



## Selected Acquisition Report (SAR)

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



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

As of FY 2015 President's Budget

Defense Acquisition Management  
Information Retrieval  
(DAMIR)

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## Common Acronyms and Abbreviations

Acq O&M - Acquisition-Related Operations and Maintenance  
APB - Acquisition Program Baseline  
APPN - Appropriation  
APUC - Average Procurement Unit Cost  
BA - Budget Authority/Budget Activity  
BY - Base Year  
DAMIR - Defense Acquisition Management Information Retrieval  
Dev Est - Development Estimate  
DoD - Department of Defense  
DSN - Defense Switched Network  
Econ - Economic  
Eng - Engineering  
Est - Estimating  
FMS - Foreign Military Sales  
FY - Fiscal Year  
IOC - Initial Operational Capability  
\$K - Thousands of Dollars  
LRIP - Low Rate Initial Production  
\$M - Millions of Dollars  
MILCON - Military Construction  
N/A - Not Applicable  
O&S - Operating and Support  
Oth - Other  
PAUC - Program Acquisition Unit Cost  
PB - President's Budget  
PE - Program Element  
Proc - Procurement  
Prod Est - Production Estimate  
QR - Quantity Related  
Qty - Quantity  
RDT&E - Research, Development, Test, and Evaluation  
SAR - Selected Acquisition Report  
Sch - Schedule  
Spt - Support  
TBD - To Be Determined  
TY - Then Year  
UCR - Unit Cost Reporting

## Program Information

**Program Name**

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

**DoD Component**

Navy

## Responsible Office

**Responsible Office**

CAPT Joe Mauser  
Program Executive Office  
Unmanned Aviation and Strike Weapons  
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**DSN Fax** --

**Date Assigned** July 29, 2011

## References

**SAR Baseline (Production Estimate)**

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

**Approved APB**

Navy Acquisition Executive (NAE) Approved Acquisition Program Baseline (APB) dated April 11, 2011

## Mission and Description

The Tactical Tomahawk RGM-109E/UGM-109E Missile (TACTOM) counters threats against United States Forces by destroying fixed and mobile targets, which include command, control and logistic systems, industrial and other high value targets, and fixed and mobile defense systems. The Tomahawk Weapons System (TWS) consists of the TACTOM missile, the Tomahawk Command and Control System (TC2S), and the Tactical Tomahawk Weapons Control System (TTWCS). TACTOM is an Acquisition Category (ACAT) IC program, TC2S is an ACAT II program, and TTWCS is an ACAT III program. TACTOM provides major modernization to the existing Tomahawk technology by increasing responsiveness and flexibility at a more affordable production unit cost.

Key elements of the TACTOM design are an improved navigation and guidance computer, improved anti-jam Global Positioning System 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 of over-flown areas prior to impact. Modern manufacturing techniques and Commercial Off-the-Shelf/Government Off-the-Shelf hardware provide this improved capability. Additionally, the life cycle costs are significantly reduced by extending the re-certification interval from eight years for the currently fielded Block III to 15 years for TACTOM. TACTOM will maximize the use of existing TWS program and logistic support.

## Executive Summary

TACTOM is an Acquisition Category IC program that entered the Production and Deployment Phase based on a Milestone III Acquisition Decision Memorandum issued on August 3, 2004 by the Assistant Secretary of the Navy (Research, Development, and Acquisition).

The program has exercised ten full-rate production contracts to date; the most recent occurring in FY 2012 and FY 2013 respectively. The FY 2012 contract for the procurement of 361 TACTOM missiles included the additional FY 2011 funding received through an OMNIBUS reprogramming action (DoD Serial Number FY11-21-R PA signed September 13, 2011) to replenish the 221 TACTOM missile expenditures incurred during Operation ODYSSEY DAWN in Libya. The FY 2013 contract was exercised in December for a total of 252 missiles.

As of February 28, 2014, a total of 3,145 TACTOM missiles have been delivered, which includes 65 FMS missiles for the United Kingdom.

As of February 28, 2014, RMS has achieved 56 consecutive months of meeting or exceeding the contracted TACTOM missile delivery requirements. The current combined Block III and IV fleet inventory is sufficient to satisfy projected calendar year 2014 United States Navy operational load-outs.

Procurement of new missiles has been suspended beginning in FY 2016, five years earlier than the FY 2014 PB Program of Record. The Department of the Navy will continue to reassess production throughout the Future Years Defense Program.

The program continues to focus on hardware obsolescence, product improvement and modernization opportunities to meet existing requirements, ensure continued weapons system viability, and keep pace with evolving threats. Initial modernization efforts would be associated with communication upgrades to enable missile communications in non-permissive environments.

The TACTOM procurement line item has been reduced \$29.1M in FY 2011 and FY 2012 combined as part of the FY 2013 sequestration order.

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

## Threshold Breaches

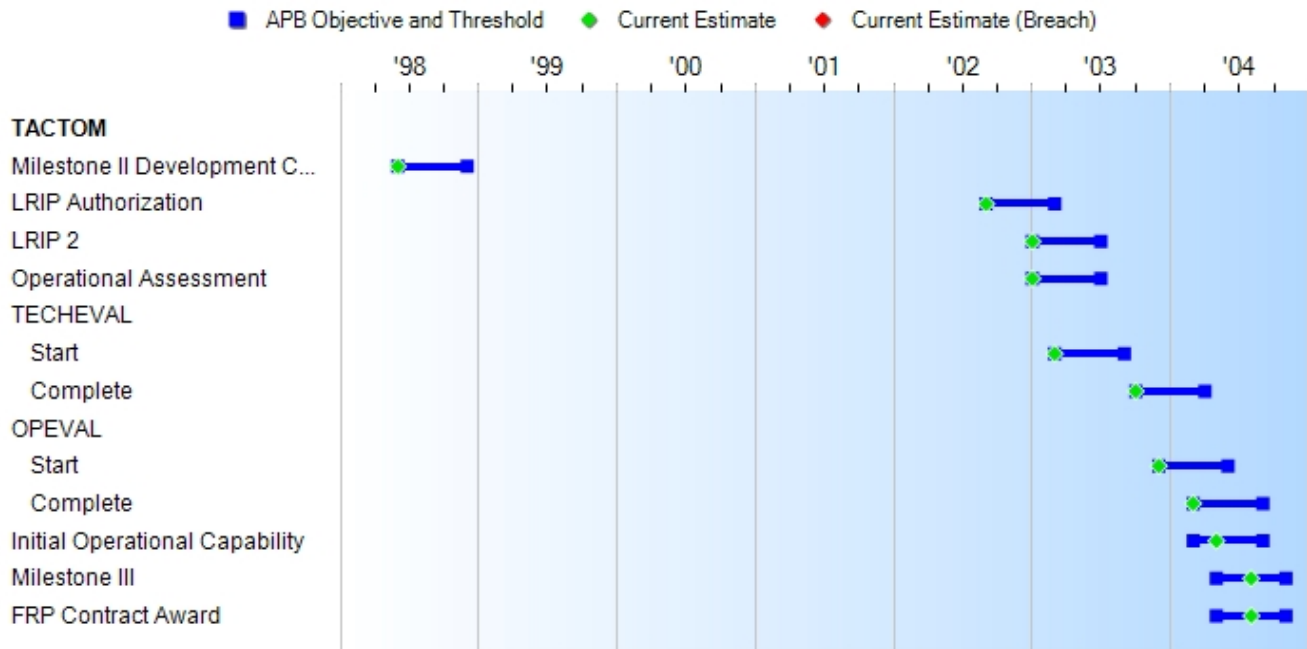
### APB Breaches

<b>Schedule</b>		<input type="checkbox"/>
<b>Performance</b>		<input type="checkbox"/>
<b>Cost</b>	RDT&E	<input type="checkbox"/>
	Procurement	<input type="checkbox"/>
	MILCON	<input type="checkbox"/>
	Acq O&M	<input type="checkbox"/>
<b>O&amp;S Cost</b>		<input type="checkbox"/>
<b>Unit Cost</b>	PAUC	<input type="checkbox"/>
	APUC	<input type="checkbox"/>

### Nunn-McCurdy Breaches

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

### Schedule



Milestones	SAR Baseline Prod Est	Current APB Production Objective/Threshold		Current Estimate
Milestone II Development Contract Award	JUN 1998	JUN 1998	DEC 1998	JUN 1998
LRIP Authorization	SEP 2002	SEP 2002	MAR 2003	SEP 2002
LRIP 2	JAN 2003	JAN 2003	JUL 2003	JAN 2003
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
Initial Operational Capability	MAR 2004	MAR 2004	SEP 2004	MAY 2004
Milestone III	MAY 2004	MAY 2004	NOV 2004	AUG 2004
FRP Contract Award	MAY 2004	MAY 2004	NOV 2004	AUG 2004

**Change Explanations**

None



**Acronyms and Abbreviations**

FRP - Full Rate Production

OPEVAL - Operational Evaluation

TECHEVAL - Technical Evaluation

## Performance

Characteristics	SAR Baseline Prod Est	Current APB Production Objective/Threshold		Demonstrated Performance	Current Estimate
MR (%)	.90	.90	.86	.93	.93
CR (%)	.96	.96	.94	.99	.99

(Ch-1)

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

### Requirements Source

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

### Change Explanations

(Ch-1) The only change to the performance section is an administrative correction to CR which changed the current estimate from 1.0 to .99. The Operation ODYSSEY DAWN strike reconstruction was completed in June 2012, and identified two TACTOM cruise failures. The data was incorporated into the TACTOM MR for the SAR 2012 submission however the CR was not adjusted.

### Memo

The data set for CR and MR includes Tomahawk Flight Tests, combat expenditures, and accounting for corrective actions in the missile inventory. Test events include Operational Evaluation, Technical Evaluation, Tactical Tomahawk Penetrating Vehicle flights, contractor flights, ground tests, and combat expenditures. Corrected failures that meet all of the following criteria have been removed from the data set: root cause of a failure is known, the failure mode is eliminated by hardware or software modification, the modification has been appropriately verified by test, and the modification has been implemented throughout the entire missile population.

### Acronyms and Abbreviations

CR - Cruise Reliability  
MR - Mission Reliability

## Track to Budget

## RDT&amp;E

Appn	BA	PE	
Navy	1319	07	0204229N
	<b>Project</b>	<b>Name</b>	
	A0545	TACTICAL TOMAHAWK/TACTICAL TOMAHAWK	(Shared)
	<b>Notes:</b>	Current Estimate includes RDT&E funding for modernization efforts in FY 2014 - FY 2019 to mitigate navigation and communication obsolescence.	
	A2658	TACTICAL TOMAHAWK/TACTICAL TOMAHAWK	(Sunk)
	A2659	TACTICAL TOMAHAWK/TACTICAL TOMAHAWK	(Sunk)

RDT&E funding for Tomahawk modernization is a subset of the total RDT&E funding within PE 0204229N.

## Procurement

Appn	BA	PE	
Navy	1507	02	0204229N
	<b>Line Item</b>	<b>Name</b>	
	210100	TACTICAL TOMAHAWK	

## Cost and Funding

### Cost Summary

#### Total Acquisition Cost and Quantity

Appropriation	BY1999 \$M			BY1999 \$M	TY \$M		
	SAR Baseline Prod Est	Current APB Production Objective/Threshold	Current Estimate		SAR Baseline Prod Est	Current APB Production Objective	Current Estimate
RDT&E	564.9	564.9	621.4	608.7	581.0	581.9	643.3
Procurement	2412.4	4962.6	5458.8	3787.0	2709.3	6303.5	4633.6
Flyaway	--	--	--	3701.2	--	--	4525.1
Recurring	--	--	--	3666.0	--	--	4487.4
Non Recurring	--	--	--	35.2	--	--	37.7
Support	--	--	--	85.8	--	--	108.5
Other Support	--	--	--	85.8	--	--	108.5
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	5527.5	N/A	4395.7	3290.3	6885.4	5276.9

Confidence Level for Current APB Cost 51% -

The estimate to support this program, like most cost estimates, 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 we have been successful.

Quantity	SAR Baseline Prod Est	Current APB Production	Current Estimate
RDT&E	10	10	10
Procurement	2780	4730	3790
Total	2790	4740	3800

Program's Current Estimate quantity is consistent with the FY 2015 PB.

## Cost and Funding

### Funding Summary

#### Appropriation and Quantity Summary FY2015 President's Budget / December 2013 SAR (TY\$ M)

Appropriation	Prior	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	To Complete	Total
RDT&E	581.9	2.4	8.3	8.1	27.3	13.9	1.4	0.0	643.3
Procurement	4008.9	312.5	194.3	95.9	10.2	6.2	5.6	0.0	4633.6
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 2015 Total	4590.8	314.9	202.6	104.0	37.5	20.1	7.0	0.0	5276.9
PB 2014 Total	4683.0	312.4	322.8	330.2	336.2	342.2	388.4	393.8	7109.0
Delta	-92.2	2.5	-120.2	-226.2	-298.7	-322.1	-381.4	-393.8	-1832.1

RDT&E funding for Tomahawk modernization is a subset of the total RDT&E funding within PE 0204229N and does not include funding designated for Tactical Tomahawk Weapons Control System or Tomahawk Command and Control System. In FY 2017 a request for funding for modernization hardware related to modernization efforts to resolve communication obsolescence issues is expected.

Quantity	Undistributed	Prior	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	To Complete	Total
Development	10	0	0	0	0	0	0	0	0	10
Production	0	3494	196	100	0	0	0	0	0	3790
PB 2015 Total	10	3494	196	100	0	0	0	0	0	3800
PB 2014 Total	10	3494	196	196	196	196	196	239	238	4961
Delta	0	0	0	-96	-196	-196	-196	-239	-238	-1161

## 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
1998	--	--	--	--	--	--	49.8
1999	--	--	--	--	--	--	122.4
2000	--	--	--	--	--	--	164.2
2001	--	--	--	--	--	--	105.4
2002	--	--	--	--	--	--	63.0
2003	--	--	--	--	--	--	57.3
2004	--	--	--	--	--	--	19.8
2005	--	--	--	--	--	--	--
2006	--	--	--	--	--	--	--
2007	--	--	--	--	--	--	--
2008	--	--	--	--	--	--	--
2009	--	--	--	--	--	--	--
2010	--	--	--	--	--	--	--
2011	--	--	--	--	--	--	--
2012	--	--	--	--	--	--	--
2013	--	--	--	--	--	--	--
2014	--	--	--	--	--	--	2.4
2015	--	--	--	--	--	--	8.3
2016	--	--	--	--	--	--	8.1
2017	--	--	--	--	--	--	27.3
2018	--	--	--	--	--	--	13.9
2019	--	--	--	--	--	--	1.4
<b>Subtotal</b>	<b>10</b>	--	--	--	--	--	<b>643.3</b>

## Annual Funding BY\$

## 1319 | RDT&amp;E | Research, Development, Test, and Evaluation, Navy

Fiscal Year	Quantity	End Item Recurring Flyaway BY 1999 \$M	Non End Item Recurring Flyaway BY 1999 \$M	Non Recurring Flyaway BY 1999 \$M	Total Flyaway BY 1999 \$M	Total Support BY 1999 \$M	Total Program BY 1999 \$M
1998	--	--	--	--	--	--	49.9
1999	--	--	--	--	--	--	121.3
2000	--	--	--	--	--	--	160.3
2001	--	--	--	--	--	--	101.5
2002	--	--	--	--	--	--	60.1
2003	--	--	--	--	--	--	53.9
2004	--	--	--	--	--	--	18.1
2005	--	--	--	--	--	--	--
2006	--	--	--	--	--	--	--
2007	--	--	--	--	--	--	--
2008	--	--	--	--	--	--	--
2009	--	--	--	--	--	--	--
2010	--	--	--	--	--	--	--
2011	--	--	--	--	--	--	--
2012	--	--	--	--	--	--	--
2013	--	--	--	--	--	--	--
2014	--	--	--	--	--	--	1.8
2015	--	--	--	--	--	--	6.1
2016	--	--	--	--	--	--	5.8
2017	--	--	--	--	--	--	19.3
2018	--	--	--	--	--	--	9.6
2019	--	--	--	--	--	--	1.0
<b>Subtotal</b>	<b>10</b>	--	--	--	--	--	<b>608.7</b>

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

<b>Fiscal Year</b>	<b>Quantity</b>	<b>End Item Recurring Flyaway TY \$M</b>	<b>Non End Item Recurring Flyaway TY \$M</b>	<b>Non Recurring Flyaway TY \$M</b>	<b>Total Flyaway TY \$M</b>	<b>Total Support TY \$M</b>	<b>Total Program TY \$M</b>
2002	25	46.3	--	24.0	70.3	2.4	72.7
2003	377	420.5	--	13.7	434.2	2.9	437.1
2004	322	344.5	--	--	344.5	7.4	351.9
2005	298	268.5	--	--	268.5	8.7	277.2
2006	409	362.7	--	--	362.7	9.9	372.6
2007	355	343.3	--	--	343.3	7.7	351.0
2008	496	469.1	--	--	469.1	5.0	474.1
2009	207	274.5	--	--	274.5	5.0	279.5
2010	196	268.0	--	--	268.0	6.3	274.3
2011	417	541.7	--	--	541.7	6.7	548.4
2012	196	270.9	--	--	270.9	5.6	276.5
2013	196	287.8	--	--	287.8	5.8	293.6
2014	196	306.6	--	--	306.6	5.9	312.5
2015	100	188.3	--	--	188.3	6.0	194.3
2016	--	--	90.3	--	90.3	5.6	95.9
2017	--	--	4.4	--	4.4	5.8	10.2
2018	--	--	--	--	--	6.2	6.2
2019	--	--	--	--	--	5.6	5.6
<b>Subtotal</b>	<b>3790</b>	<b>4392.7</b>	<b>94.7</b>	<b>37.7</b>	<b>4525.1</b>	<b>108.5</b>	<b>4633.6</b>



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

<b>Fiscal Year</b>	<b>Quantity</b>	<b>End Item Recurring Flyaway BY 1999 \$M</b>	<b>Non End Item Recurring Flyaway BY 1999 \$M</b>	<b>Non Recurring Flyaway BY 1999 \$M</b>	<b>Total Flyaway BY 1999 \$M</b>	<b>Total Support BY 1999 \$M</b>	<b>Total Program BY 1999 \$M</b>
2002	25	43.6	--	22.6	66.2	2.3	68.5
2003	377	388.1	--	12.6	400.7	2.7	403.4
2004	322	308.8	--	--	308.8	6.6	315.4
2005	298	234.2	--	--	234.2	7.6	241.8
2006	409	308.6	--	--	308.6	8.4	317.0
2007	355	285.9	--	--	285.9	6.4	292.3
2008	496	384.5	--	--	384.5	4.1	388.6
2009	207	221.8	--	--	221.8	4.0	225.8
2010	196	212.9	--	--	212.9	5.0	217.9
2011	417	421.8	--	--	421.8	5.3	427.1
2012	196	207.6	--	--	207.6	4.3	211.9
2013	196	216.9	--	--	216.9	4.4	221.3
2014	196	227.1	--	--	227.1	4.3	231.4
2015	100	136.8	--	--	136.8	4.4	141.2
2016	--	--	64.3	--	64.3	4.0	68.3
2017	--	--	3.1	--	3.1	4.0	7.1
2018	--	--	--	--	--	4.2	4.2
2019	--	--	--	--	--	3.8	3.8
<b>Subtotal</b>	<b>3790</b>	<b>3598.6</b>	<b>67.4</b>	<b>35.2</b>	<b>3701.2</b>	<b>85.8</b>	<b>3787.0</b>

## Low Rate Initial Production

	<b>Initial LRIP Decision</b>	<b>Current Total LRIP</b>
<b>Approval Date</b>	4/12/2001	8/26/2003
<b>Approved Quantity</b>	25	402
<b>Reference</b>	LRIP ADM	LRIP III ASR/AP
<b>Start Year</b>	2002	2002
<b>End Year</b>	2005	2007

The Current Total LRIP Quantity is more than 10% of the total production quantity due to missile production suspension in FY 2016 and beyond.

LRIP-1 was 25 missiles, LRIP-2 was 167 missiles, and LRIP-3 was 210 missiles, which brings the total Block IV Tactical Tomahawk All-Up-Round LRIP quantity to 402 missiles.

## Foreign Military Sales

Country	Date of Sale	Quantity	Total Cost \$M	Memo
United Kingdom	3/11/2013	4	5.7	Torpedo Tube Launch (TTL) Block IV missiles were purchased in FY 2013; cost includes missiles and ancillary equipment.
United Kingdom	2/10/2006	65	64.0	TTL Block IV missiles were purchased in FY 2006; cost includes missiles and ancillary equipment. All United Kingdom missiles on contract have been delivered.

## Nuclear Costs

None

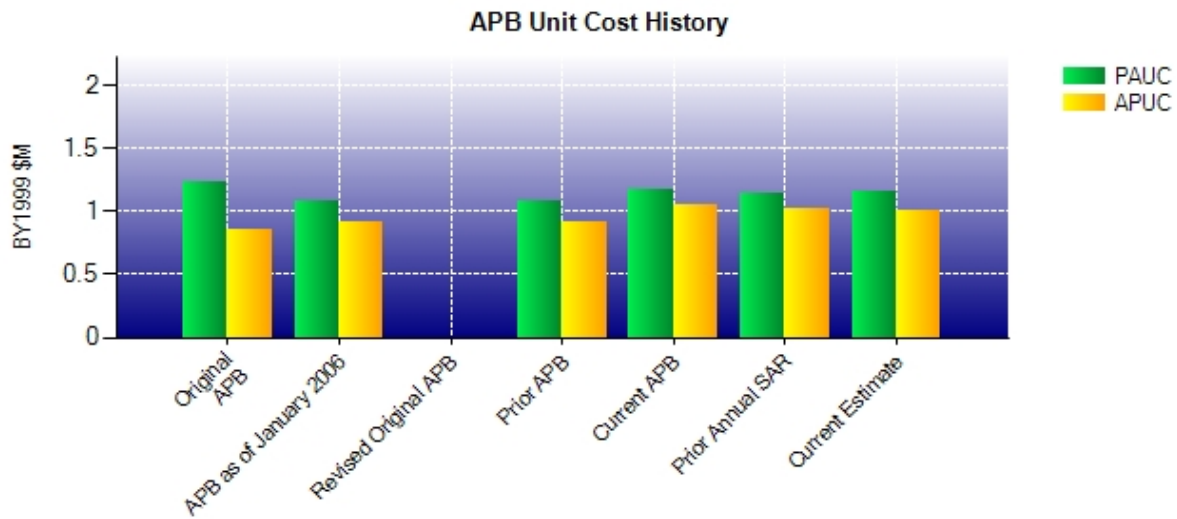
**Unit Cost****Unit Cost Report**

	BY1999 \$M	BY1999 \$M	
Unit Cost	Current UCR Baseline (APR 2011 APB)	Current Estimate (DEC 2013 SAR)	BY % Change
<b>Program Acquisition Unit Cost (PAUC)</b>			
Cost	5527.5	4395.7	
Quantity	4740	3800	
Unit Cost	1.166	1.157	-0.77
<b>Average Procurement Unit Cost (APUC)</b>			
Cost	4962.6	3787.0	
Quantity	4730	3790	
Unit Cost	1.049	0.999	-4.77

	BY1999 \$M	BY1999 \$M	
Unit Cost	Original UCR Baseline (SEP 1999 APB)	Current Estimate (DEC 2013 SAR)	BY % Change
<b>Program Acquisition Unit Cost (PAUC)</b>			
Cost	1683.7	4395.7	
Quantity	1365	3800	
Unit Cost	1.233	1.157	-6.16
<b>Average Procurement Unit Cost (APUC)</b>			
Cost	1158.4	3787.0	
Quantity	1353	3790	
Unit Cost	0.856	0.999	+16.71

## Unit Cost History



	Date	BY1999 \$M		TY \$M	
		PAUC	APUC	PAUC	APUC
<b>Original APB</b>	SEP 1999	1.233	0.856	1.365	0.984
<b>APB as of January 2006</b>	APR 2005	1.076	0.913	1.237	1.069
<b>Revised Original APB</b>	N/A	N/A	N/A	N/A	N/A
<b>Prior APB</b>	APR 2005	1.076	0.913	1.237	1.069
<b>Current APB</b>	APR 2011	1.166	1.049	1.453	1.333
<b>Prior Annual SAR</b>	DEC 2012	1.136	1.024	1.433	1.318
<b>Current Estimate</b>	DEC 2013	1.157	0.999	1.389	1.223

## 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	
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 Prod Est	Changes								PAUC Current Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1.179	0.031	-0.135	0.060	0.021	0.216	0.000	0.017	0.210	1.389

## 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	
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 Prod Est	Changes								APUC Current Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.975	0.031	-0.082	0.061	0.021	0.200	0.000	0.017	0.248	1.223

## SAR Baseline History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	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	5276.9
Total Quantity	N/A	1365	2790	3800
Prog. Acq. Unit Cost (PAUC)	N/A	1.365	1.179	1.389

**Cost Variance**

<b>Summary Then Year \$M</b>				
	<b>RDT&amp;E</b>	<b>Proc</b>	<b>MILCON</b>	<b>Total</b>
SAR Baseline (Prod Est)	581.0	2709.3	--	3290.3
Previous Changes				
Economic	+0.9	+146.7	--	+147.6
Quantity	--	+1920.9	--	+1920.9
Schedule	--	+354.0	--	+354.0
Engineering	--	+123.7	--	+123.7
Estimating	--	+1196.2	--	+1196.2
Other	--	--	--	--
Support	--	+76.3	--	+76.3
Subtotal	+0.9	+3817.8	--	+3818.7
Current Changes				
Economic	--	-29.6	--	-29.6
Quantity	--	-1249.2	--	-1249.2
Schedule	--	-124.2	--	-124.2
Engineering	--	-43.3	--	-43.3
Estimating	+61.4	-436.4	--	-375.0
Other	--	--	--	--
Support	--	-10.8	--	-10.8
Subtotal	+61.4	-1893.5	--	-1832.1
Total Changes	+62.3	+1924.3	--	+1986.6
CE - Cost Variance	643.3	4633.6	--	5276.9
CE - Cost & Funding	643.3	4633.6	--	5276.9

<b>Summary Base Year 1999 \$M</b>				
	<b>RDT&amp;E</b>	<b>Proc</b>	<b>MILCON</b>	<b>Total</b>
SAR Baseline (Prod Est)	564.9	2412.4	--	2977.3
Previous Changes				
Economic	--	--	--	--
Quantity	--	+1357.4	--	+1357.4
Schedule	--	+274.3	--	+274.3
Engineering	--	+89.1	--	+89.1
Estimating	+0.2	+878.6	--	+878.8
Other	--	--	--	--
Support	--	+59.6	--	+59.6
<b>Subtotal</b>	<b>+0.2</b>	<b>+2659.0</b>	<b>--</b>	<b>+2659.2</b>
Current Changes				
Economic	--	--	--	--
Quantity	--	-857.5	--	-857.5
Schedule	--	-85.2	--	-85.2
Engineering	--	-29.7	--	-29.7
Estimating	+43.6	-304.6	--	-261.0
Other	--	--	--	--
Support	--	-7.4	--	-7.4
<b>Subtotal</b>	<b>+43.6</b>	<b>-1284.4</b>	<b>--</b>	<b>-1240.8</b>
<b>Total Changes</b>	<b>+43.8</b>	<b>+1374.6</b>	<b>--</b>	<b>+1418.4</b>
CE - Cost Variance	608.7	3787.0	--	4395.7
CE - Cost & Funding	608.7	3787.0	--	4395.7

Previous Estimate: December 2012



RDT&E	\$M	
	Base Year	Then Year
<b>Current Change Explanations</b>		
Revised estimate for modernization efforts that will mitigate navigation and communication obsolescence in FY 2014 - FY 2019. (Estimating)	+43.6	+61.4
RDT&E Subtotal	+43.6	+61.4

Procurement	\$M	
	Base Year	Then Year
<b>Current Change Explanations</b>		
Revised escalation indices. (Economic)	N/A	-29.6
Adjustment for current and prior escalation. (Estimating)	+8.7	+11.3
Total Quantity variance resulting from a decrease of 1,161 TACTOM missiles from 4,951 to 3,790. (Subtotal)	-1175.3	-1712.2
Quantity variance resulting from a decrease of 1,161 TACTOM missiles from 4,951 to 3,790. (Quantity)	(-773.1)	(-1126.0)
Allocation to Schedule resulting from Quantity change. (Schedule) (QR)	(-85.2)	(-124.2)
Allocation to Engineering resulting from Quantity change. (Engineering) (QR)	(-29.7)	(-43.3)
Allocation to Estimating resulting from Quantity change. (Estimating) (QR)	(-287.3)	(-418.7)
Additional quantity variance due to production line suspension. (Quantity)	-84.4	-123.2
Realignment of Cancelled/Expired Account Liability funding and other miscellaneous adjustments. (Estimating)	-5.9	-7.3
Revised due to Congressional reductions in FY 2011 - FY 2013. (Estimating)	-42.5	-55.4
Revised estimate to reflect actual program support costs in FY 2011 and FY 2012. (Estimating)	+3.5	+4.5
Revised estimate for Vertical Launch System All-Up-Round unit cost in FY 2015 due to limited production. (Estimating)	+6.8	+9.5
Revised estimate due to production line deferral in FY 2016. (Estimating) (QR)	+34.9	+49.1
Revised estimate due to Sequestration reductions in FY 2011 - FY 2012. (Estimating)	-22.6	-29.1
Revised estimate due to Expired Account realignment in FY 2011. (Estimating)	-0.2	-0.3
Adjustment for current and prior escalation. (Support)	+0.1	+0.3
Decrease in Other Support resulting from missile quantity reduction. (Support) (QR)	-7.5	-11.1
Procurement Subtotal	-1284.4	-1893.5

(QR) Quantity Related

## Contracts

### Appropriation: Procurement

Contract Name	<b>BLK IV TACTOM FRP FY12-13</b>
Contractor	Raytheon Missile Systems
Contractor Location	Tucson, AZ 85747
Contract Number, Type	N00019-12-C-2000, FFP
Award Date	June 07, 2012
Definitization Date	June 07, 2012

Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price at Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
337.8	N/A	361	692.7	N/A	617	692.7	692.7

### Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to the FY 2013 procurement option being exercised for an additional 252 United States Navy (USN) missiles and four United Kingdom missiles.

### Cost and Schedule Variance Explanations

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

### Contract Comments

The FY 2012 BY contract was awarded in June 2012 for the procurement of 361 missiles at a price of \$337.8M (the previously listed base year value \$377.8M was in error). The FY 2013 contract option for USN missiles was exercised in December 2012. An additional option was also exercised in March 2013 to procure four FMS missiles resulting in an increase of the total contract procurement quantity to 617 missiles (USN and FMS) and the total contract price to \$692.7M (as of December 31, 2013).

Full Rate Production (FY 2012 - FY 2013) includes a base year plus one option year. Contract was signed on June 7, 2012 to procure up to 740 TACTOM missiles.

Current contract price includes USN missiles, subsurface variant capsules, production support and ancillary equipment, in addition to \$5.7M FMS Torpedo Tube Launch procurement dollars.

Additional FY 2011 funding was received through OMNIBUS reprogramming action to replenish the 221 Tomahawk missile expenditures during Libyan Operations.

Libyan Operations replenishment missiles were procured utilizing the FY 2012 procurement contract.

## Deliveries and Expenditures

Delivered to Date	Plan to Date	Actual to Date	Total Quantity	Percent Delivered
Development	10	10	10	100.00%
Production	3000	3080	3790	81.27%
Total Program Quantity Delivered	3010	3090	3800	81.32%

Expended and Appropriated (TY \$M)			
Total Acquisition Cost	5276.9	Years Appropriated	17
Expended to Date	3982.7	Percent Years Appropriated	77.27%
Percent Expended	75.47%	Appropriated to Date	4905.7
Total Funding Years	22	Percent Appropriated	92.97%

The above data is current as of 2/28/2014.

As of February 28, 2014, a total of 3,145 TACTOM missiles have been delivered, which includes 65 FMS missiles for the United Kingdom.

## Operating and Support Cost

### TACTOM

#### Assumptions and Ground Rules

##### Cost Estimate Reference:

The Block TACTOM estimate is from the Life Cycle Cost Estimate prepared for the MS III decision in May of 2004. This original estimate was re-estimated in February 2014 to account for the suspension of the All-Up-Round production line.

##### Sustainment Strategy:

The Operating and Support costs include: maintenance and recertification costs of the AUR; an Operational flight test program to track Tomahawk Weapons System performance.

TACTOM Sustainment Strategy is based on the original Tomahawk Program "Wooden Round" concept which relies upon a fifteen (15) year missile warranty, and features limited missile maintenance outside of the Original Equipment Manufacturer (OEM). The OEM serves as the depot activity and is responsible for conducting the majority of the maintenance for TACTOM, and their efforts are largely covered by the 15 year warranty. The TACTOM depot maintenance costs are expected to be less than the Block III Tomahawk due to the 15 year recertification interval. Recertifications are anticipated to begin in FY 2019 for a total inventory of 3,790 missiles (per PB15 Program of Record (POR)). The total life of TACTOM is anticipated to be thirty (30) years.

Organizational level maintenance is limited to visual inspections, missile inventory checks (surface only), Mode 7 alignment confidence checks (submarine only) and minor unscheduled maintenance (corrosion control, etc.). Intermediate level maintenance is limited to missile ID checks, receipt and transfer inspections, electrical continuity, and nitrogen pressure checks.

##### Antecedent Information:

The Block III Tomahawk is the antecedent system of TACTOM. Antecedent costs were derived from average annual expenditures (non-VAMOSOC budget data) spanning 24 years for fixed costs and from the actual costs of recertifications for variable costs. Data source was budget data. Inventory was 1,296 BLKIII missiles. Service life was 30 years. Data normalized to FY 1999 dollars.

Unitized O&S Costs BY1999 \$M			
Cost Element	TACTOM		Tomahawk Block III
	Average Annual Cost of Block IV Missile Inventory		(Antecedent) Average Annual Cost of Block III Missile Inventory
Unit-Level Manpower	0.000		0.000
Unit Operations	0.000		0.000
Maintenance	0.000		0.000
Sustaining Support	38.714		36.600
Continuing System Improvements	0.000		0.000
Indirect Support	0.000		0.000
Other	18.016		65.400
<b>Total</b>	<b>56.730</b>		<b>102.000</b>

Unitized Cost Comments:

The unit represented is the average annual cost (FY 2004 - FY 2047) of the TACTOM missile inventory in BY 1999 dollars.

As a result of the February 2014 re-estimation, the average annual cost had a minimal overall difference. TACTOM PB15 program production profile (quantity) was reduced. The difference in the total annualized recertification dollars/FY dollars is due to the number of missiles decreasing and the number of years the total remaining dollars are divided by. Realized costs were utilized through 2013, and revised budget projections through FY 2047 to derive the average annual costs reported in the December 2013 SAR.

Depot recertification activities at the Original Equipment Manufacturer (OEM) facility will begin in FY 2019 and are captured in the 'Other' cost section.

The unitized costs shown above are the Base Year O&S totals shown below, divided by the expected 43 year service life (FY 2004 - FY 2047). Missile recertification costs (shown as "other" in the unitized cost summary above) are an estimate for recertifying the entire PoR quantity (3,790 missiles), divided by 43 years. The recertification program, however, is only scheduled to last for approximately 15 years, so the unitized recertification cost should not be used for annual budgeting purposes. The current estimated cost of recertifying a Block IV missile is based on a Block III recertification cost, plus inflation. Additionally, the actual number of recertifications expected per year is based on delivery date plus an initial 15 year service life. After 15 years, missiles should be returned for recertification. Historically, budget constraints have caused schedule variances between anticipated recertification dates and actual recertification dates. As a result, while the duration of the TACTOM recertification program is estimated to last 15 years, the actual program is likely to extend beyond 15 years.

	Total O&S Cost \$M			
	Current Production APB Objective/Threshold		Current Estimate	
	TACTOM		TACTOM	Tomahawk Block III (Antecedent)
<b>Base Year</b>	N/A	N/A	2439.4	3058.4
<b>Then Year</b>	N/A	N/A	3482.5	N/A

Total O&S Costs Comments:

The TACTOM O&S Costs from the May 2004 Life Cycle Cost Estimate have been reviewed and re-estimated as of

February 2014.

The revised O&S estimate is based on actual and projected expenditures from program inception in FY 2004 through end of service life in FY 2047.

Demilitarization and disposal costs were removed from the O&S total as part of the re-estimation.

<b>O&amp;S Cost Variance</b>		
<b>Category</b>	<b>Base Year 1999 \$M</b>	<b>Change Explanation</b>
Prior SAR Total O&S Estimate December 2012	2549.0	
Cost Estimating Methodology	0.0	
Cost Data Update	0.0	
Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	0.0	
Programmatic/Planning Factors	-109.6	TACTOM FY 2015 PB program production profile (quantity) was reduced. To reflect these changes, the program calculated fewer missiles and fewer years of support.
Other	0.0	
Total Changes	-109.6	
Current Estimate	2,439.4	

#### **Disposal Costs:**

Disposal costs for TACTOM are estimated to be \$38.6M in FY 1999 dollars.