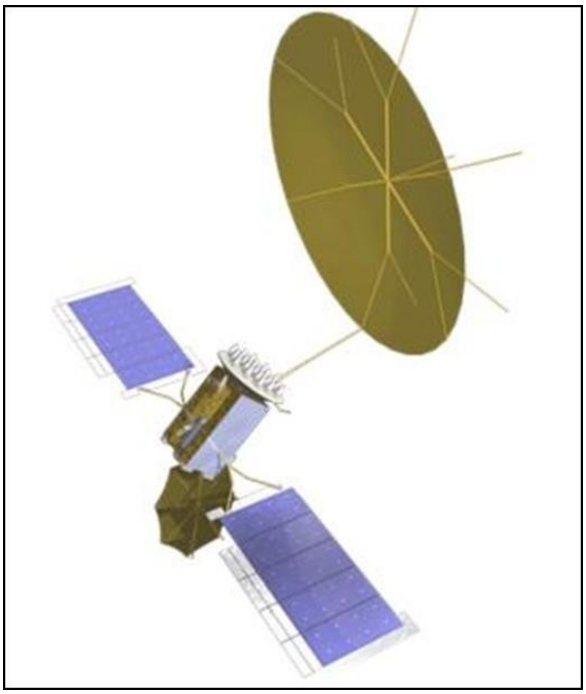
Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-345



Mobile User Objective System (MUOS)

As of December 31, 2012

Defense Acquisition Management
Information Retrieval
(DAMIR)

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Program Information

Program Name

Mobile User Objective System (MUOS)

DoD Component

Navy

Responsible Office

Responsible Office

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Date Assigned August 24, 2010

References

SAR Baseline (Production Estimate)

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated March 15, 2008

Approved APB

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated July 24, 2012

Mission and Description

MUOS is a narrowband Military Satellite Communications (MILSATCOM) system that supports a worldwide, multi-Service population of mobile and fixed-site terminal users in the Ultra High Frequency (UHF) band, providing increased communications capabilities to smaller terminals while still supporting interoperability to legacy terminals.

MUOS adapts a commercial third generation Wideband Code Division Multiple Access (WCDMA) cellular phone network architecture and combines it with geosynchronous satellites (in place of cell towers) to provide a new and more capable UHF MILSATCOM system. The constellation of four operational satellites and ground network control will provide greater than ten times the system capacity of the current UHF Follow-On (UFO) constellation.

MUOS includes the satellite constellation, a ground control and network management system, and a new waveform for user terminals. The space segment is comprised of a constellation of four geosynchronous satellites, plus one on-orbit spare. The ground system includes the ground transport, network management, satellite control, and associated infrastructure to both fly the satellites and manage the users' communications. MUOS is designed to support users that require greater mobility, higher data rates, and improved operational availability. The new waveform is termed the MUOS Common Air Interface (CAI), a Software Communications Architecture compliant modulation technique for the Joint Tactical Radio System terminals.

The flow of information between users when MUOS is operational will be much different than today's systems. Users will communicate with the satellite via UHF WCDMA links and the satellites will relay this to one of four interconnected ground sites located in Wahiawa (Hawaii), Chesapeake (Virginia), Niscemi (Italy), and Geraldton (Australia) via a Ka-band feeder link. These facilities identify the destination of the communications, and route the information to the appropriate ground site for Ka-band uplink to the satellite and UHF WCDMA downlink to the correct users. A network management facility, located at Wahiawa, will feature a government-controlled, priority-based resource management capability that will be adaptable and responsive to changing operational communications requirements. Additionally, MUOS will provide access to select Defense Information System Network services, providing a voice and data capability that has not been available to UHF MILSATCOM users on prior systems. For satellite telemetry, tracking, and commanding, MUOS will use existing control centers operated by the Naval Satellite Operations Center Headquarters at Point Mugu, California, and their detachment at Schriever Air Force Base, Colorado Springs, Colorado.

When MUOS is fielded, it will serve a mixed terminal population. Some users will have terminals only able to support the legacy waveforms while other users will have newer terminals able to support the MUOS CAI. In anticipation of this, each MUOS satellite carries a legacy payload similar to that flown on UFO-11. These legacy payloads will continue to support legacy terminals, allowing for a more gradual transition to the MUOS WCDMA waveform.

Executive Summary

The Acquisition Decision Memorandum (ADM) signed on January 18, 2011 directed Director, Cost Assessment and Program Evaluation (D, CAPE) to reassess and update their MUOS cost estimate from the December 2009 ADM not later than April 15, 2011. D, CAPE presented an update to Under Secretary of Defense for Acquisition, Technology, and Logistics (USD (AT&L)) in April 2011, which resulted in a net $69 million (M) MUOS funding shortfall in FY 2011 through FY 2013 (relative to the FY 2012 President's Budget (PB)). The program office projects a continued shortfall to the D,CAPE estimate of approximately $46M in FY 2011 through FY 2014, relative to the FY 2014 PB. The MUOS Program Manager (PM) projects the program to be adequately funded to the most recent PM Estimate At Complete (as of November 2012). The Navy remains committed to funding MUOS to D, CAPE levels if needed.

MUOS-1 was launched on February 24, 2012. Handover to Government was completed June 21, 2012. The MUOS-1 Legacy Payload was accepted for Early Operational Use by Commander, United States Strategic Command and was placed into operations on November 2, 2012.

An ADM was signed on May 1, 2012 establishing the MUOS PM as the single Government lead responsible for oversight of the development and integration of MUOS space and ground segment with the AN/PRC-155 Manpack Radio, previously known as the Joint Tactical Radio System Manpack terminal. The United States Army's Program Executive Office for Command, Control and Communications-Tactical is developing this terminal by adding the MUOS capability to this new radio. Per the ADM, an in-depth End to End (E2E) Program Review with USD(AT&L) was held November 6, 2012 (presented to the Assistant Secretary of Defense for Acquisition). Additionally, an updated MUOS System Engineering Plan associated with the new E2E role was completed.

A revised Acquisition Program Baseline (APB), requested in the ADM signed December 22, 2009, was prepared to address identified cost and schedule deviations. APB Change 1 (Production) was signed on July 24, 2012.

MUOS met its statutory requirement to conduct a Configuration Steering Board during a Gate 6 Sustainment Review held on December 10, 2012. Meeting minutes were released from the Assistant Secretary of the Navy (Research, Development and Acquisition) on January 11, 2013.

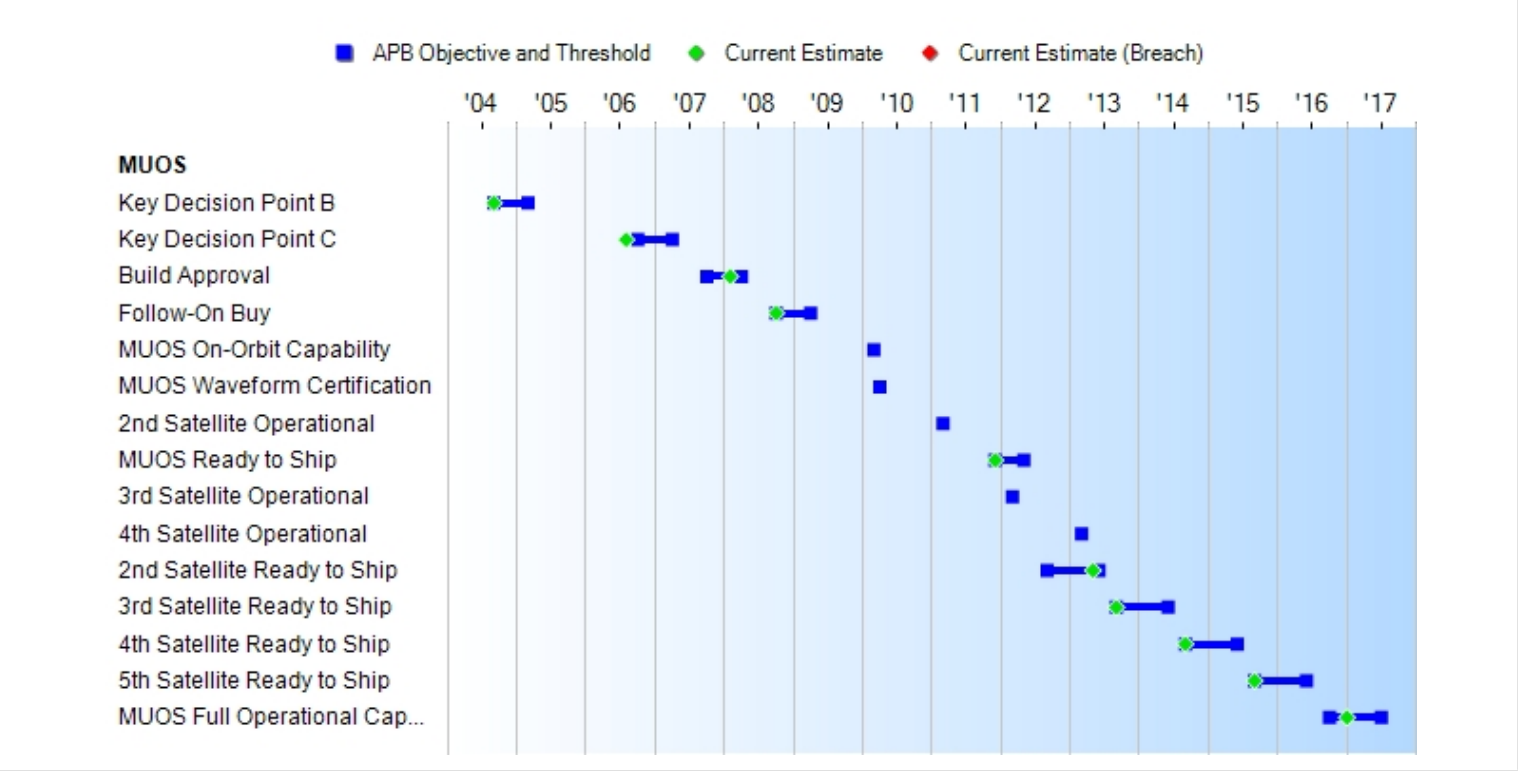
There are no significant software-related issues with this program at this time.

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



Milestones	SAR Baseline Prod Est	Current APB Production Objective/Threshold		Current Estimate	
Key Decision Point B	SEP 2004	SEP 2004	MAR 2005	SEP 2004	
Key Decision Point C	OCT 2006	OCT 2006	APR 2007	AUG 2006	
Build Approval	OCT 2007	OCT 2007	APR 2008	FEB 2008	
Follow-On Buy	OCT 2008	OCT 2008	APR 2009	OCT 2008	
MUOS On-Orbit Capability	MAR 2010	N/A	N/A	N/A	(Ch-1)
MUOS Waveform Certification	APR 2010	N/A	N/A	N/A	
2nd Satellite Operational	MAR 2011	N/A	N/A	N/A	(Ch-1)
MUOS Ready to Ship	N/A	DEC 2011	MAY 2012	DEC 2011	(Ch-2)
3rd Satellite Operational	MAR 2012	N/A	N/A	N/A	(Ch-1)
4th Satellite Operational	MAR 2013	N/A	N/A	N/A	(Ch-1)
2nd Satellite Ready to Ship	N/A	SEP 2012	JUN 2013	MAY 2013	(Ch-2)
3rd Satellite Ready to Ship	N/A	SEP 2013	JUN 2014	SEP 2013	(Ch-2)
4th Satellite Ready to Ship	N/A	SEP 2014	JUN 2015	SEP 2014	(Ch-2)
5th Satellite Ready to Ship	N/A	SEP 2015	JUN 2016	SEP 2015	(Ch-2)
MUOS Full Operational Capability	MAR 2014	OCT 2016	JUL 2017	JAN 2017	(Ch-3)

Acronyms And Abbreviations

N/A - Not Applicable.

Change Explanations

(Ch-1) Also identified within the MUOS APB Change 1 (Production), On-Orbit Capability and Satellite Operational milestones were removed. This change was made because the MUOS program does not control On-Orbit Capability and Satellite Operational dates since the launch manifest is outside program scope. The Air Force CLSRB assigns missions to the launch manifest based on Commander, United States Strategic Command mission priorities and spacecraft readiness.

(Ch-2) The MUOS Acquisition Program Baseline (APB) Change 1 (Production) was signed July 24, 2012 to address previously identified cost and schedule deviations. The APB was updated to add Satellite Ready to Ship milestones as these are within the program's scope and that change is reflected in the schedule above. Threshold dates have been set to nine months after the objective date to allow for optimal trade-space. Risks to the MUOS program require significant schedule to mitigate due to the complex integration and lack of access to the components within the satellite.

(Ch-3) The previously reported MUOS Full Operational Capability (FOC) Current Estimate was October 2016, and has been updated to January 2017. MUOS FOC is three months after MUOS-5 launches. The MUOS Capability Production Document (CPD) defines FOC as all satellites and a spare are on orbit, their associated satellite control terminals and network management system are fully operational, support personnel are trained and in position, logistics support capability is in place to support MUOS CPD performance parameter threshold values, and Follow-on Operational Test and Evaluation has been successfully completed. The FY 2014 budget shifts Weapons Procurement, Navy funding for launch vehicle #5 procurement from FY 2014 to FY 2015. Launch vehicles are funded 24 months prior to their proposed launch date. MUOS-5 is anticipated for potential launch availability to be scheduled no earlier than October 2016, pending the Air Force Current Launch Schedule Review Board (CLSRB) final approval. MUOS FOC is delayed as a direct result of this delay. This deviation is beyond the Program Manager's control.

Performance

Characteristics	SAR Baseline Prod Est	Current APB Production Objective/Threshold		Demonstrated Performance	Current Estimate
Coverage	24 hours/day communicat-ions services at all latitudes and longitudes	24 hours/day communicat-ions services at all latitudes and longitudes	24 hours/day communicat-ions services from 65 degrees North to 65 degrees South latitude at all longitudes	Demonstra-ted via analysis that each MUOS satellite always has optical line of site to one MUOS RAF and there is at least one MUOS satellite accessible from any point within the coverage area from 65 degrees North to 65 degrees South measured at every 0.1 degree increments of longitude over the worst case 24 hour orbital period	24 hours/day communica-tions services from 65 degrees North to 65 degrees South latitude at all longitudes
Capacity	300% worldwide simultaneous accesses (5,991 at 117.6 Mbps) associated with the CMTW scenario	300% worldwide simultaneous accesses (5,991 at 117.6 Mbps) associated with the CMTW scenario	1,997 worldwide simultaneous accesses (39.2 Mbps) with 502 simultaneous theater accesses (3 Mbps)	TBD	1,997 worldwide simultaneous accesses (39.2 Mbps) with 502 simultaneous theater accesses (3 Mbps)
Access and Control	Resources planned, allocated,	Resources planned, allocated,	Resources planned, allocated,	Automated functionality for resource	Resources planned, allocated,

	prioritized, and dynamically configured or reconfigured in less than 5 minutes for all networks; and priority-based access is provided or the request is queued and feedback provided to the user within 3 seconds 90% of the time and 6 seconds 99% of the time	prioritized, and dynamically configured or reconfigured in less than 5 minutes for all networks; and priority-based access is provided or the request is queued and feedback provided to the user within 3 seconds 90% of the time and 6 seconds 99% of the time	prioritized, and dynamically configured or reconfigured within 15 minutes and for selected high priority networks within 5 minutes; and priority-based access is provided or the request is queued and feedback provided to the user within 6 seconds 90% of the time and 10 seconds 99% of the time	planning, allocation and prioritization have been demonstrated via test; network configuration/ reconfiguration was demonstrated via test and analysis to be accomplished in 4.7 seconds Priority-based access has been partially demonstrated via test during Ground System test events and will complete demonstration via analysis coincident with the Capacity KPP demonstration using MPM	prioritized, and dynamically configured or reconfigured in less than 5 minutes for all networks; and priority-based access is provided or the request is queued and feedback provided to the user within 6 seconds 90% of the time and 10 seconds 99% of the time
Net Ready	Fully support execution of all operational activities identified in the applicable joint and system	Fully support execution of all operational activities identified in the applicable joint and system	Fully support execution of joint critical operational activities identified in the applicable joint and system	Letter from Joint Staff J-6, dated October 30, 2007, grants interoperability and supportability certification of the Net	Fully support execution of joint critical operational activities identified in the applicable joint and system

	integrated architectures and the system must satisfy the technical requirements for Net-Centric military operations to include 1) DISR mandated GIG IT standards and profiles identified in the TV-1, 2) DISR mandated GIG KIPs identified in the KIP declaration table, 3) NCOW RM Enterprise Services 4) Information assurance requirements including availability, integrity, authenticat-ion, confidential-ity, and nonrepudiat-ion, and issuance of an ATO by the DAA, and 5) Operationally effective information exchanges; and mission critical	integrated architectures and the system must satisfy the technical requirements for Net-Centric military operations to include 1) DISR mandated GIG IT standards and profiles identified in the TV-1, 2) DISR mandated GIG KIPs identified in the KIP declaration table, 3) NCOW RM Enterprise Services 4) Information assurance requirements including availability, integrity, authenticat-ion, confidential-ity, and nonrepudiat-ion, and issuance of an ATO by the DAA, and 5) Operationally effective information exchanges; and mission critical	integrated architectures and the system must satisfy the technical requirements for transition to Net-Centric military operations to include 1) DISR mandated GIG IT standards and profiles identified in the TV-1, 2) DISR mandated GIG KIPs identified in the KIP declaration table, 3) NCOW RM Enterprise Services 4) Information assurance requirements including availability, integrity, authenticat-ion, confidential-ity, and nonrepudiat-ion, and issuance of an IATO by the DAA, and 5) Operationally effective information exchanges; and mission	Ready Key Performance Parameter Interoper-ability test certification by DISA Joint Interoper-ability Test Command is will conclude following on-orbit testing of MUOS Satellite #2	integrated architectures and the system must satisfy the technical requirements for transition to Net-Centric military operations to include 1) DISR mandated GIG IT standards and profiles identified in the TV-1, 2) DISR mandated GIG KIPs identified in the KIP declaration table, 3) NCOW RM Enterprise Services 4) Information assurance requirements including availability, integrity, authentica-tion, confidential-ity, and nonrepudia-tion, and issuance of an IATO by the DAA, and 5) Operationally effective information exchanges; and mission

	performance and information assurance attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views	performance and information assurance attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views	critical performance and information assurance attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views		critical performance and information assurance attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views
Types of Service	Support synchronous and asynchron-ous broadcast, point-to-point, and netted communicat-ions topologies plus support an asymmetrical multicast communicat-ions topology	Threshold plus support an asymmetrical multicast communicat-ions topology	Support synchronous and asynchron-ous broadcast, point-to-point, and netted communicat-ions topologies	TBD	Support synchronous and asynchron-ous broadcast, point-to-point, and netted communica-tions topologies
Communications on the Move	Support communicat-ions on the move when and where needed in all environments while engaged in combat operations	Support communicat-ions on the move when and where needed in all environments while engaged in combat operations	Support communicat-ions on the move when and where needed in all environments while engaged in combat operations	TBD	Support communica-tions on the move when and where needed in all environments while engaged in combat operations

Availability	Provide an operational link availabil-ity of at least 99% averaged over any year of operation and a constellation availability over the required length of service of at least 90%	Provide an operational link availability of at least 99% averaged over any year of operation and a constellation availability over the required length of service of at least 90%	Provide an operational link availability of at least 97% averaged over any year of operation and a constellation availability over the required length of service of at least 70%	TBD	Provide an operational link availability of at least 97% averaged over any year of operation and a constellation availability over the required length of service of at least 70%

Requirements Source: Capability Production Document (CPD) dated January 15, 2008

Acronyms And Abbreviations

ATO - Approval to Operate
CMTW - Combined Major Theater War
DAA - Designated Approval Authority
DISA - Defense Information Systems Agency
DISR - DOD Informational Technology Standards Region
GIG - Global Information Grid
IATO - Interim Approval to Operate
IT - Information Technology
KIPs - Key Interface Profiles
KPP - Key Performance Parameter
Mbps - megabits per second
MPM - MUOS Performance Model
NCOW RM - Net-Centric Operations and Warfare Reference Model
RAF - Radio Access Facility
TBD - To Be Determined
TV-1 - Technical View 1

Change Explanations

None

Track To Budget

RDT&E				
APPN 1319	BA 07	PE 0303109N	(Navy)	
	Project 2472	Satellite Communications (SPACE)/Mobile User Objective System	(Shared)	
Procurement				
APPN 1507	BA 02	PE 0303109N	(Navy)	
	ICN 243300	Fleet Satellite Communications Follow-On	(Shared)	
MILCON				
APPN 1205	BA 01	PE 0301376N	(Navy)	
	Project P131	Facilities Restoration & Mod - Communication	(Shared)	(Sunk)
Acq O&M				
APPN 1804	BA 04	PE 0303109N	(Navy)	
	Subactivity Group 6M	Satellite Communications (SPACE)	(Shared)	(Sunk)

Cost and Funding

Cost Summary

Total Acquisition Cost and Quantity

	BY2004 $M			BY2004 $M	TY $M		
Appropriation	SAR Baseline Prod Est	Current APB Production Objective/Threshold		Current Estimate	SAR Baseline Prod Est	Current APB Production Objective	Current Estimate
RDT&E	3245.2	3684.0	4052.4	3662.1	3636.2	4138.2	4140.1
Procurement	2460.3	2354.2	2589.6	2327.5	3104.1	2896.3	2932.3
Flyaway	2460.3	--	--	2327.5	3104.1	--	2932.3
Recurring	2460.3	--	--	2327.5	3104.1	--	2932.3
Non Recurring	0.0	--	--	0.0	0.0	--	0.0
Support	0.0	--	--	0.0	0.0	--	0.0
Other Support	0.0	--	--	0.0	0.0	--	0.0
Initial Spares	0.0	--	--	0.0	0.0	--	0.0
MILCON	30.7	30.8	33.9	30.8	34.5	34.6	34.6
Acq O&M	32.7	25.2	27.7	25.2	35.8	26.8	26.8
Total	5768.9	6094.2	N/A	6045.6	6810.6	7095.9	7133.8

Confidence Level for Current APB Cost 50% -
This cost estimate incorporates the 2011 Director, Cost Assessment and Program Evaluation (D,CAPE) Research, Development, Test and Evaulation (RDT&E) estimate (April 2011) which, like all CAPE estimates, carries a confidence level of 50%. The development estimate presented by the CAPE in April 2011, as a result of Acquisition Decision Memorandum (ADM) direction January 2011, like all life-cycle cost estimates previously performed by the CAPE, 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 Major Defense Acquisition Programs (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. The program office's estimate for Procurement and Sustainment activities (December 2011), like the RDT&E estimate, was completed with a 50% confidence level.

The RDT&E effort is 90% complete, Procurement effort is 58% complete, and Sustainment effort is 5% complete.

Quantity	SAR Baseline Prod Est	Current APB Production	Current Estimate
RDT&E	2	2	2
Procurement	4	4	4
Total	6	6	6

The units of measure for the MUOS program consist of six satellites, six launch vehicles, the entire ground system, and the associated support.

Cost and Funding

Funding Summary

Appropriation and Quantity Summary
FY2014 President's Budget / December 2012 SAR (TY$ M)

Appropriation	Prior	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	To Complete	Total
RDT&E	3796.7	145.9	36.0	8.5	7.2	7.4	7.6	130.8	4140.1
Procurement	1794.4	21.5	23.0	253.0	40.9	10.4	10.2	778.9	2932.3
MILCON	34.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.6
Acq O&M	26.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.8
PB 2014 Total	5652.5	167.4	59.0	261.5	48.1	17.8	17.8	909.7	7133.8
PB 2013 Total	5659.2	167.4	273.7	9.1	9.4	8.1	11.1	898.6	7036.6
Delta	-6.7	0.0	-214.7	252.4	38.7	9.7	6.7	11.1	97.2

Program funding and production quantities listed in this SAR are consistent with the FY 2014 President's Budget (PB). The FY 2014 PB did not reflect the enacted DoD appropriation for FY 2013, nor sequestration; it reflected the President's requested amounts for FY 2013.

Quantity	Undistributed	Prior	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	To Complete	Total
Development	2	0	0	0	0	0	0	0	0	2
Production	0	3	0	0	0	0	0	0	1	4
PB 2014 Total	2	3	0	0	0	0	0	0	1	6
PB 2013 Total	2	3	0	0	0	0	0	0	1	6
Delta	0	0	0	0	0	0	0	0	0	0

Cost and Funding

Annual Funding By Appropriation

Annual Funding TY$
1319 | RDT&E | Research, Development, Test, and Evaluation, Navy

Fiscal Year	Quantity	End Item Recurring Flyaway TY $M	Non End Item Recurring Flyaway TY $M	Non Recurring Flyaway TY $M	Total Flyaway TY $M	Total Support TY $M	Total Program TY $M
2000	--	--	--	--	--	--	8.6
2001	--	--	--	--	--	--	27.1
2002	--	--	--	--	--	--	32.5
2003	--	--	--	--	--	--	67.0
2004	--	--	--	--	--	--	84.4
2005	--	--	--	--	--	--	375.2
2006	--	--	--	--	--	--	449.5
2007	--	--	--	--	--	--	637.2
2008	--	--	--	--	--	--	591.3
2009	--	--	--	--	--	--	497.0
2010	--	--	--	--	--	--	398.3
2011	--	--	--	--	--	--	391.4
2012	--	--	--	--	--	--	237.2
2013	--	--	--	--	--	--	145.9
2014	--	--	--	--	--	--	36.0
2015	--	--	--	--	--	--	8.5
2016	--	--	--	--	--	--	7.2
2017	--	--	--	--	--	--	7.4
2018	--	--	--	--	--	--	7.6
2019	--	--	--	--	--	--	18.8
2020	--	--	--	--	--	--	74.9
2021	--	--	--	--	--	--	5.2
2022	--	--	--	--	--	--	10.4
2023	--	--	--	--	--	--	10.4
2024	--	--	--	--	--	--	11.1
Subtotal	**2**	**--**	**--**	**--**	**--**	**--**	**4140.1**

Annual Funding BY$
1319 | RDT&E | Research, Development, Test, and Evaluation, Navy

Fiscal Year	Quantity	End Item Recurring Flyaway BY 2004 $M	Non End Item Recurring Flyaway BY 2004 $M	Non Recurring Flyaway BY 2004 $M	Total Flyaway BY 2004 $M	Total Support BY 2004 $M	Total Program BY 2004 $M
2000	--	--	--	--	--	--	9.0
2001	--	--	--	--	--	--	28.0
2002	--	--	--	--	--	--	33.2
2003	--	--	--	--	--	--	67.5
2004	--	--	--	--	--	--	82.7
2005	--	--	--	--	--	--	358.3
2006	--	--	--	--	--	--	416.3
2007	--	--	--	--	--	--	576.0
2008	--	--	--	--	--	--	524.9
2009	--	--	--	--	--	--	435.6
2010	--	--	--	--	--	--	343.9
2011	--	--	--	--	--	--	329.3
2012	--	--	--	--	--	--	195.7
2013	--	--	--	--	--	--	118.1
2014	--	--	--	--	--	--	28.6
2015	--	--	--	--	--	--	6.6
2016	--	--	--	--	--	--	5.5
2017	--	--	--	--	--	--	5.6
2018	--	--	--	--	--	--	5.6
2019	--	--	--	--	--	--	13.6
2020	--	--	--	--	--	--	53.1
2021	--	--	--	--	--	--	3.6
2022	--	--	--	--	--	--	7.1
2023	--	--	--	--	--	--	7.0
2024	--	--	--	--	--	--	7.3
Subtotal	**2**	**--**	**--**	**--**	**--**	**--**	**3662.1**

Annual Funding TY$
1507 | Procurement | Weapons Procurement, Navy

Fiscal Year	Quantity	End Item Recurring Flyaway TY $M	Non End Item Recurring Flyaway TY $M	Non Recurring Flyaway TY $M	Total Flyaway TY $M	Total Support TY $M	Total Program TY $M
2008	--	203.7	--	--	203.7	--	203.7
2009	1	339.5	--	--	339.5	--	339.5
2010	1	509.9	--	--	509.9	--	509.9
2011	1	503.1	--	--	503.1	--	503.1
2012	--	238.2	--	--	238.2	--	238.2
2013	--	21.5	--	--	21.5	--	21.5
2014	--	23.0	--	--	23.0	--	23.0
2015	--	253.0	--	--	253.0	--	253.0
2016	--	40.9	--	--	40.9	--	40.9
2017	--	10.4	--	--	10.4	--	10.4
2018	--	10.2	--	--	10.2	--	10.2
2019	--	8.1	--	--	8.1	--	8.1
2020	--	57.4	--	--	57.4	--	57.4
2021	1	432.8	--	--	432.8	--	432.8
2022	--	248.5	--	--	248.5	--	248.5
2023	--	8.0	--	--	8.0	--	8.0
2024	--	8.2	--	--	8.2	--	8.2
2025	--	7.0	--	--	7.0	--	7.0
2026	--	8.9	--	--	8.9	--	8.9
Subtotal	**4**	**2932.3**	**--**	**--**	**2932.3**	**--**	**2932.3**

Annual Funding BY$
1507 | Procurement | Weapons Procurement, Navy

Fiscal Year	Quantity	End Item Recurring Flyaway BY 2004 $M	Non End Item Recurring Flyaway BY 2004 $M	Non Recurring Flyaway BY 2004 $M	Total Flyaway BY 2004 $M	Total Support BY 2004 $M	Total Program BY 2004 $M
2008	--	178.9	--	--	178.9	--	178.9
2009	1	293.9	--	--	293.9	--	293.9
2010	1	433.4	--	--	433.4	--	433.4
2011	1	418.3	--	--	418.3	--	418.3
2012	--	194.3	--	--	194.3	--	194.3
2013	--	17.2	--	--	17.2	--	17.2
2014	--	18.1	--	--	18.1	--	18.1
2015	--	194.9	--	--	194.9	--	194.9
2016	--	30.9	--	--	30.9	--	30.9
2017	--	7.7	--	--	7.7	--	7.7
2018	--	7.4	--	--	7.4	--	7.4
2019	--	5.8	--	--	5.8	--	5.8
2020	--	40.3	--	--	40.3	--	40.3
2021	1	297.9	--	--	297.9	--	297.9
2022	--	167.8	--	--	167.8	--	167.8
2023	--	5.3	--	--	5.3	--	5.3
2024	--	5.3	--	--	5.3	--	5.3
2025	--	4.5	--	--	4.5	--	4.5
2026	--	5.6	--	--	5.6	--	5.6
Subtotal	**4**	**2327.5**	**--**	**--**	**2327.5**	**--**	**2327.5**

Cost Quantity Information
1507 | Procurement | Weapons Procurement, Navy

Fiscal Year	Quantity	End Item Recurring Flyaway (Aligned with Quantity) BY 2004 $M
2008	--	--
2009	1	446.2
2010	1	432.5
2011	1	442.3
2012	--	--
2013	--	--
2014	--	--
2015	--	--
2016	--	--
2017	--	--
2018	--	--
2019	--	--
2020	--	--
2021	1	1006.5
2022	--	--
2023	--	--
2024	--	--
2025	--	--
2026	--	--
Subtotal	**4**	**2327.5**

Annual Funding TY$
1205 | MILCON | Military Construction, Navy and Marine Corps

Fiscal Year	Total Program TY $M
2007	26.1
2008	8.5
Subtotal	**34.6**

Annual Funding BY$
1205 | MILCON | Military Construction, Navy and Marine Corps

Fiscal Year	Total Program BY 2004 $M
2007	23.3
2008	7.5
Subtotal	**30.8**

Annual Funding TY$
1804 | Acq O&M | Operation and Maintenance, Navy

Fiscal Year	Total Program TY $M
2002	4.2
2003	4.6
2004	4.5
2005	--
2006	--
2007	--
2008	4.6
2009	5.0
2010	3.9
Subtotal	**26.8**

Annual Funding BY$
1804 | Acq O&M | Operation and Maintenance, Navy

Fiscal Year	Total Program BY 2004 $M
2002	4.3
2003	4.6
2004	4.4
2005	--
2006	--
2007	--
2008	4.1
2009	4.4
2010	3.4
Subtotal	**25.2**

Low Rate Initial Production

There is no Low Rate Initial Production for this program.

Foreign Military Sales

None

Nuclear Cost

None

Unit Cost

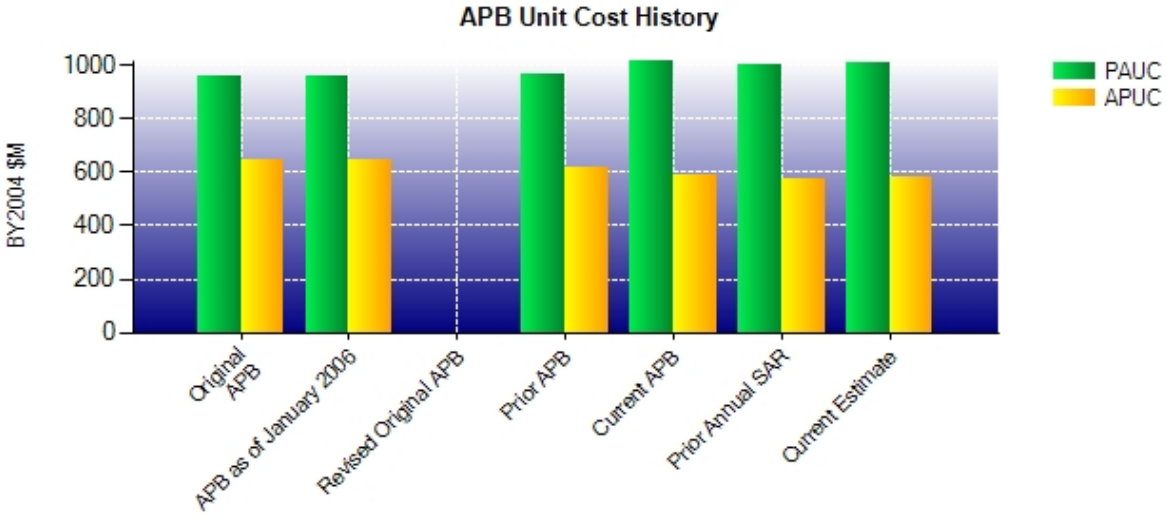
Unit Cost Report

Unit Cost	BY2004 $M Current UCR Baseline (JUL 2012 APB)	BY2004 $M Current Estimate (DEC 2012 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	6094.2	6045.6	
Quantity	6	6	
Unit Cost	1015.700	1007.600	-0.80
Average Procurement Unit Cost (APUC)			
Cost	2354.2	2327.5	
Quantity	4	4	
Unit Cost	588.550	581.875	-1.13

Unit Cost	BY2004 $M Original UCR Baseline (DEC 2004 APB)	BY2004 $M Current Estimate (DEC 2012 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	5738.0	6045.6	
Quantity	6	6	
Unit Cost	956.333	1007.600	+5.36
Average Procurement Unit Cost (APUC)			
Cost	2591.0	2327.5	
Quantity	4	4	
Unit Cost	647.750	581.875	-10.17

PAUC reflects the sum of six satellites, six launch vehicles, the entire ground segment, and the associated support, divided by the total quantity of six. APUC reflects the sum of four satellites and six launch vehicles, divided by a procurement quantity of four.

Unit Cost History



		BY2004 $M		TY $M	
	Date	PAUC	APUC	PAUC	APUC
Original APB	DEC 2004	956.333	647.750	1080.183	776.025
APB as of January 2006	DEC 2004	956.333	647.750	1080.183	776.025
Revised Original APB	N/A	N/A	N/A	N/A	N/A
Prior APB	MAR 2008	961.483	615.075	1135.100	776.025
Current APB	JUL 2012	1015.700	588.550	1182.650	724.075
Prior Annual SAR	DEC 2011	1000.267	575.400	1172.767	717.350
Current Estimate	DEC 2012	1007.600	581.875	1188.967	733.075

SAR Unit Cost History

Initial SAR Baseline to Current SAR Baseline (TY $M)

Initial PAUC Dev Est	Changes								PAUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1080.183	49.000	0.000	2.750	0.000	3.167	0.000	0.000	54.917	1135.100

Current SAR Baseline to Current Estimate (TY $M)

PAUC Prod Est	Changes								PAUC Current Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1135.100	-9.417	0.000	1.167	6.833	55.284	0.000	0.000	53.867	1188.967

Initial SAR Baseline to Current SAR Baseline (TY $M)

Initial APUC Dev Est	Changes								APUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
776.025	39.100	0.000	4.125	0.000	-43.225	0.000	0.000	0.000	776.025

Current SAR Baseline to Current Estimate (TY $M)

APUC Prod Est	Changes								APUC Current Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
776.025	-13.100	0.000	1.750	0.000	-31.600	0.000	0.000	-42.950	733.075

SAR Baseline History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone A	N/A	N/A	N/A	N/A
Milestone B	N/A	SEP 2004	SEP 2004	SEP 2004
Milestone C	N/A	OCT 2006	OCT 2006	AUG 2006
IOC	N/A	N/A	N/A	N/A
Total Cost (TY $M)	N/A	6481.1	6810.6	7133.8
Total Quantity	N/A	6	6	6
Prog. Acq. Unit Cost (PAUC)	N/A	1080.183	1135.100	1188.967

Milestone (MS) B and C dates reflect National Security Space Acquisition Policy 03-01 dates for Key Decision Point B and C, not MS B and C as specified in DoD 5000.

Initial Operational Capability is synonymous with the term On-Orbit Capability, which is referenced by the MUOS Program.

Cost Variance

Summary Then Year $M					
	RDT&E	Proc	MILCON	Acq O&M	Total
SAR Baseline (Prod Est)	3636.2	3104.1	34.5	35.8	6810.6
Previous Changes					
Economic	-14.0	-76.3	+0.1	+0.1	-90.1
Quantity	--	--	--	--	--
Schedule	--	+7.0	--	--	+7.0
Engineering	--	--	--	--	--
Estimating	+483.6	-165.4	--	-9.1	+309.1
Other	--	--	--	--	--
Support	--	--	--	--	--
Subtotal	+469.6	-234.7	+0.1	-9.0	+226.0
Current Changes					
Economic	+9.7	+23.9	--	--	+33.6
Quantity	--	--	--	--	--
Schedule	--	--	--	--	--
Engineering	+41.0	--	--	--	+41.0
Estimating	-16.4	+39.0	--	--	+22.6
Other	--	--	--	--	--
Support	--	--	--	--	--
Subtotal	+34.3	+62.9	--	--	+97.2
Total Changes	+503.9	-171.8	+0.1	-9.0	+323.2
CE - Cost Variance	4140.1	2932.3	34.6	26.8	7133.8
CE - Cost & Funding	4140.1	2932.3	34.6	26.8	7133.8

Summary Base Year 2004 $M					
	RDT&E	Proc	MILCON	Acq O&M	Total
SAR Baseline (Prod Est)	3245.2	2460.3	30.7	32.7	5768.9
Previous Changes					
Economic	--	--	--	--	--
Quantity	--	--	--	--	--
Schedule	--	+2.5	--	--	+2.5
Engineering	--	--	--	--	--
Estimating	+398.8	-161.2	+0.1	-7.5	+230.2
Other	--	--	--	--	--
Support	--	--	--	--	--
Subtotal	+398.8	-158.7	+0.1	-7.5	+232.7
Current Changes					
Economic	--	--	--	--	--
Quantity	--	--	--	--	--
Schedule	--	--	--	--	--
Engineering	+31.5	--	--	--	+31.5
Estimating	-13.4	+25.9	--	--	+12.5
Other	--	--	--	--	--
Support	--	--	--	--	--
Subtotal	+18.1	+25.9	--	--	+44.0
Total Changes	+416.9	-132.8	+0.1	-7.5	+276.7
CE - Cost Variance	3662.1	2327.5	30.8	25.2	6045.6
CE - Cost & Funding	3662.1	2327.5	30.8	25.2	6045.6

Previous Estimate: December 2011

RDT&E	$M	
Current Change Explanations	**Base Year**	**Then Year**
Revised escalation indices. (Economic)	N/A	+9.7
Increased Information Assurance Requirements. (Engineering)	+27.5	+36.0
Development of MUOS Terminal Integration and Test lab to test industry developed terminals on MUOS system. (Engineering)	+4.0	+5.0
Miscellaneous budget adjustments (Realignments, Purchase Inflation, etc.). (Estimating)	-7.9	-9.8
Adjustment for current and prior escalation. (Estimating)	-5.5	-6.6
RDT&E Subtotal	+18.1	+34.3

Procurement	$M	
Current Change Explanations	**Base Year**	**Then Year**
Revised escalation indices. (Economic)	N/A	+23.9
Adjustment for current and prior escalation. (Estimating)	-5.1	-6.0
Cost increase associated with the delay of Evolved Expendable Launch Vehicle (EELV) #5 funding delay from FY 2014 to FY 2015. (Estimating)	+38.3	+54.7
Miscellaneous budget adjustments (Realignments, Purchase Inflation, etc.) (Estimating)	-7.3	-9.7
Procurement Subtotal	+25.9	+62.9

Contracts

Appropriation: RDT&E	
Contract Name	**MUOS RRDD AOS Contract - Contract Line Item Number (CLIN) 1**
Contractor	Lockheed Martin (LMSSC)
Contractor Location	1111 Lockheed Martin Way Sunnyvale, CA 94089-1212
Contract Number, Type	N00039-04-C-2009, CPAF/CPIF
Award Date	September 24, 2004
Definitization Date	September 24, 2004

Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
2097.9	N/A	2	2280.1	N/A	2	3444.8	3457.2

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date (2/24/2013)	-292.3	-11.8
Previous Cumulative Variances	-171.5	-14.5
Net Change	-120.8	+2.7

Cost And Schedule Variance Explanations

The unfavorable net change in the cost variance is due to technical issues primarily in the Ground Segment (User Entry) and Satellite Assembly, Integration, and Test Segment. Both MUOS-1 and MUOS-2 experienced cost inefficiencies as a result of issues with Single Line Flow (SLF) testing.

The favorable net change in the schedule variance is due to successful Launch, On-Orbit Testing, and On-Orbit System Validation for MUOS-1. Subsequently, handover of MUOS-1 from the contractor to the Government completed on June 21, 2012. Also contributing to the favorable schedule variance is the completion of SLF testing on MUOS-2 and the successful delivery of MUOS Waveform version 3.1 to the Joint Tactical Radio System Information Repository.

Contract Comments

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

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to the incorporation of the Secure Communications Engineering Change Proposal (ECP), and the Enhanced Digital Receiver Unit ECP.

The difference between the Contract Price and both the Contractor's Estimated Price at Completion, and the Program Manager's Price at Completion, is driven by adjustments made for Over Target Baseline (OTB) #1 and OTB #2.

Appropriation: Procurement

Contract Name	**MUOS RRDD AOS Contract - Contract Line Item Number (CLIN) 3**
Contractor	Lockheed Martin (LMSSC)
Contractor Location	1111 Lockheed Martin Way Sunnyvale, CA 94089-1212
Contract Number, Type	N00039-04-C-2009/3, FPIF
Award Date	September 24, 2004
Definitization Date	September 24, 2009

Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
279.0	298.5	1	282.5	332.5	1	332.6	332.5

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date (2/24/2013)	+3.6	-15.1
Previous Cumulative Variances	+5.9	-8.8
Net Change	-2.3	-6.3

Cost And Schedule Variance Explanations

The unfavorable net change in the cost variance is due to post-mate testing inefficiencies realized in Satellite Assembly, Integration, and Test Segment.

The unfavorable net change in the schedule variance is due to late hardware deliveries and inefficiencies in Single Line Flow testing.

Contract Comments

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to the inclusion of a contract Engineering Change Proposal (ECP).

The Program Manager’s Estimated Price at Completion is equal to the current Contract Ceiling Price.

This is not a new contract, but a previous contract line item that was exercised on the MUOS contract N00039-04-C-2009.

Appropriation: Procurement

Contract Name	**MUOS RRDD AOS Contract – Contract Line Item Number (CLIN) 5**
Contractor	Lockheed Martin (LMSSC)
Contractor Location	1111 Lockheed Martin Way Sunnyvale, CA 94089-1212
Contract Number, Type	N00039-04-C-2009/5, FPIF
Award Date	September 24, 2004
Definitization Date	January 25, 2010

Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
287.7	307.7	1	277.8	324.7	1	325.2	324.7

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date (2/24/2013)	+25.0	-11.7
Previous Cumulative Variances	+14.9	-2.4
Net Change	+10.1	-9.3

Cost And Schedule Variance Explanations

The favorable net change in the cost variance is due to cost efficiencies in the Program Management and Payload Segments. The favorable net change is also attributable to labor rates and efficiencies realized as a result of having multiple spacecraft in production.

The unfavorable net change in the schedule variance is due to the delayed shipment of MUOS-4 system module due to inefficiencies in system module testing.

Contract Comments

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to the change in methodology to align the target price to the Cost Performance Reporting data reported by the Prime Contractor, which excludes $9.9M Mission Success Fee. In previous SAR submissions, the Mission Success Fee was included in the target price. In accordance with guidance, the Original Target Price remains unchanged, and continues to include the $9.9M of Fee.

The Program Manager’s Estimated Price at Completion is equal to the current Contract Ceiling Price.

This is not a new contract, but a previous contract line item that was exercised on the MUOS contract N00039-04-C-2009.

Appropriation: RDT&E	
Contract Name	**MUOS RRDD AOS Contract – Contract Line Item Number (CLIN) 7**
Contractor	Lockheed Martin (LMSSC)
Contractor Location	1111 Lockheed Martin Way Sunnyvale, CA 94089-1212
Contract Number, Type	N00039-04-C-2009/7, FPIF
Award Date	September 24, 2004
Definitization Date	January 25, 2011

Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
288.5	339.6	1	288.5	339.6	1	332.3	339.6

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date (2/24/2013)	+18.7	-3.7
Previous Cumulative Variances	+6.3	+27.0
Net Change	+12.4	-30.7

Cost And Schedule Variance Explanations

The favorable net change in the cost variance is due to labor efficiencies experienced in Legacy Subsystem, and Program Management.

The unfavorable net change in the schedule variance is due to offsets to performance taken in earlier periods for efforts completed ahead of schedule in several Work Breakdown Structure elements (primarily Space Bus and Payload Segments).

Contract Comments

The Program Manager’s Estimated Price at Completion is equal to the current Contract Ceiling Price.

This is not a new contract, but a previous contract line item that was exercised on the MUOS contract N00039-04-C-2009.

Deliveries and Expenditures

Deliveries To Date	Plan To Date	Actual To Date	Total Quantity	Percent Delivered
Development	1	1	2	50.00%
Production	0	0	4	0.00%
Total Program Quantities Delivered	1	1	6	16.67%

Expenditures and Appropriations (TY $M)			
Total Acquisition Cost	7133.8	Years Appropriated	14
Expenditures To Date	4900.0	Percent Years Appropriated	51.85%
Percent Expended	68.69%	Appropriated to Date	5819.9
Total Funding Years	27	Percent Appropriated	81.58%

The above data is current as of 3/31/2013.

Operating and Support Cost

MUOS

Assumptions and Ground Rules

Cost Estimate Reference:

Current program office estimate reviewed with the Office of the Secretary of Defense, Cost Assessment and Program Evaluation, December 2012, based on the approved Logistics Requirements Funding Summary (LRFS) dated November 8, 2012.

Sustainment Strategy:

The MUOS constellation consists of five satellites, four operational and one on-orbit spare. In addition, the Acquistion Program Baseline includes procurement of a sixth satellite to replace the first satellite at end-of-life. MUOS Operations and Support (O&S) costs include sustainment of all satellites and four ground sites located in Wahiawa (Hawaii), Chesapeake (Virginia), Niscemi (Italy), and Geraldton (Australia).

Antecedent Information:

The antecedent system to MUOS was the Ultra High Frequency (UHF) Follow-on (UFO) satellite communications program. Comparisons of O&S costs for UFO are not provided. Although the MUOS system continues to support UHF capabilities, the infrastructure of MUOS and its sustainment are not comparable to UFO.

Unitized O&S Costs BY2004 $M

Cost Element	MUOS Cost Per Satellite Per Year	UFO (Antecedent) Cost Per Satellite Per Year
Unit-Level Manpower	0.0	0.0
Unit Operations	0.0	0.0
Maintenance	0.5	0.0
Sustaining Support	3.2	0.0
Continuing System Improvements	0.0	0.0
Indirect Support	0.2	0.0
Other	0.0	0.0
Total	3.9	--

Unitized Cost Comments:

O&S costs include maintenance and sustainment of the entire MUOS system, including the space and ground segments. The unitized annual costs reflect the total O&S cost divided by six satellites and 16 years (FY 2011 - FY 2026).

	Total O&S Cost $M			
	Current Production APB Objective/Threshold		Current Estimate	
	MUOS		MUOS	UFO (Antecedent)
Base Year	379.9	417.9	368.4	N/A
Then Year	508.2	N/A	509.5	N/A

Total O&S Costs Comments:

The total O&S estimate increased from $174.8 million (M) Base Year (BY) 2004 in the 2011 SAR to $368.4M BY 2004 in the 2012 SAR due to refinement of the sustainment strategy and delays in Full Operational Capability driven by technical issues during satellite production.

Disposal Costs

Disposal costs are excluded from the O&S estimate. Satellites will be disposed on-orbit using on-board fuel paid for during the procurement phase of the program.