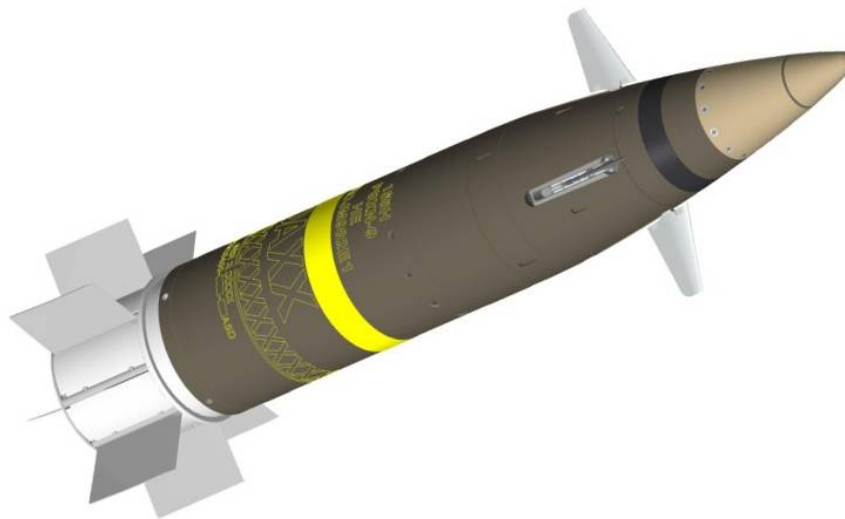




## Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-366



### **Excalibur Precision 155mm Projectiles (Excalibur)**

As of FY 2015 President's Budget

Defense Acquisition Management  
Information Retrieval  
(DAMIR)

# Report Documentation Page

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*OMB No. 0704-0188*

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				5c. PROGRAM ELEMENT NUMBER	
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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**

Excalibur Precision 155mm Projectiles (Excalibur)

**DoD Component**

Army

## Responsible Office

**Responsible Office**

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**Date Assigned** June 6, 2012

## References

**SAR Baseline (Production Estimate)**

Army Acquisition Executive (AAE) Approved Acquisition Program Baseline (APB) dated March 14, 2011

**Approved APB**

Army Acquisition Executive (AAE) Approved Acquisition Program Baseline (APB) dated December 13, 2012

## Mission and Description

The Excalibur Precision 155-millimeter (mm) Projectiles (Excalibur) program provides the Brigade Combat Teams with an organic precision fires capability. Additionally, it provides improved fire support capability due to its increased range of 37.5-kilometers and demonstrated accuracy of less than four-meters radial miss distance, which enables a first round effect on target reducing the number of rounds required while reducing collateral damage. Excalibur is compatible with the M777A2 Lightweight 155-mm Howitzer, the M109A6 Paladin Howitzer, and the M109A7 Paladin Integrated Management Howitzer. Excalibur provides a 33-percent range increase over current Rocket Assisted Projectiles with a less than ten meter circular error probable requirement at all ranges. Excalibur is also highly resistant to Global Positioning System jamming. This item is Code A, approved for Service use.

## Executive Summary

Excalibur Increments la-1 and la-2 are currently fielded and in use by units throughout Afghanistan and deployed globally to support Other Contingency Operations. Excalibur is an International Cooperative Development program, teamed with the Kingdom of Sweden (KoS), which contributes resources towards the development in accordance with an established Project Agreement. Excalibur has completed FMS to Canada, United Kingdom, Australia, Germany, and the KoS, and has received interest for future sales from numerous other countries. Excalibur Increment la-1 was initially fielded to units in Iraq and Afghanistan in response to urgent need requests in support of Operation Iraqi Freedom (as of September 2010 re-named to Operation New Dawn) and Operation Enduring Freedom. Increment la-2 was fielded in early FY 2012 and greatly increases range from 25.2-kilometers (km) to 37.5-km. The Excalibur guided projectile program is using an incremental development approach to provide a combat capability to the soldier as quickly as possible while delivering advanced capabilities at lower costs. Excalibur Increment Ib will provide further performance improvements while significantly lowering unit costs.

### Increments la-1 and la-2

As of December 31, 2013, Product Manager (PM) Excalibur has procured and delivered 2,132 Increment la-1 (Department of the Army (DA)39) projectiles, of which 1,424 were delivered to the Army, 422 to the U.S. Marine Corps (USMC), and 286 to foreign customers. Additionally, PM Excalibur has procured 4,316 Increment la-2 (DA45) projectiles, of which 2,048 were procured for the Army, 2,061 for the USMC, and 208 for foreign customers. Total deliveries of Increment la-2 projectiles total 2,881. Foreign customers include: Canada, United Kingdom, Australia, and the KoS. The Army and USMC have fired a total of 704 projectiles since the first production deliveries were made available to troops in 2007 with a proven field reliability of 88.7 percent. Excalibur is highly successful at proving the value of precision munitions in dense urban environments by virtually eliminating collateral damage while providing effects on the intended target.

On April 28, 2013, 1st Battalion 41st Field Artillery (1-41 FA) executed the longest range Excalibur Increment la-2 fire mission in combat. 1-41 FA conducted a combat mission in Afghanistan, firing two Excalibur Increment la-2 projectiles into a 3-meter (m) round water pit (part of an irrigation system) that was holding a cache of enemy weapons and ammunition. Both projectiles functioned successfully with a reported miss distance of less than 3-m. The gun-to-target range was approximately 37,700-m.

On July 24, 2013, Joint Munitions Command signed the approval memo granting Full Materiel Release (FMR) status to the Excalibur Increment la-1 projectile which was previously fielded under an Urgent Materiel Release. The FMR of the Increment la-1 projectile is significant as it allows for global deployment of this capability. Increment la-2 was granted FMR in 2011.

### Increment Ib

Increment Ib is an integral part of the strategy to field Excalibur capability to the DoD and the KoS. It delivers a lower cost, higher reliability precision munition to the warfighter. As of December 31, 2013, PM Excalibur procured 1,800 Increment Ib projectiles for the Army and the KoS procured an additional 297 projectiles.

On December 12, 2012, the Army Acquisition Executive (AAE) chaired the Excalibur Increment Ib Milestone C Army Systems Acquisition Review Council to review the program's status and consider the request to enter into LRIP. The AAE approved for Excalibur Increment Ib to proceed into LRIP.

On December 21, 2012, the Government modified Contract W15QKN-08-C-0530 to definitize Excalibur Increment Ib production options through FY 2016 with a maximum contract quantity threshold of 9,000 projectiles. This

modification included the first LRIP procurement of 819 Increment Ib projectiles. The current negotiated amount for all projectiles under the contract is \$68,404 per projectile.

In August 2013, the Army completed the final Developmental Testing required for Excalibur Increment Ib. After demonstrating to the AAE that the program remained on track to meet all Key Performance Parameters, the Army awarded the second Increment Ib LRIP option for 765 projectiles. On December 16, 2013, the Army awarded a third Increment Ib LRIP option for 216 projectiles, bringing the total number of Increment Ib projectiles on contract to 1,800.

In December 2013 and February 2014, respectively, PM Excalibur successfully completed the Increment Ib First Article Test (FAT) and Initial Operational Test and Evaluation (IOT&E). Throughout FY 2013, Increment Ib successfully completed many significant test events including: Swedish Archer Verification and Validation, Low Quadrant Elevation Live Fire, Environmental Qualification, Pre-IOT&E Live Fire, Sequential Environmental Testing for Safety, Sequential Environmental Testing for Performance, and FAT. These tests have contributed to the current reliability assessment of 93.0%.

The Excalibur program continues to execute within all APB parameters. No current issues exist that impact cost, schedule, or performance.

The Army plans to procure 3,455 projectiles of Increment Ib out of the 6,930 total projectiles to meet cost and performance goals. The total procurement quantity of 6,930 projectiles provides 6,264 projectiles for operational use and 666 projectiles for consumption in contract acceptance and reliability growth testing.

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



## Threshold Breaches

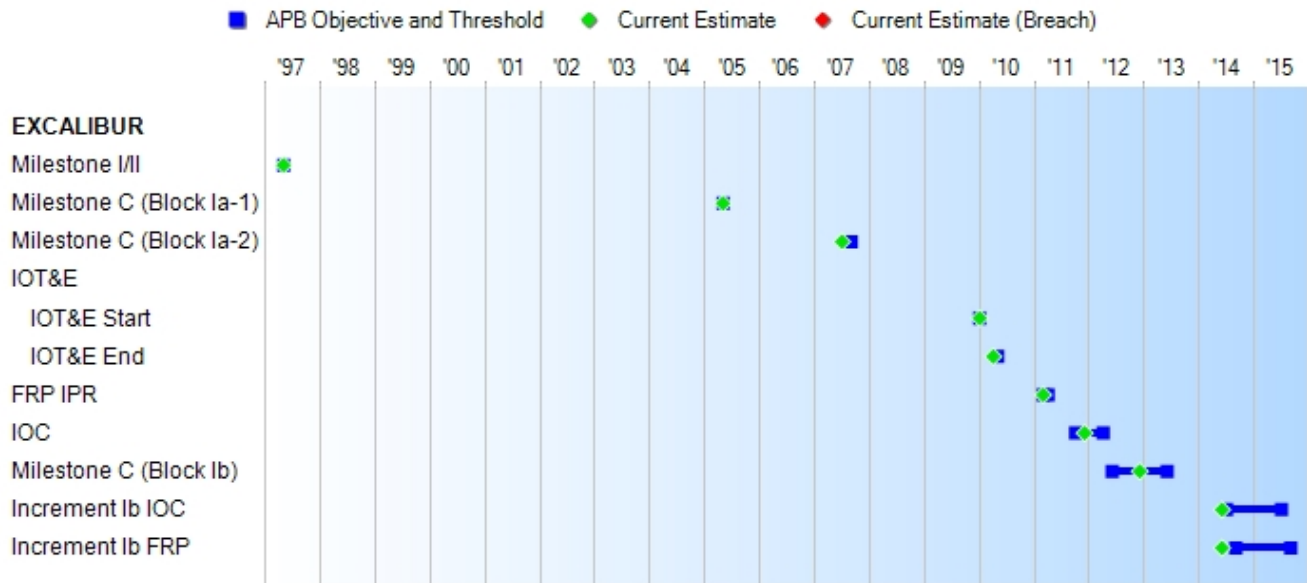
APB Breaches		
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<b>Schedule</b>		<input type="checkbox"/>
<b>Performance</b>		<input type="checkbox"/>
<b>Cost</b>	RDT&E	<input type="checkbox"/>
	Procurement	<input type="checkbox"/>
	MILCON	<input type="checkbox"/>
	Acq O&M	<input type="checkbox"/>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

Nunn-McCurdy Breaches		
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<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 I/II	MAY 1997	MAY 1997	MAY 1997	MAY 1997
Milestone C (Block Ia-1)	MAY 2005	MAY 2005	MAY 2005	MAY 2005
Milestone C (Block Ia-2)	SEP 2007	SEP 2007	SEP 2007	JUL 2007
IOT&E				
IOT&E Start	JAN 2010	JAN 2010	JAN 2010	JAN 2010
IOT&E End	MAY 2010	MAY 2010	MAY 2010	APR 2010
FRP IPR	MAR 2011	MAR 2011	APR 2011	MAR 2011
IOC	OCT 2011	OCT 2011	APR 2012	DEC 2011
Milestone C (Block Ib)	JUN 2012	JUN 2012	JUN 2013	DEC 2012
Increment Ib IOC	MAR 2014	JUL 2014	JUL 2015	JUN 2014 (Ch-1)
Increment Ib FRP	MAR 2014	SEP 2014	SEP 2015	JUN 2014 (Ch-1)

#### Change Explanations

(Ch-1) The Increment Ib IOC and FRP current estimates moved from July 2014 to June 2014 based on the current program schedule.

## **Acronyms and Abbreviations**

FRP - Full Rate Production

IOT&E - Initial Operational Test and Evaluation

IPR - In-Process Review

## Performance

Characteristics	SAR Baseline Prod Est	Current APB Production Objective/Threshold		Demonstrated Performance	Current Estimate
Accuracy (CEP)(m)	<= 10 CEP	<= 10 CEP	<= 20 CEP	<4m CEP	<4m CEP
Reliability (percent)	>= 96	>= 96	>= 85	88	88
Effectiveness	>=M107 HE	>=M107 HE	>=M107 HE	>=M107 HE	>=M107 HE
Net Ready	ATO	ATO	IATO	ATO	ATO
Accuracy (CEP)(m) Increment Ib	<= 10m CEP	<= 10m CEP	<= 10m CEP	2m CEP	<= 10m CEP
Range (Increment Ib)	>=40 km	>=40 km	>= 35 km	37.5 km	>=37.5 km
Effectiveness (Increment Ib)	>=M107 HE	>=M107 HE	>=M107 HE	>=M107 HE	>=M107 HE
Reliability (percent) (Increment Ib)	>=96%	>=96%	>=90%	93%.	>=90%
Net Ready (Increment Ib)	ATO	ATO	IATO	TBD	ATO

### Requirements Source

Capability Production Document (CPD) dated October 24, 2012

### Change Explanations

None

### Memo

The first four performance characteristics listed above (Accuracy, Reliability, Effectiveness, and Net Ready) pertain to Increment Ia projectiles.

The current assessment of the overall Increment Ia-2 reliability, based on combined results from both test results and in-theater firing, is approximately 88 percent. When considered independently, the point estimate for reliability in the production contract acceptance testing is currently at 93 percent.

Increment Ib accuracy has been demonstrated at a cumulative CEP averaging 2-m through Initial Operational Test & Evaluation in February 2014.

Current Army Test and Evaluation Command assessment of Increment Ib reliability is 93 percent.

### Acronyms and Abbreviations

ATO - Approval to Operate  
 CEP - Circular Error Probable  
 HE - High Explosives  
 IATO - Interim Approval To Operate  
 km - kilometer  
 m - meter

### Track to Budget

#### RDT&E

Appn	BA	PE		
Army	2040	05	0604814A	
	<b>Project</b>		<b>Name</b>	
	708		M982 Projectile	(Shared) (Sunk)
	<b>Notes:</b>		Completed in FY 2014	
Defense-Wide	9999	05	0604814A	
	<b>Project</b>		<b>Name</b>	
	708		M982 Projectile	(Shared) (Sunk)
	<b>Notes:</b>		Completed in FY 2012.	

The Excalibur RDT&E funding line supports the Excalibur Unitary variant. This funding line is shared with all Excalibur Increments and was shared in prior years with the Spin Stabilized Sensor Fuzed Munition and the Enhanced Portable Inductive Artillery Fuze Setter.

Excalibur is an international program, with a Memorandum of Agreement for the cooperative development with the Kingdom of Sweden, which has contributed \$69M to the development program (\$57M contributed to Increment Ia and \$12M to Increment Ib). These funds are included in this SAR as Non-Treasury RDT&E (9999).

#### Procurement

Appn	BA	PE		
Army	2034	01	0210600A	
	<b>Line Item</b>		<b>Name</b>	
	E80103		Excalibur Unitary	
Defense-Wide	0300	01	0210600A	
	<b>Line Item</b>		<b>Name</b>	
	E80103		Excalibur	(Sunk)
	<b>Notes:</b>		Completed in FY 2009.	

The parent Line Item for Excalibur is E80100.

Excalibur procured additional projectiles in FY 2007 - FY 2009 as FMS Buy Back rounds. The funds are included in this SAR as Other Procurement, Defense Agency (0300).

## Cost and Funding

### Cost Summary

#### Total Acquisition Cost and Quantity

Appropriation	BY2007 \$M			BY2007 \$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	993.4	1003.9	1104.3	1006.0	972.7	984.1	987.9
Procurement	661.2	701.3	771.4	688.5	706.3	758.3	746.4
Flyaway	--	--	--	685.7	--	--	743.4
Recurring	--	--	--	664.6	--	--	720.8
Non Recurring	--	--	--	21.1	--	--	22.6
Support	--	--	--	2.8	--	--	3.0
Other Support	--	--	--	2.8	--	--	3.0
Initial Spares	--	--	--	0.0	--	--	0.0
MILCON	0.0	0.0	--	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	--	0.0	0.0	0.0	0.0
Total	1654.6	1705.2	N/A	1694.5	1679.0	1742.4	1734.3

Confidence Level for Current APB Cost 50% -

The Excalibur Army Cost Position (ACP), approved November 15, 2012 by Assistant Secretary of the Army for Financial Management & Comptroller (ASA FM&C) was used to establish the APB. Costs are reflected at a 50% Confidence Level in accordance with the Army Cost and Economic Analysis Program, AR 11-18.

Quantity	SAR Baseline Prod Est	Current APB Production	Current Estimate
RDT&E	544	544	544
Procurement	6930	6930	6876
Total	7474	7474	7420

The Current Estimate in this document reflects the FY 2015 PB which procures 6,876 projectiles. However, during the Excalibur Increment 1b Milestone C review the Army committed to fully funding the program to the planned procurement quantity of 6,930 projectiles.

Excalibur's total planned procurement quantity of 6,930 includes 6,264 projectiles to be delivered to inventory and 666 projectiles for contract acceptance and reliability growth testing.

## 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	979.7	8.2	0.0	0.0	0.0	0.0	0.0	0.0	987.9
Procurement	587.9	77.3	35.7	45.5	0.0	0.0	0.0	0.0	746.4
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	1567.6	85.5	35.7	45.5	0.0	0.0	0.0	0.0	1734.3
PB 2014 Total	1621.7	76.1	0.0	0.0	0.0	0.0	0.0	0.0	1697.8
Delta	-54.1	9.4	35.7	45.5	0.0	0.0	0.0	0.0	36.5

Quantity	Undistributed	Prior	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	To Complete	Total
Development	544	0	0	0	0	0	0	0	0	544
Production	0	5059	929	416	472	0	0	0	0	6876
PB 2015 Total	544	5059	929	416	472	0	0	0	0	7420
PB 2014 Total	544	6506	802	0	0	0	0	0	0	7852
Delta	0	-1447	127	416	472	0	0	0	0	-432

## Cost and Funding

### Annual Funding By Appropriation

#### Annual Funding TY\$

#### 2040 | RDT&E | Research, Development, Test, and Evaluation, Army

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
1997	--	--	--	--	--	--	4.7
1998	--	--	--	--	--	--	8.9
1999	--	--	--	--	--	--	7.5
2000	--	--	--	--	--	--	9.8
2001	--	--	--	--	--	--	28.6
2002	--	--	--	--	--	--	59.3
2003	--	--	--	--	--	--	102.1
2004	--	--	--	--	--	--	112.5
2005	--	--	--	--	--	--	129.0
2006	--	--	--	--	--	--	102.0
2007	--	--	--	--	--	--	95.1
2008	--	--	--	--	--	--	60.9
2009	--	--	--	--	--	--	68.8
2010	--	--	--	--	--	--	40.9
2011	--	--	--	--	--	--	30.5
2012	--	--	--	--	--	--	45.8
2013	--	--	--	--	--	--	4.3
2014	--	--	--	--	--	--	8.2
<b>Subtotal</b>	<b>544</b>	--	--	--	--	--	<b>918.9</b>



## Annual Funding BY\$

## 2040 | RDT&amp;E | Research, Development, Test, and Evaluation, Army

Fiscal Year	Quantity	End Item Recurring Flyaway BY 2007 \$M	Non End Item Recurring Flyaway BY 2007 \$M	Non Recurring Flyaway BY 2007 \$M	Total Flyaway BY 2007 \$M	Total Support BY 2007 \$M	Total Program BY 2007 \$M
1997	--	--	--	--	--	--	5.5
1998	--	--	--	--	--	--	10.4
1999	--	--	--	--	--	--	8.7
2000	--	--	--	--	--	--	11.1
2001	--	--	--	--	--	--	32.1
2002	--	--	--	--	--	--	65.8
2003	--	--	--	--	--	--	111.2
2004	--	--	--	--	--	--	119.6
2005	--	--	--	--	--	--	133.3
2006	--	--	--	--	--	--	102.6
2007	--	--	--	--	--	--	93.4
2008	--	--	--	--	--	--	58.7
2009	--	--	--	--	--	--	65.5
2010	--	--	--	--	--	--	38.3
2011	--	--	--	--	--	--	28.0
2012	--	--	--	--	--	--	41.4
2013	--	--	--	--	--	--	3.8
2014	--	--	--	--	--	--	7.1
<b>Subtotal</b>	<b>544</b>	--	--	--	--	--	<b>936.5</b>

**Annual Funding TY\$**  
**9999 | RDT&E | Non Treasury Funds**

<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>
2003	--	--	--	--	--	--	9.5
2004	--	--	--	--	--	--	9.5
2005	--	--	--	--	--	--	9.5
2006	--	--	--	--	--	--	9.5
2007	--	--	--	--	--	--	9.5
2008	--	--	--	--	--	--	9.5
2009	--	--	--	--	--	--	3.0
2010	--	--	--	--	--	--	3.0
2011	--	--	--	--	--	--	4.0
2012	--	--	--	--	--	--	2.0
<b>Subtotal</b>	--	--	--	--	--	--	<b>69.0</b>

**Annual Funding BY\$**  
**9999 | RDT&E | Non Treasury Funds**

<b>Fiscal Year</b>	<b>Quantity</b>	<b>End Item Recurring Flyaway BY 2007 \$M</b>	<b>Non End Item Recurring Flyaway BY 2007 \$M</b>	<b>Non Recurring Flyaway BY 2007 \$M</b>	<b>Total Flyaway BY 2007 \$M</b>	<b>Total Support BY 2007 \$M</b>	<b>Total Program BY 2007 \$M</b>
2003	--	--	--	--	--	--	10.3
2004	--	--	--	--	--	--	10.1
2005	--	--	--	--	--	--	9.8
2006	--	--	--	--	--	--	9.6
2007	--	--	--	--	--	--	9.3
2008	--	--	--	--	--	--	9.2
2009	--	--	--	--	--	--	2.9
2010	--	--	--	--	--	--	2.8
2011	--	--	--	--	--	--	3.7
2012	--	--	--	--	--	--	1.8
<b>Subtotal</b>	--	--	--	--	--	--	<b>69.5</b>

This appropriation is being used to account for the \$69M of development funding provided by the Kingdom of Sweden for the Excalibur program.

## Annual Funding TY\$

## 2034 | Procurement | Procurement of Ammunition, Army

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
2005	127	35.1	--	1.8	36.9	--	36.9
2006	321	48.3	--	1.0	49.3	--	49.3
2007	793	84.5	--	1.7	86.2	--	86.2
2008	400	47.5	--	--	47.5	--	47.5
2009	435	57.9	--	10.1	68.0	0.8	68.8
2010	900	103.2	--	--	103.2	2.2	105.4
2011	100	30.5	--	--	30.5	--	30.5
2012	744	56.1	--	2.0	58.1	--	58.1
2013	840	65.9	--	2.6	68.5	--	68.5
2014	929	75.8	--	1.5	77.3	--	77.3
2015	416	34.6	--	1.1	35.7	--	35.7
2016	472	44.7	--	0.8	45.5	--	45.5
<b>Subtotal</b>	<b>6477</b>	<b>684.1</b>	<b>--</b>	<b>22.6</b>	<b>706.7</b>	<b>3.0</b>	<b>709.7</b>

**Annual Funding BY\$****2034 | Procurement | Procurement of Ammunition, Army**

<b>Fiscal Year</b>	<b>Quantity</b>	<b>End Item Recurring Flyaway BY 2007 \$M</b>	<b>Non End Item Recurring Flyaway BY 2007 \$M</b>	<b>Non Recurring Flyaway BY 2007 \$M</b>	<b>Total Flyaway BY 2007 \$M</b>	<b>Total Support BY 2007 \$M</b>	<b>Total Program BY 2007 \$M</b>
2005	127	35.9	--	1.9	37.8	--	37.8
2006	321	48.0	--	1.0	49.0	--	49.0
2007	793	82.0	--	1.7	83.7	--	83.7
2008	400	45.4	--	--	45.4	--	45.4
2009	435	54.8	--	9.5	64.3	0.8	65.1
2010	900	95.9	--	--	95.9	2.0	97.9
2011	100	27.8	--	--	27.8	--	27.8
2012	744	50.3	--	1.8	52.1	--	52.1
2013	840	57.6	--	2.3	59.9	--	59.9
2014	929	65.2	--	1.3	66.5	--	66.5
2015	416	29.2	--	0.9	30.1	--	30.1
2016	472	37.0	--	0.7	37.7	--	37.7
<b>Subtotal</b>	<b>6477</b>	<b>629.1</b>	<b>--</b>	<b>21.1</b>	<b>650.2</b>	<b>2.8</b>	<b>653.0</b>

**Annual Funding TY\$**  
**0300 | Procurement | Procurement, Defense-Wide**

<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>
2007	295	25.1	--	--	25.1	--	25.1
2008	75	6.2	--	--	6.2	--	6.2
2009	29	5.4	--	--	5.4	--	5.4
<b>Subtotal</b>	<b>399</b>	<b>36.7</b>	<b>--</b>	<b>--</b>	<b>36.7</b>	<b>--</b>	<b>36.7</b>

**Annual Funding BY\$****0300 | Procurement | Procurement, Defense-Wide**

<b>Fiscal Year</b>	<b>Quantity</b>	<b>End Item Recurring Flyaway BY 2007 \$M</b>	<b>Non End Item Recurring Flyaway BY 2007 \$M</b>	<b>Non Recurring Flyaway BY 2007 \$M</b>	<b>Total Flyaway BY 2007 \$M</b>	<b>Total Support BY 2007 \$M</b>	<b>Total Program BY 2007 \$M</b>
2007	295	24.5	--	--	24.5	--	24.5
2008	75	5.9	--	--	5.9	--	5.9
2009	29	5.1	--	--	5.1	--	5.1
<b>Subtotal</b>	<b>399</b>	<b>35.5</b>	<b>--</b>	<b>--</b>	<b>35.5</b>	<b>--</b>	<b>35.5</b>

This appropriation captures the procurement of FMS buy back projectiles.

## Low Rate Initial Production

	<b>Initial LRIP Decision</b>	<b>Current Total LRIP</b>
<b>Approval Date</b>	5/23/2005	12/13/2012
<b>Approved Quantity</b>	500	1800
<b>Reference</b>	AAE ADM for Increment Ia Milestone (MS) C	AAE ADM for Increment Ib MS C
<b>Start Year</b>	2005	2012
<b>End Year</b>	2006	2014

The Current Total LRIP Quantity is more than 10% of the total production quantity due to the significant decrease in Army Procurement Objective from 30,000 projectiles to 6,264.

The program received an Army Acquisition Executive (AAE) Acquisition Decision Memorandum (ADM) on May 23, 2005 to authorize entry into LRIP and procurement of up to 500 Increment Ia-1 projectiles in FY 2005 - FY 2006.

The AAE provided a revised ADM on March 26, 2007 to increase the authorized LRIP procurement quantity up to 1,500 Increment Ia-1 projectiles.

A revised ADM dated July 31, 2007 authorized entry into Increment Ia-2 LRIP with procurement authorization of up to 2,500 Increment Ia projectiles in FY 2005 - FY 2009.

An ADM dated December 13, 2012 authorized entry into Increment Ib LRIP with procurement authorization of up to 1,800 Increment Ib projectiles in FY 2013 - FY 2014.



## Foreign Military Sales

Country	Date of Sale	Quantity	Total Cost \$M	Memo
Germany	5/2/2013	8	1.8	Letter of Authorization and Acceptance (LOA) and project agreement with Germany was signed on May 2, 2013 for 8 Increment Ia-2 projectiles for compatibility testing with their gun system.
Sweden	4/25/2013	297	21.7	297 Increment Ib projectiles were procured by the Kingdom of Sweden (KoS) under the Excalibur Production Project Agreement.
Canada	1/10/2011	75	8.8	LOA with Canada was signed on January 10, 2011 to procure 75 M982 Ia-2 projectiles.
Sweden	9/23/2009	114	12.0	114 Increment Ia-2 projectiles were sold to the KoS under the Excalibur Production Project Agreement.
United Kingdom	3/6/2009	6	1.1	The United Kingdom has purchased six projectiles.
Australia	5/8/2008	250	26.9	Australia has purchased 250 Excalibur Increment Ia-1 projectiles.
Sweden	10/15/2007	18	2.3	KoS Letter of Offer and Acceptance FMS Case was signed October 15, 2007.
Canada	10/7/2007	30	4.1	Canadian Defense Forces FMS contract for FY 2007 projectiles.

Other countries have expressed interest in Excalibur and have begun development of FMS cases.

## Nuclear Costs

None

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

	BY2007 \$M	BY2007 \$M	
Unit Cost	Current UCR Baseline (DEC 2012 APB)	Current Estimate (DEC 2013 SAR)	BY % Change

## Program Acquisition Unit Cost (PAUC)

Cost	1705.2	1694.5	
Quantity	7474	7420	
Unit Cost	0.228	0.228	0.00

## Average Procurement Unit Cost (APUC)

Cost	701.3	688.5	
Quantity	6930	6876	
Unit Cost	0.101	0.100	-0.99

	BY2007 \$M	BY2007 \$M	
Unit Cost	Revised Original UCR Baseline (MAR 2011 APB)	Current Estimate (DEC 2013 SAR)	BY % Change

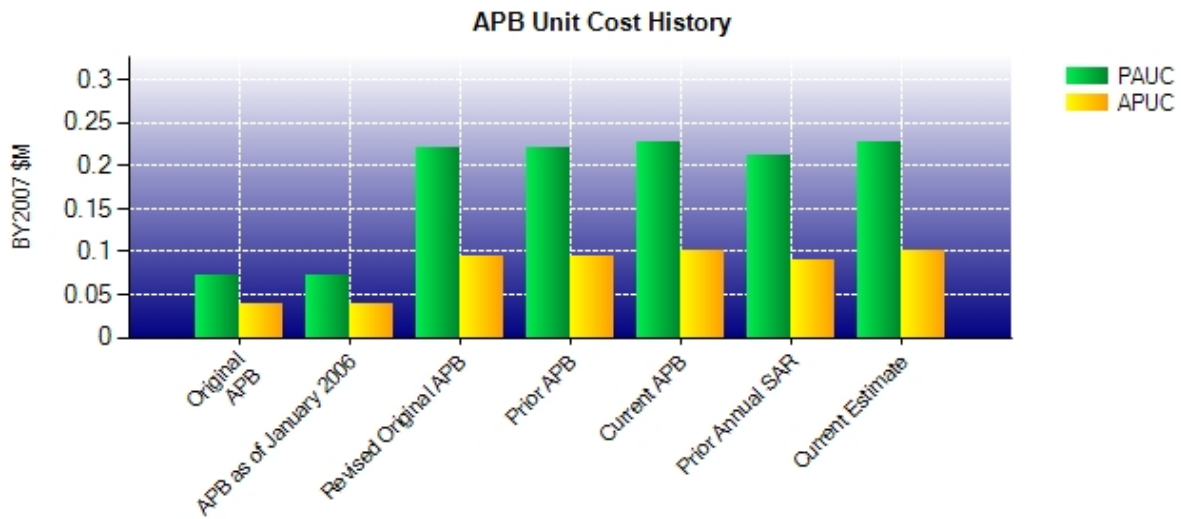
## Program Acquisition Unit Cost (PAUC)

Cost	1654.6	1694.5	
Quantity	7474	7420	
Unit Cost	0.221	0.228	+3.17

## Average Procurement Unit Cost (APUC)

Cost	661.2	688.5	
Quantity	6930	6876	
Unit Cost	0.095	0.100	+5.26

### Unit Cost History



	Date	BY2007 \$M		TY \$M	
		PAUC	APUC	PAUC	APUC
<b>Original APB</b>	OCT 2004	0.072	0.039	0.076	0.045
<b>APB as of January 2006</b>	OCT 2004	0.072	0.039	0.076	0.045
<b>Revised Original APB</b>	MAR 2011	0.221	0.095	0.225	0.102
<b>Prior APB</b>	MAR 2011	0.221	0.095	0.225	0.102
<b>Current APB</b>	DEC 2012	0.228	0.101	0.233	0.109
<b>Prior Annual SAR</b>	DEC 2012	0.212	0.090	0.216	0.097
<b>Current Estimate</b>	DEC 2013	0.228	0.100	0.234	0.109

### 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	
0.063	-0.005	0.142	0.011	0.006	0.006	0.000	0.000	0.160	0.225

#### Current SAR Baseline to Current Estimate (TY \$M)

PAUC Prod Est	Changes								PAUC Current Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.225	0.001	0.005	0.000	0.002	0.001	0.000	0.000	0.009	0.234

**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	
0.054	-0.005	0.040	0.010	0.000	0.003	0.000	0.000	0.048	0.102

**Current SAR Baseline to Current Estimate (TY \$M)**

APUC Prod Est	Changes								APUC Current Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.102	0.001	0.004	0.001	0.002	-0.001	0.000	0.000	0.007	0.109

**SAR Baseline History**

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	MAY 1997	N/A	N/A
Milestone II	N/A	MAY 1997	MAY 1997	MAY 1997
Milestone C	N/A	JUN 2006	MAY 2005	MAY 2005
IOC	N/A	SEP 2008	OCT 2011	DEC 2011
Total Cost (TY \$M)	N/A	4798.7	1679.0	1734.3
Total Quantity	N/A	76677	7474	7420
Prog. Acq. Unit Cost (PAUC)	N/A	0.063	0.225	0.234

**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)	972.7	706.3	--	1679.0
Previous Changes				
Economic	+1.3	+8.3	--	+9.6
Quantity	--	+40.0	--	+40.0
Schedule	--	-0.4	--	-0.4
Engineering	--	+12.8	--	+12.8
Estimating	+13.9	-55.6	--	-41.7
Other	--	--	--	--
Support	--	-1.5	--	-1.5
Subtotal	+15.2	+3.6	--	+18.8
Current Changes				
Economic	-0.3	-2.8	--	-3.1
Quantity	--	-14.7	--	-14.7
Schedule	--	+4.0	--	+4.0
Engineering	--	-0.1	--	-0.1
Estimating	+0.3	+50.6	--	+50.9
Other	--	--	--	--
Support	--	-0.5	--	-0.5
Subtotal	--	+36.5	--	+36.5
Total Changes	+15.2	+40.1	--	+55.3
CE - Cost Variance	987.9	746.4	--	1734.3
CE - Cost & Funding	987.9	746.4	--	1734.3

<b>Summary Base Year 2007 \$M</b>				
	<b>RDT&amp;E</b>	<b>Proc</b>	<b>MILCON</b>	<b>Total</b>
SAR Baseline (Prod Est)	993.4	661.2	--	1654.6
Previous Changes				
Economic	--	--	--	--
Quantity	--	+39.2	--	+39.2
Schedule	--	-3.3	--	-3.3
Engineering	--	+11.1	--	+11.1
Estimating	+12.3	-49.4	--	-37.1
Other	--	--	--	--
Support	--	-1.4	--	-1.4
Subtotal	+12.3	-3.8	--	+8.5
Current Changes				
Economic	--	--	--	--
Quantity	--	-12.6	--	-12.6
Schedule	--	--	--	--
Engineering	--	-0.1	--	-0.1
Estimating	+0.3	+44.3	--	+44.6
Other	--	--	--	--
Support	--	-0.5	--	-0.5
Subtotal	+0.3	+31.1	--	+31.4
Total Changes	+12.6	+27.3	--	+39.9
CE - Cost Variance	1006.0	688.5	--	1694.5
CE - Cost & Funding	1006.0	688.5	--	1694.5

Previous Estimate: December 2012

RDT&E	\$M	
	Base Year	Then Year
<b>Current Change Explanations</b>		
Revised escalation indices. (Economic)	N/A	-0.3
Adjustment for current and prior escalation. (Estimating)	+0.3	+0.3
RDT&E Subtotal	+0.3	0.0

Procurement	\$M	
	Base Year	Then Year
<b>Current Change Explanations</b>		
Revised escalation indices. (Economic)	N/A	-2.8
Adjustment for current and prior escalation. (Support)	-0.1	0.0
Total Quantity variance resulting from a decrease of 432 projectiles from 7,308 to 6,876 (Army). (Subtotal)	-12.3	-14.3
Quantity variance resulting from a decrease of 432 projectiles from 7,308 to 6,876 (Army). (Quantity)	(-12.6)	(-14.7)
Allocation to Engineering resulting from Quantity change. (Engineering) (QR)	(-0.1)	(-0.1)
Allocation to Estimating resulting from Quantity change. (Estimating) (QR)	(+0.4)	(+0.5)
Stretch-out of procurement buy profile from three years to five years (Army). (Schedule)	0.0	+4.0
Adjustment for current and prior escalation. (Estimating)	+2.6	+2.8
The Excalibur production unit cost in FY 2013 was higher than projected due to reduced funding and quantity. (Estimating)	+39.2	+45.0
Revised estimate for projectile container due to insolvency of previous vendor. (Estimating)	+2.0	+2.3
Revised Government staffing estimate. (Estimating)	+2.3	+2.6
Revised estimate of Engineering Change Orders due to successful Developmental Testing (DT) and Operational Testing (OT). (Estimating)	-1.3	-1.5
Revised estimate for testing during production due to successful DT and OT. (Estimating)	-0.9	-1.1
Decrease in Other Support related to a reduced quantity in FY 2013 from 2,287 to 840 projectiles (Army). (Support) (QR)	-0.4	-0.5
Procurement Subtotal	+31.1	+36.5

(QR) Quantity Related

### Change Explanations Memo

The quantity and quantity related changes listed above are primarily due to the FY 2014 PB not reflecting the appropriations enacted for FY 2013 which reduced FY 2013 funding by \$54M and FY 2013 quantity by 1,447 projectiles. The FY 2015 PB restored funding in FY 2015 and FY 2016, resulting in a net decrease of 432 projectiles.

## Contracts

### Appropriation: Procurement

Contract Name	<b>XM982 ER Projectile-Incr lb Production</b>
Contractor	Raytheon Missile Systems
Contractor Location	Tucson, AZ 85706
Contract Number, Type	W15QKN-08-C-0530/3, FFP
Award Date	December 21, 2012
Definitization Date	December 21, 2012

Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price at Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
56.6	N/A	819	128.4	N/A	1800	128.4	128.4

### Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to subsequent awards of contract options for additional projectiles.

### Cost and Schedule Variance Explanations

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

### Contract Comments

This is the contract for Production of the Excalibur Increment lb projectile.  
 The total price includes:  
 An initial award of \$56.6M for 819 projectiles.  
 An option award of \$54.0M for 765 projectiles.  
 An option award of \$17.8M for 216 projectiles.



**Appropriation: RDT&E**

Contract Name **XM982 ER Projectile-Incr Ib RDT&E SDD-RMS**  
 Contractor Raytheon Missile Systems  
 Contractor Location Tucson, AZ 85706  
 Contract Number, Type W15QKN-08-C-0530/2, CPIF  
 Award Date August 25, 2010  
 Definitization Date August 25, 2010

Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price at Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
22.8	N/A	N/A	79.8	N/A	N/A	79.8	79.8

**Target Price Change Explanation**

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to exercising the contract option for Part 2 of the Phase II contract.

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date (11/12/2013)	-6.3	-0.7
Previous Cumulative Variances	-6.8	-1.2
Net Change	+0.5	+0.5

**Cost and Schedule Variance Explanations**

None

**Contract Comments**

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

This contract is for Phase II (Qualification) of Increment Ib Engineering and Manufacturing Development. The Phase I contracts were Firm Fixed Price and the Phase II contract is Cost Plus Incentive Fee. Increment Ib is the next Increment in the development of the fielded Excalibur Increment Ia projectile that provides higher reliability at a lower unit production cost. The lower unit production cost is a result of competition for the Increment Ib contract, which drove the contractor to reduce the manufacturing complexity of the projectile and utilize lower cost materials without sacrificing performance.

This contract was completed on January 31, 2014.

**Appropriation: Procurement**

**Contract Name** XM982 ER Projectile-Incr Ia Prod FY2010, FY2011  
**Contractor** Raytheon Missile Systems  
**Contractor Location** Tucson, AZ 85437  
**Contract Number, Type** W15QKN-07-C-0100/4, FFP  
**Award Date** March 30, 2011  
**Definitization Date** March 30, 2011

Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price at Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
79.1	N/A	1000	79.1	N/A	1000	79.1	79.1

**Cost and Schedule Variance Explanations**

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

**Contract Comments**

This contract modification was a single combined FY 2010 - FY 2011 Full Rate Production award for Excalibur Increment Ia-2 projectiles. It procures 1,000 projectiles for the Army as well as 2,163 projectiles for the United States Marine Corps.

The final 334 projectiles on this contract are scheduled to be delivered in April 2014.

## Deliveries and Expenditures

Delivered to Date	Plan to Date	Actual to Date	Total Quantity	Percent Delivered
Development	544	544	544	100.00%
Production	3183	3183	6876	46.29%
Total Program Quantity Delivered	3727	3727	7420	50.23%

Expended and Appropriated (TY \$M)			
Total Acquisition Cost	1734.3	Years Appropriated	18
Expended to Date	1441.6	Percent Years Appropriated	90.00%
Percent Expended	83.12%	Appropriated to Date	1653.1
Total Funding Years	20	Percent Appropriated	95.32%

The above data is current as of 2/19/2014.

Plan and actual projectile quantities refer to projectiles delivered to the Army, FMS and United States Marine Corps sales are not included.

Production deliveries include 3,141 Increment Ia projectiles and 42 Increment Ib projectiles.

## Operating and Support Cost

### EXCALIBUR

#### Assumptions and Ground Rules

##### Cost Estimate Reference:

This estimate is part of the Excalibur Increment 1b Milestone (MS) C Army Cost Position (ACP) with fact of life changes, which was approved by the Assistant Secretary of the Army (Financial Management & Comptroller) on November 15, 2012.

##### Sustainment Strategy:

Excalibur is a one shot use item. There is no scheduled maintenance over the 20-year shelf life. There is a defined stockpile surveillance program which will be used to calculate stockpile reliability and detect/measure adverse trends of critical parameters. To date, tracking reliability from continuous theater usage has allowed the program to delay initiation of stockpile surveillance.

Quantity: A total of 6,876 projectiles will be procured, 6,210 will be delivered to inventory and 666 will be consumed in testing.

Service Life: Excalibur is planned to be in the field for 31 years from FY 2007 to FY 2037.

##### Antecedent Information:

No Antecedent program.

Unitized O&S Costs BY2007 \$K		
Cost Element	EXCALIBUR Average Annual Cost for all Projectiles	No Antecedent (Antecedent)
Unit-Level Manpower	0.000	--
Unit Operations	0.000	--
Maintenance	243.070	--
Sustaining Support	255.480	--
Continuing System Improvements	586.870	--
Indirect Support	0.000	--
Other	0.000	--
Total	1085.420	--

##### Unitized Cost Comments:

These costs are calculated as the average annual cost for all projectiles for each category over the 31-years Excalibur is planned to be in the field (FY 2007 - FY 2037).

Total Cost = average annual cost \* planned life = 1085.42 \* 31 = 33.6

Maintenance costs include stockpile surveillance, laboratory teardown testing, and Depot Inventory Management. Sustaining Support includes the storage cost of projectiles and Systems Engineering/Program Management. Continuing System Improvements include the cost of maintaining the system's knowledge base and making software fixes/updates as required.

	Total O&S Cost \$M				
	Current Production APB Objective/Threshold		Current Estimate		
	EXCALIBUR		EXCALIBUR	No Antecedent (Antecedent)	
<b>Base Year</b>	36.9	40.6	33.6	N/A	
<b>Then Year</b>	50.7	N/A	48.8	N/A	

Total O&S Costs Comments:Variance Explanation:

The total BY 2007 O&S cost estimate has decreased to \$33.6M from the Increment Ib MS C ACP of \$35.1M. The decrease is due to continued theater usage of Excalibur, which has allowed further delay to initiation of stockpile surveillance.

O&S Cost Variance		
Category	Base Year 2007 \$M	Change Explanation
Prior SAR Total O&S Estimate DECEMBER 2012	35.1	
Cost Estimating Methodology	0.000	
Cost Data Update	0.000	
Labor Rate	0.000	
Energy Rate	0.000	
Technical Input	0.000	
Programmatic/Planning Factors	-1.451	Continued theater usage of Excalibur has allowed further delay to initiation of stockpile surveillance.
Other	0.000	
Total Changes	-1.451	
Current Estimate	33.6	

**Disposal Costs:**

Demilitarization/Disposal costs of \$1.8M (BY 2007) are included in the Increment Ib MS C ACP.