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## Selected Acquisition Report (SAR)

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 2020 President's Budget

Defense Acquisition Management  
Information Retrieval  
(DAMIR)

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**Sensitivity Originator**

No originator information is 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**

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 October 20, 2015

## 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 Presidents Budget (PB) included a removal of Advanced Battle Management Surveillance 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 2021 - FY 2024 also has disconnects which are being resolved in the FY 2021 PB.

Additional key software deficiencies were identified during Operational Test and Evaluation and need to be resolved prior to follow-on operational test and evaluation. Currently the Mission Computing Software 12.3 is planned for software delivery NLT Second Quarter FY 2019. Operational Utility Evaluation is planned for the start of January 2019. Final Operational Test and Evaluation (FOT&E) is expected to be executed during the Fourth Quarter FY 2020.

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

<b>Schedule</b>		<input checked="" 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 checked="" type="checkbox"/>
<b>Unit Cost</b>	PAUC	<input type="checkbox"/>
	APUC	<input type="checkbox"/>

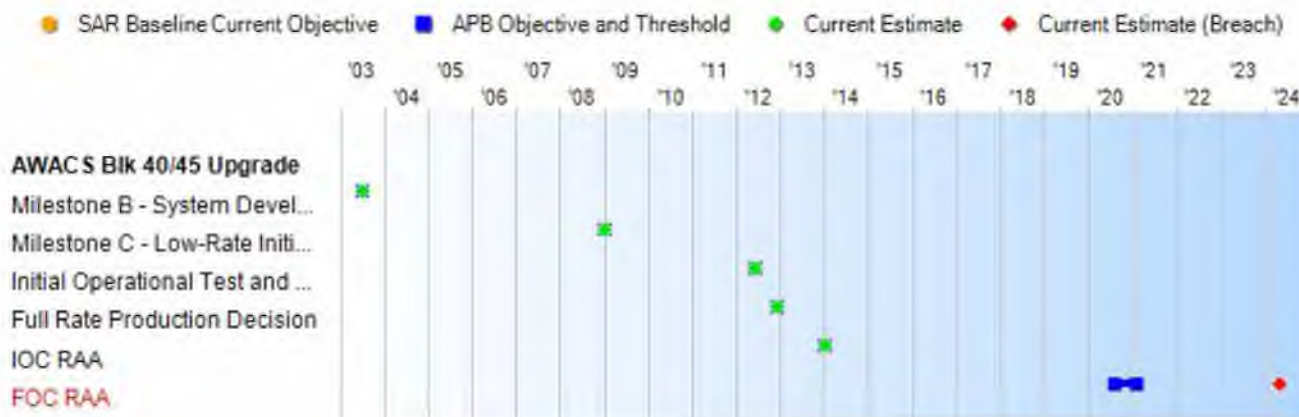
#### Explanation of Breach

The schedule breach of FOC Required Assets Available (RAA) and the O&S cost breach are due to a quantity increase of seven aircraft. The FOC RAA estimate is now May 2024 and the O&S cost estimate is now \$670M (BY 2012). An updated APB is in coordination.

#### Nunn-McCurdy Breaches

<b>Current UCR Baseline</b>		
	PAUC	None
	APUC	None
<b>Original UCR Baseline</b>		
	PAUC	None
	APUC	None

### Schedule



Schedule Events				
Events	SAR Baseline Production Estimate	Current APB Production Objective/Threshold	Current Estimate	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	Aug 2020	Feb 2021	<b>May 2024<sup>1</sup></b>

<sup>1</sup> APB Breach

#### 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. Current estimated FOC RAA date is based on FY 2019 PB and 31 aircraft fleet size.

(3) The reason for the schedule deviation is the increase in AWACS fleet quantity from 24 to 31. The FY 2015 President's budget reduced the AWACS inventory of 31 aircraft to 24 and funding for Block 40/45 Full Rate Production to 24 aircraft. The FOC RAA objective and threshold dates remained August 2020 and February 2021, respectively. Recent FY 2017 - FY 2019 budgetary actions have restored the required funding for these seven aircraft. The change in the FOC RAA schedule is due to a delay in the aircraft kit deliveries from Boeing.

**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	
<b>Multi-Source Integration</b>				
(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.
<b>Net Ready</b>				
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 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 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 DAA; 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**

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  
ISP - Information Support Plan  
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
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67411L Airborne Warning and Control Systems (Sunk)

### Procurement

Appn	BA	PE
------	----	----

Air Force 3010 06 0207417F

Line Item	Name
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000999 Initial Spares (Sunk)

Air Force 3010 05 0207417F

Line Item	Name
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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	Current Estimate
RDT&E	1319.0	1272.6	1415.8	1272.7	1192.2	1145.9	1145.9
Procurement	1503.4	1389.8	1527.4	1480.4	1615.4	1496.5	1603.5
Flyaway	--	--	--	1428.0	--	--	1546.2
Recurring	--	--	--	1017.4	--	--	1096.0
Non Recurring	--	--	--	410.6	--	--	450.2
Support	--	--	--	52.4	--	--	57.3
Other Support	--	--	--	0.0	--	--	0.0
Initial Spares	--	--	--	52.4	--	--	57.3
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	2822.4	2662.4	N/A	2753.1	2807.6	2642.4	2749.4

#### Current APB Cost Estimate Reference

AWACS Block 40/45 FRP SCP Update dated July 28, 2015

#### Cost Notes

Throughout the Cost and Funding section, the quantity of 31 reflects kit procurement and not kit installations. To date, the program has procured and delivered 20 kits, 17 of which have been installed on aircraft.

Program Cost Risks include Cyber Security updates, Non-Recurring Engineering to address Hardware and Software obsolescence and higher depot labor costs driven by design changes.

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

Total Quantity			
Quantity	SAR Baseline Production Estimate	Current APB Production	Current Estimate
RDT&E		0	0
Procurement		31	24
Total		31	24

## 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	1145.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1145.9
Procurement	1404.9	74.0	36.0	46.1	42.5	0.0	0.0	0.0	1603.5
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	2550.8	74.0	36.0	46.1	42.5	0.0	0.0	0.0	2749.4
PB 2019 Total	2602.0	57.7	41.7	39.5	28.8	0.0	0.0	0.0	2769.7
Delta	-51.2	16.3	-5.7	6.6	13.7	0.0	0.0	0.0	-20.3

#### Funding Notes

The FY 2020 Presidents Budget adjusted Program Funding in FY 2020 - FY 2022.

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	0	0	0	0	0	0	0	0	0	0
Production	0	31	0	0	0	0	0	0	0	31
PB 2020 Total	0	31	0	0	0	0	0	0	0	31
PB 2019 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	--	37.6	16.0	101.9	155.5	--	155.5	
2017	4	108.8	63.4	73.0	245.2	18.0	263.2	
2018	7	82.6	17.4	42.9	142.9	--	142.9	
2019	--	25.6	5.6	26.5	57.7	16.3	74.0	
2020	--	--	19.8	16.2	36.0	--	36.0	
2021	--	31.9	5.4	8.8	46.1	--	46.1	
2022	--	29.8	5.3	7.4	42.5	--	42.5	
Subtotal	31	879.2	216.8	450.2	1546.2	57.3	1603.5	

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	--	59.1	9.4	62.6	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	--	34.2	14.6	92.7	141.5	--	141.5	
2017	4	97.0	56.6	65.1	218.7	16.1	234.8	
2018	7	72.1	15.2	37.4	124.7	--	124.7	
2019	--	21.9	4.8	22.7	49.4	13.9	63.3	
2020	--	--	16.6	13.6	30.2	--	30.2	
2021	--	26.2	4.4	7.3	37.9	--	37.9	
2022	--	24.0	4.3	6.0	34.3	--	34.3	
Subtotal	31	819.9	197.5	410.6	1428.0	52.4	1480.4	

In the chart below, "Cost Quantity Information", the End Item Recurring Flyaway costs reflect the year that the Block 40/45 Upgrade kits are purchased, not when they are installed.

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	117.0
2015	7	110.4
2016	--	--
2017	4	131.2
2018	7	144.2
2019	--	--
2020	--	--
2021	--	--
2022	--	--
Subtotal	31	819.9

## Low Rate Initial Production

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

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

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**

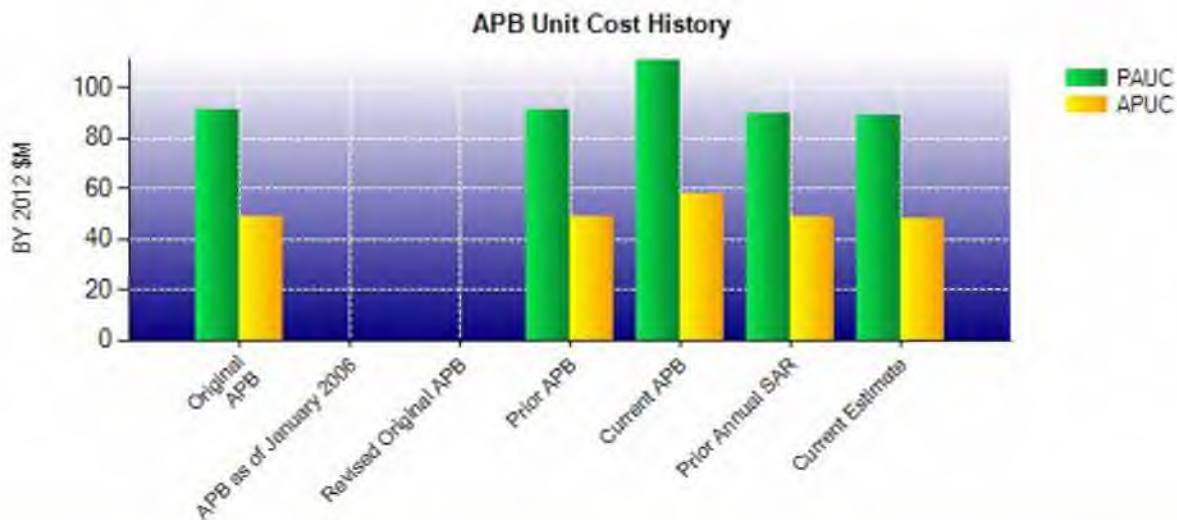
None

## **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 (Oct 2015 APB)	Current Estimate (Dec 2018 SAR)	
<b>Program Acquisition Unit Cost</b>			
Cost	2662.4	2753.1	
Quantity	24	31	
Unit Cost	110.933	88.810	-19.94
<b>Average Procurement Unit Cost</b>			
Cost	1389.8	1480.4	
Quantity	24	31	
Unit Cost	57.908	47.755	-17.53
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 2018 SAR)	
<b>Program Acquisition Unit Cost</b>			
Cost	2822.4	2753.1	
Quantity	31	31	
Unit Cost	91.045	88.810	-2.45
<b>Average Procurement Unit Cost</b>			
Cost	1503.4	1480.4	
Quantity	31	31	
Unit Cost	48.497	47.755	-1.53



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	May 2013	91.045	48.497	90.568	52.110
Current APB	Oct 2015	110.933	57.908	110.100	62.354
Prior Annual SAR	Dec 2017	89.632	48.577	89.345	52.381
Current Estimate	Dec 2018	88.810	47.755	88.690	51.726

**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	-0.129	-1.424	-0.806	0.000	0.055	0.000	0.426	-1.878	88.690

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	-0.152	-1.422	-0.268	0.000	1.032	0.000	0.426	-0.384	51.726

<b>SAR Baseline History</b>				
<b>Item</b>	<b>SAR Planning Estimate</b>	<b>SAR Development Estimate</b>	<b>SAR Production Estimate</b>	<b>Current Estimate</b>
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	2749.4
Total Quantity	N/A	N/A	31	31
PAUC	N/A	N/A	90.568	88.690

**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	-10.9	--	-10.2
Quantity	--	-44.1	--	-44.1
Schedule	-16.7	-8.3	--	-25.0
Engineering	--	--	--	--
Estimating	-30.3	+1.9	--	-28.4
Other	--	--	--	--
Support	--	+13.5	--	+13.5
Subtotal	-46.3	-47.9	--	-94.2
Current Changes				
Economic	--	+6.2	--	+6.2
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	+30.1	--	+30.1
Other	--	--	--	--
Support	--	-0.3	--	-0.3
Subtotal	--	+36.0	--	+36.0
Total Changes	-46.3	-11.9	--	-58.2
CE - Cost Variance	1145.9	1603.5	--	2749.4
CE - Cost & Funding	1145.9	1603.5	--	2749.4

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	--	-40.5
Other	--	--	--	--
Support	--	+11.1	--	+11.1
Subtotal	-46.3	-46.9	--	-93.2
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	+24.2	--	+24.2
Other	--	--	--	--
Support	--	-0.3	--	-0.3
Subtotal	--	+23.9	--	+23.9
Total Changes	-46.3	-23.0	--	-69.3
CE - Cost Variance	1272.7	1480.4	--	2753.1
CE - Cost & Funding	1272.7	1480.4	--	2753.1

Previous Estimate: September 2018

Procurement	\$M	
	Base Year	Then Year
<b>Current Change Explanations</b>		
Revised escalation indices. (Economic)	N/A	+6.2
Additional funding in FY 2020 - FY 2022 to align to the FY 2020 PB. (Estimating)	+29.4	+36.0
Adjustment for current and prior escalation. (Estimating)	-4.5	-5.0
Revised estimate due to application of new out year escalation indices. (Estimating)	-0.7	-0.9
Adjustment for current and prior escalation. (Support)	-0.3	-0.4
Decrease in Initial Spares due to the realignment of funding from FY 2018 to FY 2019. (Support)	0.0	+0.1
<b>Procurement Subtotal</b>	<b>+23.9</b>	<b>+36.0</b>

## 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	318.7	327.6

### 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 (2/26/2019)	+18.9	-13.0
Previous Cumulative Variances	+18.3	-9.7
Net Change	+0.6	-3.3

### Cost and Schedule Variance Explanations

The favorable net change in the cost variance is due to completed FRP CLINS that under-ran. Contractor realized efficiencies across multiple procurement efforts.

The unfavorable net change in the 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.



**Notes**

The Earned Value (EV) data 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 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	17	17	31	54.84%
Total Program Quantity Delivered	17	17	31	54.84%

Expended and Appropriated (TY \$M)			
Total Acquisition Cost	2749.4	Years Appropriated	21
Expended to Date	1971.3	Percent Years Appropriated	87.50%
Percent Expended	71.70%	Appropriated to Date	2624.8
Total Funding Years	24	Percent Appropriated	95.47%

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

## Operating and Support Cost

### Cost Estimate Details

<b>Date of Estimate:</b>	September 30, 2018
<b>Source of Estimate:</b>	POE
<b>Quantity to Sustain:</b>	31
<b>Unit of Measure:</b>	Aircraft
<b>Service Life per Unit:</b>	25.00 Years
<b>Fiscal Years in Service:</b>	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
<b>Total</b>	<b>21.502</b>	<b>20.636</b>

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		Current Estimate	AWACS Blk 30/35 (Antecedent)
	Current Production APB Objective/Threshold			
<b>Base Year</b>	550.0	605.0	<b>670.0<sup>1</sup></b>	15993.7
<b>Then Year</b>	731.3	N/A	883.0	N/A

<sup>1</sup> APB O&S Cost Breach

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).  $\$16,663.6M / 25 / 31 = \$21.502M$  per aircraft per year.

O&S Cost Variance		
Category	BY 2012 \$M	Change Explanations
Prior SAR Total O&S Estimates - Sep 2018 SAR	661.8	
Programmatic/Planning Factors	0.0	
Cost Estimating Methodology	8.2	SCP Minor Methodology Update
Cost Data Update	0.0	
Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	0.0	
Other	0.0	
Total Changes	8.2	
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.