



## Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-289



### **Tactical Tomahawk RGM-109E/UGM-109E Missile (TACTOM)**

As of FY 2011 President's Budget

Defense Acquisition Management  
Information Retrieval  
(DAMIR)

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## Common Acronyms and Abbreviations for MDAP Programs

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

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

## Program Information

**Program Name**

Block IV Tomahawk (Tactical Tomahawk) (TOMAHAWK(R/UGM-109E))

**DoD Component**

Navy

## Responsible Office

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## References

**SAR Baseline (Production Estimate)**

Navy Acquisition Executive (NAE) Approved Acquisition Program Baseline (APB) dated August 3, 2004

**Approved APB**

NAE Approved Acquisition Program Baseline (APB) dated April 11, 2005

## Mission and Description

The Tomahawk Land Attack Missile counters threats against U.S. Forces by destroying targets ashore including command, control and logistic systems; industrial and other high value targets; and ground and air defense systems. The Tomahawk Weapons System (TWS) consists of: the Block IV Tomahawk All-Up-Round (AUR) missile; the Tomahawk Command and Control System (TC2S); and the Tactical Tomahawk Weapons Control System (TTWCS). The AUR is an ACAT IC program; TC2S is an ACAT II program, and TTWCS is an ACAT III program. Block IV Tomahawk provides major modernization to the existing Tomahawk technology, increasing responsiveness and flexibility at a more affordable production unit cost.

Key elements of the Block IV Tomahawk AUR design are an improved navigation and guidance computer; improved anti-jam Global Positioning System (GPS) capability; improved responsiveness and flexibility through two-way satellite communications for in-flight re-targeting; a loiter capability; and the ability to send a single frame, Battle Damage Indication Image (BDII) of over-flown areas prior to impact. Modern manufacturing techniques and Commercial Off-the-Shelf/Government Off-the-Shelf/(COTS/GOTS) hardware provide this improved capability at less than half the production cost of a Block III Tomahawk. Additionally, the life cycle costs are significantly reduced by extending the re-certification interval from 8 years for the currently fielded Block III to 15 years for the Block IV Tomahawk AUR. The Block IV Tomahawk AUR will maximize the use of existing Tomahawk Weapon System program and logistic support. There is no change to the system's overall support concept.

## Executive Summary

The Assistant Secretary of the Navy (Research Development and Acquisition (RD&A)), authorized approval of the Block IV Tomahawk All-Up-Round (AUR), for entry into the Production and Deployment Phase on August 3, 2004. A Multi-Year Procurement (MYP), (FY04-FY08) contract was signed with Raytheon Missile Systems (RMS), for the acquisition of up to 2200 Block IV Tomahawk AUR missiles, on August 18, 2004. The program has delivered to the US Navy (USN) 1930 missiles to date. MYP contract deliveries are on schedule to be completed in September of 2010. A contract for the follow-on production Block IV Tomahawk (AUR) program has been signed for the acquisition of up to 1050 additional missiles, a FY09 procurement contract for 207 missiles, and two priced production options; FY10 for 196 missiles and FY11 for 196 missiles. The FY10 firm fixed price option for 196 missiles was awarded in January of 2010. The Minimum Sustaining Rate (MSR) for Tactical Tomahawk is 196 missiles per year. To address rising unit costs, the Program has recently completed supporting analysis for, and implemented, numerous cost reduction initiatives that have directly resulted in \$15M of cost avoidance benefits.

During the January 2008 thru December 2009 SAR reporting period, RMS completed delivery of 970 Full Rate Production (FRP)-3/-4/-5 AURs. The Tomahawk Program has successfully completed 23 consecutive Block IV operational flight tests from fleet surface and subsurface platforms.

As a result of multiple material quality issues, RMS did not meet BLK IV missile contracted delivery requirements during the period June through November 2008. The Program Manager had briefed all major stakeholders regarding the production issues. RMS has successfully validated and implemented corrective actions into the missile production hardware, processes and materials as related to all previously reported technical issues that were discovered during missile testing. RMS has achieved seven consecutive months of meeting or exceeding the revised contracted missile delivery requirements.

The Program Manager resumed acceptance of Surface Block IV Vertical Launch System (VLS), subsurface Block IV Capsule Launch System (CLS) and Block IV Torpedo Tube Launch (TTL) weapons in December 2008. As of the end of December 2009, RMS has delivered 597 BLK IV new production missiles and is presently 72 missiles ahead of contracted delivery requirements. The current combined Block III and IV Fleet inventory is sufficient to satisfy projected 2010 USN operational load-outs.

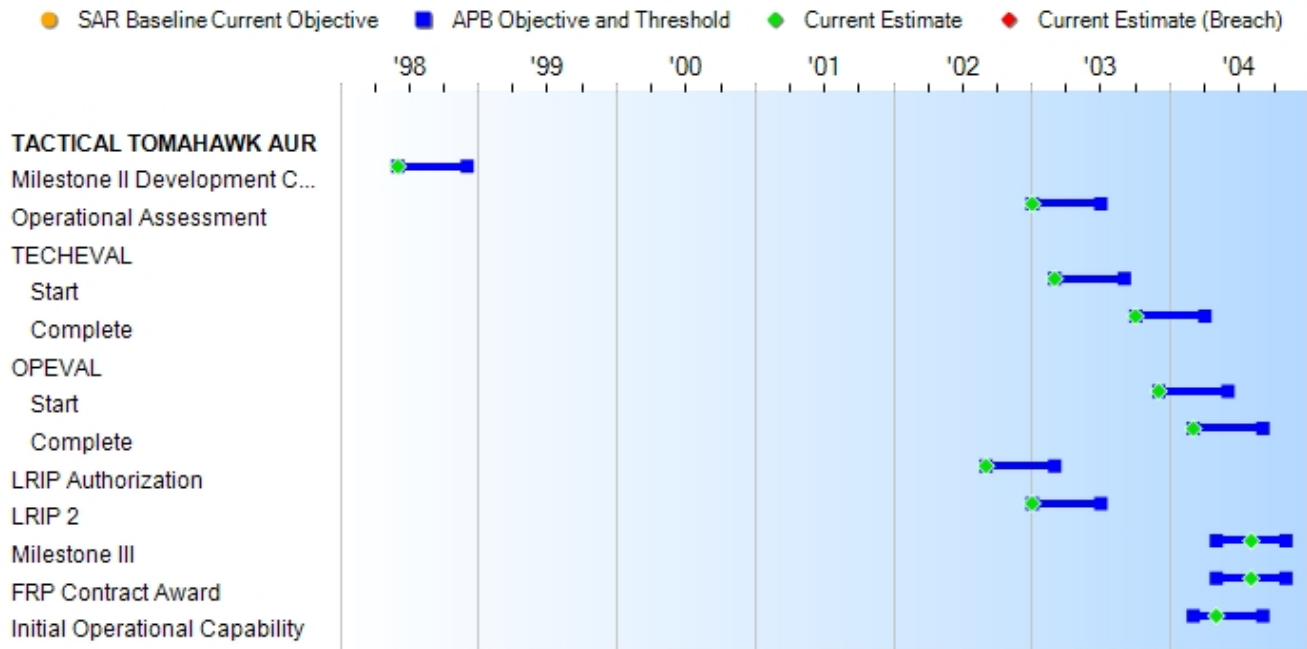
There are no software related issues for this program at this time.

## Threshold Breaches

APB Breaches		Explanation of Breach
<b>Schedule</b>	<input type="checkbox"/>	<p>SAR is based on PB11 which includes estimated "to complete" Tomahawk missile procurements through FY20. Prior President Budgets did not populate the "to complete" field. The PB11 procurement funding levels will cause the Tomahawk program to breach the April 2005 Acquisition Program Baseline (APB) procurement funding threshold value of \$3409.0M (FY99\$M) and breach the APB Average Procurement Unit Cost (APUC) threshold value of 1.004. In order to procure sufficient weapons necessary to satisfy Fleet inventory requirements, and as a direct result of adding FY16 through FY20 missile procurements (at 213 weapons per year), this APUC Breach will exceed the current APB objective value by 14.90%.</p> <p>To support completion of missile procurements through 2020, the Tomahawk program office has submitted a program deviation report and is preparing a revised APB to be submitted for Assistant Secretary of the Navy (Research Development and Acquisition (ASN (RD&amp;A))) approval. As the Block III inventory completes retirement in 2020, the revised program baseline will enable completing Tomahawk procurements necessary to sustain the missile inventory at a level that supports Fleet requirements. The revised APB will reflect procurement quantities and program unit cost data that support completion of all Tomahawk missile procurements.</p>
<b>Performance</b>	<input type="checkbox"/>	
<b>Cost</b>	<input type="checkbox"/>	
RDT&E	<input type="checkbox"/>	
Procurement	<input checked="" type="checkbox"/>	
MILCON	<input type="checkbox"/>	
Acq O&M	<input type="checkbox"/>	
<b>O&amp;S Cost</b>	<input type="checkbox"/>	
<b>Unit Cost</b>	<input type="checkbox"/>	
PAUC	<input type="checkbox"/>	
APUC	<input checked="" type="checkbox"/>	
Nunn-McCurdy Breaches		
<b>Current UCR Baseline</b>		
PAUC	None	
APUC	None	
<b>Original UCR Baseline</b>		
PAUC	None	
APUC	None	



### Schedule



Schedule Events				
Events	SAR Baseline Production Estimate	Current APB Production Objective/Threshold	Current Estimate	Current Estimate
Milestone II Development Contract Award	Jun 1998	Jun 1998	Dec 1998	Jun 1998
Operational Assessment	Jan 2003	Jan 2003	Jul 2003	Jan 2003
TECHEVAL				
Start	Mar 2003	Mar 2003	Sep 2003	Mar 2003
Complete	Oct 2003	Oct 2003	Apr 2004	Oct 2003
OPEVAL				
Start	Dec 2003	Dec 2003	Jun 2004	Dec 2003
Complete	Mar 2004	Mar 2004	Sep 2004	Mar 2004
LRIP Authorization	Sep 2002	Sep 2002	Mar 2003	Sep 2002
LRIP 2	Jan 2003	Jan 2003	Jul 2003	Jan 2003
Milestone III	May 2004	May 2004	Nov 2004	Aug 2004
FRP Contract Award	May 2004	May 2004	Nov 2004	Aug 2004
Initial Operational Capability	Mar 2004	Mar 2004	Sep 2004	May 2004

**Change Explanations**

None

**Acronyms and Abbreviations**

FRP - Full Rate Production

LRIP - Low Rate Initial Production

OPEVAL - Operational Evaluation

TECHEVAL - Technical Evaluation

## Performance

Performance Characteristics				
SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Demonstrated Performance	Current Estimate
<b>Mission Reliability (%)</b>				
.90	.90	.86	.97	.88
<b>Cruise Reliability (%)</b>				
.96	.96	.94	1.00	.94

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

### Requirements Reference

Operational Requirements Document (ORD) #641-76-04 dated August 11, 2004

### Change Explanations

None

## Track to Budget

### RDT&E

Appn	BA	PE
Navy	1319 07	0204229N

Project	Name
A0545	TACTICAL TOMAHAWK/TACTICAL TOMAHAWK
A2658	TACTICAL TOMAHAWK/TACTICAL TOMAHAWK
A2659	TACTICAL TOMAHAWK/TACTICAL TOMAHAWK

### Procurement

Appn	BA	PE
Navy	1507 02	0204229N

Line Item	Name
210100	TACTICAL TOMAHAWK

## Cost and Funding

### Cost Summary

Total Acquisition Cost							
Appropriation	BY 1999 \$M			BY 1999 \$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	564.9	564.9	621.4	565.1	581.0	581.0	581.9
Procurement	2412.4	3099.1	3409.0	4962.6 <sup>1</sup>	2709.3	3629.1	6303.5
Flyaway	--	--	--	4870.5	--	--	6186.9
Recurring	--	--	--	4835.2	--	--	6149.2
Non Recurring	--	--	--	35.3	--	--	37.7
Support	--	--	--	92.1	--	--	116.6
Other Support	--	--	--	92.1	--	--	116.6
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	2977.3	3664.0	N/A	5527.7	3290.3	4210.1	6885.4

<sup>1</sup> APB Breach

#### Cost Notes

This SAR is based on the FY 2011 President's Budget (PB 11) which includes estimated "to complete" Tomahawk missile procurements through FY20. Prior President Budgets did not populate the "to complete" field. The PB 11 procurement funding levels will cause the Tomahawk program to breach the April 2005 Acquisition Program Baseline (APB) procurement funding threshold value of \$3409.0M (FY99\$M) and breach the APB Average Procurement Unit Cost (APUC) threshold value of 1.004. In order to procure sufficient weapons necessary to satisfy Fleet inventory requirements, and as a direct result of adding FY16 through FY20 missile procurements (at 213 weapons per year), this APUC Breach will exceed the current APB objective value by 14.90%.

To support completion of missile procurements through 2020, the Tomahawk program office has submitted a Program Deviation Report (PDR) and is preparing a revised APB to be submitted for Assistant Secretary of the Navy (Research Development and Acquisition (ASN(RD&A))) approval. As the Block III inventory completes retirement in 2020, the revised program baseline will enable completing Tomahawk procurements necessary to sustain the missile inventory at a level that supports Fleet requirements. The revised APB will reflect procurement quantities and program unit cost data that support completion of all Tomahawk missile procurements.

Total Quantity			
Quantity	SAR Baseline Production Estimate	Current APB Production	Current Estimate
RDT&E	10	10	10
Procurement	2780	3394	4730
Total	2790	3404	4740

## Cost and Funding

### Funding Summary

Appropriation Summary									
FY 2011 President's Budget / December 2009 SAR (TY\$ M)									
Appropriation	Prior	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	To Complete	Total
RDT&E	581.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	581.9
Procurement	2621.3	276.5	300.2	305.4	313.9	322.6	332.8	1830.8	6303.5
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 2011 Total	3203.2	276.5	300.2	305.4	313.9	322.6	332.8	1830.8	6885.4
PB 2009 Total	3109.1	290.0	304.8	334.3	337.1	0.0	0.0	0.0	4375.3
Delta	94.1	-13.5	-4.6	-28.9	-23.2	322.6	332.8	1830.8	2510.1

Quantity Summary										
FY 2011 President's Budget / December 2009 SAR (TY\$ M)										
Quantity	Undistributed	Prior	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	To Complete	Total
Development	10	0	0	0	0	0	0	0	0	10
Production	0	2489	196	196	196	196	196	196	1065	4730
PB 2011 Total	10	2489	196	196	196	196	196	196	1065	4740
PB 2009 Total	10	2386	209	218	243	226	0	0	0	3292
Delta	0	103	-13	-22	-47	-30	196	196	1065	1448

## Cost and Funding

### Annual Funding By Appropriation

Annual Funding								
1319   RDT&E   Research, Development, Test, and Evaluation, Navy								
Fiscal Year	Quantity	TY \$M						Total Program
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support		
1998	--	--	--	--	--	--	--	49.8
1999	--	--	--	--	--	--	--	122.4
2000	--	--	--	--	--	--	--	164.2
2001	--	--	--	--	--	--	--	105.4
2002	--	--	--	--	--	--	--	63.0
2003	--	--	--	--	--	--	--	57.3
2004	--	--	--	--	--	--	--	19.8
Subtotal	10	--	--	--	--	--	--	581.9



Annual Funding 1319   RDT&E   Research, Development, Test, and Evaluation, Navy							
Fiscal Year	Quantity	BY 1999 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
1998	--	--	--	--	--	--	49.9
1999	--	--	--	--	--	--	121.3
2000	--	--	--	--	--	--	160.3
2001	--	--	--	--	--	--	101.5
2002	--	--	--	--	--	--	60.1
2003	--	--	--	--	--	--	53.9
2004	--	--	--	--	--	--	18.1
Subtotal	10	--	--	--	--	--	565.1

Annual Funding 1507   Procurement   Weapons Procurement, Navy							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2002	25	46.2	--	24.0	70.2	2.4	72.6
2003	377	420.9	--	13.7	434.6	2.9	437.5
2004	322	344.6	--	--	344.6	7.4	352.0
2005	298	268.5	--	--	268.5	8.7	277.2
2006	409	363.1	--	--	363.1	9.9	373.0
2007	355	345.3	--	--	345.3	7.7	353.0
2008	496	470.8	--	--	470.8	5.0	475.8
2009	207	275.2	--	--	275.2	5.0	280.2
2010	196	271.1	--	--	271.1	5.4	276.5
2011	196	294.7	--	--	294.7	5.5	300.2
2012	196	299.8	--	--	299.8	5.6	305.4
2013	196	308.1	--	--	308.1	5.8	313.9
2014	196	316.6	--	--	316.6	6.0	322.6
2015	196	326.6	--	--	326.6	6.2	332.8
2016	213	350.3	--	--	350.3	6.3	356.6
2017	213	356.6	--	--	356.6	6.5	363.1
2018	213	363.4	--	--	363.4	6.6	370.0
2019	213	360.2	--	--	360.2	6.8	367.0
2020	213	367.2	--	--	367.2	6.9	374.1
Subtotal	4730	6149.2	--	37.7	6186.9	116.6	6303.5

Annual Funding 1507   Procurement   Weapons Procurement, Navy								
Fiscal Year	Quantity	BY 1999 \$M						
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program	
2002	25	43.5	--	22.6	66.1	2.3	68.4	
2003	377	388.4	--	12.7	401.1	2.7	403.8	
2004	322	308.8	--	--	308.8	6.7	315.5	
2005	298	234.2	--	--	234.2	7.6	241.8	
2006	409	309.0	--	--	309.0	8.4	317.4	
2007	355	287.6	--	--	287.6	6.5	294.1	
2008	496	386.4	--	--	386.4	4.1	390.5	
2009	207	223.1	--	--	223.1	4.1	227.2	
2010	196	217.0	--	--	217.0	4.3	221.3	
2011	196	232.3	--	--	232.3	4.3	236.6	
2012	196	232.4	--	--	232.4	4.4	236.8	
2013	196	234.9	--	--	234.9	4.4	239.3	
2014	196	237.3	--	--	237.3	4.5	241.8	
2015	196	240.7	--	--	240.7	4.6	245.3	
2016	213	253.9	--	--	253.9	4.5	258.4	
2017	213	254.1	--	--	254.1	4.7	258.8	
2018	213	254.6	--	--	254.6	4.7	259.3	
2019	213	248.2	--	--	248.2	4.7	252.9	
2020	213	248.8	--	--	248.8	4.6	253.4	
Subtotal	4730	4835.2	--	35.3	4870.5	92.1	4962.6	

Cost Savings (for Mk-14 canister re-use) are reflected in FY19 and FY20 budgeted totals.

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## Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
<b>Approval Date</b>	4/12/2001	8/26/2003
<b>Approved Quantity</b>	192	402
<b>Reference</b>	Tactical Tomahawk AUR LRIP ADM dated 12 April 2001.	Tactical Tomahawk AUR LRIP III ASR/AP signed by ASN(RD&A) 26 Aug 2003.
<b>Start Year</b>	2002	2002
<b>End Year</b>	2007	2007

Low Rate Initial Production (LRIP-1) was initiated in October 2002 with a contract for 25 Block IV Tomahawk AUR missiles. The LRIP-2 contract option was exercised for an additional 167 Block IV Tomahawk AUR missiles in January 2003. As a result of Operation Iraqi Freedom and expenditures of a large number of Block III Tomahawks, FY03 Emergency Supplemental funding was provided for 210 additional Tomahawk Block IV AUR LRIP missiles (LRIP-3) to increase the total LRIP quantity to 402 missiles, resulting in production quantities exceeding the 10% LRIP threshold.

## Foreign Military Sales

Country	Date of Sale	Quantity	Total Cost \$M	Description
United Kingdom	2/10/2006	65	64.0	Torpedo Tube Launch Block IV missiles in FY06, and cost includes missiles and ancillary equipment. All UK missiles on contract have been delivered.

### Notes

## Nuclear Costs

None

## Unit Cost

### Unit Cost Report

Item	BY 1999 \$M	BY 1999 \$M	% Change
	Current UCR Baseline (Apr 2005 APB)	Current Estimate (Dec 2009 SAR)	
<b>Program Acquisition Unit Cost</b>			
Cost	3664.0	5527.7	
Quantity	3404	4740	
Unit Cost	1.076	1.166	+8.36
<b>Average Procurement Unit Cost</b>			
Cost	3099.1	4962.6	
Quantity	3394	4730	
Unit Cost	0.913	<b>1.049<sup>1</sup></b>	+14.90

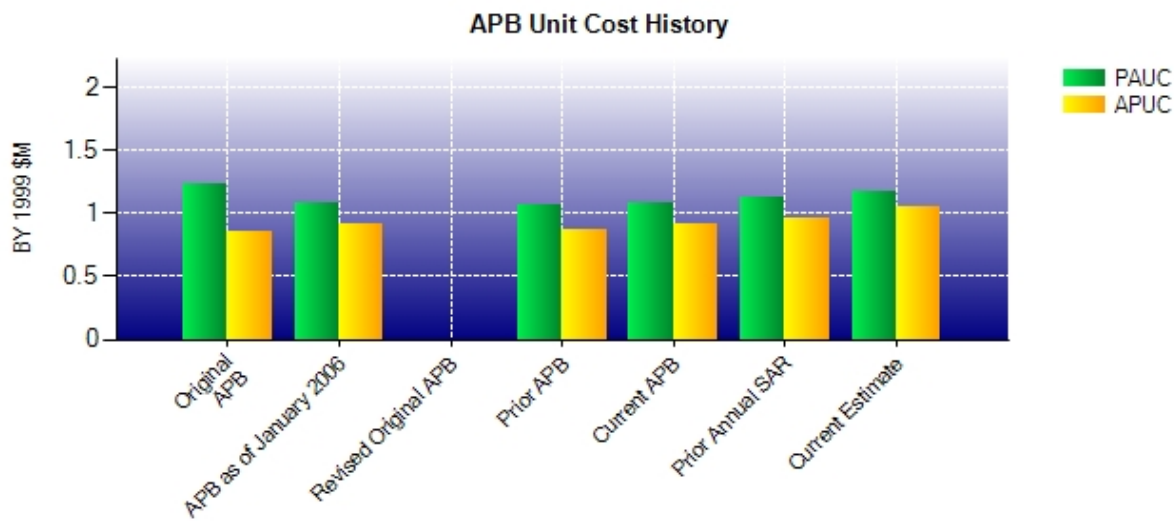
Item	BY 1999 \$M	BY 1999 \$M	% Change
	Original UCR Baseline (Sep 1999 APB)	Current Estimate (Dec 2009 SAR)	
<b>Program Acquisition Unit Cost</b>			
Cost	1683.7	5527.7	
Quantity	1365	4740	
Unit Cost	1.233	1.166	-5.43
<b>Average Procurement Unit Cost</b>			
Cost	1158.4	4962.6	
Quantity	1353	4730	
Unit Cost	0.856	1.049	+22.55

<sup>1</sup> APB Unit Cost Breach

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**Unit Cost History**



Item	Date	BY 1999 \$M		TY \$M	
		PAUC	APUC	PAUC	APUC
Original APB	Sep 1999	1.233	0.856	1.365	0.984
APB as of January 2006	Apr 2005	1.076	0.913	1.237	1.069
Revised Original APB	N/A	N/A	N/A	N/A	N/A
Prior APB	Aug 2004	1.067	0.868	1.179	0.975
Current APB	Apr 2005	1.076	0.913	1.237	1.069
Prior Annual SAR	Dec 2007	1.126	0.957	1.329	1.156
Current Estimate	Dec 2009	1.166	1.049	1.453	1.333

**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	
1.365	-0.015	0.324	0.117	0.000	-0.716	0.000	0.104	-0.186	1.179

Current SAR Baseline to Current Estimate (TY \$M)									
PAUC Production Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1.179	0.011	-0.126	0.079	0.008	0.286	0.000	0.016	0.274	1.453



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	
0.984	-0.015	0.325	0.097	0.000	-0.520	0.000	0.104	-0.009	0.975

Current SAR Baseline to Current Estimate (TY \$M)									
APUC Production Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.975	0.011	-0.042	0.079	0.008	0.286	0.000	0.016	0.358	1.333

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	Jun 1998	Jun 1998	Jun 1998
Milestone III	N/A	Jun 2003	May 2004	Aug 2004
IOC	N/A	Apr 2003	Mar 2004	May 2004
Total Cost (TY \$M)	N/A	1863.4	3290.3	6885.4
Total Quantity	N/A	1365	2790	4740
PAUC	N/A	1.365	1.179	1.453

## Cost Variance

Summary TY \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	581.0	2709.3	--	3290.3
Previous Changes				
Economic	+1.1	+87.0	--	+88.1
Quantity	--	+330.2	--	+330.2
Schedule	--	+233.0	--	+233.0
Engineering	--	+24.7	--	+24.7
Estimating	-0.2	+353.2	--	+353.0
Other	--	--	--	--
Support	--	+56.0	--	+56.0
Subtotal	+0.9	+1084.1	--	+1085.0
Current Changes				
Economic	-0.2	-37.2	--	-37.4
Quantity	--	+1373.2	--	+1373.2
Schedule	--	+139.2	--	+139.2
Engineering	--	+15.3	--	+15.3
Estimating	+0.2	+1000.5	--	+1000.7
Other	--	--	--	--
Support	--	+19.1	--	+19.1
Subtotal	--	+2510.1	--	+2510.1
Total Changes	+0.9	+3594.2	--	+3595.1
Current Estimate	581.9	6303.5	--	6885.4

Summary BY 1999 \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	564.9	2412.4	--	2977.3
Previous Changes				
Economic	--	--	--	--
Quantity	--	+235.4	--	+235.4
Schedule	--	+151.3	--	+151.3
Engineering	--	+19.7	--	+19.7
Estimating	--	+275.5	--	+275.5
Other	--	--	--	--
Support	--	+46.4	--	+46.4
Subtotal	--	+728.3	--	+728.3
Current Changes				
Economic	--	--	--	--
Quantity	--	+977.2	--	+977.2
Schedule	--	+103.3	--	+103.3
Engineering	--	+10.9	--	+10.9
Estimating	+0.2	+718.4	--	+718.6
Other	--	--	--	--
Support	--	+12.1	--	+12.1
Subtotal	+0.2	+1821.9	--	+1822.1
Total Changes	+0.2	+2550.2	--	+2550.4
Current Estimate	565.1	4962.6	--	5527.7

Previous Estimate: December 2007

RDT&E	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-0.2
Adjustment for current and prior escalation. (Estimating)	+0.2	+0.2
<b>RDT&amp;E Subtotal</b>	<b>+0.2</b>	<b>0.0</b>

Procurement	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-37.2
Acceleration of procurement buy profile. (Schedule)	0.0	-6.0
Total Quantity variance resulting from an increase of 1448 Missiles from 3282 to 4730. (Subtotal)	+1248.1	+1754.2
Quantity variance resulting from an increase of 1448 Missiles from 3282 to 4730. (Quantity)	(+977.2)	(+1373.2)
Allocation to Estimating resulting from Quantity change. (Estimating) (QR)	(+156.7)	(+220.5)
Allocation to Engineering resulting from Quantity change. (Engineering) (QR)	(+10.9)	(+15.3)
Allocation to Schedule resulting from Quantity change. (Schedule) (QR)	(+103.3)	(+145.2)
Adjustment for current and prior escalation. (Estimating)	+8.8	+10.9
Revised estimate due to changes in estimating assumptions resulting from decreased efficiencies in production line costs. (Estimating)	+72.5	+94.3
Correction to flyaway costs in Dec 2007 SAR. (Estimating)	-1.2	-1.4
Hardware costs associated with procurement of capsules/canisters for missiles procured in FY14 thru FY20. Cost savings for Mk-14 canister re-use are reflected in FY19 and FY20 budget totals (Estimating) (QR)	+308.5	+433.2
Additional production and systems engineering support for FY14-FY20. (Estimating)	+173.1	+243.0
Adjustment for current and prior escalation. (Support)	+0.4	+0.4
Increase in Other Support for additional missiles FY14-FY20. (Support) (QR)	+11.7	+18.7
<b>Procurement Subtotal</b>	<b>+1821.9</b>	<b>+2510.1</b>

(QR) Quantity Related

## Contracts

### Contract Identification

**Appropriation:** Procurement  
**Contract Name:** BLK IV TOM. FRP/MYP  
**Contractor:** RAYTHEON MISSILE SYSTEMS  
**Contractor Location:** TUCSON, AZ 85747  
**Contract Number:** N00019-04-C-0569  
**Contract Type:** Firm Fixed Price (FFP)  
**Award Date:** August 18, 2004  
**Definitization Date:** August 18, 2004

### Contract Price

Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
1441.2	N/A	1981	1723.9	N/A	1946	1723.9	1723.9

### Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to

### Cost and Schedule Variance Explanations

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

### Notes

Full Rate Production Multi Year (FY04-FY08) Production contract signed August 18 2004, for up to 2200 Block IV Tomahawk AURs at a unit cost of \$729K per missile.

Deliveries are planned to complete in September 2010.

Current contract price includes USN missiles, subsurface variant capsules, production support and ancillary equipment, in addition to \$64M Foreign Military Sales Torpedo Tube Launch procurement dollars.

Contract missiles include FY08 missile procurement and 103 Global War on Terror (GWOT) procured missiles. The GWOT missiles were also procured in FY08.

Increase from initial contract price to current contract price is due to quantity changes.

**Contract Identification**

**Appropriation:** Procurement  
**Contract Name:** BLK IV TOM FRP FY09-11  
**Contractor:** Raytheon Missile Systems  
**Contractor Location:** Tucson, AZ 85747  
**Contract Number:** N00019-09-C-0007  
**Contract Type:** Firm Fixed Price (FFP)  
**Award Date:** March 31, 2009  
**Definitization Date:** March 31, 2009

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
207.3	N/A	207	411.4	N/A	403	411.4	411.4

**Target Price Change Explanation**

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to

**Cost and Schedule Variance Explanations**

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

**Notes**

Full Rate Production (FY09-FY11) base year plus two option years. Contract signed March 31, 2009 for up to 1050 Block IV Tomahawk All-Up-Round (AUR) missiles.

Current contract price includes USN missiles, subsurface variant capsules, production support and ancillary equipment.

The FY09 base year contract was awarded in January 2009 for the procurement of 207 missiles at a contract price of \$207.3M.

The FY10 contract option was awarded in January 2010 for the procurement of 196 missiles . This brought the total contract procurement quantity to 403 missiles at a total contract price of \$411.4M.

The FY11 missile procurement option is planned for option exercise in 2nd Qtr FY11, for the procurement of an additional 196 missiles.

## Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	10	10	10	100.00%
Production	1858	1930	4730	40.80%
Total Program Quantity Delivered	1868	1940	4740	40.93%

Expended and Appropriated (TY \$M)			
Total Acquisition Cost	6885.4	Years Appropriated	13
Expended to Date	2792.6	Percent Years Appropriated	56.52%
Percent Expended	40.56%	Appropriated to Date	3479.7
Total Funding Years	23	Percent Appropriated	50.54%

## Operating and Support Cost

### Assumptions and Ground Rules

The operational concept is a "wooden round" which does not undergo maintenance except at the depot level. The maintenance cycle is known as a recertification and includes examination and replacement of time limited components. Block IV Tomahawk depot maintenance is significantly less than Block III because of the 15 year recertification interval.

An Operational Test Launch (OTL) program is conducted to determine operational readiness and aging effects of the deployed system and to provide fleet training. The Block III OTL program generally averaged 8 launches per year, while the Block IV Tomahawk program was estimated at 3 launches per year.

The software support activity includes hardware and software maintenance for the operational flight system, the weapons fire control system, and independent validation and verification of the software.

Technical and Operations costs include life cycle management training, Naval Weapons station operations, integrated logistic support and contractor engineering technical services.

Theater Mission Planning provides for the programming of Tomahawk missions and maintenance of hardware and software systems. This was a cost element of Tomahawk Block III because those costs were reported at a total weapons system level, but is not a cost element of the Block IV Tomahawk AUR because the Block IV Tomahawk costs are reported at the AUR only level.

Platform maintenance was included for Tomahawk Block III launch platforms at an approximate level of 134 platforms per year. This was a cost element of Tomahawk Block III because those costs were reported at a total weapons system level, but is not a cost element of Block IV Tomahawk because the Block IV Tomahawk costs are reported at the AUR only level.

The Block IV Tomahawk will be maintained using the same maintenance philosophy and infrastructure as the current Tomahawk Block III. Tomahawk Block III is the antecedent system. Due to differences in the estimation of O&S cost elements for the Tomahawk Block III and the Block IV Tomahawk, the comparison of total O&S costs is not meaningful.

Total O&S costs for both systems have been normalized to a 30-year period and to FY99 Base Year Dollars.

Estimate of Block IV Tomahawk O&S Costs are as of February 2005.

Note: Total Block III O&S costs in TY \$ are unavailable.

Cost Estimate Reference:

None

Sustainment Strategy:

None

Antecedent Information:

None



Unitized O&S Costs BY1999 \$M			
Cost Element	TACTICAL TOMAHAWK AUR AVG. ANN. COST OF 3282 MSL.		TOMAHAWK BLOCK III (Antecedent) AVG. ANN. COST OF 1296 MSL. FOR TOTAL SYSTEM
	Mission Pay & Allowance	0.000	
Unit Level Consumption	0.000		0.000
Intermediate Maintenance	0.000		0.000
Depot Maintenance	29.300		36.600
Contractor Support	0.000		0.000
Sustaining Support	0.000		0.000
Indirect	--		--
Other	57.200		65.400
<b>Total</b>	<b>86.500</b>		<b>102.000</b>

Unitized Cost Comments:

None

Item	Total O&S Cost \$M			
	TACTICAL TOMAHAWK AUR			TOMAHAWK BLOCK III (Antecedent)
	Current Production APB Objective/Threshold		Current Estimate	
<b>Base Year</b>	N/A	N/A	2597.2	3058.4
<b>Then Year</b>	N/A	N/A	3922.2	N/A

Total O&S Cost Comment

None

**Disposal Estimate Details**

Date of Estimate:

Source of Estimate:

Disposal/Demilitarization Total Cost (BY 1999 \$M):