PAIRS CASE 2022-C-0312

LONG RANGE STAND OFF (LRSO)

Selected Acquisition Report (SAR)

AS OF THE FY 2023 PRESIDENT'S BUDGET

U.S. AIR FORCE

Contents

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Mission and Description

The Long Range Standoff (LRSO) Cruise Missile is a long range survivable standoff weapon capable of delivering lethal nuclear effects on strategic targets. LRSO will replace the currently fielded Air Launched Cruise Missile (ALCM) and will be integrated on both legacy and future bomber aircraft. The LRSO weapon system will be capable of penetrating and surviving advanced Integrated Air Defense Systems (IADS) from significant standoff ranges to prosecute strategic targets in support of the Air Force's global attack capability and strategic deterrence core function.

Executive Summary

Program Highlights Since Last Report

This is the initial SAR submission for the LRSO program.

The LRSO Technology Maturation and Risk Reduction (TMRR) phase began on August 17, 2017, when TMRR contracts were awarded to both Lockheed-Martin and Raytheon Missiles and Defense (RMD) corporations. The TMRR acquisition strategy included pre-determined knowledge points to evaluate the technical progress of each competitor.

On June 30, 2021, LRSO achieved Milestone B with the Milestone Decision Authority (MDA) signing an acquisition decision memorandum authorizing entry into Engineering & Manufacturing Design (EMD). The Air Force awarded the EMD contract via a sole-source contract to Raytheon on July 1, 2021. Key residual industry and government TMRR tasks were integrated into the EMD program planning and execution.

After the EMD contract award, LRSO executed an initial Integrated Baseline Review (IBR) in December 2021. The review baselined the program through Critical Design Review (February 2023) and the baseline was assessed at low-to-moderate risk. Three follow-on events-based IBRs are planned and are aligned with key EMD events. The program is fully funded. The department is currently adjusting budget execution plans as directed by the MDA at the June 2021 Milestone B.

LRSO is implementing a design approach to develop a Modular Open System Architecture (MOSA). The defined approach includes the software and hardware organic to LRSO, as well as the life-cycle process such as logistical support, sustainment, and technology insertion. Implementation of MOSA is focused on the following system attributes:

- Reconfigurability
- Portability
- Maintainability, and
- Technology Insertion

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

History of Significant Developments Since Program Initiation

History of Significant Developments Since Program Initiation	
Date	**Significant Development Description**
June 2021	Program achieved Milestone B on June 30, 2021.
December 2021	The program conducted their initial IBR on December 7-8, 2021.
December 2021	Separation Control Test Vehicle-1 (SCTV-1) Free Flight was conducted on December 8, 2021.
December 2021	Program completed the Annual General Accountability Office Program Review in December 2021.

Schedule

Schedule Events

Schedule Events					
Events	**EMD APB Objective**	**Current APB Development Objective/Threshold**		**Current Estimate/Actual**	**Deviation**
Milestone B	June 2021	June 2021	June 2021	June 2021	
Critical Design Review	February 2023	February 2023	August 2023	February 2023	
Milestone C	April 2027	April 2027	October 2027	April 2027	
Full Rate Production	June 2029	June 2029	December 2029	June 2029	

Schedule Notes

Initial Operational Capability (IOC) date is Controlled Unclassified Information (CUI). Per paragraph (i) of title 10 United States Code 2432 CUI has been removed from this Unclassified SAR.

Significant Schedule Risks

Significant Schedule Risks	
Current Estimate (December 2021)	
1.	This is the initial SAR, there are no known risks with this program at this time.

Performance:

Performance Characteristics					
Development APB Objective	**Current APB Development Objective/Threshold**		**Demonstrated Performance (include Date of Demonstration)**	**Current Estimate/Actual**	**Deviation**
KPP 4: Aircraft Integration					
KPP	B-21	B-52	LRSO integration has been demonstrated on the B-52 via multiple captive carry and release missions. This refinement of LRSO-to-B-52 integration will continue throughout the LRSO EMD phase. Integration is on-track to support IOC.	B-52	
KPP 6: Training					
KPP	The LRSO training program shall allow for the qualification and certification of missile maintenance, weapons load crew, nuclear weapons (warhead) maintenance, aircrew, mission planners, and EOD personnel to pass an INSI prior to IOC.	T=O	The LRSO training program is in planning as part of the recently awarded EMD contract. It will be proven via prototype development and multiple demonstrations of support equipment. The training program is on track to support a timely INSI.	The LRSO training program shall allow for the qualification and certification of missile maintenance, weapons load crew, nuclear weapons (warhead) maintenance, aircrew, mission planners, and EOD personnel to pass an INSI prior to IOC.	
KPP 7: Energy					
KPP	The mandatory Energy KPP is not applicable to the LRSO since it is a pre-fueled, single use, expendable system that will be mated to its respective launch platform. Even when deployed, the LRSO missile in itself will not	T=O	Not Applicable.		

Performance Characteristics					
Development APB Objective	**Current APB Development Objective/Threshold**		**Demonstrated Performance (include Date of Demonstration)**	**Current Estimate/Actual**	**Deviation**
	pose a burden on the energy supply chain or infrastructure.				
KPP 8: Force Protection					
KPP	The Force Protection KPP is not applicable to LRSO as it is not a manned system, nor is it a system designed to enhance personnel survivability. Carrier aircraft Force Protection KPPs are addressed in respective CDDs.	T=O	Not Applicable.		

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

Requirements Source

Capabilities Development Document (CDD), Approved by Joint Requirements Oversight Council (JROC), August 28, 2020.

Acquisition Budget Estimate

Total Acquisition Cost

Category	Base Year	Development APB Objective (BY$,M)	APB (Current) 06/30/2021 Objective (BY$,M)	APB (Current) 06/30/2021 Threshold (BY$,M)	Budget Estimate PB 2023 BY$M	Budget Estimate PB 2023 TY$M	Deviation
RDT&E	2021	6,104.3	6,104.3	6,714.7	6,179.0	6,448.3	
Procurement	2021	8,006.9	8,006.9	8,807.6	7,864.0	9,790.0	
MILCON	2021	122.2	122.2	134.4	120.4	137.8	
Acq. O&M	2021	0.0	0.0	0.0	0.0	0.0	
Total							
PAUC	2021	Per paragraph (i) of title 10 United States Code 2432 CUI has been removed from this Unclassified SAR.					
APUC	2021						

Total End Item Quantity

Per paragraph (i) of title 10 United States Code 2432 CUI quantity data has been removed from this Unclassified SAR.

Risk and Sensitivity Analysis

Risks and Sensitivity Analysis	
Current Procurement Cost (December 2021)	
1.	There are no risks identified with the current estimate. At Milestone B the MDA directed the department to align the program budget with the CAPE ICE.
Current Baseline Estimate (June 2021)	
1.	The Current Baseline Estimate risks are the same as the Original Baseline Estimate.
Revised Original Estimate (Not Applicable)	
1.	Not Applicable
Original Baseline Estimate (June 2021)	
1.	There were no risks identified with the baseline estimate. It was aligned with the Milestone B CAPE ICE.

Unit Cost

Current Baseline Compared with Current Estimate

Category ($M)	Current APB	Current Estimate	% Change	NMC Breach
PAUC				
Cost	14,233.4	14,163.3	-0.49%	-
Quantity	Per paragraph (i) of title 10 United States Code 2432 CUI has been removed from this Unclassified SAR.			
Unit Cost				
APUC				
Cost	8,006.9	7,864.0	-1.78%	-
Quantity	Per paragraph (i) of title 10 United States Code 2432 CUI has been removed from this Unclassified SAR.			
Unit Cost				

Original Baseline Compared with Current Estimate

Category ($M)	Current APB	Current Estimate	% Change	NMC Breach
PAUC				
Cost	14,233.4	14,163.3	-0.49%	-
Quantity	Per paragraph (i) of title 10 United States Code 2432 CUI has been removed from this Unclassified SAR.			
Unit Cost				
APUC				
Cost	8,006.9	7,864.0	-1.78%	-
Quantity	Per paragraph (i) of title 10 United States Code 2432 CUI has been removed from this Unclassified SAR.			
Unit Cost				

Unit Cost Note

Per paragraph (i) of title 10 United States Code 2432 CUI quantity data has been removed from this Unclassified SAR.

Contracts

Contract Notes

Per paragraph (i) of title 10 United States Code 2432 CUI has been removed from this Unclassified SAR.

Technologies and Systems Engineering

Significant Technical Risks

Significant Technical Risks	
Current Estimate (December 2021)	
1.	A B-21-to-LRSO handoff error greater than requirements, potentially reduces LRSO range resulting in LRSO being unable to reach the intended target. Mitigation plan in place. Projected closure: March 2022.
2.	Diminishing Manufacturing Sources and Material Shortages (DMSMS) may delay Initial Operational Capability. Mitigation plan complete and quarterly DMSMS reviews are in place.
3.	Nuclear Safety Cross Check Analysis (NSCCA) must be in place to support timely nuclear certification of LRSO software. Mitigation plan in place and on track. Projected closure: August 2022.
4.	Current calculations indicate that when four or more stores are loaded on the rotary launcher, the stores clash with the fuel tank. Mitigation plan is in place and on track. Projected closure: June 2022.

Deliveries and Expenditures

Per paragraph (i) of title 10 United States Code 2432 CUI has been removed from this Unclassified SAR.

Expended and Appropriated (TY $M)

Total Acquisition Cost: 16,242
Expended to Date: 2,210.4
Percent Expended: 13.6%
Total Funding Years: 21
Years Appropriated: 10 (FY22 under CR)
Percent Years Appropriated: 48
Appropriated to Date: 2,428.2
Percent Appropriated: 15.0

Low Rate Initial Production

Per paragraph (i) of title 10 United States Code 2432 CUI has been removed from this Unclassified SAR.

Operating and Support Costs

Total Program O&S Cost Compared with Baseline

	Current APB Objective (BY$)	Current APB Threshold (BY$)	Current Estimate (BY$)	Current Estimate (TY$)	Deviation
Total O&S ($M)	7,774.9	7,774.9	7,612.0	13,050	

O&S Cost Breakdown

Category (BY$M)	LRSO
Unit-Level Manpower	3,506.9
Unit Operations	72.3
Maintenance	573.9
Sustaining Support	2,177.8
Continued System Improvements	1,226.3
Other	54.8
Total O&S	7,612.0