



Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-261



Advanced Extremely High Frequency Satellite (AEHF)

As of FY 2016 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

Table of Contents

Common Acronyms and Abbreviations for MDAP Programs	3
Program Information	5
Responsible Office	5
References	6
Mission and Description	7
Executive Summary	8
Threshold Breaches	10
Schedule	11
Performance	14
Track to Budget	20
Cost and Funding	22
Low Rate Initial Production	43
Foreign Military Sales	44
Nuclear Costs	44
Unit Cost	45
Cost Variance	51
Contracts	57
Deliveries and Expenditures	60
Operating and Support Cost	61

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)

Program Information

Program Name

Advanced Extremely High Frequency Satellite (AEHF)

DoD Component

Air Force

Joint Participants

Canada; The Netherlands; United Kingdom

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References

AEHF SV 1-4

SAR Baseline (Production Estimate)

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated March 3, 2005

Approved APB

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated March 31, 2014

AEHF SV 5-6

SAR Baseline (Production Estimate)

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated October 23, 2012

Approved APB

Approved Acquisition Program Baseline (APB) dated October 23, 2012

Mission and Description

Advanced Extremely High Frequency Satellite (AEHF) is a joint service satellite communications system that provides global, survivable, secure, protected, and jam-resistant communications for high priority military ground, sea, and air assets. The system consists of four satellites in Geosynchronous Earth Orbit that provide 10 times the capacity of the 1990s-era Milstar Block II satellites. The system provides continuous 24-hour Extremely High Frequency Extended Data Rate coverage between 65 degrees north and 65 degrees south latitude. AEHF allows the National Security Council and Combatant Commanders to control their tactical and strategic forces at all levels of conflict up to and including general nuclear war, and it supports the attainment of information superiority.

The AEHF operational system is composed of three segments: space, terminals, and mission control. The space segment consists of a cross-linked constellation of satellites to provide worldwide coverage. The terminal segment includes fixed and mobile ground terminals, ship and submarine terminals, and airborne terminals. The mission control segment controls satellites on orbit, monitors satellite health, and provides communication system planning and monitoring. This segment is also survivable, with both fixed and mobile control stations.

International Cooperative Program – The three countries that have signed Memoranda of Understanding are as follows: Canada, November 16, 1999; the Netherlands, November 8, 2002; and the United Kingdom, September 9, 2003. These bilateral agreements allocate a portion of protected communication resources in exchange for financial participation in development. The Netherlands, Canada, and the United Kingdom signed Memoranda of Understanding in preparation for entering into a Foreign Military Sales case to purchase International Partnership variants of AEHF terminals.

Executive Summary

Program Highlights Since Last Report

The Advanced Extremely High Frequency (AEHF) program had noteworthy achievements in 2014. AEHF-3 successfully arrived on-orbit on January 6, 2014 following a launch on September 18, 2013. U.S. Strategic Command (USSTRATCOM) declared early operational use of AEHF-1, -2, & -3 on May 12, 2014. All three vehicles are fully integrated into the Milstar/AEHF constellation and performing well with AEHF-1 operating from 68 degrees West (covering the Eastern United States), AEHF-2 operating from 16.5 degrees West (covering Western Europe and Africa), and AEHF-3 which began repositioning from its interim Multi-service Operational Test and Evaluation (MOT&E) location of 155 deg West on January 21, 2015. AEHF-3 is expected to arrive at its new operating location of 152 deg East (covering the Western Pacific Ocean) on approximately March 18, 2015.

The AEHF-4 satellite bus is 79% complete and the payload is 79% complete. Northrop Grumman delivered the payload to the AEHF prime contractor, Lockheed Martin, for Payload Integration and Test over four months ahead of the baseline schedule. The Payload Module and Core Module have been successfully mated, marking the beginning of single line flow integration and testing well ahead of the baseline schedule. Launch availability for AEHF-4 is projected for 2017.

AEHF 5-6 production has steadily progressed since contract definitization on October 31, 2013 with a value of \$2.2B. The Lockheed Martin satellite buses for the combined AEHF 5-6 effort are 47% complete and the Northrop Grumman payloads for the combined effort are 47% complete. Launch availability for AEHF-5 and AEHF-6 are projected for 2018 and 2019 respectively.

On October 16, 2014, the program received PEO certification for the systems (ground and space vehicle) to enter Air Force Operational Test and Evaluation Center (AFOTEC) System Dedicated Operational Test which began November 3, 2014 and ran through mid-January 2015. AFOTEC has completed testing with the Navy, Army, and on-site data collection for USSTRATCOM. MOT&E completed on January 16, 2015. The program is currently on track to reach IOC in June 2015.

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

History of Significant Developments Since Program Initiation

May 1999: The DAE signed the Milestone I ADM approving entry into Phase I, System Definition.

August 1999: Two competitive System Definition contracts were awarded to Lockheed/TRW (now Northrop Grumman) and Hughes (now Boeing Satellite Systems) teams. Following the System Requirements Review (SRR) and the Milstar flight 3 launch failure, the AEHF competition was re-established into a National Team consisting of all three contractors with Lockheed as the prime integration contractor. A "pathfinder" concept was put into effect to mitigate the loss of Milstar 3 capability. This concept included the acceleration of a Milstar II capable AEHF satellite followed by delivery of four additional fully capable AEHF satellites.

May 26, 2000: An ADM approved by USD(AT&L) authorized a sole source Firm Fixed Price pathfinder concept award to a team of contractors. Thereafter the program was broken into two production cycles due to fiscal constraints. The first cycle consisted of AEHF-1 & -2 and the Mission Control Segment (MCS) development for an FY 2008 IOC. The second cycle included AEHF-3, -4, & -5 production for a FOC in FY 2012.

FY 2002: Congressional reductions and the initiation of the Transformational Communications Satellite (TSAT) program, resulted in a Deputy Secretary of Defense directed change to the acquisition strategy in December 2002 removing AEHF-4 & -5 from the baseline.

December 2002: The contract launch dates for AEHF-1 & -2 were December 2006 and December 2007, and AEHF-3 was

projected to be launched in April 2009. The definitized contract breached the APB's IOC schedule threshold and overall program cost. An updated APB incorporating the new August 2009 IOC and revised strategy was signed in December 2002.

March 2005: A revised APB to include the launch slip and approval of AEHF-3 procurement was signed. Due to funding constraints, the FY 2004 PB introduced a one-year production gap between AEHF-2 and AEHF-3. In addition to the cost of delaying AEHF-3 production, other subsequent cost drivers, including payload hardware testing, information assurance product delivery delays and replacement of critical electronic parts, drove a one-year launch delay. A Nunn-McCurdy significant unit cost breach was sent to Congress on December 2, 2004.

May 2007: The AEHF-1 & -2 and MCS developments were well underway. The program successfully completed run-for-record intersegment tests for AEHF/Milstar compatibility and Lockheed Martin also successfully demonstrated the ability of the AEHF Satellite Mission Control Subsystem to command and control the AEHF payload engineering model and the Interim Command and Control (C2) Terminal (ICT) for Milstar.

September 2008: A Nunn-McCurdy critical unit cost breach notification occurred on September 5, 2008 due to the addition of AEHF-4 to the program and the AEHF-1 & -2 launch slips' cascading cost and schedule impacts on AEHF-3. The Government had concluded the production gap of four years for AEHF-4 would cause significant cost impacts to obsolescence issues such as Monolithic Microwave Integrated Circuits. The Nunn-McCurdy breach was caused by additional funding required for obsolescence, a seven month schedule delay due to AEHF-1 hardware issues, additional Thermal Vacuum tests, greater than expected AEHF-1 & -2 integration costs, and an overall IOC schedule slip. The USD (AT&L) signed an ADM on December 29, 2008 certifying the AEHF program to proceed with a fully-funded four-satellite baseline. The ADM established new launch dates of September 2010, 2011, 2012, and 2016.

June 2009: After the cancellation of the TSAT program, the DoD directed the procurement of additional AEHF satellites. The AEHF-4 contract was awarded for \$1.4B in December 2010, and the MDA approved the AEHF 1-4 APB in June 2011. In December 2011, The MDA approved the AEHF 5-6 Acquisition Strategy as a DoD Efficient Space Procurement (ESP), and the APB designating AEHF 5-6 as a subprogram was approved by MDA October 23, 2012. On October 31, 2013 the Fixed Price Incentive Fee contract was definitized for the block buy of AEHF 5-6.

May 2010: The AEHF program office completed the Command and Control (C2) transition of the five-satellite Milstar constellation from a legacy C2 system to the new AEHF C2 system. In December 2011 an Interim Contractor Support contract was awarded to Lockheed Martin to provide sustainment of the space and ground segments until IOC is achieved.

August 2010: AEHF-1 was successfully launched from Cape Canaveral Air Force Station (CCAFS) on August 14, 2010. AEHF-1 experienced an anomaly that resulted in the failure of a Liquid Apogee Engine. Orbit raising was completed using the Reaction Engine Assemblies on October 24, 2011 after a 14-month effort. Satellite Control Authority (SCA) was transferred on March 12, 2012.

May 2012: AEHF-2 was successfully launched from Cape Canaveral Air Force Station (CCAFS) on May 4, 2012 and the space vehicle successfully completed on-orbit testing on September 24, 2012. SCA was transferred on November 7, 2012.

September 2013: AEHF-3 was successfully launched from Cape Canaveral Air Force Station (CCAFS) on September 18, 2013 and the space vehicle successfully completed on-orbit testing on January 6, 2014. SCA was completed on March 21, 2014. AEHF-1, -2, & -3 are now fully integrated into the Milstar constellation.

Threshold Breaches

AEHF SV 1-4

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

AEHF SV 5-6

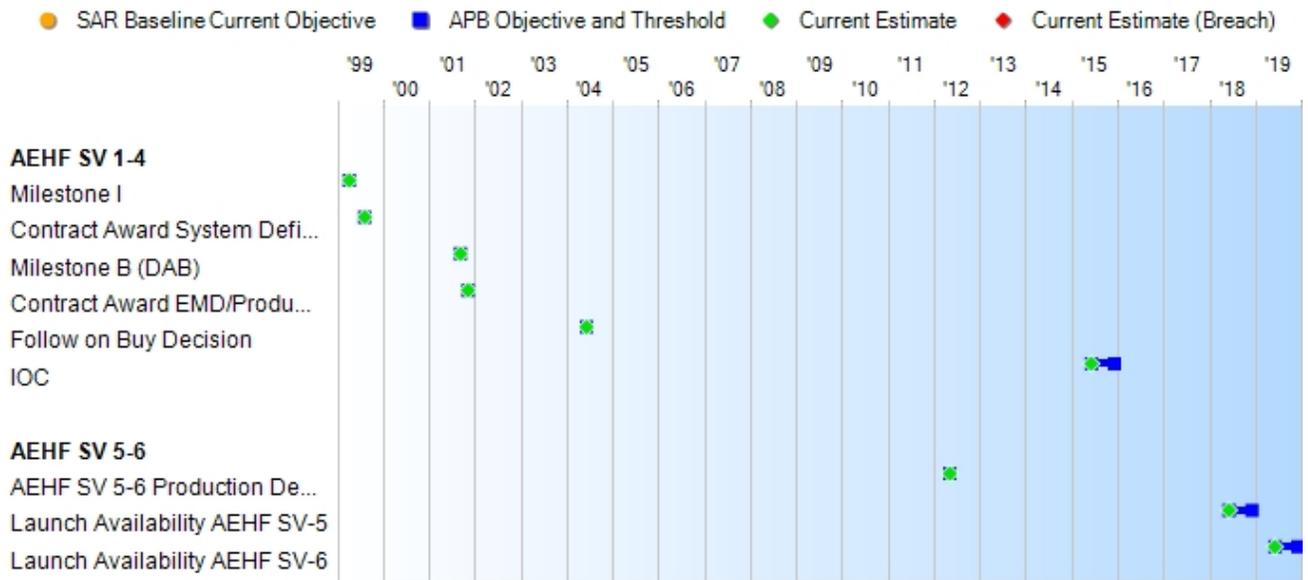
APB Breaches

- 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



AEHF SV 1-4

Schedule Events				
Events	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate
Milestone I	Apr 1999	Apr 1999	Apr 1999	Apr 1999
Contract Award System Definition	Aug 1999	Aug 1999	Aug 1999	Aug 1999
Milestone B (DAB)	Jun 2001	Sep 2001	Sep 2001	Sep 2001
Contract Award EMD/Production	Jun 2001	Nov 2001	Nov 2001	Nov 2001
Follow on Buy Decision	Jun 2004	Jun 2004	Jun 2004	Jun 2004
IOC	Jun 2010	Jun 2015	Dec 2015	Jun 2015

Change Explanations

None

Notes

The IOC milestone is defined in the AEHF Operational Requirements Document dated October 2000 and addresses the capability at the time satellite two is operational. It also includes missions supported, networks active and two separate satellites operating in the AEHF mode. The operational control segment consists of one fixed and one transportable control element and an interim fully operational communications management system.

Mission Planning Element Release 7.5 and AEHF Satellite Mission Control System Release 7.5.1 completed MOT&E on January 16, 2015. Both releases will be utilized for AEHF system IOC declaration in 2015.

Acronyms and Abbreviations

SV - Space Vehicle

AEHF SV 5-6

Schedule Events				
Events	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate
AEHF SV 5-6 Production Decision	May 2012	May 2012	May 2012	May 2012
Launch Availability AEHF SV-5	Jun 2018	Jun 2018	Dec 2018	Jun 2018
Launch Availability AEHF SV-6	Jun 2019	Jun 2019	Dec 2019	Jun 2019

Change Explanations

None

Notes

Launch availability is defined as all factory work completed and satellite readied for shipment to the launch base.

Acronyms and Abbreviations

SV - Space Vehicle

Performance

AEHF SV 1-4

Performance Characteristics				
SAR Baseline Production Estimate	Current APB Production Objective/Threshold	Demonstrated Performance	Current Estimate	
Capacity				
1.2 Gbps CMTW, 600 Mbps Strategic	1.2 Gbps CMTW, 600 Mbps Strategic	Support at least 500 Mbps for CMTW Scenario and at least 350 Mbps for Strategic Scenario	1.0 Gbps CMTW Scenario, 600 Mbps Strategic Scenario - verified required capability as part of system requirement sell-off prior to AEHF-1 launch	1.2 Gbps CMTW, 600 Mbps Strategic
Nuclear Protection				
Provide assured communications to survivable nuclear forces exposed to the environment specified in NCGS-89-06, and for those critical networks that support the following critical functions: situation monitoring, decision making, force direction, force management, and planning	Provide assured communications to survivable nuclear forces exposed to the environment specified in NCGS-89-06, and for those critical networks that support the following critical functions: situation monitoring, decision making, force direction, force management, and planning	Provide assured communications to survivable nuclear forces exposed to the environment specified in NCGS-89-06, and for those critical networks that support the following critical functions: situation monitoring, decision making, force direction, force management, and planning	Verified required capability as part of system requirement sell-off prior to AEHF-2 launch.	Provide assured communications to survivable nuclear forces exposed to the environment specified in NCGS-89-06, and for those critical networks that support the following critical functions: situation monitoring, decision making, force direction, force management, and planning
Access and Control				
Provide users ability to plan, control, & reconfigure their apportioned resources; critical functions such as situation monitoring, decision making, force direction, force management, & planning shall not be disrupted by communications configuration changes to	Provide users ability to plan, control, & reconfigure their apportioned resources; critical functions such as situation monitoring, decision making, force direction, force management, & planning shall not be disrupted by communications configuration changes to	Provide users ability to plan, control, & reconfigure their apportioned resources; critical functions such as situation monitoring, decision making, force direction, force management, & planning shall not be disrupted by communications configuration changes to	Verified required capability as part of system requirement sell-off prior to AEHF-2 launch. Demonstrated LDR operationally ready capability in AEHF-1 on-orbit test	Provide users ability to plan, control, & reconfigure their apportioned resources; critical functions such as situation monitoring, decision making, force direction, force management, & planning shall not be disrupted by communications configuration changes to noncritical functions.

noncritical functions	noncritical functions	noncritical functions		
Interoperability				
AEHF Interoperability				
Support joint interoperable war-fighter communications among all military branches EHF terminals	Support joint interoperable war-fighter communications among all military branches EHF terminals	Support joint interoperable war-fighter communications among all military branches EHF terminals	Verified required capability as part of system requirement sell-off prior to AEHF-2 launch. Demonstrated operationally ready capability in AEHF-1 on-orbit test.	Support joint interoperable warfighter communications among all military branches EHF terminals
Milstar Backward Compatible				
Operate with the Milstar system, at all LDR and MDR terminal supported data rates, throughout the Milstar transition to the AEHF system	Operate with the Milstar system, at all LDR and MDR terminal supported data rates, throughout the Milstar transition to the AEHF system	Operate with the Milstar system, at all LDR and MDR terminal supported data rates, throughout the Milstar transition to the AEHF system	Verified required capability as part of system requirement sell-off prior to AEHF-1 launch. Demonstrated operationally ready capability in AEHF-1 on-orbit test.	Operate with the Milstar system, at all LDR and MDR terminal supported data rates, throughout the Milstar transition to the AEHF system

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

Requirements Reference

Operational Requirements Document (ORD), dated October 1, 2000

Change Explanations

None

Notes

Performance Characteristics are the same on the AEHF 1-4 and 5-6 sub-programs.

The program completed Multi-service Operational Test and Evaluation in January 2015. A final report of AFOTEC's assessment of Dedicated Operational Test will be available 90 days after the conclusion of testing.

Acronyms and Abbreviations

AEHF - Advanced Extremely High Frequency
AFOTEC - Air Force Operational Test and Evaluation Center
CMTW - Combined Major Theater Warfare
EHF - Extremely High Frequency
Gbps - Giga bytes per second
LDR - Low Data Rate
Mbps - Mega bytes per second
MCS - Mission Control Segment
MDR - Medium Data Rate
Milstar - Military Strategic and Tactical Relay
NCGS - Nuclear Criteria Group Secretariat
OUE - Operational Utility Evaluation
SV - Space Vehicle

AEHF SV 5-6

Performance Characteristics				
SAR Baseline Production Estimate	Current APB Production Objective/Threshold	Demonstrated Performance	Current Estimate	
Capacity				
1.2 Gbps CMTW, 600 Mbps Strategic	1.2 Gbps CMTW, 600 Mbps Strategic	Support at least 500 Mbps for CMTW Scenario and at least 350 Mbps for Strategic Scenario	1.0 Gbps CMTW Scenario, 600 Mbps Strategic Scenario - verified required capability as part of system requirement sell-off prior to AEHF-1 launch	1.2 Gbps CMTW, 600 Mbps Strategic
Nuclear Protection				
Provide assured communications to survivable nuclear forces exposed to the environment specified in NCGS-89-06, and for those critical networks that support the following critical functions: situation monitoring, decision making, force direction, force management, and planning	Provide assured communications to survivable nuclear forces exposed to the environment specified in NCGS-89-06, and for those critical networks that support the following critical functions: situation monitoring, decision making, force direction, force management, and planning	Provide assured communications to survivable nuclear forces exposed to the environment specified in NCGS-89-06, and for those critical networks that support the following critical functions: situation monitoring, decision making, force direction, force management, and planning	Verified required capability as part of system requirement sell-off prior to AEHF-2 launch.	Provide assured communications to survivable nuclear forces exposed to the environment specified in NCGS-89-06, and for those critical networks that support the following critical functions: situation monitoring, decision making, force direction, force management, and planning.
Access and Control				
Provide users ability to plan, control, & reconfigure their apportioned resources; critical functions such as situation monitoring, decision making, force direction, force management, & planning shall not be disrupted by communications configuration changes to noncritical functions	Provide users ability to plan, control, & reconfigure their apportioned resources; critical functions such as situation monitoring, decision making, force direction, force management, & planning shall not be disrupted by communications configuration changes to noncritical functions	Provide users ability to plan, control, & reconfigure their apportioned resources; critical functions such as situation monitoring, decision making, force direction, force management, & planning shall not be disrupted by communications configuration changes to noncritical functions	Verified required capability as part of system requirement sell-off prior to AEHF-2 launch. Demonstrated LDR operationally ready capability in AEHF-1 on-orbit test	Provide users ability to plan, control, & reconfigure their apportioned resources; critical functions such as situation monitoring, decision making, force direction, force management, & planning shall not be disrupted by communications configuration changes to noncritical functions.
AEHF Interoperability				

Support joint interoperable war-fighter communications among all military branches EHF terminals	Support joint interoperable war-fighter communications among all military branches EHF terminals	Support joint interoperable war-fighter communications among all military branches EHF terminals	Verified required capability as part of system requirement sell-off prior to AEHF-2 launch. Demonstrated operationally ready capability in AEHF-1 on-orbit test	Support joint interoperable war-fighter communications among all military branches EHF terminals
Milstar Backward Compatible				
Operate with the Milstar system, at all LDR and MDR terminal supported data rates, throughout the Milstar transition to the AEHF system	Operate with the Milstar system, at all LDR and MDR terminal supported data rates, throughout the Milstar transition to the AEHF system	Operate with the Milstar system, at all LDR and MDR terminal supported data rates, throughout the Milstar transition to the AEHF system	Verified required capability as part of system requirement sell-off prior to AEHF-1 launch. Demonstrated operationally ready capability in AEHF-1 on-orbit test	Operate with the Milstar system, at all LDR and MDR terminal supported data rates, throughout the Milstar transition to the AEHF system

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Requirements Reference

Operational Requirements Document (ORD), dated October 1, 2000

Change Explanations

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Notes

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Acronyms and Abbreviations

AFOTEC - Air Force Operational Test and Evaluation Center
CMTW - Combined Major Theater Warfare
EHF - Extremely High Frequency
Gbps - Giga bytes per second
LDR - Low Data Rate
Mbps - Mega bytes per second
MCS - Mission Control Segment
MDR - Medium Data Rate
Milstar - Military Strategic and Tactical Relay
NCGS - Nuclear Criteria Group Secretariat
OUE - Operational Utility Evaluation
SV - Space Vehicle

Track to Budget

AEHF SV 1-4

General Notes

RDT&E is associated with AEHF Space Vehicles (SV) 1 and 2 and procurement is associated with AEHF SV 3 and 4.

In December 2014, the Office of Management and Budget directed the DoD to establish a new space procurement appropriation as a five-year availability account. Beginning in FY 2016, Air Force major procurement funding formerly under appropriation 3020F (Missile Procurement, Air Force) BA 05 will now be under 3021F (Space Procurement, Air Force) BA 01. The FY 2016 PB justification books reflect the new 3021F appropriation, and the SARs for programs impacted by this new appropriation also reflect this change.

RDT&E

Appn	BA	PE	
Air Force	3600	04	0603430F
	Project	Name	
	644050	AEHF Military Satellite Communications (MILSATCOM) (Space) (Sunk)	
Air Force	3600	05	0605431F
	Project	Name	
	657103	AEHF MILSATCOM (Space)	
	Notes:	FY 2013 only	
	657104	Evolved AEHF MILSATCOM (EAM) (Shared) (Sunk)	
	Notes:	FY 2012, FY 2014 - 2018 only	

Procurement

Appn	BA	PE	
Air Force	3020	05	0303604F
	Line Item	Name	
	ADV555	Advanced EHF (Sunk)	
Air Force	3021	01	0303604F
	Line Item	Name	
	ADV555	Advanced EHF	

AEHF SV 5-6

RDT&E

Appn	BA	PE	
Air Force	3600	04	0603430F
	Project	Name	
	644050	AEHF MILSATCOM (Space) (Sunk)	

Notes: FY 2011 only

64A030 Evolved AEHF MILSATCOM (Shared) (Sunk)
(EAM)

Notes: FY 2013 only

Air Force 3600 05 0605431F

Project	Name
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657104 Evolved AEHF MILSATCOM (Shared) (Sunk)
(EAM)

Notes: FY 2014 - 2015 only

Notes

Projects 64A030 and 657104 also fund the Military Satellite Communications (MILSATCOM) Space Modernization Initiative. AEHF RDT&E funding is for the AEHF SV 6 KI-54D cryptographic device. Project 644050 is FY 2011 only. Project 64A030 is FY 2013 only. Project 657104 is for FY 2014 - 2015 only.

Procurement

Appn	BA	PE
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Air Force 3020 05 0303604F

Line Item	Name
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ADV555 Advanced EHF (Sunk)

Air Force 3021 01 0303604F

Line Item	Name
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ADV555 Advanced EHF

Cost and Funding

Cost Summary - Total Program

Total Acquisition Cost - Total Program							
Appropriation	BY 2002 \$M			BY 2002 \$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	5282.8	6489.3	--	6826.0	5542.2	7117.8	7565.0
Procurement	3233.0	5311.1	--	4601.7	4031.7	6565.5	5705.7
Flyaway	--	--	--	4601.7	--	--	5705.7
Recurring	--	--	--	4601.7	--	--	5705.7
Non Recurring	--	--	--	0.0	--	--	0.0
Support	--	--	--	0.0	--	--	0.0
Other Support	--	--	--	0.0	--	--	0.0
Initial Spares	--	--	--	0.0	--	--	0.0
MILCON	0.0	0.0	--	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	--	0.0	0.0	0.0	0.0
Total	8515.8	11800.4	N/A	11427.7	9573.9	13683.3	13270.7

Cost and Funding

Cost Summary - AEHF SV 1-4

Total Acquisition Cost - AEHF SV 1-4							
Appropriation	BY 2002 \$M			BY 2002 \$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	5223.7	6430.2	7073.2	6775.8	5468.4	7044.0	7501.8
Procurement	577.0	2655.1	2920.6	2561.6	617.3	3151.1	3048.2
Flyaway	--	--	--	2561.6	--	--	3048.2
Recurring	--	--	--	2561.6	--	--	3048.2
Non Recurring	--	--	--	0.0	--	--	0.0
Support	--	--	--	0.0	--	--	0.0
Other Support	--	--	--	0.0	--	--	0.0
Initial Spares	--	--	--	0.0	--	--	0.0
MILCON	0.0	0.0	--	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	--	0.0	0.0	0.0	0.0
Total	5800.7	9085.3	N/A	9337.4	6085.7	10195.1	10550.0

Confidence Level

Confidence Level of cost estimate for current APB: 50%

The Independent Cost Estimate (ICE) that supports the AEHF SV 1-4, like all life-cycle cost estimates previously performed by Cost Assessment and Program Evaluation (CAPE), is built upon a product-oriented work breakdown structure, which is based on historical actual cost information to the maximum extent possible, and, most importantly, based on conservative assumptions that are consistent with actual demonstrated contractor and Government performance for a series of acquisition programs in which the Department has been successful.

It is difficult to calculate mathematically the precise confidence levels associated with life-cycle cost estimates prepared for Major Defense Acquisition Programs. Based on the rigor in methods used in building estimates, the strong adherence to the collection and use of historical cost information, and the review of applied assumptions, we project that it is about equally likely that the estimate will prove too low or too high for execution of the program described.

Total Quantity - AEHF SV 1-4			
Quantity	SAR Baseline Production Estimate	Current APB Production	Current Estimate
RDT&E		2	2
Procurement		1	2
Total		3	4

Cost Summary - AEHF SV 5-6

Total Acquisition Cost - AEHF SV 5-6							
Appropriation	BY 2002 \$M			BY 2002 \$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	59.1	59.1	65.0	50.2	73.8	73.8	63.2
Procurement	2656.0	2656.0	2921.6	2040.1	3414.4	3414.4	2657.5
Flyaway	--	--	--	2040.1	--	--	2657.5
Recurring	--	--	--	2040.1	--	--	2657.5
Non Recurring	--	--	--	0.0	--	--	0.0
Support	--	--	--	0.0	--	--	0.0
Other Support	--	--	--	0.0	--	--	0.0
Initial Spares	--	--	--	0.0	--	--	0.0
MILCON	0.0	0.0	--	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	--	0.0	0.0	0.0	0.0
Total	2715.1	2715.1	N/A	2090.3	3488.2	3488.2	2720.7

Confidence Level

Confidence Level of cost estimate for current APB: 50%

The Independent Cost Estimate (ICE) to support the AEHF SV 5-6 decision, like all life-cycle cost estimates previously performed by Cost Assessment and Program Evaluation (CAPE), is built upon a product-oriented work breakdown structure, which is based on historical actual cost information to the maximum extent possible, and, most importantly, based on conservative assumptions that are consistent with actual demonstrated contractor and Government performance for a series of acquisition programs in which the Department has been successful.

It is difficult to calculate mathematically the precise confidence levels associated with life-cycle cost estimates prepared for Major Defense Acquisition Programs. Based on the rigor in methods used in building estimates, the strong adherence to the collection and use of historical cost information, and the review of applied assumptions, we project that it is about equally likely that the estimate will prove too low or too high for execution of the program described.

Cost Notes

The AEHF SV 5-6 current estimate reflects the ceiling price on SV 5/6 Fixed Price Incentive, Firm (FPIF) contract, including potential engineering change orders.

Total Quantity - AEHF SV 5-6				
Quantity	SAR Baseline Production Estimate	Current APB Production	Current Estimate	
RDT&E	0	0	0	0
Procurement	2	2	2	2
Total	2	2	2	2

Cost and Funding

Funding Summary - Total Program

Appropriation Summary									
FY 2016 President's Budget / December 2014 SAR (TY\$ M)									
Appropriation	Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	To Complete	Total
RDT&E	7183.3	253.2	77.7	37.8	13.0	0.0	0.0	0.0	7565.0
Procurement	4289.0	298.5	333.3	650.7	57.3	29.5	31.4	16.0	5705.7
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 2016 Total	11472.3	551.7	411.0	688.5	70.3	29.5	31.4	16.0	13270.7
PB 2015 Total	11437.3	510.9	399.6	678.0	57.8	29.8	31.7	16.0	13161.1
Delta	35.0	40.8	11.4	10.5	12.5	-0.3	-0.3	0.0	109.6

Cost and Funding

Funding Summary - AEHF SV 1-4

Appropriation Summary									
FY 2016 President's Budget / December 2014 SAR (TY\$ M)									
Appropriation	Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	To Complete	Total
RDT&E	7140.1	233.2	77.7	37.8	13.0	0.0	0.0	0.0	7501.8
Procurement	2866.5	67.9	93.1	20.7	0.0	0.0	0.0	0.0	3048.2
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 2016 Total	10006.6	301.1	170.8	58.5	13.0	0.0	0.0	0.0	10550.0
PB 2015 Total	9903.3	259.9	157.0	51.2	0.0	0.0	0.0	0.0	10371.4
Delta	103.3	41.2	13.8	7.3	13.0	0.0	0.0	0.0	178.6

Quantity Summary										
FY 2016 President's Budget / December 2014 SAR (TY\$ M)										
Quantity	Undistributed	Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	To Complete	Total
Development	2	0	0	0	0	0	0	0	0	2
Production	0	2	0	0	0	0	0	0	0	2
PB 2016 Total	2	2	0	0	0	0	0	0	0	4
PB 2015 Total	2	2	0	0	0	0	0	0	0	4
Delta	0	0	0	0	0	0	0	0	0	0

Funding Summary - AEHF SV 5-6

Appropriation Summary									
FY 2016 President's Budget / December 2014 SAR (TY\$ M)									
Appropriation	Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	To Complete	Total
RDT&E	43.2	20.0	0.0	0.0	0.0	0.0	0.0	0.0	63.2
Procurement	1422.5	230.6	240.2	630.0	57.3	29.5	31.4	16.0	2657.5
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 2016 Total	1465.7	250.6	240.2	630.0	57.3	29.5	31.4	16.0	2720.7
PB 2015 Total	1534.0	251.0	242.6	626.8	57.8	29.8	31.7	16.0	2789.7
Delta	-68.3	-0.4	-2.4	3.2	-0.5	-0.3	-0.3	0.0	-69.0

Quantity Summary										
FY 2016 President's Budget / December 2014 SAR (TY\$ M)										
Quantity	Undistributed	Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	To Complete	Total
Development	0	0	0	0	0	0	0	0	0	0
Production	0	2	0	0	0	0	0	0	0	2
PB 2016 Total	0	2	0	0	0	0	0	0	0	2
PB 2015 Total	0	2	0	0	0	0	0	0	0	2
Delta	0	0	0	0	0	0	0	0	0	0

Cost and Funding

Annual Funding By Appropriation - AEHF SV 1-4

Annual Funding - AEHF SV 1-4							
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
1995	--	--	--	--	--	--	23.1
1996	--	--	--	--	--	--	31.0
1997	--	--	--	--	--	--	32.3
1998	--	--	--	--	--	--	34.2
1999	--	--	--	--	--	--	54.6
2000	--	--	--	--	--	--	89.8
2001	--	--	--	--	--	--	229.8
2002	--	--	--	--	--	--	494.8
2003	--	--	--	--	--	--	832.6
2004	--	--	--	--	--	--	872.7
2005	--	--	--	--	--	--	652.2
2006	--	--	--	--	--	--	647.7
2007	--	--	--	--	--	--	599.3
2008	--	--	--	--	--	--	659.1
2009	--	--	--	--	--	--	440.7
2010	--	--	--	--	--	--	456.2
2011	--	--	--	--	--	--	364.8
2012	--	--	--	--	--	--	288.3
2013	--	--	--	--	--	--	137.0
2014	--	--	--	--	--	--	199.9
2015	--	--	--	--	--	--	233.2
2016	--	--	--	--	--	--	77.7
2017	--	--	--	--	--	--	37.8
2018	--	--	--	--	--	--	13.0
Subtotal	2	--	--	--	--	--	7501.8

Annual Funding - AEHF SV 1-4							
3600 RDT&E Research, Development, Test, and Evaluation, Air Force							
Fiscal Year	Quantity	BY 2002 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
1995	--	--	--	--	--	--	25.0
1996	--	--	--	--	--	--	33.0
1997	--	--	--	--	--	--	33.9
1998	--	--	--	--	--	--	35.7
1999	--	--	--	--	--	--	56.4
2000	--	--	--	--	--	--	91.4
2001	--	--	--	--	--	--	230.5
2002	--	--	--	--	--	--	491.1
2003	--	--	--	--	--	--	815.2
2004	--	--	--	--	--	--	833.7
2005	--	--	--	--	--	--	607.5
2006	--	--	--	--	--	--	585.6
2007	--	--	--	--	--	--	528.0
2008	--	--	--	--	--	--	569.2
2009	--	--	--	--	--	--	375.6
2010	--	--	--	--	--	--	384.0
2011	--	--	--	--	--	--	301.4
2012	--	--	--	--	--	--	234.0
2013	--	--	--	--	--	--	109.3
2014	--	--	--	--	--	--	157.1
2015	--	--	--	--	--	--	181.0
2016	--	--	--	--	--	--	59.3
2017	--	--	--	--	--	--	28.3
2018	--	--	--	--	--	--	9.6
Subtotal	2	--	--	--	--	--	6775.8

The RDT&E APPN funding profile identified in this SAR includes \$270.5M in International Partners (IP) funding, \$114.6M in Capability Insertion Program (CIP) funding, and does not include \$119M (FY 2003 - FY 2009) for Production and Qualification (P&Q) of Radiation Hardened Components.

The yearly breakout of the funding is as follows:

IP Funds (TY \$M)

FY 2002	35.2
FY 2003	44.0
FY 2004	91.0
FY 2005	67.0
FY 2006	28.5
FY 2007	3.0
FY 2008	1.8

Total 270.5

The yearly breakout of the P&Q of Radiation Hardened Components funding is as follows:

P&Q (TY \$M)

FY 2003	19.0
FY 2004	19.0
FY 2005	21.0
FY 2006	20.0
FY 2007	21.0
FY 2009	19.0

Total 119.0

The yearly breakout of the CIP funding from the Evolved AEHF Military Satellite Communications Budget Program Activity Code 657104, is as follows:

CIP (TY \$M)

FY 2012	4.7
FY 2014	14.3
FY 2015	41.8
FY 2016	24.2
FY 2017	16.5
FY2018	13.0

Total 114.6

Annual Funding - AEHF SV 1-4								
3020 Procurement Missile 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	
2005	--	78.2	--	--	78.2	--	78.2	
2006	1	521.9	--	--	521.9	--	521.9	
2007	--	--	--	--	--	--	--	
2008	--	141.4	--	--	141.4	--	141.4	
2009	--	181.2	--	--	181.2	--	181.2	
2010	1	1734.5	--	--	1734.5	--	1734.5	
2011	--	29.7	--	--	29.7	--	29.7	
2012	--	45.8	--	--	45.8	--	45.8	
2013	--	69.9	--	--	69.9	--	69.9	
2014	--	63.9	--	--	63.9	--	63.9	
2015	--	67.9	--	--	67.9	--	67.9	
Subtotal	2	2934.4	--	--	2934.4	--	2934.4	

Annual Funding - AEHF SV 1-4								
3020 Procurement Missile Procurement, Air Force								
Fiscal Year	Quantity	BY 2002 \$M						
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program	
2005	--	72.0	--	--	72.0	--	72.0	
2006	1	467.3	--	--	467.3	--	467.3	
2007	--	--	--	--	--	--	--	
2008	--	121.3	--	--	121.3	--	121.3	
2009	--	153.2	--	--	153.2	--	153.2	
2010	1	1446.2	--	--	1446.2	--	1446.2	
2011	--	24.3	--	--	24.3	--	24.3	
2012	--	36.8	--	--	36.8	--	36.8	
2013	--	54.7	--	--	54.7	--	54.7	
2014	--	49.3	--	--	49.3	--	49.3	
2015	--	51.7	--	--	51.7	--	51.7	
Subtotal	2	2476.8	--	--	2476.8	--	2476.8	

Cost Quantity Information - AEHF SV 1-4 3020 Procurement Missile Procurement, Air Force		
Fiscal Year	Quantity	End Item Recurring Flyaway (Aligned With Quantity) BY 2002 \$M
2005	--	--
2006	1	858.0
2007	--	--
2008	--	--
2009	--	--
2010	1	1703.6
2011	--	--
2012	--	--
2013	--	--
2014	--	--
2015	--	--
Subtotal	2	2561.6

Annual Funding - AEHF SV 1-4								
3021 Procurement Space 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	
2016	--	93.1	--	--	93.1	--	93.1	
2017	--	20.7	--	--	20.7	--	20.7	
Subtotal	--	113.8	--	--	113.8	--	113.8	

Annual Funding - AEHF SV 1-4 3021 Procurement Space Procurement, Air Force							
Fiscal Year	Quantity	BY 2002 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2016	--	69.6	--	--	69.6	--	69.6
2017	--	15.2	--	--	15.2	--	15.2
Subtotal	--	84.8	--	--	84.8	--	84.8

Annual Funding By Appropriation - AEHF SV 5-6

Annual Funding - AEHF SV 5-6							
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
2011	--	--	--	--	--	--	13.8
2012	--	--	--	--	--	--	--
2013	--	--	--	--	--	--	15.0
2014	--	--	--	--	--	--	14.4
2015	--	--	--	--	--	--	20.0
Subtotal	--	--	--	--	--	--	63.2

Annual Funding - AEHF SV 5-6							
3600 RDT&E Research, Development, Test, and Evaluation, Air Force							
Fiscal Year	Quantity	BY 2002 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2011	--	--	--	--	--	--	11.4
2012	--	--	--	--	--	--	--
2013	--	--	--	--	--	--	12.0
2014	--	--	--	--	--	--	11.3
2015	--	--	--	--	--	--	15.5
Subtotal	--	--	--	--	--	--	50.2

Annual Funding - AEHF SV 5-6 3020 Procurement Missile 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
2011	--	227.2	--	--	227.2	--	227.2
2012	2	524.1	--	--	524.1	--	524.1
2013	--	406.7	--	--	406.7	--	406.7
2014	--	264.5	--	--	264.5	--	264.5
2015	--	230.6	--	--	230.6	--	230.6
Subtotal	2	1653.1	--	--	1653.1	--	1653.1

Annual Funding - AEHF SV 5-6 3020 Procurement Missile Procurement, Air Force							
Fiscal Year	Quantity	BY 2002 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2011	--	185.6	--	--	185.6	--	185.6
2012	2	420.9	--	--	420.9	--	420.9
2013	--	318.5	--	--	318.5	--	318.5
2014	--	203.9	--	--	203.9	--	203.9
2015	--	175.4	--	--	175.4	--	175.4
Subtotal	2	1304.3	--	--	1304.3	--	1304.3

Cost Quantity Information - AEHF SV 5-6 3020 Procurement Missile Procurement, Air Force		
Fiscal Year	Quantity	End Item Recurring Flyaway (Aligned With Quantity) BY 2002 \$M
2011	--	--
2012	2	2040.1
2013	--	--
2014	--	--
2015	--	--
Subtotal	2	2040.1

Annual Funding - AEHF SV 5-6								
3021 Procurement Space 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	
2016	--	240.2	--	--	240.2	--	240.2	
2017	--	630.0	--	--	630.0	--	630.0	
2018	--	57.3	--	--	57.3	--	57.3	
2019	--	29.5	--	--	29.5	--	29.5	
2020	--	31.4	--	--	31.4	--	31.4	
2021	--	16.0	--	--	16.0	--	16.0	
Subtotal	--	1004.4	--	--	1004.4	--	1004.4	

Annual Funding - AEHF SV 5-6								
3021 Procurement Space Procurement, Air Force								
Fiscal Year	Quantity	BY 2002 \$M						
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program	
2016	--	179.5	--	--	179.5	--	179.5	
2017	--	461.8	--	--	461.8	--	461.8	
2018	--	41.2	--	--	41.2	--	41.2	
2019	--	20.8	--	--	20.8	--	20.8	
2020	--	21.7	--	--	21.7	--	21.7	
2021	--	10.8	--	--	10.8	--	10.8	
Subtotal	--	735.8	--	--	735.8	--	735.8	

Low Rate Initial Production

There is no LRIP for this program.

Foreign Military Sales

AEHF SV 1-4

Country	Date of Sale	Quantity	Total Cost \$M	Description
United Kingdom	9/9/2003		84.0	
Netherlands	11/8/2002		39.8	
Canada	11/16/1999		146.2	

Notes

The AEHF program has no FMS; all sales in the table are International Partner (IP) cooperation.

The IPs access the antennas and a portion of the capacity on the AEHF satellites.

NOTE: The total IP O&S contribution is \$114.3M. O&S costs are commensurate with system resource usage respectively. The specific break out by IP is as follows:

Canada: \$68.2M
 The Netherlands: \$14.8M
 United Kingdom: \$31.3M

AEHF SV 5-6

None

Nuclear Costs

AEHF SV 1-4

None

AEHF SV 5-6

None

Unit Cost

AEHF SV 1-4

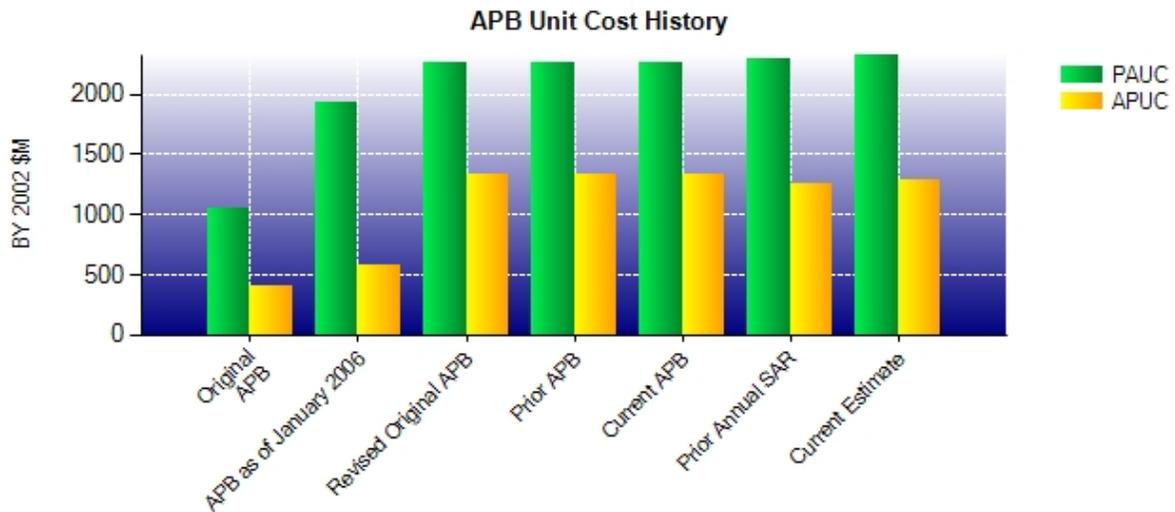
Unit Cost Report

Item	BY 2002 \$M	BY 2002 \$M	% Change
	Current UCR Baseline (Mar 2014 APB)	Current Estimate (Dec 2014 SAR)	
Program Acquisition Unit Cost			
Cost	9085.3	9337.4	
Quantity	4	4	
Item	2271.325	2334.350	+2.77
Average Procurement Unit Cost			
Cost	2655.1	2561.6	
Quantity	2	2	
Unit Cost	1327.550	1280.800	-3.52

Item	BY 2002 \$M	BY 2002 \$M	% Change
	Revised Original UCR Baseline (Jun 2011 APB)	Current Estimate (Dec 2014 SAR)	
Program Acquisition Unit Cost			
Cost	9085.3	9337.4	
Quantity	4	4	
Unit Cost	2271.325	2334.350	+2.77
Average Procurement Unit Cost			
Cost	2655.1	2561.6	
Quantity	2	2	
Unit Cost	1327.550	1280.800	-3.52

AEHF SV 1-4

Unit Cost History



Item	Date	BY 2002 \$M		TY \$M	
		PAUC	APUC	PAUC	APUC
Original APB	Oct 2001	1055.840	401.667	1129.060	460.133
APB as of January 2006	Mar 2005	1933.567	577.000	2028.567	617.300
Revised Original APB	Jun 2011	2271.325	1327.550	2548.775	1575.550
Prior APB	Oct 2012	2271.325	1327.550	2548.775	1575.550
Current APB	Mar 2014	2271.325	1327.550	2548.775	1575.550
Prior Annual SAR	Dec 2013	2298.500	1250.450	2592.850	1487.150
Current Estimate	Dec 2014	2334.350	1280.800	2637.500	1524.100

SAR Unit Cost History

Initial SAR Baseline to Current SAR Baseline (TY \$M)									
Initial PAUC Development Estimate	Changes								PAUC Production Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1129.060	-35.225	-291.584	262.425	0.000	342.633	0.000	-0.275	277.974	2028.567

Current SAR Baseline to Current Estimate (TY \$M)									
PAUC Production Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2028.567	41.850	-270.642	316.800	50.650	470.275	0.000	0.000	608.933	2637.500

Initial SAR Baseline to Current SAR Baseline (TY \$M)									
Initial APUC Development Estimate	Changes								APUC Production Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
460.133	-3.250	912.967	88.600	0.000	998.650	0.000	-0.550	1996.417	617.300

Current SAR Baseline to Current Estimate (TY \$M)									
APUC Production Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
617.300	24.700	164.350	-30.900	0.000	748.650	0.000	0.000	906.800	1524.100

SAR Baseline History				
Item	SAR Planning Estimate	SAR Development Estimate	SAR Production Estimate	Current Estimate
Milestone I	Apr 1999	Apr 1999	Apr 1999	Apr 1999
Milestone B	Feb 2001	Jun 2001	Jun 2001	Sep 2001
Milestone C	Feb 2001	Jun 2004	Jun 2004	Jun 2004
IOC	Nov 2007	Jul 2008	Jun 2010	Jun 2015
Total Cost (TY \$M)	2690.6	5645.3	6085.7	10550.0
Total Quantity	2	5	3	4
PAUC	1345.300	1129.060	2028.567	2637.500

AEHF SV 5-6

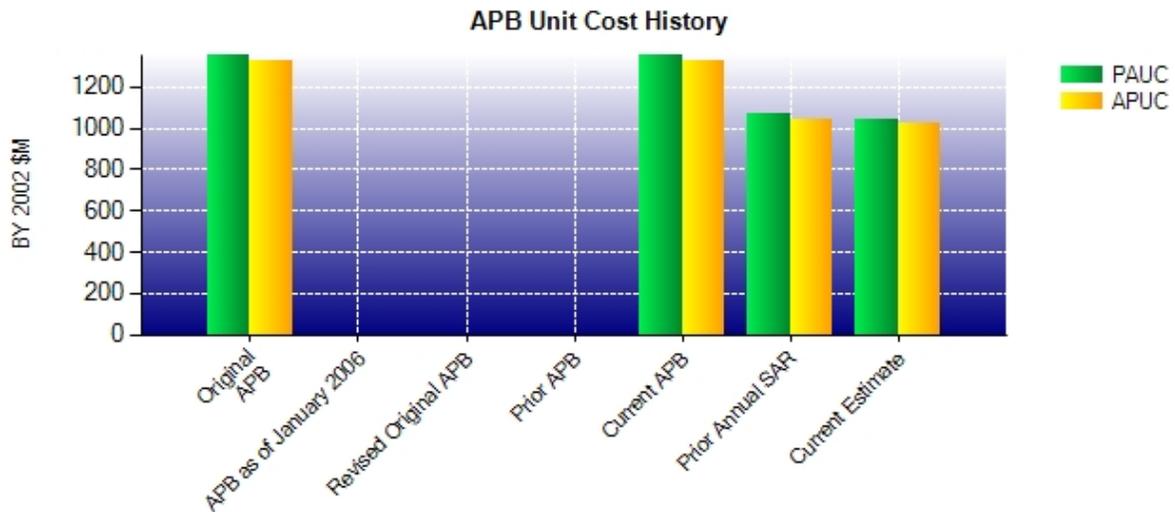
Unit Cost Report

Item	BY 2002 \$M	BY 2002 \$M	% Change
	Current UCR Baseline (Oct 2012 APB)	Current Estimate (Dec 2014 SAR)	
Program Acquisition Unit Cost			
Cost	2715.1	2090.3	
Quantity	2	2	
Item	1357.550	1045.150	-23.01
Average Procurement Unit Cost			
Cost	2656.0	2040.1	
Quantity	2	2	
Unit Cost	1328.000	1020.050	-23.19

Item	BY 2002 \$M	BY 2002 \$M	% Change
	Original UCR Baseline (Oct 2012 APB)	Current Estimate (Dec 2014 SAR)	
Program Acquisition Unit Cost			
Cost	2715.1	2090.3	
Quantity	2	2	
Unit Cost	1357.550	1045.150	-23.01
Average Procurement Unit Cost			
Cost	2656.0	2040.1	
Quantity	2	2	
Unit Cost	1328.000	1020.050	-23.19

AEHF SV 5-6

Unit Cost History



Item	Date	BY 2002 \$M		TY \$M	
		PAUC	APUC	PAUC	APUC
Original APB	Oct 2012	1357.550	1328.000	1744.100	1707.200
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	N/A	N/A	N/A	N/A	N/A
Current APB	Mar 2014	1357.550	1328.000	1744.100	1707.200
Prior Annual SAR	Dec 2013	1065.200	1037.950	1394.850	1360.450
Current Estimate	Dec 2014	1045.150	1020.050	1360.350	1328.750

SAR Unit Cost History

Current SAR Baseline to Current Estimate (TY \$M)									
Initial PAUC Production Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1744.100	33.550	0.000	0.000	0.000	-417.300	0.000	0.000	-383.750	1360.350

Current SAR Baseline to Current Estimate (TY \$M)									
Initial APUC Production Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1707.200	33.150	0.000	0.000	0.000	-411.600	0.000	0.000	-378.450	1328.750

SAR Baseline History				
Item	SAR Planning Estimate	SAR Development Estimate	SAR Production Estimate	Current Estimate
Milestone A		N/A	N/A	N/A
Milestone B		N/A	N/A	N/A
Milestone C		N/A	N/A	N/A
IOC		N/A	N/A	N/A
Total Cost (TY \$M)		N/A	N/A	3488.2
Total Quantity		N/A	N/A	2
PAUC		N/A	N/A	1744.100

Cost Variance

AEHF SV 1-4

Summary TY \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	5468.4	617.3	--	6085.7
Previous Changes				
Economic	+121.1	+52.1	--	+173.2
Quantity	--	+946.0	--	+946.0
Schedule	+1329.0	-61.8	--	+1267.2
Engineering	+88.1	--	--	+88.1
Estimating	+390.5	+1420.7	--	+1811.2
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+1928.7	+2357.0	--	+4285.7
Current Changes				
Economic	-3.1	-2.7	--	-5.8
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	+114.5	--	--	+114.5
Estimating	-6.7	+76.6	--	+69.9
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+104.7	+73.9	--	+178.6
Total Changes	+2033.4	+2430.9	--	+4464.3
CE - Cost Variance	7501.8	3048.2	--	10550.0
CE - Cost & Funding	7501.8	3048.2	--	10550.0

Summary BY 2002 \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	5223.7	577.0	--	5800.7
Previous Changes				
Economic	--	--	--	--
Quantity	--	+784.9	--	+784.9
Schedule	+1091.3	--	--	+1091.3
Engineering	+77.0	--	--	+77.0
Estimating	+301.1	+1139.0	--	+1440.1
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+1469.4	+1923.9	--	+3393.3
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	+87.8	--	--	+87.8
Estimating	-5.1	+60.7	--	+55.6
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+82.7	+60.7	--	+143.4
Total Changes	+1552.1	+1984.6	--	+3536.7
CE - Cost Variance	6775.8	2561.6	--	9337.4
CE - Cost & Funding	6775.8	2561.6	--	9337.4

Previous Estimate: December 2013

RDT&E	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-3.1
Updated estimate to account for Capability Insertion Program funding allocated to AEHF ground enhancements. (Engineering)	+86.3	+112.5
Updated estimate for Universal S-Band (USB) testing. (Engineering)	+1.5	+2.0
Revised estimate to reflect prior year reductions. (Small Business Innovative Research, Federally Funded Research & Development Center general reduction and reprogramming to other Air Force priorities) (Estimating)	-4.2	-5.2
Increase in funding to carry AEHF Ground Interim Contractor Support through IOC. (Estimating)	+4.7	+6.0
Revised estimate for Key Management Infrastructure (KMI) requirements enabling reduction in FY 2016 with planned restoration in FY 2017. (Estimating)	-7.3	-9.6
Adjustment for current and prior escalation. (Estimating)	+1.7	+2.1
RDT&E Subtotal	+82.7	+104.7

Procurement	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-2.7
Revised estimate to reallocate actuals between AEHF subprograms to align with actual subprogram execution. (Estimating)	+56.3	+71.1
Increase in funding for previously unfunded AEHF Calibration Facility - Interim Command & Control (ACF-IC2). (Estimating)	+3.5	+4.4
Adjustment for current and prior escalation. (Estimating)	+0.9	+1.1
Procurement Subtotal	+60.7	+73.9

Cost Variance

AEHF SV 5-6

Summary TY \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	73.8	3414.4	--	3488.2
Previous Changes				
Economic	+0.9	+84.3	--	+85.2
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-5.9	-777.8	--	-783.7
Other	--	--	--	--
Support	--	--	--	--
Subtotal	-5.0	-693.5	--	-698.5
Current Changes				
Economic	-0.1	-18.0	--	-18.1
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-5.5	-45.4	--	-50.9
Other	--	--	--	--
Support	--	--	--	--
Subtotal	-5.6	-63.4	--	-69.0
Total Changes	-10.6	-756.9	--	-767.5
CE - Cost Variance	63.2	2657.5	--	2720.7
CE - Cost & Funding	63.2	2657.5	--	2720.7

Summary BY 2002 \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	59.1	2656.0	--	2715.1
Previous Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-4.6	-580.1	--	-584.7
Other	--	--	--	--
Support	--	--	--	--
Subtotal	-4.6	-580.1	--	-584.7
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-4.3	-35.8	--	-40.1
Other	--	--	--	--
Support	--	--	--	--
Subtotal	-4.3	-35.8	--	-40.1
Total Changes	-8.9	-615.9	--	-624.8
CE - Cost Variance	50.2	2040.1	--	2090.3
CE - Cost & Funding	50.2	2040.1	--	2090.3

Previous Estimate: December 2013

RDT&E	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-0.1
Revised estimate to reflect prior year actuals; dollars reallocated to higher Air Force priorities. (Estimating)	-4.6	-5.8
Increase in funding for Crypto Modernization Study. (Estimating)	+0.2	+0.2
Adjustment for current and prior escalation. (Estimating)	+0.1	+0.1
RDT&E Subtotal	-4.3	-5.6

Procurement	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-18.0
Increase in funding for previously unfunded AEHF Calibration Facility - Interim Command & Control (ACF-IC2). (Estimating)	+12.5	+15.6
Revised estimate to reallocate actuals between AEHF subprograms to align with actual subprogram execution. (Estimating)	-52.3	-66.2
Revised estimate to reflect Federally Funded Research & Development Center general reduction. (Estimating)	-0.3	-0.4
Adjustment for current and prior escalation. (Estimating)	+4.3	+5.6
Procurement Subtotal	-35.8	-63.4

Contracts

Contract Identification

Appropriation: Procurement
Contract Name: AEHF 4 Production and Launch, 5/6 Long Lead, KI-54
Contractor: Lockheed Martin Corp.
Contractor Location: 1111 Lockheed Martin Way
 Sunnyvale, CA 94089
Contract Number: F04701-02-C-0002/2
Contract Type: Cost Plus Incentive Fee (CPIF), Cost Plus Fixed Fee (CPFF)
Award Date: December 15, 2010
Definitization Date: December 15, 2010

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
1396.5	N/A	1	1613.1	N/A	2	1619.0	1613.1

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to contract modifications for AEHF 4 Launch Operations, AEHF 5-6 Long Lead, KI-54D cryptographic device, X37 integration and analysis, Protected Key Management Architecture (PKMA), and studies.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/28/2014)	+49.7	+15.9
Previous Cumulative Variances	+26.0	-3.6
Net Change	+23.7	+19.5

Cost and Schedule Variance Explanations

The favorable net change in the cost variance is due to sharing of resources across programs, test efficiencies, and performance efficiencies on the bus electrical power system.

The favorable net change in the schedule variance is due to entry into Space Vehicle Integration and Test 4.5 months ahead of schedule.

Notes

This contract page includes AEHF 4 Production, AEHF 4 Launch Operations, AEHF 5/6 Long Lead, KI-54D, X37 and studies.

The contract award date was updated to match the Contract Performance Report. AEHF 4 resides on the same contract as the AEHF 1-3 effort which is over 90% complete so no longer reported. The December 2013 SAR award date reflected the initial award date of the overall AEHF 1-4 contract.

Contract Identification

Appropriation: Procurement
Contract Name: AEHF 5/6 Long Lead Firm Fixed Price
Contractor: Lockheed Martin Corp.
Contractor Location: 1111 Lockheed Martin Way
 Sunnyvale, CA 94089
Contract Number: F04701-02-C-0002/3
Contract Type: Firm Fixed Price (FFP)
Award Date: November 16, 2001
Definitization Date: August 15, 2002

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
193.6	N/A	N/A	193.6	N/A	N/A	193.6	193.6

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.

Contract Identification

Appropriation: Procurement
Contract Name: AEHF 5-6 Production and Launch
Contractor: Lockheed Martin
Contractor Location: 1111 Lockheed Martin Way
 Sunnyvale, CA 94089
Contract Number: FA8808-12-C-0010/1
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: May 12, 2012
Definitization Date: October 31, 2013

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
1914.4	2001.6	2	1914.4	2001.6	2	1914.4	1914.4

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/28/2014)	+44.6	-6.1
Previous Cumulative Variances	+21.2	+9.2
Net Change	+23.4	-15.3

Cost and Schedule Variance Explanations

The favorable net change in the cost variance is due to sharing of resources across programs, payload batch efficiencies, bus telemetry, tracking and command efficiencies, and bus structure efficiencies.

The unfavorable net change in the schedule variance is due to competing priorities, rework and late part deliveries on the payload pointing, command and control system and resource availability and rework on the payload radio frequency crosslink.

Notes

Updated contract award date to reflect the Contract Performance Report. The award date on the December 2013 SAR was incorrect.

Deliveries and Expenditures

AEHF SV 1-4

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	2	2	2	100.00%
Production	1	1	2	50.00%
Total Program Quantity Delivered	3	3	4	75.00%

Expended and Appropriated (TY \$M)			
Total Acquisition Cost	10550.0	Years Appropriated	21
Expended to Date	9198.5	Percent Years Appropriated	87.50%
Percent Expended	87.19%	Appropriated to Date	10307.7
Total Funding Years	24	Percent Appropriated	97.70%

The above data is current as of January 31, 2015.

AEHF SV 5-6

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	0	0	0	--
Production	0	0	2	0.00%
Total Program Quantity Delivered	0	0	2	0.00%

Expended and Appropriated (TY \$M)			
Total Acquisition Cost	2720.7	Years Appropriated	5
Expended to Date	1127.5	Percent Years Appropriated	45.45%
Percent Expended	41.44%	Appropriated to Date	1716.3
Total Funding Years	11	Percent Appropriated	63.08%

The above data is current as of January 31, 2015.

Operating and Support Cost

AEHF SV 1-4

Cost Estimate Details

Date of Estimate:	December 31, 2011
Source of Estimate:	POE
Quantity to Sustain:	1
Unit of Measure:	System
Service Life per Unit:	14.00 Years
Fiscal Years in Service:	FY 2015 - FY 2030

The December 2011 O&S POE included AEHF 1-6 through FY 2030. The MILSATCOM Directorate will develop a new O&S cost model in FY 2015 after award of the Combined Orbital Operation, Logistics Sustainment (COOLS) contract. The system consists of a four satellite constellation and associated ground segment.

Sustainment Strategy

The O&S costs support a four satellite constellation from FY 2015 through FY 2030. The estimates assume that AEHF and Milstar will be operated in parallel by the 4th Space Operations Squadron at Schriever Air Force Base (AFB). Due to the proprietary nature of the AEHF Space Satellite (on-orbit) Segment, this segment is not considered core and the Depot Source of Repair is Contractor Logistics Support (CLS) for the life of the satellites. The sustainment of the AEHF Space Satellite (on-orbit) Segment will be on the COOLS contract post-IOC. All other AEHF workloads were designated as core. Tobyhanna Army Depot (TYAD) is the candidate depot for hardware and OO-ALC Hill AFB UT for software. A Public Private Partnership (PPP) will be used on the COOLS contract to ramp up the OO-ALC ground software capability.

Antecedent Information

The antecedent system for AEHF is Milstar which consists of a five satellite constellation and associated ground segment. The cost estimate is based on validated requirements in the Air Force Space Command Logistics Support Requirements Brochures built for the FY 2004 President's Budget Request. The Milstar O&S costs cover all operational activities for both the space and ground segment for FY 2009 - FY 2018.

The antecedent Milstar program office estimate is from April 2003 finalized in Air Force Space Command's budget request to Headquarters Air Force.

Annual O&S Costs BY2002 \$M		
Cost Element	AEHF SV 1-4 Average Annual Cost Per System	Milstar (Antecedent) Average Annual Cost Per System
Unit-Level Manpower	19.420	16.900
Unit Operations	0.053	13.200
Maintenance	14.294	3.900
Sustaining Support	54.956	39.000
Continuing System Improvements	34.611	0.000
Indirect Support	3.220	7.200
Other	0.000	0.000
Total	126.554	80.200

AEHF Average Annual Cost Per System numbers above reflect costs for planning usage and monitoring health of the AEHF constellation.

Item	Total O&S Cost \$M			
	AEHF SV 1-4		Milstar (Antecedent)	
	Current Production APB Objective/Threshold	Current Estimate		
Base Year	1143.6	1258.0	1143.6	801.5
Then Year	1593.6	N/A	1593.6	N/A

Equation to Translate Annual Cost to Total Cost

$(\text{AEHF SV1-4 Total O\&S Cost} + \text{AEHF 5-6 Total O\&S Cost}) / 16 \text{ years} = \text{Average Annual O\&S cost}$
 $(\$1143.6\text{M} + \$881.3\text{M}) / 16 = \$126.5\text{M}$

Although the first AEHF satellite was launched in FY 2010, the sustainment of the system is executed under the RDT&E Interim Contractor Support (ICS) contract until IOC. After IOC, the sustainment will transition to O&S funding.

When the O&S estimate was developed in 2011, IOC was scheduled for early FY 2015. The AEHF system consists of 4 satellites and AEHF 4 is scheduled to launch in early FY 2017. The satellites have a 14 year design life so the estimate was carried through FY 2030 (14 years inclusive of FY2017 and FY 2030). The 16 year divisor in the equation was calculated based on an O&S start date of FY2015 and end date of FY 2030 (16 years inclusive of FY 2015 and FY2030).

O&S Cost Variance		
Category	BY 2002 \$M	Change Explanations
Prior SAR Total O&S Estimates - Dec 2013 SAR	1143.6	
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	1143.6

Disposal Estimate Details

Date of Estimate:

Source of Estimate:

Disposal/Demilitarization Total Cost (BY 2002 \$M):

The disposal estimate is to be determined.

AEHF SV 5-6

Cost Estimate Details

Date of Estimate:	December 31, 2011
Source of Estimate:	POE
Quantity to Sustain:	1
Unit of Measure:	System
Service Life per Unit:	14.00 Years
Fiscal Years in Service:	FY 2015 - FY 2030

The December 2011 O&S POE included AEHF 1-6 through FY 2030. The MILSATCOM Directorate will develop a new O&S cost model in FY 2015 after award of the Combined Orbital Operation, Logistics Sustainment (COOLS) contract. The system consists of a four satellite constellation and associated ground segment.

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Annual O&S Costs BY2002 \$M		
Cost Element	AEHF SV 5-6 Average Annual Cost Per System	Milstar (Antecedent) Average Annual Cost Per System
Unit-Level Manpower	19.420	16.900
Unit Operations	0.053	13.200
Maintenance	14.294	3.900
Sustaining Support	54.956	39.000
Continuing System Improvements	34.611	0.000
Indirect Support	3.220	7.200
Other	0.000	0.000
Total	126.554	80.200

AEHF Average Annual Cost Per System numbers above reflect costs for planning usage and monitoring health of the AEHF constellation.

Item	Total O&S Cost \$M			
	AEHF SV 5-6		Milstar (Antecedent)	
	Current Production APB Objective/Threshold	Current Estimate		
Base Year	881.3	969.4	881.3	801.5
Then Year	1453.8	N/A	1453.8	N/A

Equation to Translate Annual Cost to Total Cost

$(\text{AEHF SV1-4 Total O\&S Cost} + \text{AEHF 5-6 Total O\&S Cost}) / 16 \text{ years} = \text{Average Annual O\&S cost}$
 $(\$1143.6\text{M} + \$881.3\text{M}) / 16 = \$126.5\text{M}$

Although the first AEHF satellite was launched in FY 2010, the sustainment of the system is executed under the RDT&E Interim Contractor Support (ICS) contract until IOC. After IOC, the sustainment will transition to O&S funding.

When the O&S estimate was developed in 2011, IOC was scheduled for early FY 2015. The AEHF system consists of 4 satellites and AEHF 4 is scheduled to launch in early FY 2017. The satellites have a 14 year design life so the estimate was carried through FY 2030 (14 years inclusive of FY2017 and FY 2030). The 16 year divisor in the equation was calculated based on an O&S start date of FY2015 and end date of FY 2030 (16 years inclusive of FY 2015 and FY2030).

O&S Cost Variance		
Category	BY 2002 \$M	Change Explanations
Prior SAR Total O&S Estimates - Dec 2013 SAR	881.3	

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	881.3

Disposal Estimate Details

Date of Estimate:

Source of Estimate:

Disposal/Demilitarization Total Cost (BY 2002 \$M):

The disposal estimate is to be determined.