New Estimating change. Funding increase/decrease in FY 2019. (Estimating)	+6.9	+8.2
Adjustment for current and prior escalation. (Support)	0.0	+0.1
Funding increase for Initial Spares in FY 2019. (Support)	+1.0	+1.1
Procurement Subtotal	+29.7	+33.7

Contracts

Contract Identification	
Appropriation:	RDT&E
Contract Name:	AWACS 40/45 Upgrade Program Full Rate Production
Contractor:	The Boeing Company
Contractor Location:	P.O. Box 3707 Seattle, WA 98124-2207
Contract Number:	F19628-01-D-0016/26
Contract Type:	Fixed Price Incentive(Firm Target) (FPIF)
Award Date:	November 17, 2011
Definitization Date:	November 17, 2011

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
137.3	N/A	24	341.0	N/A	31	325.3	332.7

Target Price Change Explanation
The difference between the Initial Contract Price Target and the Current Contract Price Target is due to the original target price was based on CLINs 3300, 3606, and 3608. The current target price includes all 14 EV CLINs (3300, 3302, 3606, 3608, 3613, 3610, 3304, 3126, 3327, 3620, 3624, 3625, 3626, and 3642).

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/20/2019)	+8.0	-7.2
Previous Cumulative Variances	+18.9	-13.0
Net Change	-10.9	+5.8

Cost and Schedule Variance Explanations
The unfavorable net change in the cost variance is due to lab closures, part procurement delays, and additional Non Recurring Engineering for Data at Rest and the console computer replacement effort.
The favorable net change in the schedule variance is due to completed FRP CLINS. Contractor realized efficiencies and finalized multiple procurement efforts.

Notes

The Earned Value (EV) data as of December 2019 is based on fourteen Full Rate Production (FRP) CLINs; six CLINs are closed (3300, 3302, 3606, 3608, 3613, 3610) and eight are open (3304, 3126, 3327, 3620, 3624, 3625, 3626, and 3642).

The favorable cost variance is due to completed FRP CLINS that under-ran. Contractor realized efficiencies across multiple procurement efforts. The unfavorable cost variance on the eight open FRP CLINS Contractor work to recover schedule for software development and test issues.

The unfavorable schedule variance is due to lab closures, part procurement delays, and additional Non-Recurring Engineering for Data at Rest and the console computer replacement effort.

The negotiated cost is based off of the 14 EV CLINs (3300, 3302, 3606, 3608, 3613, 3610, 3304, 3126, 3327, 3620, 3624, 3625, 3626, 3642)

Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	0	0	0	--
Production	20	20	31	64.52%
Total Program Quantity Delivered	20	20	31	64.52%

Expended and Appropriated (TY \$M)			
Total Acquisition Cost	2783.1	Years Appropriated	22
Expended to Date	2029.8	Percent Years Appropriated	91.67%
Percent Expended	72.93%	Appropriated to Date	2687.3
Total Funding Years	24	Percent Appropriated	96.56%

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

Operating and Support Cost

Cost Estimate Details

Date of Estimate: September 30, 2018
Source of Estimate: POE
Quantity to Sustain: 31
Unit of Measure: Aircraft
Service Life per Unit: 25.00 Years
Fiscal Years in Service: FY 2011 - FY 2035

Sustainment Strategy

- Production will leave the AWACS fleet with one Commercial Off The Shelf (COTS) Diminishing Manufacturing Sources (DMS) version (DMS 4.0) going into the O&S phase
- Aircraft DMS End of Life assume 10 years and Ground Station and Trainer DMS End of life every 5 years
- O&S COTS procured with Air Force O&M funding
- O&S COTS installed by Air Logistics Complex during Programmed Depot Maintenance or a dedicated modification installation line
- Software maintained organically with contractor support/partnership
- COTS, active DMS, and DMS refreshes done with contractor partnership
- No modifications or capability upgrades included other than planned DMS tech refresh
- The Product Support Business Case Analysis was completed in December 2016 and indicated that a competitive Performance Based Logistics contract was the best strategy. This has been incorporated in the Life Cycle Sustainment Plan.

Antecedent Information

The Antecedent system is AWACS Block 30/35. AWACS Block 30/35 O&S cost is based on historical Block 30/35 O&S cost projected through FY 2035. These costs are used for comparison to Block 40/45 O&S costs. This comparison assumes Block 30/35 can be maintained through FY 2035 and assumes no major DMS issues (Status Quo). Block 30/35 cost was obtained from the Air Force Total Ownership Cost database for a period of FY 2012-2014. The data was normalized to BY 2012 and projected out through FY 2035.

Cost Element	Annual O&S Costs BY2012 \$M	
	AWACS Blk 40/45 Upgrade Average Annual Cost Per Aircraft	AWACS Blk 30/35 (Antecedent) Average Annual Cost Per Aircraft
Unit-Level Manpower	10.595	10.559
Unit Operations	0.620	0.591
Maintenance	6.503	6.584
Sustaining Support	0.852	0.515
Continuing System Improvements	1.021	0.492
Indirect Support	1.911	1.895
Other	0.000	0.000
Total	21.502	20.636

AWACS Block 40/45 Upgrade program Yearly Average per Aircraft costs represent total O&S costs for the E-3 Aircraft to include the Block 40/45 Upgrade.

Item	Total O&S Cost \$M			
	AWACS Blk 40/45 Upgrade			AWACS Blk 30/35 (Antecedent)
	Current Production APB Objective/Threshold		Current Estimate	
Base Year	662.0	728.2	670.0	15993.7
Then Year	881.0	N/A	883.0	0.0

The AWACS Block 40/45 Upgrade program Current Estimate is the delta cost from the AWACS Block 30/35 (Antecedent) Current Estimate, reflecting the total O&S cost of the AWACS Enterprise.

Equation to Translate Annual Cost to Total Cost

Average annual cost per AWACS aircraft (31) (entire fleet) is calculated by adding the AWACS 40/45 delta cost (\$670M) to the 30/35 cost (\$15,993.7) divided by the life of the platform (FY 2011-2035, 25 years) and the number of Aircraft (31).
 $\$16,663.6\text{M} / 25 / 31 = \21.502M per aircraft per year.

O&S Cost Variance		
Category	BY 2012 \$M	Change Explanations
Prior SAR Total O&S Estimates - Dec 2018 SAR	670.0	
Programmatic/Planning Factors	0.0	
Cost Estimating Methodology	0.0	
Cost Data Update	0.0	
Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	0.0	
Other	0.0	
Total Changes	0.0	
Current Estimate	670.0	

Disposal Estimate Details

Date of Estimate:

Source of Estimate:

Disposal/Demilitarization Total Cost (BY 2012 \$M):

There are no disposal costs associated specifically with the AWACS Block 40/45 Upgrade.