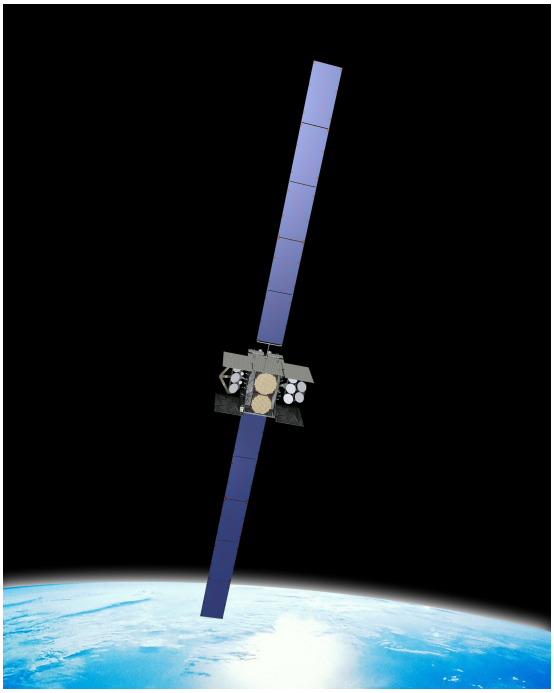
Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-326



Wideband Global SATCOM (WGS)

As of FY 2017 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

Table of Contents

Common Acronyms and Abbreviations for MDAP Programs

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

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

Program Information

Program Name

Wideband Global SATCOM (WGS)

DoD Component

Air Force

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References

SAR Baseline (Production Estimate)

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated August 11, 2010

Approved APB

Air Force Acquisition Executive (AFAE) Approved Acquisition Program Baseline (APB) dated March 12, 2014

Mission and Description

Wideband Global SATCOM (WGS), previously reported as Wideband Gapfiller Satellites, is a constellation of the Department of Defense's highest capacity communication satellites. WGS augments the Defense Satellite Communications System III and the Global Broadcast Service Phase II. WGS is a fully duplexed communications platform offering warfighters a significant increase in capacity, connectivity and interoperability. It provides high capacity and digitally channelized service at both X and Ka frequency bands, opening up a new 2-way Ka communication capability. This highly flexible communications satellite design leverages commercial processes, practices and technology to provide a wideband payload compatible with existing and future terminals. WGS provides an order of magnitude increase in communications bandwidth to our infrastructure users, Soldiers, Sailors, Airmen and Marines.

The WGS program has two International Partnerships. In exchange for access to a portion of the WGS constellation, Australia is providing funds for WGS-6 while Canada, Denmark, Luxembourg, the Netherlands, New Zealand and the United States are providing funds for WGS-9.

Executive Summary

Wideband Global SATCOM (WGS), previously reported as Wideband Gapfiller Satellites, is a constellation of the Department of Defense's highest capacity communication satellites. WGS Block I satellites became operational with WGS-1 in April 2008 (IOC was declared in January 2009), WGS-2 in August 2009, and WGS-3 in June 2010. WGS Block II satellites became operational with WGS-4 in August 2012, WGS-5 in December 2013 (FOC declared in May 2014) and WGS-6 in February 2014. WGS-7 launched on July 23, 2015 and achieved operational acceptance on January 5, 2016.

The Wideband Digital Channelizer upgrade, to be implemented on WGS 8-10, completed the engineering model qualification unit build and is starting system level testing.

The WGS-6 financial data is not reported in this SAR because funding is provided by Australia in exchange for access to a portion of the WGS constellation bandwidth.

The WGS-9 financial data is not reported in this SAR because funding is provided by Canada, Denmark, Luxembourg, the Netherlands, and New Zealand in exchange for access to a portion of the WGS constellation bandwidth.

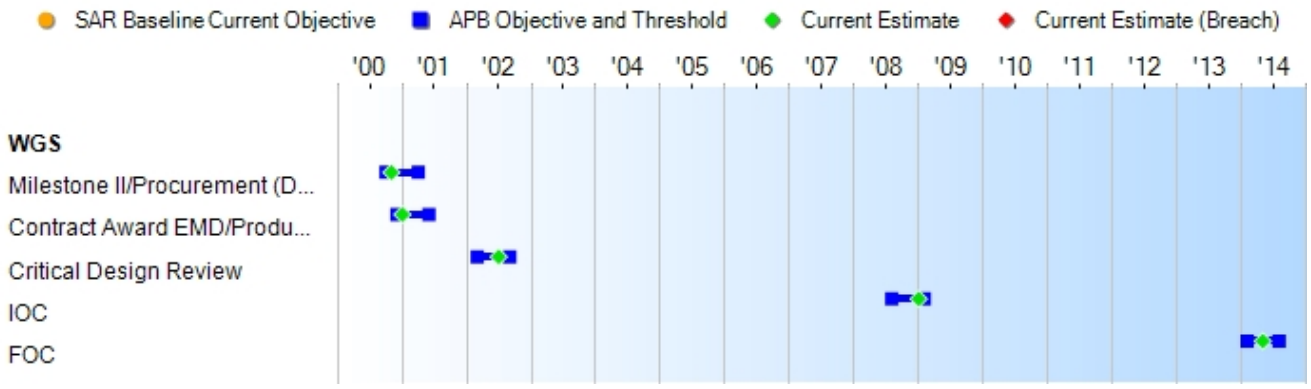
There are no significant software-related issues with this program at this time.

Threshold Breaches

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

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

Schedule



Schedule Events				
Events	**SAR Baseline Production Estimate**	**Current APB Production Objective/Threshold**		**Current Estimate**
Milestone II/Procurement (DAB)	Oct 2000	Oct 2000	Apr 2001	Nov 2000
Contract Award EMD/Production	Dec 2000	Dec 2000	Jun 2001	Jan 2001
Critical Design Review	Mar 2002	Mar 2002	Sep 2002	Jul 2002
IOC	Aug 2008	Aug 2008	Feb 2009	Jan 2009
FOC	Jun 2013	Feb 2014	Aug 2014	May 2014

Change Explanations

None

Notes

WGS met the following conditions for a successful FOC:

a) Satellites 1-5 must be operating in their assigned orbital locations.
b) Satellites 1-5 must be capable of supporting deployed military forces in each coverage area and have the ability to focus those coverage areas anywhere within the satellite Field of View.
c) Satellites 1-5 must be fully capable of providing intra and inter-coverage connectivity and frequency cross-banding.
d) Satellites 1-5 and the control system must be fully capable of providing S-band platform and payload control.
e) Satellites 1-5 and the control system must be fully capable of providing X and Ka in-band satellite control in each satellite's operations region.
f) Satellites 1-5 must be fully interoperable with existing DoD X-band and Global Broadcast Service Ka-band terminals.
g) All program support needed to operate and maintain satellites 1-5 and associated mission control must be in place, to include: All operator, maintenance and software training completed, all training equipment and software delivered, all provisioning data delivered, all spares delivered, all depot support equipment delivered, all software maintenance documentation and maintenance support equipment delivered, payload equipment string delivered, and contractor anomaly resolution and software maintenance capability in place.

Performance

Performance Characteristics				
SAR Baseline Production Estimate	**Current APB Production Objective/Threshold**		**Demonstrated Performance**	**Current Estimate**
Coverage				
Capable of providing communicat-ions connec-tivity anywhere between 70 deg N and 65 deg S latitude and at all longitudes within each satellites field of view, 24 hrs a day	Capable of providing communicat-ions connec-tivity anywhere between 70 deg N and 65 deg S latitude and at all longitudes within each satellites field of view, 24 hrs a day	Capable of providing communicat-ions connec-tivity anywhere between 65 deg N and 65 deg S latitude and at all longitudes within each satellites field of view, 24 hrs a day	Confirmed by analysis using industry-standard Satellite Tool Kit. Operationally verified at 64º N latitude.	Capable of providing communications connectivity anywhere between 65º N and 65º S latitude and at all longitudes within each satellites field of view, 24 hrs a day.
Capacity				
Each satellite should provide a min throughput of 3.6 Gbps	Each satellite should provide a min throughput of 3.6 Gbps	Each satellite should provide a min throughput of 1.2 Gbps	Calculated simplex throughput of 4.186 Gbps*. Current average throughput is 2.1 Gbps.	Each satellite should provide a minimum throughput of ~2.14 Gbps.
Access and Control				
Provide platform and payload controlled capabilities to perform Launch and Early Orbit, On-Orbit Operations, Station-keeping, Satellite Reposition-ing, Platform and Payload Maintenance, and Anomaly Identification and Resolution	Provide platform and payload controlled capabilities to perform Launch and Early Orbit, On-Orbit Operations, Station-keeping, Satellite Reposition-ing, Platform and Payload Maintenance, and Anomaly Identification and Resolution	Provide platform and payload controlled capabilities to perform Launch and Early Orbit, On-Orbit Operations, Station-keeping, Satellite Reposition-ing, Platform and Payload Maintenance, and Anomaly Identification and Resolution	Positive platform and payload operator ratings.	Provide platform and payload controlled capabilities to perform Launch and Early Orbit, On-Orbit Operations, Station-keeping, Satellite Repositioning, Platform and Payload Maintenance, and Anomaly Identification and Resolution.
Interoperability				
Satellites must be fully inter-operable with existing and programmed DSCS and GBS terminals	Satellites must be fully inter-operable with existing and programmed DSCS and GBS terminals	Satellites must be fully inter-operable with existing and programmed DSCS and GBS terminals	Confirmed interoperability with 40 terminal types, including DSCS & GBS.	Satellites must be fully interoperable with existing and programmed DSCS and GBS terminals.

Requirements Reference

ORD 004-99 dated May 3, 2000

Change Explanations

None

Notes

* Capacity demonstrated performance of 4.186 Gbps is based on a scenario of optimized ground terminal power/antenna aperture function. Interoperability demonstrated performance is based on testing with 40 terminals.

Acronyms and Abbreviations

deg - degrees
DSCS - Defense Satellite Communications System
Gbps - Gigabits per second
GBS - Global Broadcast Service
hrs - hours
min - minimum
N - North
S - South

Track to Budget

General Notes

Budget documentations (i.e. P/R Docs) for program name remained unchanged; program began as "Wideband Gapfiller Satellites," but is now known as "Wideband Global SATCOM."

RDT&E

Appn	BA	PE
Air Force	04	0603854F

Project	Name		
644811	Wideband Gapfiller Satellites	(Shared)	(Sunk)

Procurement

Appn	BA	PE
Air Force	05	0303600F

Line Item	Name		
GAP000	Wideband Gapfiller Satellites		(Sunk)

Appn	BA	PE
Air Force	01	0303600F

Line Item	Name
GAP000	Wideband Gapfiller Satellites

Appn	BA	PE
Air Force	03	0303600F

Line Item	Name		
836780	Wideband Gapfiller Satellites	(Shared)	(Sunk)

Notes

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.

Cost and Funding

Cost Summary

Total Acquisition Cost							
Appropriation	BY 2010 $M			BY 2010 $M	TY $M		
	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate	SAR Baseline Production Estimate	Current APB Production Objective	Current Estimate
RDT&E	417.2	417.2	458.9	444.4	380.7	380.7	409.6
Procurement	3193.4	3193.4	3512.6	3386.9	3159.0	3159.0	3392.3
Flyaway	--	--	--	3354.1	--	--	3363.2
Recurring	--	--	--	3354.1	--	--	3363.2
Non Recurring	--	--	--	0.0	--	--	0.0
Support	--	--	--	32.8	--	--	29.1
Other Support	--	--	--	32.8	--	--	29.1
Initial Spares	--	--	--	0.0	--	--	0.0
MILCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	3610.6	3610.6	N/A	3831.3	3539.7	3539.7	3801.9

Confidence Level

Confidence Level of cost estimate for current APB: 50%

The ICE to support WGS Milestone C decision, like all life-cycle cost estimates previously performed by the CAPE office, is built upon a product-oriented work breakdown structure, 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 MDAPs. 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.

Confidence Level for Current APB O&S Estimate Exceeds 50% -
A mathematically derived confidence level was not computed for the Operations and Support (O&S) estimate used in the Current Baseline. The O&S estimate does however represent the expected value, or mean, of the distribution, and it exceeds the 50% confidence level. This estimate takes into consideration relevant risks, including ordinary levels of external and unforeseen events. It aims to provide sufficient resources to execute the O&S program under normal conditions encountering average levels of technical, schedule, and programmatic risk and external influence.

Total Quantity			
Quantity	**SAR Baseline Production Estimate**	**Current APB Production**	**Current Estimate**
RDT&E	0	0	0
Procurement	7	7	8
Total	7	7	8

Quantity Notes

The WGS APB was amended with an administrative note only on May 8, 2012 increasing the total quantities from seven to eight satellites. These eight satellites include three satellites (WGS 1-3) on the Block I contract, two satellites (WGS 4-5) on the Block II contract and three additional satellites (WGS 7-8 and WGS 10) on the WGS 7-10 contract.

Cost and Funding

Funding Summary

Appropriation Summary									
FY 2017 President's Budget / December 2015 SAR (TY$ M)									
Appropriation	Prior	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	To Complete	Total
RDT&E	409.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	409.6
Procurement	3078.7	74.5	86.3	90.7	62.1	0.0	0.0	0.0	3392.3
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 2017 Total	3488.3	74.5	86.3	90.7	62.1	0.0	0.0	0.0	3801.9
PB 2016 Total	3505.5	53.5	65.4	48.3	11.2	0.0	0.0	0.0	3683.9
Delta	-17.2	21.0	20.9	42.4	50.9	0.0	0.0	0.0	118.0

Quantity Summary										
FY 2017 President's Budget / December 2015 SAR (TY$ M)										
Quantity	Undistributed	Prior	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	To Complete	Total
Development	0	0	0	0	0	0	0	0	0	0
Production	0	8	0	0	0	0	0	0	0	8
PB 2017 Total	0	8	0	0	0	0	0	0	0	8
PB 2016 Total	0	8	0	0	0	0	0	0	0	8
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	--	--	--	--	--	--	0.7
2000	--	--	--	--	--	--	4.5
2001	--	--	--	--	--	--	77.7
2002	--	--	--	--	--	--	79.0
2003	--	--	--	--	--	--	--
2004	--	--	--	--	--	--	--
2005	--	--	--	--	--	--	31.7
2006	--	--	--	--	--	--	78.5
2007	--	--	--	--	--	--	28.5
2008	--	--	--	--	--	--	--
2009	--	--	--	--	--	--	9.8
2010	--	--	--	--	--	--	42.5
2011	--	--	--	--	--	--	56.7
Subtotal	--	--	--	--	--	--	409.6

Annual Funding 3600 | RDT&E | Research, Development, Test, and Evaluation, Air Force							
Fiscal Year	Quantity	BY 2010 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
1999	--	--	--	--	--	--	0.8
2000	--	--	--	--	--	--	5.4
2001	--	--	--	--	--	--	91.5
2002	--	--	--	--	--	--	92.2
2003	--	--	--	--	--	--	--
2004	--	--	--	--	--	--	--
2005	--	--	--	--	--	--	34.7
2006	--	--	--	--	--	--	83.4
2007	--	--	--	--	--	--	29.5
2008	--	--	--	--	--	--	--
2009	--	--	--	--	--	--	9.8
2010	--	--	--	--	--	--	42.0
2011	--	--	--	--	--	--	55.1
Subtotal	--	--	--	--	--	--	444.4

Annual Funding 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
2001	--	24.6	--	--	24.6	--	24.6
2002	2	372.9	--	--	372.9	--	372.9
2003	1	184.1	--	--	184.1	--	184.1
2004	--	21.8	--	--	21.8	--	21.8
2005	--	35.4	--	--	35.4	--	35.4
2006	--	76.1	--	--	76.1	--	76.1
2007	1	428.7	--	--	428.7	--	428.7
2008	1	304.8	--	--	304.8	--	304.8
2009	--	50.4	--	--	50.4	--	50.4
2010	--	197.0	--	--	197.0	--	197.0
2011	1	517.0	--	--	517.0	--	517.0
2012	2	748.7	--	--	748.7	--	748.7
2013	--	25.1	--	--	25.1	--	25.1
2014	--	26.9	--	--	26.9	--	26.9
2015	--	36.1	--	--	36.1	--	36.1
Subtotal	8	3049.6	--	--	3049.6	--	3049.6

Annual Funding 3020 | Procurement | Missile Procurement, Air Force							
Fiscal Year	Quantity	BY 2010 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2001	--	28.8	--	--	28.8	--	28.8
2002	2	429.1	--	--	429.1	--	429.1
2003	1	209.5	--	--	209.5	--	209.5
2004	--	24.3	--	--	24.3	--	24.3
2005	--	38.3	--	--	38.3	--	38.3
2006	--	80.1	--	--	80.1	--	80.1
2007	1	440.1	--	--	440.1	--	440.1
2008	1	307.4	--	--	307.4	--	307.4
2009	--	50.1	--	--	50.1	--	50.1
2010	--	192.9	--	--	192.9	--	192.9
2011	1	496.6	--	--	496.6	--	496.6
2012	2	706.9	--	--	706.9	--	706.9
2013	--	23.2	--	--	23.2	--	23.2
2014	--	24.5	--	--	24.5	--	24.5
2015	--	32.5	--	--	32.5	--	32.5
Subtotal	8	3084.3	--	--	3084.3	--	3084.3

Cost Quantity Information 3020 | Procurement | Missile Procurement, Air Force		
Fiscal Year	**Quantity**	**End Item Recurring Flyaway (Aligned With Quantity) BY 2010 $M**
2001	--	--
2002	2	643.1
2003	1	299.9
2004	--	--
2005	--	--
2006	--	--
2007	1	504.8
2008	1	435.8
2009	--	--
2010	--	--
2011	1	542.1
2012	2	658.6
2013	--	--
2014	--	--
2015	--	--
Subtotal	8	3084.3

Annual Funding 3080 | Procurement | Other 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
2003	--	--	--	--	--	15.1	15.1
2004	--	--	--	--	--	10.8	10.8
2005	--	--	--	--	--	--	--
2006	--	--	--	--	--	--	--
2007	--	--	--	--	--	--	--
2008	--	--	--	--	--	--	--
2009	--	--	--	--	--	--	--
2010	--	--	--	--	--	1.6	1.6
2011	--	--	--	--	--	1.6	1.6
Subtotal	--	--	--	--	--	29.1	29.1

Annual Funding 3080 | Procurement | Other Procurement, Air Force							
Fiscal Year	Quantity	BY 2010 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2003	--	--	--	--	--	17.4	17.4
2004	--	--	--	--	--	12.2	12.2
2005	--	--	--	--	--	--	--
2006	--	--	--	--	--	--	--
2007	--	--	--	--	--	--	--
2008	--	--	--	--	--	--	--
2009	--	--	--	--	--	--	--
2010	--	--	--	--	--	1.6	1.6
2011	--	--	--	--	--	1.6	1.6
Subtotal	--	--	--	--	--	32.8	32.8

Annual Funding 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
2012	--	--	--	--	--	--	--
2013	--	--	--	--	--	--	--
2014	--	--	--	--	--	--	--
2015	--	--	--	--	--	--	--
2016	--	74.5	--	--	74.5	--	74.5
2017	--	86.3	--	--	86.3	--	86.3
2018	--	90.7	--	--	90.7	--	90.7
2019	--	62.1	--	--	62.1	--	62.1
Subtotal	--	313.6	--	--	313.6	--	313.6

Annual Funding 3021 | Procurement | Space Procurement, Air Force							
Fiscal Year	Quantity	BY 2010 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2012	--	--	--	--	--	--	--
2013	--	--	--	--	--	--	--
2014	--	--	--	--	--	--	--
2015	--	--	--	--	--	--	--
2016	--	65.9	--	--	65.9	--	65.9
2017	--	74.9	--	--	74.9	--	74.9
2018	--	77.2	--	--	77.2	--	77.2
2019	--	51.8	--	--	51.8	--	51.8
Subtotal	--	269.8	--	--	269.8	--	269.8

Cost Quantity Information 3021 | Procurement | Space Procurement, Air Force		
Fiscal Year	**Quantity**	**End Item Recurring Flyaway (Aligned With Quantity) BY 2010 $M**
2012	--	269.8
2013	--	--
2014	--	--
2015	--	--
2016	--	--
2017	--	--
2018	--	--
2019	--	--
Subtotal	--	269.8

Low Rate Initial Production

There is no LRIP for this program.

Foreign Military Sales

Country	Date of Sale	Quantity	Total Cost $M	Description
Multilateral	1/12/2012	1	387.6	A Memorandum of Understanding (MOU) with Canada, Denmark, Luxembourg, the Netherlands and New Zealand was signed on January 12, 2012 for the procurement of WGS-9 in exchange for access to the WGS constellation.
Australia	11/14/2007	1	297.0	MOU between the DoD of the United States of America and the DoD of Australia concerning production, operations, and support of WGS was signed on November 14, 2007. Australia is providing funds for WGS-6 in exchange for access to the WGS constellation.

Notes

The WGS program has no FMS; all sales in the table are International Cooperations.

Multilateral numbers include WGS-9 Channelizer upgrade.

Australia numbers reflect the final Boeing negotiated/settled cost for WGS-6.

Nuclear Costs

None

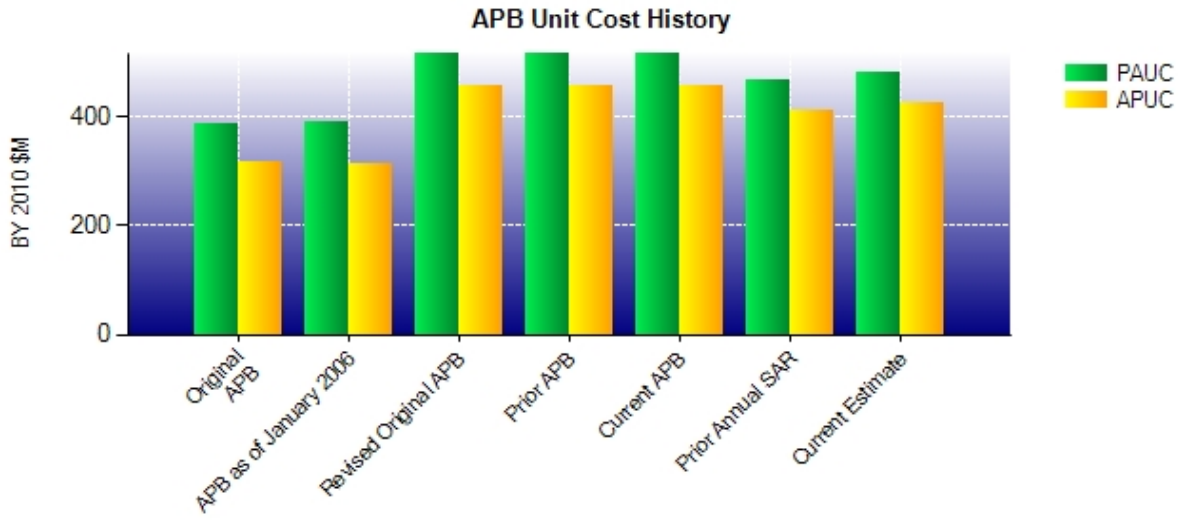
Unit Cost

Unit Cost Report

Item	BY 2010 $M Current UCR Baseline (Mar 2014 APB)	BY 2010 $M Current Estimate (Dec 2015 SAR)	% Change
Program Acquisition Unit Cost			
Cost	3610.6	3831.3	
Quantity	7	8	
Unit Cost	515.800	478.912	-7.15
Average Procurement Unit Cost			
Cost	3193.4	3386.9	
Quantity	7	8	
Unit Cost	456.200	423.362	-7.20

Item	BY 2010 $M Revised Original UCR Baseline (Aug 2010 APB)	BY 2010 $M Current Estimate (Dec 2015 SAR)	% Change
Program Acquisition Unit Cost			
Cost	3610.6	3831.3	
Quantity	7	8	
Unit Cost	515.800	478.912	-7.15
Average Procurement Unit Cost			
Cost	3193.4	3386.9	
Quantity	7	8	
Unit Cost	456.200	423.362	-7.20

Unit Cost History



Item	Date	BY 2010 $M		TY $M	
		PAUC	APUC	PAUC	APUC
Original APB	Dec 2000	387.400	317.933	347.500	287.900
APB as of January 2006	Feb 2004	390.600	314.300	353.420	286.480
Revised Original APB	Aug 2010	515.800	456.200	505.671	451.286
Prior APB	Aug 2010	515.800	456.200	505.671	451.286
Current APB	Mar 2014	515.800	456.200	505.671	451.286
Prior Annual SAR	Dec 2014	466.062	410.525	460.488	409.288
Current Estimate	Dec 2015	478.912	423.362	475.238	424.038

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	
347.500	3.214	74.201	0.000	19.057	64.585	0.000	-2.886	158.171	505.671

Current SAR Baseline to Current Estimate (TY $M)									
PAUC Production Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
505.671	2.688	-12.370	0.000	18.262	-38.975	0.000	-0.038	-30.433	475.238

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	
287.900	2.786	108.257	0.000	0.000	55.229	0.000	-2.886	163.386	451.286

Current SAR Baseline to Current Estimate (TY $M)									
APUC Production Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
451.286	2.612	-5.572	0.000	18.262	-42.512	0.000	-0.038	-27.248	424.038

SAR Baseline History				
Item	SAR Planning Estimate	SAR Development Estimate	SAR Production Estimate	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	Oct 2000	Oct 2000	Nov 2000
Milestone III	N/A	N/A	N/A	N/A
IOC	N/A	Dec 2004	Aug 2008	Jan 2009
Total Cost (TY $M)	N/A	1042.5	3539.7	3801.9
Total Quantity	N/A	3	7	8
PAUC	N/A	347.500	505.671	475.238

Cost Variance

Summary TY $M				
Item	**RDT&E**	**Procurement**	**MILCON**	**Total**
SAR Baseline (Production Estimate)	380.7	3159.0	--	3539.7
Previous Changes				
Economic	+0.7	+24.1	--	+24.8
Quantity	--	+406.7	--	+406.7
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+28.2	-315.2	--	-287.0
Other	--	--	--	--
Support	--	-0.3	--	-0.3
Subtotal	+28.9	+115.3	--	+144.2
Current Changes				
Economic	-0.1	-3.2	--	-3.3
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	+146.1	--	+146.1
Estimating	+0.1	-24.9	--	-24.8
Other	--	--	--	--
Support	--	--	--	--
Subtotal	--	+118.0	--	+118.0
Total Changes	+28.9	+233.3	--	+262.2
CE - Cost Variance	409.6	3392.3	--	3801.9
CE - Cost & Funding	409.6	3392.3	--	3801.9

Summary BY 2010 $M				
Item	**RDT&E**	**Procurement**	**MILCON**	**Total**
SAR Baseline (Production Estimate)	417.2	3193.4	--	3610.6
Previous Changes				
Economic	--	--	--	--
Quantity	--	+383.0	--	+383.0
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+27.1	-292.0	--	-264.9
Other	--	--	--	--
Support	--	-0.2	--	-0.2
Subtotal	+27.1	+90.8	--	+117.9
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	+124.8	--	+124.8
Estimating	+0.1	-22.1	--	-22.0
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+0.1	+102.7	--	+102.8
Total Changes	+27.2	+193.5	--	+220.7
CE - Cost Variance	444.4	3386.9	--	3831.3
CE - Cost & Funding	444.4	3386.9	--	3831.3

Previous Estimate: December 2014

RDT&E	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-0.1
Adjustment for current and prior escalation. (Estimating)	+0.1	+0.1
RDT&E Subtotal	+0.1	0.0

Procurement	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-3.2
Reallocation of funding to higher Department priorities (Missile Procurement, Air Force (AF)). (Estimating)	-15.7	-17.2
Reallocation of funding to higher Department priorities (Space Procurement, AF). (Estimating)	-4.3	-5.0
Additional funding for pathfinder 2-5 to expand the Commercial SATCOM pooled and portable bandwidth. (Engineering)	+124.8	+146.1
Congressional reduction in FY 2016. (Estimating)	-4.4	-5.0
Adjustment for current and prior escalation. (Estimating)	+2.3	+2.3
Procurement Subtotal	+102.7	+118.0

Contracts

Contract Identification

Appropriation: Procurement
Contract Name: WGS-Block II Follow-On (SVs 7-10)
Contractor: Boeing Satellite Systems, Inc.
Contractor Location: 2260 Imperial Hwy.
El Segundo, CA 90245
Contract Number: FA8808-10-C-0001/3
Contract Type: Firm Fixed Price (FFP)
Award Date: August 31, 2011
Definitization Date: August 31, 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
442.6	N/A	1	1157.3	N/A	3	1157.3	1157.3

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to the exercise of production options for satellites WGS-8 and WGS-10.

Cost and Schedule Variance Explanations

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

Deliveries and Expenditures

Deliveries				
Delivered to Date	**Planned to Date**	**Actual to Date**	**Total Quantity**	**Percent Delivered**
Development	0	0	0	--
Production	6	6	8	75.00%
Total Program Quantity Delivered	6	6	8	75.00%

Expended and Appropriated (TY $M)			
Total Acquisition Cost	3801.9	Years Appropriated	18
Expended to Date	3183.8	Percent Years Appropriated	85.71%
Percent Expended	83.74%	Appropriated to Date	3562.8
Total Funding Years	21	Percent Appropriated	93.71%

The above data is current as of February 29, 2016.

The WGS APB was amended with an administrative note only on May 8, 2012 increasing the total quantities from seven to eight satellites without updating the APB cost parameters. The eight satellites in the approved APB include: three satellites (WGS 1-3) on the Block I contract, two satellites (WGS 4-5) on the Block II contract and three additional satellites (WGS 7-8 and WGS-10) on the WGS 7-10 contract.

A third satellite (WGS-6) on the Block II contract is funded by Australia and thus is not included in the APB costs, budgets or quantities. Similar to WGS-6, WGS-9 is being funded by international partners (Canada, Denmark, Luxembourg, The Netherlands, New Zealand and the United States) and is also not included in the APB costs, budgets or quantities.

Three satellites (WGS 1-3) on the Block I contract, two satellites (WGS 4-5) on the Block II contract and one satellite (WGS-7) on the Block II follow-on have been delivered to date.

Operating and Support Cost

Cost Estimate Details

Date of Estimate: December 13, 2013
Source of Estimate: SCP
Quantity to Sustain: 8
Unit of Measure: Total Quantity
Service Life per Unit: 14.00 Years
Fiscal Years in Service: FY 2009 - FY 2030

Sustainment Strategy

Contract Logistics Support (CLS) has been provided by Boeing covering the whole system, via a Time and Material (T&M) CLIN option exercised every calendar year as necessary. On December 31, 2014 a separate CLS sustainment contract was established and started on January 1, 2015.

Antecedent Information

The antecedent system is Defense Satellite Communication System (DSCS) III. The first DSCS III satellite was launched in October 1982 and the last DSCS III satellite was launched in August 2003. O&S effort for DSCS transitioned to Air Force O&M funding in FY 2005. Prior to this transition, on-going O&S for on-orbit DSCS satellites were part of missile procurement costs. O&S costs include all costs for operating, maintaining and supporting the DSCS assets (14 satellites and ground segment) for an assumed designed life of ten years.

O&S costs for DSCS are based on validated requirements from Air Force Space Command Logistics Support Requirements Brochures for the FY 2004 President's Budget.

The antecedent DSCS program office estimate is from April 2002 finalized in Air Force Space Command's budget request to Headquaters Air Force.

Annual O&S Costs BY2010 $M

Cost Element	WGS Average Annual Cost Per Total Quantity	DSCS (Antecedent) Average Annual Cost Per Total Quantity
Unit-Level Manpower	9.381	0.000
Unit Operations	0.249	0.830
Maintenance	1.863	0.000
Sustaining Support	6.525	12.802
Continuing System Improvements	2.760	0.000
Indirect Support	4.073	1.304
Other	0.000	2.371
Total	24.851	17.307

Item	Total O&S Cost $M			
	WGS			DSCS (Antecedent)
	Current Production APB Objective/Threshold		Current Estimate	
Base Year	546.7	601.4	546.7	173.1
Then Year	662.0	N/A	662.0	0.0

Equation to Translate Annual Cost to Total Cost

Total O&S Costs = Average annual cost x years to sustain = $24.851M x 22 = $546.7M

O&S Cost Variance		
Category	**BY 2010 $M**	**Change Explanations**
Prior SAR Total O&S Estimates - Dec 2014 SAR	546.7	
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	546.7	

Disposal Estimate Details

Date of Estimate:

Source of Estimate:

Disposal/Demilitarization Total Cost (BY 2010 $M):

The disposal estimate is to be determined.