



Selected Acquisition Report (SAR)

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



Excalibur Precision 155mm Projectiles (Excalibur)

As of FY 2017 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

Table of Contents

Common Acronyms and Abbreviations for MDAP Programs	3
Program Information	5
Responsible Office	5
References	5
Mission and Description	6
Executive Summary	7
Threshold Breaches	8
Schedule	9
Performance	11
Track to Budget	13
Cost and Funding	14
Low Rate Initial Production	26
Foreign Military Sales	27
Nuclear Costs	27
Unit Cost	28
Cost Variance	31
Contracts	34
Deliveries and Expenditures	36
Operating and Support Cost	37

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

Excalibur Precision 155mm Projectiles (Excalibur)

DoD Component

Army

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Date Assigned: June 21, 2015

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 June 25, 2014

Mission and Description

Excalibur Precision 155-mm Projectiles (Excalibur) provide Brigade Combat Teams an organic precision fires capability. Additionally, it provides improved fire support capability due to its increased range of 40.5-kilometers (km) and demonstrated accuracy of less than three meters radial miss distances, which enables a first round effect on target reducing the number of rounds required and reducing collateral damage. Excalibur is compatible with the M777A2 Lightweight 155-mm Howitzer, the M109A6 Paladin Howitzer, the M109A7 Paladin Integrated Management Howitzer, and the Swedish Archer Howitzer. Excalibur provides a 35 percent range increase over current Rocket Assisted Projectiles with less than ten-meter circular error probable requirement at all ranges. Excalibur is also highly resistant to Global Positioning System jamming.

Excalibur Inc Ia-1 and Inc Ia-2 are currently fielded and in use by units throughout Afghanistan and deployed globally to support other military contingency operations. Excalibur is an International Cooperative Development Program, teamed with the Kingdom of Sweden (KoS) which contributed resources towards development in accordance with an established Project Agreement. Excalibur Inc Ia-1 was initially fielded to units in Iraq and Afghanistan in response to urgent need requests in support of Operation Iraqi Freedom, Operation New Dawn, and Operation Enduring Freedom. Excalibur Inc Ia-2 was fielded in early FY 2012 and greatly increased range from 25.2-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 Inc Ib provides further performance improvements while significantly lowering unit costs.

Excalibur completed FMS to Canada, United Kingdom, Australia, Germany, and the KoS. The program is actively executing current FMS cases with Spain, The Netherlands, and the Kingdom of Jordan. The program also received interest for future sales from numerous other countries.

Executive Summary

Pursuant to section 2432 of title 10, U.S. Code, this is the final SAR submission for Excalibur because the program is 90 percent or more expended.

Excalibur Inc Ia-1 and Inc Ia-2

The final Excalibur Inc Ia-2 projectile was delivered to inventory in April 2014. In total, PM Excalibur procured and delivered 2,132 Excalibur Inc Ia-1 (Department of the Army (DA) 39) and 4,316 Excalibur Inc Ia-2 (DA45) projectiles to U.S. and foreign customers. The Army and U.S. Marine Corps fired a total of 832 projectiles since the first production deliveries were made available to troops in 2007 with a proven field reliability of 88 percent. Excalibur is highly successful and proves the value of precision munitions in dense urban environments by virtually eliminating collateral damage while providing effects on the intended target.

Excalibur Inc Ib

Excalibur Inc Ib is an integral part of the strategy to field Excalibur capability to the DoD and the Kingdom of Sweden (KoS). It delivers a lower cost, higher reliability precision munition to the warfighter. As of December 31, 2015, PM Excalibur contracted for 2,894 Excalibur Inc Ib projectiles for the Army, with 2,469 delivered to inventory. The KoS procured an additional 297 projectiles.

On September 14, 2015, the Excalibur Product Lead briefed the Army Acquisition Executive (AAE) to address the M-Code, Global Positioning System (GPS) Degraded, and GPS Denied retrofit options to the Excalibur Ib inventory. The PM presented the benefits to retrofitting the inventory for the M982A1 Excalibur Inc Ib variant along with the associated costs in both RDT&E and Procurement starting in FY 2018. The Excalibur program continues to execute within all APB parameters. No current issues exist that impact cost, schedule, or performance.

On October 8, 2015, the Configuration Steering Board was held during which the Product Lead for Excalibur provided a briefing to the AAE and other principals on the status and plans of the Excalibur program. Participants included PM Combat Ammunition Systems, PEO Ammunition and the Army Training and Doctrine Command Capability Manager Brigade Combat Team Fires. No de-scoping of program efforts was recommended or directed. Two topics of particular emphasis were discussed. The first was the conclusion of the Excalibur Army-funded production program with the FY 2017 purchase. There is considerable interest to ensure sufficient stockpile exists before production ends or maintaining production at the minimum sustaining rate to enable reaction to urgent needs. The second key topic regarded the robustness of the Excalibur design to the GPS threats. Several options for development of improved resistance to GPS threats were presented. A decision regarding continued production relies heavily on the results of the Army G-3 Munitions Requirements Process and funding availability from FY 2018 to FY 2022. Excalibur's GPS Degraded path forward will be considered along with other Army systems in the overall review of GPS Position, Navigation and Timing.

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

Threshold Breaches

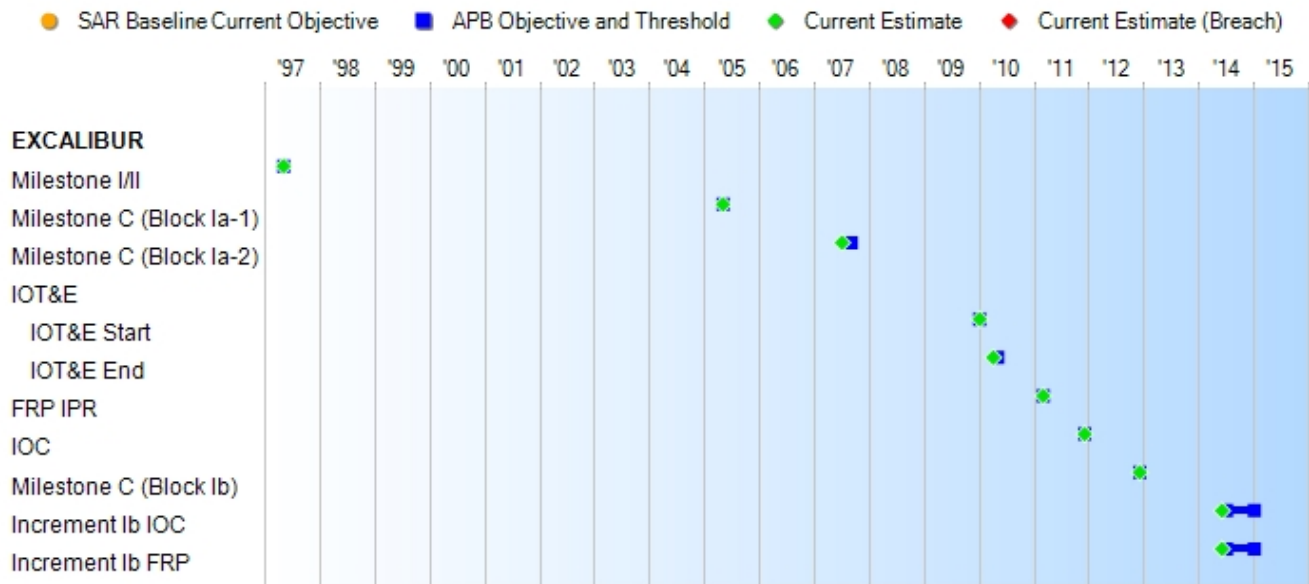
APB Breaches

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

Nunn-McCurdy Breaches

Current UCR Baseline		
	PAUC	None
	APUC	None
Original UCR Baseline		
	PAUC	None
	APUC	None

Schedule



Schedule Events				
Events	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate
Milestone 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	Mar 2011	Mar 2011
IOC	Oct 2011	Dec 2011	Dec 2011	Dec 2011
Milestone C (Block Ib)	Jun 2012	Dec 2012	Dec 2012	Dec 2012
Increment Ib IOC	Mar 2014	Jul 2014	Jan 2015	Jun 2014
Increment Ib FRP	Mar 2014	Jul 2014	Jan 2015	Jun 2014

Change Explanations

None

Acronyms and Abbreviations

IOT&E - Initial Operational Test and Evaluation
IPR - In-Process Review

Performance

Performance Characteristics				
SAR Baseline Production Estimate	Current APB Production Objective/Threshold	Demonstrated Performance	Current Estimate	
Accuracy (CEP)(m) (Increment Ia)				
<= 10 CEP	<= 10 CEP	<= 20 CEP	<4-m CEP	<4-m CEP
Reliability (percent) (Increment Ia)				
>= 96	>= 96	>= 85	88	88
Effectiveness (Increment Ia)				
>=M107 HE	>=M107 HE	>=M107 HE	>=M107 HE	>=M107 HE
Net Ready (Increment Ia)				
ATO	ATO	IATO	ATO	ATO
Accuracy (CEP)(m) (Increment Ib)				
<= 10m CEP	<= 10m CEP	<= 10m CEP	2-m CEP	2-m 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	ATO	ATO

Requirements Reference

CPD dated October 24, 2012

Change Explanations

None

Notes

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

The current assessment of the overall Excalibur Inc 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.

Current Army Test and Evaluation Command assessment of Excalibur Inc Ib Reliability is 93 percent.

Acronyms and Abbreviations

ATO - Approval to Operate

CEP - Circular Error Probable

HE - High Explosives

IATO - Interim Authority to Operate

km - kilometer

m - meter

Track to Budget

RDT&E

Appn	BA	PE
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Army 2040 05 0604814A

Project	Name
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708 M982 Projectile (Shared) (Sunk)

Notes: Completed in FY 2014

Defense-Wide 9999 05 0604814A

Project	Name
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708 M982 Projectile (Shared) (Sunk)

Notes: Completed in FY 2012

Notes

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 contributed \$69M to the development program (\$57M contributed to Excalibur Inc Ia and \$12M to Excalibur Inc Ib). These funds are included in this report as Non-Treasury RDT&E (9999).

Procurement

Appn	BA	PE
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Army 2034 01 0210600A

Line Item	Name
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E80103 Excalibur Unitary

Defense-Wide 0300 01 0210600A

Line Item	Name
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E80103 Excalibur

Notes: Parent Line for is E80100 (Projectile 155 MM Expended Range M982).

Notes

Excalibur procured additional projectiles in FY 2007 - FY 2009 and again in FY 2015 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							
Appropriation	BY 2007 \$M			BY 2007 \$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	993.4	1002.6	1102.9	1006.5	972.7	984.0	988.3
Procurement	661.2	688.2	757.0	745.6	706.3	746.3	812.2
Flyaway	--	--	--	742.8	--	--	809.2
Recurring	--	--	--	708.1	--	--	770.4
Non Recurring	--	--	--	34.7	--	--	38.8
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	0.0
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	1654.6	1690.8	N/A	1752.1	1679.0	1730.3	1800.5

Current APB Cost Estimate Reference

Army Cost Position (ACP) dated May 22, 2014

Confidence Level

Confidence Level of cost estimate for current APB: 50%

The Excalibur ACP approved by the Assistant Secretary of the Army for Financial Management and Comptroller is based on a negotiated price that was definitized prior to the FRP decision. The ICE methodology used the most recent pricing data received from the prime contractor.

Total Quantity			
Quantity	SAR Baseline Production Estimate	Current APB Production	Current Estimate
RDT&E	544	544	544
Procurement	6930	6930	7496
Total	7474	7474	8040

Quantity Notes

Excalibur's total planned procurement quantity of 7,496 includes 6,830 projectiles to be delivered to inventory (566 of which are replacing expended or damaged projectiles) and 666 projectiles for contract acceptance and reliability growth testing. Excalibur's war stock requirement is 6,264 projectiles.

Cost and Funding

Funding Summary

Appropriation Summary									
FY 2017 President's Budget / December 2015 SAR (TY\$ M)									
Appropriation	Prior	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	To Complete	Total
RDT&E	988.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	988.3
Procurement	707.5	65.5	39.2	0.0	0.0	0.0	0.0	0.0	812.2
MILCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2017 Total	1695.8	65.5	39.2	0.0	0.0	0.0	0.0	0.0	1800.5
PB 2016 Total	1692.5	45.5	0.0	0.0	0.0	0.0	0.0	0.0	1738.0
Delta	3.3	20.0	39.2	0.0	0.0	0.0	0.0	0.0	62.5

Quantity Summary										
FY 2017 President's Budget / December 2015 SAR (TY\$ M)										
Quantity	Undistributed	Prior	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	To Complete	Total
Development	544	0	0	0	0	0	0	0	0	544
Production	0	6578	546	372	0	0	0	0	0	7496
PB 2017 Total	544	6578	546	372	0	0	0	0	0	8040
PB 2016 Total	544	6563	476	0	0	0	0	0	0	7583
Delta	0	15	70	372	0	0	0	0	0	457

Cost and Funding

Annual Funding By Appropriation

Annual Funding							
2040 RDT&E Research, Development, Test, and Evaluation, Army							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
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	--	--	--	--	--	--	41.0
2011	--	--	--	--	--	--	30.5
2012	--	--	--	--	--	--	45.8
2013	--	--	--	--	--	--	3.6
2014	--	--	--	--	--	--	9.2
Subtotal	544	--	--	--	--	--	919.3

Annual Funding 2040 RDT&E Research, Development, Test, and Evaluation, Army							
Fiscal Year	Quantity	BY 2007 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
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	--	--	--	--	--	--	38.4
2011	--	--	--	--	--	--	28.0
2012	--	--	--	--	--	--	41.5
2013	--	--	--	--	--	--	3.2
2014	--	--	--	--	--	--	8.0
Subtotal	544	--	--	--	--	--	937.0

Annual Funding 9999 RDT&E Non Treasury Funds							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
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
Subtotal	--	--	--	--	--	--	69.0

Annual Funding 9999 RDT&E Non Treasury Funds							
Fiscal Year	Quantity	BY 2007 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
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
Subtotal	--	--	--	--	--	--	69.5

This appropriation accounts for \$69M provided by the Kingdom of Sweden for the Excalibur development program.

Annual Funding 2034 Procurement Procurement of Ammunition, Army								
Fiscal Year	Quantity	TY \$M						
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program	
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	928	72.0	--	2.6	74.6	--	74.6	
2014	996	75.8	--	1.5	77.3	--	77.3	
2015	428	34.6	--	1.1	35.7	--	35.7	
2016	546	49.5	--	16.0	65.5	--	65.5	
2017	372	38.2	--	1.0	39.2	--	39.2	
Subtotal	7090	733.2	--	38.8	772.0	3.0	775.0	

Annual Funding 2034 Procurement Procurement of Ammunition, Army								
Fiscal Year	Quantity	BY 2007 \$M						
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program	
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	50.4	--	1.8	52.2	--	52.2	
2013	928	63.3	--	2.3	65.6	--	65.6	
2014	996	65.9	--	1.3	67.2	--	67.2	
2015	428	29.6	--	1.0	30.6	--	30.6	
2016	546	41.7	--	13.4	55.1	--	55.1	
2017	372	31.5	--	0.8	32.3	--	32.3	
Subtotal	7090	672.2	--	34.7	706.9	2.8	709.7	

Annual Funding 0300 Procurement Procurement, Defense-Wide								
Fiscal Year	Quantity	TY \$M						
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program	
2007	295	25.1	--	--	25.1	--	25.1	
2008	75	6.2	--	--	6.2	--	6.2	
2009	29	5.4	--	--	5.4	--	5.4	
2010	--	--	--	--	--	--	--	
2011	--	--	--	--	--	--	--	
2012	--	--	--	--	--	--	--	
2013	--	--	--	--	--	--	--	
2014	--	--	--	--	--	--	--	
2015	7	0.5	--	--	0.5	--	0.5	
Subtotal	406	37.2	--	--	37.2	--	37.2	

Annual Funding 0300 Procurement Procurement, Defense-Wide							
Fiscal Year	Quantity	BY 2007 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2007	295	24.5	--	--	24.5	--	24.5
2008	75	5.9	--	--	5.9	--	5.9
2009	29	5.1	--	--	5.1	--	5.1
2010	--	--	--	--	--	--	--
2011	--	--	--	--	--	--	--
2012	--	--	--	--	--	--	--
2013	--	--	--	--	--	--	--
2014	--	--	--	--	--	--	--
2015	7	0.4	--	--	0.4	--	0.4
Subtotal	406	35.9	--	--	35.9	--	35.9

This appropriation captures the procurement of FMS Buy Back projectiles.

Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	5/23/2005	12/13/2012
Approved Quantity	500	1800
Reference	Inc Ia Milestone C ADM	Inc Ib Milestone C ADM
Start Year	2005	2012
End Year	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) ADM on May 23, 2005 to authorize entry into LRIP and procurement of up to 500 Excalibur Inc Ia-1 projectiles in FY 2005 to FY 2006.

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

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

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

Foreign Military Sales

Country	Date of Sale	Quantity	Total Cost \$M	Description
Jordan	12/27/2015	91	12.0	Letter of Offer and Acceptance (LOA) with Kingdom of Jordan was signed on December 27, 2015 to procure 91 Excalibur Inc Ib projectiles.
Netherlands	5/12/2015	100	16.5	LOA with the Netherlands was signed on May 12, 2015 to procure a total of 100 Excalibur Inc Ib projectiles.
Spain	11/7/2014	0	0.7	LOA with Spain was signed on November 7, 2014 to procure initial qualification test effort.
Germany	5/2/2013	8	2.0	LOA and Project Agreement with Germany was signed on May 2, 2013 for eight Excalibur Inc Ia-2 projectiles for compatibility testing with their gun system.
Sweden	4/25/2013	297	21.7	297 Excalibur Inc 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 signed on January 10, 2011 to procure 75 M982 Excalibur Inc Ia-2 projectiles.
Sweden	9/23/2009	114	12.0	114 Excalibur Inc Ia-2 projectiles sold to the KoS under the Excalibur Production Project Agreement.
United Kingdom	3/6/2009	6	1.1	The United Kingdom purchased six projectiles.
Australia	5/8/2008	250	26.9	Australia purchased 250 Excalibur Inc Ia-1 projectiles.
Sweden	10/15/2007	18	2.3	KoS LOA FMS case signed October 15, 2007.
Canada	10/7/2007	30	4.1	Canadian Defense Forces FMS contract for FY 2007 projectiles.

Notes

Nuclear Costs

None

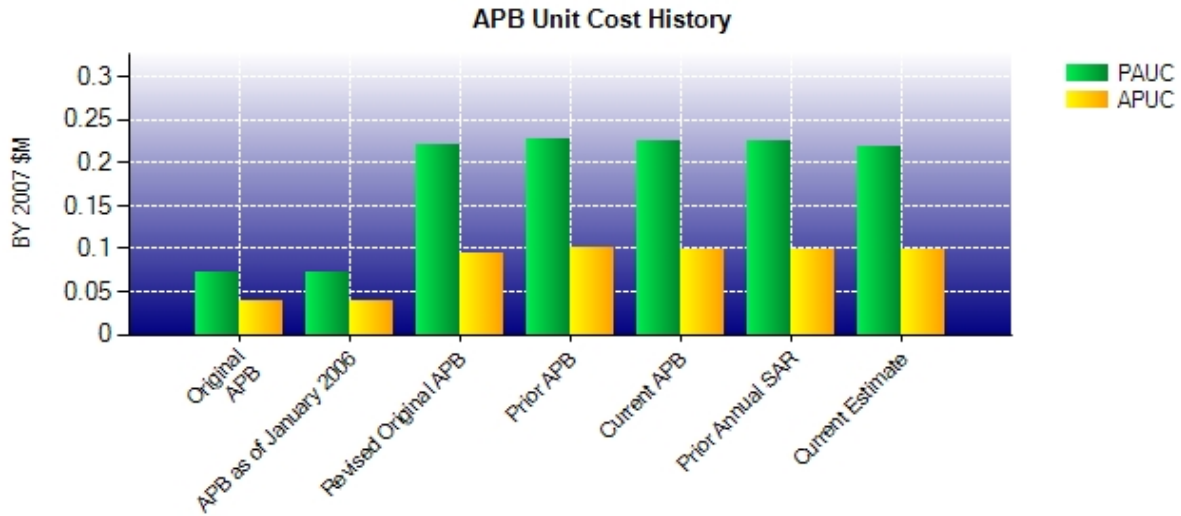
Unit Cost

Unit Cost Report

Item	BY 2007 \$M	BY 2007 \$M	% Change
	Current UCR Baseline (Jun 2014 APB)	Current Estimate (Dec 2015 SAR)	
Program Acquisition Unit Cost			
Cost	1690.8	1752.1	
Quantity	7474	8040	
Unit Cost	0.226	0.218	-3.54
Average Procurement Unit Cost			
Cost	688.2	745.6	
Quantity	6930	7496	
Unit Cost	0.099	0.099	0.00

Item	BY 2007 \$M	BY 2007 \$M	% Change
	Revised Original UCR Baseline (Mar 2011 APB)	Current Estimate (Dec 2015 SAR)	
Program Acquisition Unit Cost			
Cost	1654.6	1752.1	
Quantity	7474	8040	
Unit Cost	0.221	0.218	-1.36
Average Procurement Unit Cost			
Cost	661.2	745.6	
Quantity	6930	7496	
Unit Cost	0.095	0.099	+4.21

Unit Cost History



Item	Date	BY 2007 \$M		TY \$M	
		PAUC	APUC	PAUC	APUC
Original APB	Oct 2004	0.072	0.039	0.076	0.045
APB as of January 2006	Oct 2004	0.072	0.039	0.076	0.045
Revised Original APB	Mar 2011	0.221	0.095	0.225	0.102
Prior APB	Dec 2012	0.228	0.101	0.233	0.109
Current APB	Jun 2014	0.226	0.099	0.232	0.108
Prior Annual SAR	Dec 2014	0.224	0.099	0.229	0.107
Current Estimate	Dec 2015	0.218	0.099	0.224	0.108

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	
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 Production Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.225	0.000	-0.006	0.000	0.004	0.001	0.000	0.000	-0.001	0.224

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	
0.054	-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 Production Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.102	0.000	0.003	0.000	0.004	-0.001	0.000	0.000	0.006	0.108

SAR Baseline History				
Item	SAR Planning Estimate	SAR Development Estimate	SAR Production Estimate	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	1800.5
Total Quantity	N/A	76677	7474	8040
PAUC	N/A	0.063	0.225	0.224

Cost Variance

Summary TY \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	972.7	706.3	--	1679.0
Previous Changes				
Economic	+1.0	+4.1	--	+5.1
Quantity	--	+37.3	--	+37.3
Schedule	--	+2.5	--	+2.5
Engineering	--	+12.7	--	+12.7
Estimating	+11.8	-8.4	--	+3.4
Other	--	--	--	--
Support	--	-2.0	--	-2.0
Subtotal	+12.8	+46.2	--	+59.0
Current Changes				
Economic	-0.1	-1.3	--	-1.4
Quantity	--	+39.5	--	+39.5
Schedule	--	+0.2	--	+0.2
Engineering	+2.8	+20.0	--	+22.8
Estimating	+0.1	+1.3	--	+1.4
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+2.8	+59.7	--	+62.5
Total Changes	+15.6	+105.9	--	+121.5
CE - Cost Variance	988.3	812.2	--	1800.5
CE - Cost & Funding	988.3	812.2	--	1800.5

Summary BY 2007 \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	993.4	661.2	--	1654.6
Previous Changes				
Economic	--	--	--	--
Quantity	--	+36.6	--	+36.6
Schedule	--	-3.8	--	-3.8
Engineering	--	+11.0	--	+11.0
Estimating	+10.6	-8.1	--	+2.5
Other	--	--	--	--
Support	--	-1.9	--	-1.9
Subtotal	+10.6	+33.8	--	+44.4
Current Changes				
Economic	--	--	--	--
Quantity	--	+32.7	--	+32.7
Schedule	--	--	--	--
Engineering	+2.4	+16.8	--	+19.2
Estimating	+0.1	+1.1	--	+1.2
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+2.5	+50.6	--	+53.1
Total Changes	+13.1	+84.4	--	+97.5
CE - Cost Variance	1006.5	745.6	--	1752.1
CE - Cost & Funding	1006.5	745.6	--	1752.1

Previous Estimate: December 2014

RDT&E	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-0.1
Adjustment for current and prior escalation. (Estimating)	+0.1	+0.1
Analysis of Global Positioning System interface redesign to attain M-Code compliance. (Engineering)	+2.4	+2.8
RDT&E Subtotal	+2.5	+2.8

Procurement	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-1.3
Adjustment for current and prior escalation. (Estimating)	+1.1	+1.3
Quantity variance resulting from an increase of 450 projectiles from 6,640 to 7,090 (Army). (Quantity)	+35.7	+43.1
Quantity variance resulting from an increase of 7 projectiles from 399 to 406 (DoD). (Quantity)	+0.4	+0.5
Additional quantity variance as a result of an increase of 457 projectiles. (Quantity)	-3.4	-4.1
Contract close out costs shifted from FY 2016 to FY 2017 due to extension of production contract. (Schedule)	0.0	+0.2
Software upgrade based on updated System Threat Assessment Report. (Engineering)	+16.8	+20.0
Procurement Subtotal	+50.6	+59.7

Contracts

Contract Identification

Appropriation: Procurement
Contract Name: XM982 ER Projectile-Incr lb Production
Contractor: Raytheon Missile Systems
Contractor Location: 1151 E Hermans Rd.
 Tucson, AZ 85706
Contract Number: W15QKN-08-C-0530/3
Contract Type: Firm Fixed Price (FFP)
Award Date: December 21, 2012
Definitization Date: December 21, 2012

Contract Price							
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	129.3	N/A	1800	129.3	129.3

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.

Notes

This is the contract for Production of the Excalibur Inc lb projectile.
 The total price includes:
 An initial award of \$58.9M for 819 projectiles.
 An option award of \$54.1M for 765 projectiles.
 An option award of \$16.3M for 216 projectiles.

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

Contract Identification

Appropriation: Procurement
Contract Name: Excalibur Ib Production
Contractor: Raytheon Missile Systems
Contractor Location: 1151 E Hermans Road
 Tucson, AZ 85706
Contract Number: W15QKN-08-C-0530/4
Contract Type: Firm Fixed Price (FFP)
Award Date: December 21, 2012
Definitization Date: July 27, 2014

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
52.5	N/A	744	132.4	N/A	1854	132.4	132.4

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to contract modifications awarded for additional quantities.

Cost and Schedule Variance Explanations

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

Notes

The current target price reflects the Army portion of the contract (\$123.5M for 1,749 projectiles) as well as the FMS portion (\$8.9M for 105 projectiles).

Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	544	544	544	100.00%
Production	6563	5944	7496	79.30%
Total Program Quantity Delivered	7107	6488	8040	80.70%

Expended and Appropriated (TY \$M)			
Total Acquisition Cost	1800.5	Years Appropriated	20
Expended to Date	1632.2	Percent Years Appropriated	95.24%
Percent Expended	90.65%	Appropriated to Date	1761.3
Total Funding Years	21	Percent Appropriated	97.82%

The above data is current as of February 09, 2016.

Planned and actual projectile quantities refer to projectiles delivered to the Army. FMS and U.S. Marine Corps sales are not included.

Production deliveries include 3,475 Excalibur Inc Ia projectiles and 2,469 Excalibur Inc Ib projectiles.

Operating and Support Cost

Cost Estimate Details

Date of Estimate:	June 25, 2014
Source of Estimate:	SCP
Quantity to Sustain:	6264
Unit of Measure:	Total Quantity
Service Life per Unit:	20.00 Years
Fiscal Years in Service:	FY 2007 - FY 2038

A total of 7,496 projectiles will be procured, 6,830 will be delivered to inventory (566 replace expended or damaged projectiles, leaving 6,264 to be sustained) and 666 will be consumed in testing. The 544 RDT&E-funded projectiles were consumed in test.

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. The surveillance program began in FY 2015.

Antecedent Information

No Antecedent

Cost Element	Annual O&S Costs BY2007 \$K	
	EXCALIBUR Average Annual Cost Per Total Quantity	No Antecedent Program (Antecedent)
Unit-Level Manpower	0.000	--
Unit Operations	0.000	--
Maintenance	142.750	--
Sustaining Support	251.344	--
Continuing System Improvements	0.000	--
Indirect Support	0.000	--
Other	0.000	--
Total	394.094	--

Costs are calculated as the average annual cost for all projectiles for each category over the 32-years Excalibur is planned to be in the field (FY 2007 - FY 2038).

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.

Item	Total O&S Cost \$M			
	EXCALIBUR		No Antecedent Program (Antecedent)	
	Current Production APB Objective/Threshold	Current Estimate		
Base Year	20.8	22.9	12.6	N/A
Then Year	31.6	N/A	18.1	N/A

Disposal Cost is included in the Operating and Support Cost of the current APB objective and threshold for this program.

Equation to Translate Annual Cost to Total Cost

Total Cost = average annual cost per all fielded Excalibur projectiles * planned life = \$394.1K * 32 years = \$12.6M

O&S Cost Variance		
Category	BY 2007 \$M	Change Explanations
Prior SAR Total O&S Estimates - Dec 2014 SAR	12.5	
Programmatic/Planning Factors	0.0	
Cost Estimating Methodology	0.1	Increased cost for storage of additional projectiles being procured to replenish the stockpile.
Cost Data Update	0.0	
Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	0.0	
Other	0.0	
Total Changes	0.1	
Current Estimate	12.6	

The minor increase in O&S costs is due to the increased storage costs estimated due to the additional projectiles being procured in FY 2016 and FY 2017 to replenish the stockpile.

Disposal Estimate Details

Date of Estimate: June 25, 2015
Source of Estimate: POE
Disposal/Demilitarization Total Cost (BY 2007 \$M): Total costs for disposal of all Total Quantity are 8.9

Demilitarization/Disposal costs of \$8.9M (BY 2007) are included in the Excalibur Inc lb FRP Army Cost Position. This is a \$0.5M increase from the December 2014 estimate due to an increased quantity of projectiles to be disposed.