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RCS: DD-A&T(Q&A)823-443



## **Littoral Combat Ship Mission Modules (LCS MM)**

As of FY 2021 President's Budget

Defense Acquisition Management  
Information Retrieval  
(DAMIR)

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## Common Acronyms and Abbreviations for MDAP Programs

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

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

## Program Information

**Program Name**

Littoral Combat Ship Mission Modules (LCS MM)

**DoD Component**

Navy

## Responsible Office

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**Date Assigned:** April 26, 2019

## References

**SAR Baseline (Development Estimate)**

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated November 27, 2013

**Approved APB**

Assistant Secretary of the Navy (Research, Development & Acquisition) (ASN(RDA)) Approved Acquisition Program Baseline (APB) dated September 28, 2018

## **Mission and Description**

The Littoral Combat Ship (LCS) is a fast, agile, and networked surface combatant optimized for operations close to shore, otherwise known as the littorals. The LCS Mission Modules (MM) Program provides a modular, focused mission capability to the Combatant Commanders to provide assured access against littoral threats. The primary missions for the LCS include countering littoral mine, submarine, and surface threats to assure maritime access for Joint Forces.

A mission package consists of mission modules with crew and support aircraft. Mission modules combine mission systems (vehicles, sensors, weapons) and support equipment that install into the ship via standard interfaces.

Mission modules are added to the mission package baselines incrementally as they reach a level of maturity necessary for fielding. This approach provides for continuous improvement of warfighting capability through an evolutionary acquisition process.



## Executive Summary

### Program Highlights Since Last Report

The LCS MM Program continues to incrementally field additional capabilities to the Fleet. The Program of Record (PoR) will field capabilities as approved in the budget and in-phase with ship deliveries.

In accordance with APB Change 1 approved September 2018, the Program is procuring 44 deployable Mission Packages (MPs). The MP quantities are as follows:

- 10 Surface Warfare (SUW) MPs
- 10 Anti-Submarine Warfare (ASW) MPs
- 24 Mine Countermeasures (MCM) MPs

for a total of 44 deployable MPs.

The 44 deployable MPs will support the LCS class and other Navy platforms (Vessels of Opportunity (VOOs)) per Chief of Naval Operations direction to use VOOs to host the MCM MP. The Program will procure production representative systems for the 44 deployable mission packages and will procure the deployable MPs with Other Procurement, Navy funds (one deployable SUW MP was partially funded with RDT&E, Navy funds). The Program has procured five non-deployable engineering development model assets (one MCM MP, two SUW MPs, and two ASW MPs) with RDT&E, Navy funds which are not included in the deployable MP quantities.

#### SUW MP:

- The Navy achieved IOC for the SUW MP with the Gun Mission Module (GMM) and Maritime Security Module (MSM) in November 2014. The SUW MP with the GMM and MSM is mature, fielded, and operationally deployed in the Fleet (installed on six SUW Division Ships). Since the last Selected Acquisition Report, the LCS MM Program awarded contracts for the final components of the GMMs and MSMs required to meet inventory objective.
- The Program completed testing of the Surface-to-Surface Missile Module (SSMM) on Freedom variant in November 2018, achieved IOC of the SSMM in March 2019, awarded the first production asset August 2019, and deployed SSMM on USS Detroit (LCS 7) in October 2019. Testing on the Independence variant was completed in Q2 FY 2020.

#### ASW MP:

- The Navy accepted delivery of the Escort Mission Module (EMM) Pre-Production Test Article (PPTA) on-time in November 2018.
- The Program completed integration efforts for the ASW MP with USS Fort Worth (LCS 3) with the execution of ship modifications to accommodate the ASW MP. The Navy embarked the ASW MP on LCS 3 and began formal developmental testing in Q4 FY 2019.
- The Program will complete testing on the Freedom variant and achieve IOC in FY 2020.

#### MCM MP:

- The LCS MM Program continues to deliver modular MCM MP capabilities to the Fleet as mission systems mature and comprehensive system-level testing is performed by the individual PoRs.
- All Aviation Modules (Near Surface Detection, Airborne Mine Neutralization, and Coastal Mine Reconnaissance) are certified for deployment on Independence variant ships. In FY 2019, the Program completed integration and testing of the Aviation Modules on the LCS Freedom variant. Certification of the Aviation Modules for deployment on the Freedom variant ships is planned for Q2 FY 2020.
- Completed Unmanned Influence Sweep System (UISS) Launch and Recovery/Integration testing on USS Independence (LCS 2). In FY 2019, the Navy completed UISS system-level developmental testing and is on-track to begin IOT&E in Q3 FY 2020 with system-level IOC in Q1 FY 2021.
- The Knifefish PoR achieved Milestone C in Q4 FY 2019 and entered the production phase. Knifefish is planned to achieve system-level IOC in Q3 FY 2022. LCS MM Program integration efforts are ongoing; in FY 2019 the program



completed Knifefish Line Map Testing on USS Independence.

- The Navy plans to begin MCM MP developmental and operational testing in FY 2021 and achieve IOC in FY 2022.
- The LCS MM Program demonstrated the flexibility of the MCM MP with completion of the first at-sea exercise on a Vessel-Of-Opportunity (VOO) aboard USNS Hershel "Woody" Williams (T-ESB 4) in September 2019; a follow-on event is planned for FY 2020.

On October 3, 2012, USD AT&L delegated the MDA to the Assistant Secretary of the Navy for Research, Development, and Acquisition (ASN RD&A), designating the LCS MM Program as an ACAT IC program. ASN RD&A approved Milestone B for the LCS MM program on January 7, 2014. ASN RD&A waived the following provisions of Section 2366b of Title 10, United States Code:

1. 2366b(a)(1)(D): That funding is available to execute the product development and production plan under the program, through the period covered by the FYDP submitted during the fiscal year in which the certification is made, consistent with the estimates described in subparagraph (1)(C) for the program, having determined that, but for such a waiver, the Department would be unable to meet critical national security objectives.
2. 2366(b)(2): That the MDA has received a PDR and conducted formal post-PDR assessment, and certifies on the basis of such assessment that the program demonstrates a high likelihood of accomplishing its intended mission, having determined that, but for such a waiver, the Department would be unable to meet critical national security objectives.

The Department will continue to review the LCS MM Program at least annually until the certification components are satisfied.

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
May 2004	Milestone A / Program Initiation for the LCS Seaframes and Mission Modules.
April 2011	ADM signed splitting the LCS Seaframe and LCS MMs into two separate MDAPs.
October 2012	USD(AT&L) signed ADM of October 3, 2012 re-designating the LCS MM program as an ACAT IC program.
November 2013	USD(AT&L) approved the APB based on a Resources & Requirements Review Board conducted August 6, 2013. Initial APB included a quantity 64 deployable mission packages (MPs).
January 2014	The program achieved Milestone B approving entry into the EMD phase and procurements of five developmental MPs and up to 27 LRIP MPs.
December 2015	Secretary of Defense Memo of December 14, 2015 directed the Navy to build no more than 40 LCS and Frigate and to down select to one variant no later than FY 2019. Navy submitted a 40 ship SAR (29 LCS / 11 Frigate), consistent with PB 2017 and SECDEF guidance. Navy initiated review of the LCS Mission Package quantities based on updated LCS quantities.
February 2016	Chief of Naval Operations (CNO) directed the establishment of the LCS Review Team to review the LCS operations and sustainment strategy and number of mission packages required to support the LCS Seaframes.
February 2018	With the PB 2019 submission, the Navy reduced MP quantities (from 64 to 48 total MPs consisting of 44 deployable and 4 non-deployable Engineering Development Model MPs) based upon the total planned 32 LCS class ships, pending FY 2018 and FY 2019 budget approvals, and CNO direction to use other Navy platforms (Vessels of Opportunity) to host the Mine Countermeasures (MCM) MP to comply with Section 1046 of the FY 2018 NDAA which prohibits the retirement of legacy MCM forces until the Navy has identified a replacement capability and procured a quantity of such systems to meet combatant MCM operational requirements that are currently being met by legacy forces. The PB 2020 submission supports procurement of 24 MCM MPs, 10 Surface Warfare (SUW) MPs, and 10 Anti-Submarine (ASW) MPs.
September 2018	MDA approved the LCS MM Program re-baseline via APB Change 1.

## 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

#### Current UCR Baseline

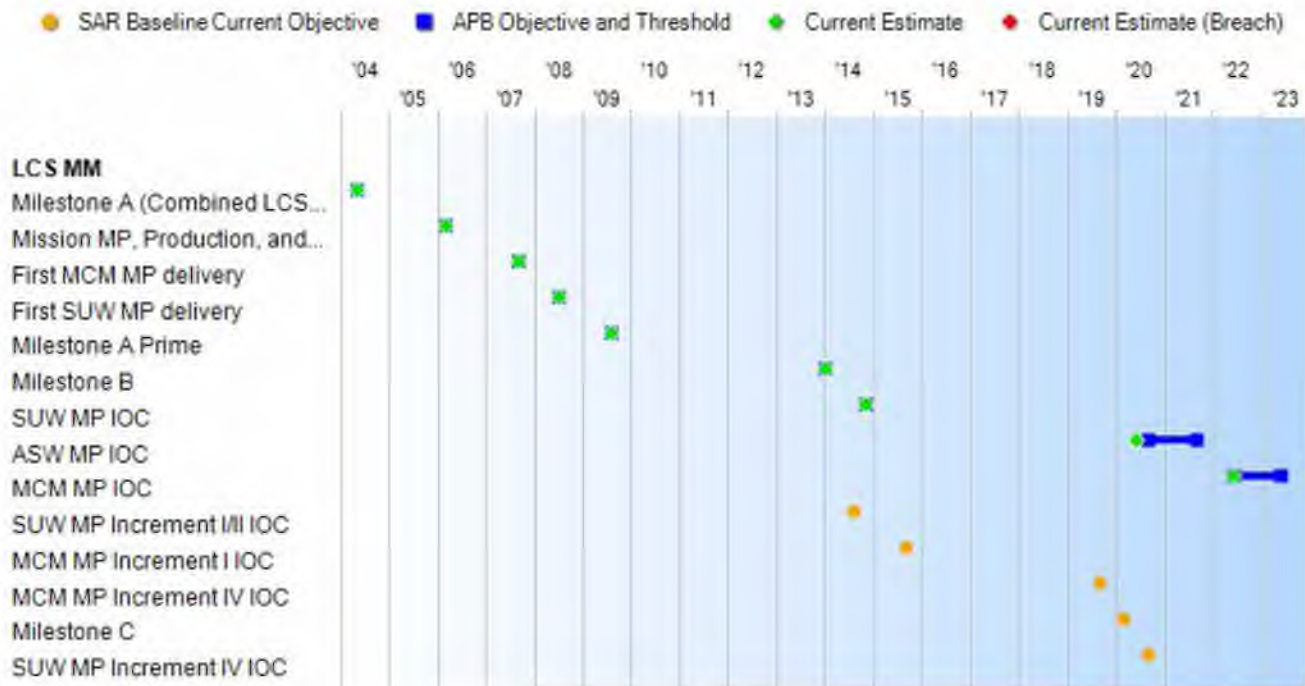
PAUC	None
APUC	None

#### Original UCR Baseline

PAUC	None
APUC	None



## Schedule



Schedule Events					(Ch-1)
Events	SAR Baseline Development Estimate	Current APB Development Objective/Threshold		Current Estimate	
Milestone A (Combined LCS program)	May 2004	May 2004	May 2004	May 2004	
Mission MP, Production, and Assembly contract award	Mar 2006	Mar 2006	Mar 2006	Mar 2006	
First MCM MP delivery	Sep 2007	Sep 2007	Sep 2007	Sep 2007	
First SUW MP delivery	Jul 2008	Jul 2008	Jul 2008	Jul 2008	
Milestone A Prime	Aug 2009	Aug 2009	Aug 2009	Aug 2009	
Milestone B	Aug 2013	Jan 2014	Jan 2014	Jan 2014	
SUW MP IOC	N/A	Nov 2014	Nov 2014	Nov 2014	
ASW MP IOC	Sep 2016	Sep 2020	Sep 2021	Jun 2020	
MCM MP IOC	N/A	Jun 2022	Jun 2023	Jun 2022	
SUW MP Increment I/II IOC	Aug 2014	N/A	N/A	N/A	
MCM MP Increment I IOC	Sep 2015	N/A	N/A	N/A	
MCM MP Increment IV IOC	Sep 2019	N/A	N/A	N/A	
Milestone C	Mar 2020	N/A	N/A	N/A	
SUW MP Increment IV IOC	Sep 2020	N/A	N/A	N/A	

**Change Explanations**

(Ch-1) ASW MP IOC change from March 2020 to June 2020 due to ship availability.

**Acronyms and Abbreviations**

ASW - Anti-Submarine Warfare  
IOC - Initial Operational Capability  
LCS - Littoral Combat Ship  
MCM - Mine Countermeasures  
MP - Mission Package  
SUW - Surface Warfare



## Performance

Performance Characteristics				
SAR Baseline Development Estimate	Current APB Development Objective/Threshold		Demonstrated Performance	Current Estimate
MCM MP				
Materiel Availability				
.712	.712	.64	TBD	.64
Train to Certify: A trained crew is required for MP Billets / Watch Stations				
Trained-to-Certify at all Team (Watch Section) levels	Trained-to-Certify at all Team (Watch Section) levels	Trained-to-Certify at all Team (Watch Section) levels	TBD	Trained-to-Certify at all Team (Watch Section) levels
SUW MP				
Materiel Availability				
.712	.712	.64	TBD	.87
Train-to-Certify: A trained crew is required for MP Billets / Watch Stations				
Trained-to-Certify at all Team (Watch Section) levels	Trained-to-Certify at all Team (Watch Section) levels	Trained-to-Certify at all Team (Watch Section) levels	TBD	Trained-to-Certify at all Team (Watch Section) levels
ASW MP				
Materiel Availability				
.712	.712	.64	TBD	.79
Train-to-Certify: A trained crew is required for MP Billets / Watch Stations				
Trained-to-Certify at all Team (Watch Section) levels	Trained-to-Certify at all Team (Watch Section) levels	Trained-to-Certify at all Team (Watch Section) levels	TBD	Trained-to-Certify at all Team (Watch Section) levels

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

### Requirements Reference

LCS Flight 0 Capability Development Document (CDD) dated May 25, 2004 and LCS Flight 0+ CDD dated June 17, 2008

**Change Explanations**

(Ch-1) MCM MP Material Availability Demonstrated Performance changed from 0.67 to TBD as full MCM MP testing has not been completed. MCM MP Material Availability Current Estimate changed from 0.71 to 0.64 to align with modeling and analysis completed to date.

(Ch-2) SUW MP Material Availability Demonstrated Performance changed from 0.81 to TBD as test analysis for the full SUW MP with SSMM is ongoing. SUW MP Material Availability Current Estimate changed from 0.71 to 0.87 to align with modeling and analysis completed to date.

(Ch-3) ASW MP Material Availability Current Estimate changed from 0.71 to 0.79 to align with modeling and analysis completed to date.

**Notes**

Interoperability Information Exchange Requirement KPP replaced by Net Ready KPP.

No materiel availability projection is available for the ASW MP currently in development.

The MCM MP KPPs are being updated to focus on the Command and Control (C2) / Integration of the MCM MP. A Resources and Requirements Review Board was chaired by the Deputy Chief of Naval Operations for Warfare Systems (N9) in April 2019 to approve the revised KPPs. In October 2019, JROC endorsed the Navy's shift in mine countermeasures strategy. The Navy is in the process of updating the CDD.

**Acronyms and Abbreviations**

ASW - Anti-Submarine Warfare  
MCM - Mine Countermeasures  
MP - Mission Package  
SUW - Surface Warfare



## Track to Budget

### RDT&E

Appn	BA	PE		
Navy	1319	04	0603581N	
	Project	Name		
	3096	LCS MP Development		(Shared) (Sunk)
	3129	LCS MP Development		(Shared) (Sunk)
Navy	1319	04	0603596N	
	Project	Name		
	2550	Mine Countermeasures (MCM) Mission Package		
	2551	Anti-Submarine Warfare (ASW) Mission Package		
	2552	Surface Warfare (SUW) Mission Package		
	3129	LCS MP Development		

### Notes

Beginning in FY 2019, MP RDT&E,Navy funding is realigned into four (4) projects:

- 2550 Mine Countermeasures (MCM) MP
- 2551 Anti-Submarine Warfare (ASW) MP
- 2552 Surface Warfare (SUW) MP
- 3129 LCS MP Development

Prior to FY 2019 all MP funding was in project 3129.

### Procurement

Appn	BA	PE
Navy	1507 04	0204230N
	<b>Line Item</b>	<b>Name</b>
	4221	LCS Module Weapons
	<b>Notes:</b>	For procurement of surface-to-surface missiles for the SUW MP.
Navy	1810 01	0204230N
	<b>Line Item</b>	<b>Name</b>
	1600	LCS Common Mission Modules Equipment
	1601	LCS MCM Mission Modules
	1602	LCS ASW Mission Modules
	1603	LCS SUW Mission Modules
	1605	Remote Minehunting System
		(Sunk)

### MILCON

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Appn		BA	PE
Navy	1205	01	0212176N
Project		Name	
60201424		LCS Mission Module Readiness Center (MMRC)	

## Cost and Funding

### Cost Summary

Total Acquisition Cost							
Appropriation	BY 2010 \$M			BY 2010 \$M	TY \$M		
	SAR Baseline Development Estimate	Current APB Development Objective/Threshold		Current Estimate	SAR Baseline Development Estimate	Current APB Development Objective	Current Estimate
RDT&E	2233.7	2369.3	2606.2	2389.7	2415.6	2514.9	2546.2
Procurement	4116.7	3279.6	3634.3	3265.8	4995.0	4047.2	4134.4
Flyaway	--	--	--	3126.5	--	--	3954.4
Recurring	--	--	--	3126.5	--	--	3954.4
Non Recurring	--	--	--	0.0	--	--	0.0
Support	--	--	--	139.3	--	--	180.0
Other Support	--	--	--	0.0	--	--	0.0
Initial Spares	--	--	--	139.3	--	--	180.0
MILCON	29.1	36.1	39.7	29.8	37.7	44.4	35.7
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	6379.5	5685.0	N/A	5685.3	7448.3	6606.5	6716.3

#### Current APB Cost Estimate Reference

#### Cost Notes

No cost estimate for the program has been completed in the previous year.



Total Quantity			
Quantity	SAR Baseline Development Estimate	Current APB Development	Current Estimate
RDT&E	5	5	5
Procurement	59	44	44
Total	64	49	49

#### Quantity Notes

The LCS MM Program uses Mission Packages (MP) as its quantity unit of measure. A MP consists of mission modules, plus a mission crew detachment and supporting aircraft.

The program provides funding to other programs for the purpose of procuring mission systems (MS). These MS (offboard vehicles, sensors, and weapons) are then combined with common mission modules equipment. For the purposes of Congressional visibility into program execution, the annual PB submission breaks out these MS procurements in detail.

In response to Section 123(b) of the National Defense Authorization Act (NDAA) for FY 2017 (Public Law 114-328), the Navy has reviewed the MP quantity requirements and the Office of the Secretary of Defense certified revised package quantities for the LCS MM Program of Record. The revised quantities are based upon the total planned 32 LCS class ships and the Chief of Naval Operations direction to use other Navy platforms (Vessels of Opportunity (VOOs)) to host the Mine Countermeasures (MCM) MP, to comply with Section 1046 of the FY 2018 NDAA which prohibits the retirement of legacy MCM forces until the Navy has identified a replacement capability and procured a quantity of such systems to meet combatant MCM operational requirements that are currently being met by legacy forces. A total of 44 deployable MPs are required as follows:

- 24 MCM MPs for the LCS ships and VOOs
- 10 Surface Warfare (SUW) MPs for the LCS ships
- 10 Anti-Submarine Warfare (ASW) MPs for the LCS ships

With the PB 2019 submission, the Office of the Secretary of Defense certified the Navy's requirement of 44 deployable MPs. The 44 deployable MPs along with 5 non-deployable Engineering Development Model (EDM) MPs equate to 49 total MPs. The 44 total deployable MPs are comprised of production representative systems (one deployable SUW MP was procured with both RDT&E, Navy and Other Procurement, Navy and is included in the inventory objective of 10 SUW MPs). The five non-deployable EDM assets are comprised of one MCM MP, two SUW MPs, and two ASW MP, which are not included in the deployable MP quantities.

## Cost and Funding

### Funding Summary

Appropriation Summary									
FY 2021 President's Budget / December 2019 SAR (TY\$ M)									
Appropriation	Prior	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	To Complete	Total
RDT&E	2232.9	108.5	61.5	48.5	28.1	28.6	24.0	14.1	2546.2
Procurement	1023.1	141.6	342.3	397.1	371.1	277.3	235.1	1346.8	4134.4
MILCON	35.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35.7
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2021 Total	3291.7	250.1	403.8	445.6	399.2	305.9	259.1	1360.9	6716.3
PB 2020 Total	3309.4	421.2	377.2	367.6	348.6	337.9	445.8	990.2	6597.9
Delta	-17.7	-171.1	26.6	78.0	50.6	-32.0	-186.7	370.7	118.4

Quantity Summary										
FY 2021 President's Budget / December 2019 SAR (TY\$ M)										
Quantity	Undistributed	Prior	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	To Complete	Total
Development	5	0	0	0	0	0	0	0	0	5
Production	0	11	1	5	5	6	2	3	11	44
PB 2021 Total	5	11	1	5	5	6	2	3	11	49
PB 2020 Total	5	11	5	3	3	3	2	4	13	49
Delta	0	0	-4	2	2	3	0	-1	-2	0



## Cost and Funding

### Annual Funding By Appropriation

Annual Funding							
1319   RDT&E   Research, Development, Test, and Evaluation, Navy							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2004	--	--	--	--	--	--	42.6
2005	--	--	--	--	--	--	81.3
2006	--	--	--	--	--	--	193.9
2007	--	--	--	--	--	--	167.3
2008	--	--	--	--	--	--	98.1
2009	--	--	--	--	--	--	167.9
2010	--	--	--	--	--	--	157.7
2011	--	--	--	--	--	--	80.6
2012	--	--	--	--	--	--	140.7
2013	--	--	--	--	--	--	196.9
2014	--	--	--	--	--	--	204.2
2015	--	--	--	--	--	--	172.8
2016	--	--	--	--	--	--	188.9
2017	--	--	--	--	--	--	153.6
2018	--	--	--	--	--	--	100.5
2019	--	--	--	--	--	--	85.9
2020	--	--	--	--	--	--	108.5
2021	--	--	--	--	--	--	61.5
2022	--	--	--	--	--	--	48.5
2023	--	--	--	--	--	--	28.1
2024	--	--	--	--	--	--	28.6
2025	--	--	--	--	--	--	24.0
2026	--	--	--	--	--	--	1.9
2027	--	--	--	--	--	--	9.8
2028	--	--	--	--	--	--	2.4
Subtotal	5	--	--	--	--	--	2546.2

Annual Funding 1319   RDT&E   Research, Development, Test, and Evaluation, Navy							
Fiscal Year	Quantity	BY 2010 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2004	--	--	--	--	--	--	47.6
2005	--	--	--	--	--	--	88.5
2006	--	--	--	--	--	--	204.8
2007	--	--	--	--	--	--	172.5
2008	--	--	--	--	--	--	99.3
2009	--	--	--	--	--	--	167.8
2010	--	--	--	--	--	--	155.3
2011	--	--	--	--	--	--	77.5
2012	--	--	--	--	--	--	133.1
2013	--	--	--	--	--	--	184.4
2014	--	--	--	--	--	--	188.5
2015	--	--	--	--	--	--	157.6
2016	--	--	--	--	--	--	169.2
2017	--	--	--	--	--	--	135.1
2018	--	--	--	--	--	--	86.4
2019	--	--	--	--	--	--	72.4
2020	--	--	--	--	--	--	89.6
2021	--	--	--	--	--	--	49.8
2022	--	--	--	--	--	--	38.5
2023	--	--	--	--	--	--	21.9
2024	--	--	--	--	--	--	21.8
2025	--	--	--	--	--	--	18.0
2026	--	--	--	--	--	--	1.4
2027	--	--	--	--	--	--	7.0
2028	--	--	--	--	--	--	1.7
Subtotal	5	--	--	--	--	--	2389.7

The PB 2019 budget separated RDT&E, Navy funds into four projects for common LCS Mission Package (MP) development, Mine Countermeasures (MCM) development, Surface Warfare (SUW) development, and Anti-Submarine Warfare (ASW) development.

Five MPs have been procured with RDT&E, Navy as test and training assets (two SUW MPs, one MCM MP, and two ASW MP). These five assets are non-deployable and do not count towards the inventory objective of 44 deployable MPs. The first deployable SUW MP was partially funded with RDT&E, Navy funds, however since it is a production representative, deployable asset, this asset is shown in the Other Procurement, Navy quantities.

RDT&E, Navy costs associated with replacement, attrition, and technology refresh (RAT) costs are accounted for in O&S per the LCS MM Milestone B SCP.

RDT&E, Navy reflects PB 2021 budget controls, however, RDT&E,N for this SAR submission deviates from the PB 2021 budget due to RAT costs for the development associated with obsolescence/technology refreshes for the MPCE, MVCS, and MPCE Sonar Signal Processing System which are being captured under O&S.



Annual Funding 1507   Procurement   Weapons Procurement, Navy								
Fiscal Year	Quantity	TY \$M						
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program	
2017	--	2.8	--	--	2.8	--	2.8	
2018	--	10.6	--	--	10.6	--	10.6	
2019	--	11.4	--	--	11.4	--	11.4	
2020	--	11.0	--	--	11.0	--	11.0	
2021	--	4.3	--	--	4.3	--	4.3	
2022	--	4.0	--	--	4.0	--	4.0	
2023	--	4.0	--	--	4.0	--	4.0	
2024	--	4.1	--	--	4.1	--	4.1	
2025	--	4.3	--	--	4.3	--	4.3	
Subtotal	--	56.5	--	--	56.5	--	56.5	

Annual Funding 1507   Procurement   Weapons Procurement, Navy							
Fiscal Year	Quantity	BY 2010 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2017	--	2.4	--	--	2.4	--	2.4
2018	--	9.0	--	--	9.0	--	9.0
2019	--	9.5	--	--	9.5	--	9.5
2020	--	8.9	--	--	8.9	--	8.9
2021	--	3.4	--	--	3.4	--	3.4
2022	--	3.1	--	--	3.1	--	3.1
2023	--	3.1	--	--	3.1	--	3.1
2024	--	3.1	--	--	3.1	--	3.1
2025	--	3.2	--	--	3.2	--	3.2
Subtotal	--	45.7	--	--	45.7	--	45.7

These are initial procurement costs for the Longbow Hellfire Missile for the Surface-to-Surface Missile Module (SSMM). Beginning in FY 2026, WPN costs for replenishment missiles are accounted for in O&S.

Annual Funding 1810   Procurement   Other Procurement, Navy							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2006	--	35.3	--	--	35.3	--	35.3
2007	--	77.7	--	--	77.7	--	77.7
2008	--	--	--	--	--	--	--
2009	--	7.2	--	--	7.2	--	7.2
2010	1	80.8	--	--	80.8	--	80.8
2011	1	43.7	--	--	43.7	4.1	47.8
2012	1	65.5	--	--	65.5	1.7	67.2
2013	2	88.9	--	--	88.9	0.4	89.3
2014	1	90.7	--	--	90.7	9.2	99.9
2015	--	56.7	--	--	56.7	10.4	67.1
2016	2	121.6	--	--	121.6	6.3	127.9
2017	1	63.4	--	--	63.4	4.1	67.5
2018	1	85.4	--	--	85.4	5.4	90.8
2019	1	136.6	--	--	136.6	3.2	139.8
2020	1	127.1	--	--	127.1	3.5	130.6
2021	5	327.5	--	--	327.5	10.5	338.0
2022	5	381.8	--	--	381.8	11.3	393.1
2023	6	359.4	--	--	359.4	7.7	367.1
2024	2	270.8	--	--	270.8	2.4	273.2
2025	3	218.2	--	--	218.2	12.6	230.8
2026	3	366.7	--	--	366.7	24.7	391.4
2027	2	320.1	--	--	320.1	21.3	341.4
2028	3	352.8	--	--	352.8	25.9	378.7
2029	3	177.1	--	--	177.1	13.8	190.9
2030	--	22.9	--	--	22.9	1.0	23.9
2031	--	13.8	--	--	13.8	0.5	14.3
2032	--	3.8	--	--	3.8	--	3.8
2033	--	2.4	--	--	2.4	--	2.4
Subtotal	44	3897.9	--	--	3897.9	180.0	4077.9

Annual Funding 1810   Procurement   Other Procurement, Navy							
Fiscal Year	Quantity	BY 2010 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2006	--	36.8	--	--	36.8	--	36.8
2007	--	79.2	--	--	79.2	--	79.2
2008	--	--	--	--	--	--	--
2009	--	7.1	--	--	7.1	--	7.1
2010	1	78.5	--	--	78.5	--	78.5
2011	1	41.8	--	--	41.8	3.9	45.7
2012	1	61.7	--	--	61.7	1.6	63.3
2013	2	82.6	--	--	82.6	0.4	83.0
2014	1	83.2	--	--	83.2	8.4	91.6
2015	--	51.3	--	--	51.3	9.4	60.7
2016	2	108.1	--	--	108.1	5.6	113.7
2017	1	55.3	--	--	55.3	3.5	58.8
2018	1	72.9	--	--	72.9	4.6	77.5
2019	1	114.4	--	--	114.4	2.6	117.0
2020	1	104.3	--	--	104.3	2.9	107.2
2021	5	263.5	--	--	263.5	8.5	272.0
2022	5	301.2	--	--	301.2	8.9	310.1
2023	6	278.0	--	--	278.0	5.9	283.9
2024	2	205.4	--	--	205.4	1.8	207.2
2025	3	162.2	--	--	162.2	9.4	171.6
2026	3	267.3	--	--	267.3	18.0	285.3
2027	2	228.7	--	--	228.7	15.3	244.0
2028	3	247.2	--	--	247.2	18.1	265.3
2029	3	121.6	--	--	121.6	9.5	131.1
2030	--	15.4	--	--	15.4	0.7	16.1
2031	--	9.1	--	--	9.1	0.3	9.4
2032	--	2.5	--	--	2.5	--	2.5
2033	--	1.5	--	--	1.5	--	1.5
Subtotal	44	3080.8	--	--	3080.8	139.3	3220.1



Other Procurement, Navy (OP,N) is split into separate Project Elements (PEs) / Budget Line Items for Common Equipment, Mine Countermeasures (MCM) Mission Package (MP) equipment, Surface Warfare MP equipment, Anti-Submarine Warfare (ASW) MP equipment, and spares.

With the PB 2019 submission, the Office of the Secretary of Defense certified the Navy's requirement of 44 deployable MPs. The 44 deployable MPs along with 5 non-deployable Engineering Development Model MPs equate to 49 total MPs. One of the 44 MPs was partially funded with RDT&E, Navy funds, however since it is a production representative, deployable asset, this asset is shown here in the Other Procurement, Navy quantities.

These are initial procurement costs. OP,N costs for replacement mission systems, attrition, technology refresh (RAT) and spares are accounted for in O&S.

OP,N reflects PB 2021 controls, however, OP,N for this SAR submission deviates from the PB 2021 budget due to RAT costs for Airborne Mine Neutralization System, Airborne Laser Mine Detection System, Mission Package Computing Environment (MPCE), Multiple Vehicle Communications System, Common Mission Package Trainer, and MPCE Sonar Signal Processing obsolescence/technology refreshes which are being captured under O&S.

Cost Quantity Information		
1810   Procurement   Other Procurement, Navy		
Fiscal Year	Quantity	End Item Recurring Flyaway (Aligned With Quantity) BY 2010 \$M
2006	--	--
2007	--	--
2008	--	--
2009	--	--
2010	1	39.7
2011	1	39.7
2012	1	39.7
2013	2	79.4
2014	1	39.7
2015	--	--
2016	2	79.4
2017	1	39.7
2018	1	39.7
2019	1	96.7
2020	1	36.3
2021	5	362.7
2022	5	302.3
2023	6	399.0
2024	2	193.4
2025	3	290.1
2026	3	229.7
2027	2	193.4
2028	3	290.1
2029	3	290.1
2030	--	--
2031	--	--
2032	--	--
2033	--	--
Subtotal	44	3080.8

Annual Funding 1205   MILCON   Military Construction, Navy and Marine Corps		
Fiscal Year	TY \$M	
	Total Program	
2016	16.2	
2017	--	
2018	--	
2019	19.5	
Subtotal	35.7	

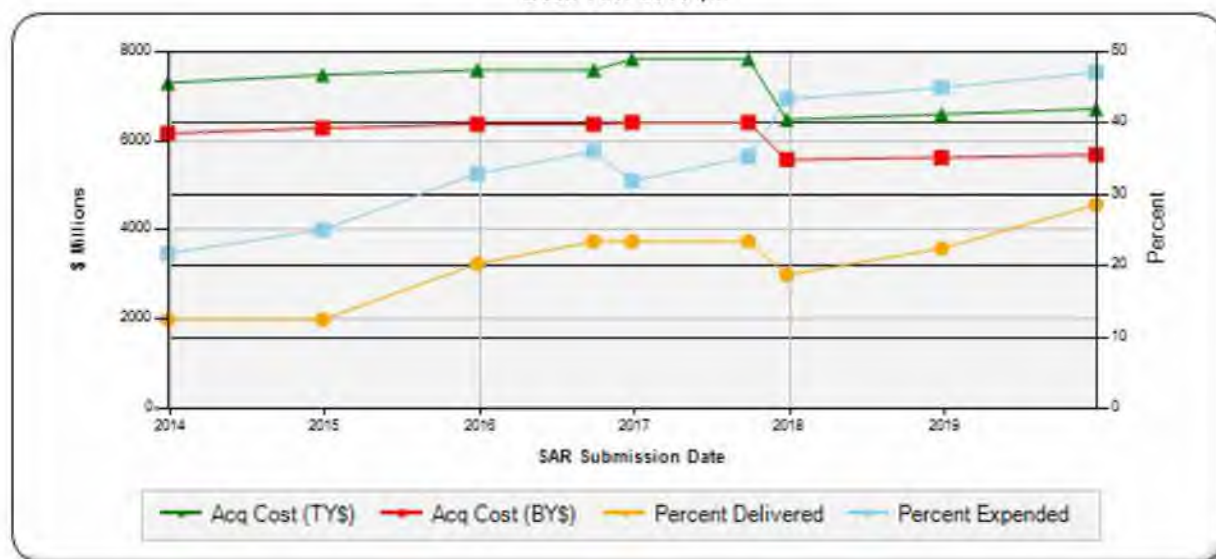
Annual Funding 1205   MILCON   Military Construction, Navy and Marine Corps	
Fiscal Year	BY 2010 \$M
	Total Program
2016	14.0
2017	--
2018	--
2019	15.8
Subtotal	29.8



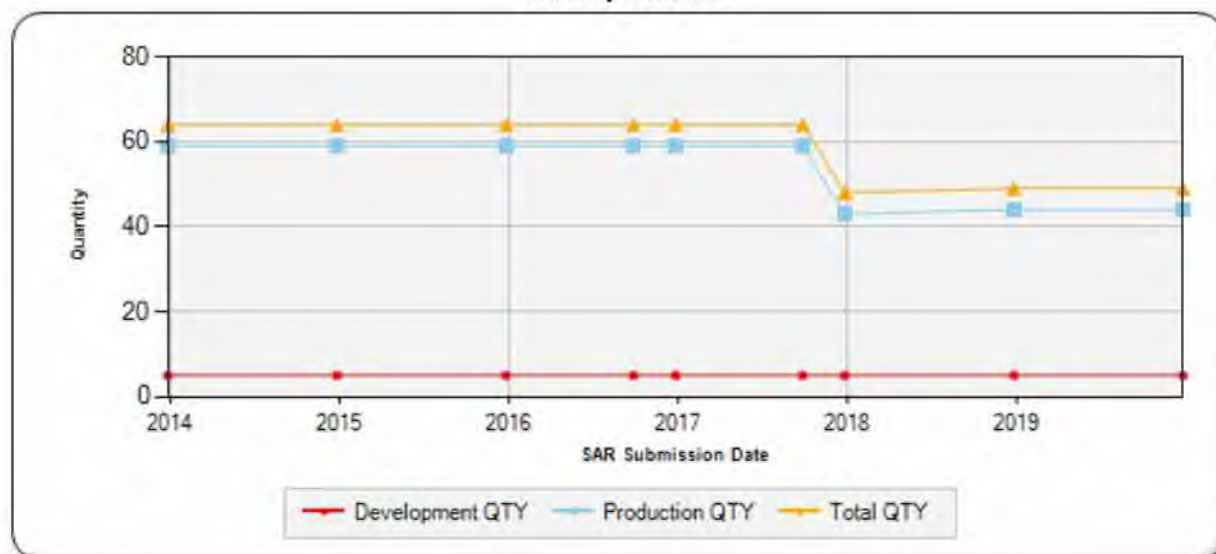
MILCON funds the construction of the facilities required by the LCS MM Program in various locations. Construction of the Mission Module Readiness Center (MMRC) in Mayport, Florida was funded in FY 2019. Construction of Outside the Continental United States (OCONUS) MMRCs is funded in FY 2019. The Naval Facilities Command manages, executes, and reports on these funds.

## Charts

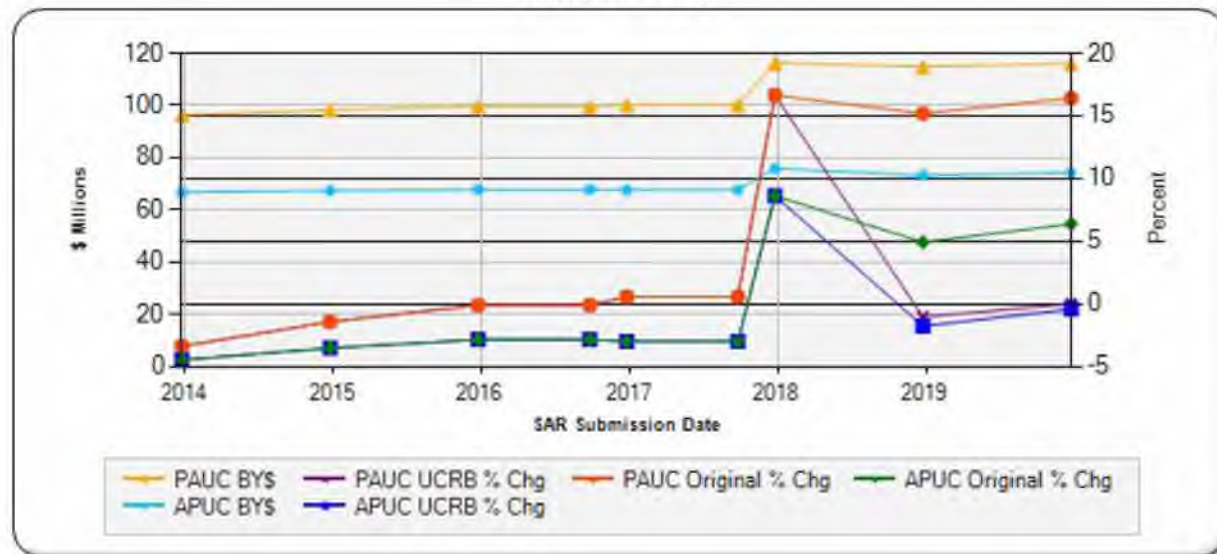
## LCS MM first began SAR reporting in December 2013

Program Acquisition Cost - LCS MM  
Base Year 2010 \$M

Quantity - LCS MM



Unit Cost - LCS MM  
Base Year 2010 \$M



## Risks

### Significant Schedule and Technical Risks

Significant Schedule and Technical Risks	
Milestone B (January 2014)	
1.	Schedule: Program is delivering mission systems as able to under sequestration-level budget constraint. Congressional Marks adversely impact ability to procure systems, delaying delivery of capability to the fleet to meet operational needs.
2.	Technical: Risk that MCM MP Deep Volume Focused Minehunting (DVFMH) Sustained Area Coverage Rate (ACRS) will be below requirements if the individual Program of Record (PoR) mission systems do not achieve their required performance, or if the System of System (SOS) assumptions are incorrect.
Current Estimate (December 2019)	
1.	Schedule: Program continues to deliver mission systems to the fleet. PB 2021 supports procurement of 44 deployable mission packages, however the FY 2020 Defense Appropriations reduced procurement funds, delaying the build-up of Surface-to-Surface Missile Module assets and key Mine Countermeasures (MCM) mission systems, and completion and funding of the Lightweight Tow (LWT) torpedo countermeasure system, delaying the delivery of these capabilities to the Fleet by at least a year. Additionally, any future budget reductions that reduce system procurements to the minimum required to sustain the production lines would likely result in unit cost growth.



## Risks

### Risk and Sensitivity Analysis

Risks and Sensitivity Analysis	
Current Baseline Estimate (September 2018)	
1.	In support of the FY 2018 program re-baseline, a Program Life Cycle Cost Estimate (PLCCE) was developed as the cost baseline for the revised APB (APB Change 1 approved September 2018). The program performed a risk assessment on the remaining drivers of acquisition cost impacting Program Acquisition Unit Cost (PAUC) and Average Procurement Unit Cost (APUC). The risk assessment resulted in a point estimate above the 50th percentile for the areas assessed. The program established APB Change 1 based on the point estimate results as any risk adjustment would underfund known costs for mature systems or underfund systems with more technical risk. The Navy is working to address any funding shortfalls identified between the current estimate and the PB 2021 budget.
Original Baseline Estimate (November 2013)	
1.	Navy accepted full funding responsibility in accordance with the Service Cost Position policy in support of the FY 2014 – FY 2018 FYDP.
Revised Original Estimate (N/A)	
None	
Current Procurement Cost (December 2019)	
1.	In support of the FY 2018 program re-baseline, a Program Life Cycle Cost Estimate (PLCCE) was developed as the cost baseline for the revised APB (APB Change 1 approved September 2018). The program performed a risk assessment on the remaining drivers of acquisition cost impacting Program Acquisition Unit Cost (PAUC) and Average Procurement Unit Cost (APUC). With an inventory objective of 44 deployable mission packages, the Program is at low risk of breaching PAUC and APUC objectives approved in the APB Change 1.

## Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	1/7/2014	1/7/2014
Approved Quantity	27	27
Reference	Milestone B ADM	Milestone B ADM
Start Year	2006	2006
End Year	2018	2021

The Current Total LRIP Quantity is more than 10% of the total production quantity due to the requirement to have enough mission packages (MP) to populate the LCS delivered or under contract through FY 2018, and the units required to support development, testing, and training. The 27 approved LRIP provides procurement authority for 12 Mine Countermeasures MPs (4th procured in FY 2021), 12 Surface Warfare MPs (Only 9 LRIPs are planned to be procured), and 3 Anti-Submarine Warfare MPs (3rd procured in FY 2021).

**Foreign Military Sales**

None

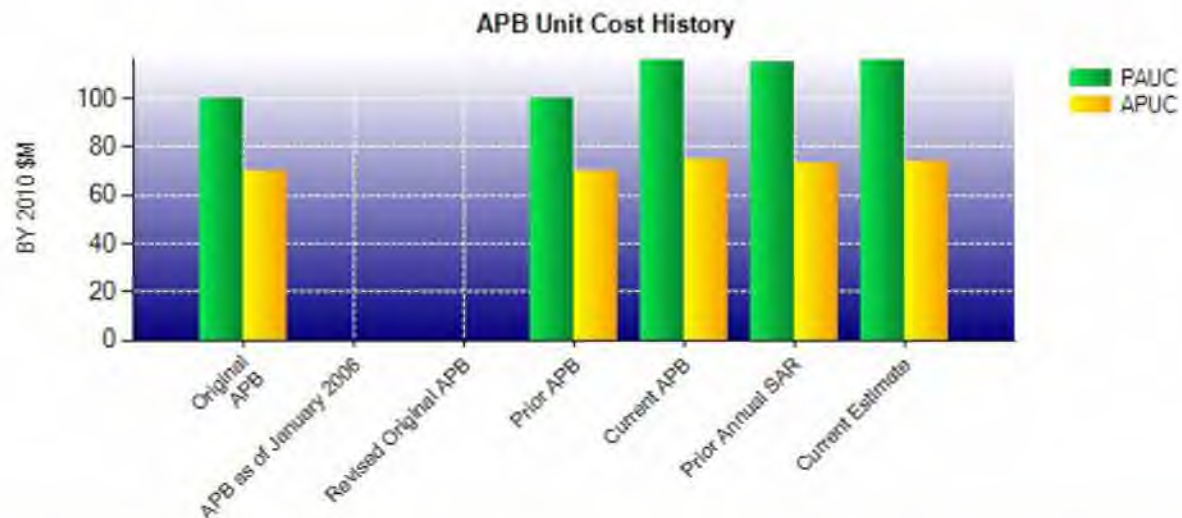
**Nuclear Costs**

None



## Unit Cost

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2010 \$M	BY 2010 \$M	% Change
	Current UCR Baseline (Sep 2018 APB)	Current Estimate (Dec 2019 SAR)	
Program Acquisition Unit Cost			
Cost	5685.0	5685.3	
Quantity	49	49	
Unit Cost	116.020	116.027	+0.01
Average Procurement Unit Cost			
Cost	3279.6	3265.8	
Quantity	44	44	
Unit Cost	74.536	74.223	-0.42
Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2010 \$M	BY 2010 \$M	% Change
	Original UCR Baseline (Nov 2013 APB)	Current Estimate (Dec 2019 SAR)	
Program Acquisition Unit Cost			
Cost	6379.5	5685.3	
Quantity	64	49	
Unit Cost	99.680	116.027	+16.40
Average Procurement Unit Cost			
Cost	4116.7	3265.8	
Quantity	59	44	
Unit Cost	69.775	74.223	+6.37



APB Unit Cost History					
Item	Date	BY 2010 \$M		TY \$M	
		PAUC	APUC	PAUC	APUC
Original APB	Nov 2013	99.680	69.775	116.380	84.661
APB as of January 2006	N/A	N/A	N/A	N/A	N/A
Revised Original APB	N/A	N/A	N/A	N/A	N/A
Prior APB	Nov 2013	99.680	69.775	116.380	84.661
Current APB	Sep 2018	116.020	74.536	134.827	91.982
Prior Annual SAR	Dec 2018	114.814	73.216	134.651	91.775
Current Estimate	Dec 2019	116.027	74.223	137.067	93.964

### SAR Unit Cost History

Current SAR Baseline to Current Estimate (TY \$M)									
PAUC Development Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
116.380	-2.690	1.039	40.453	0.545	-22.333	0.000	3.673	20.687	137.067

Current SAR Baseline to Current Estimate (TY \$M)									
Initial APUC Development Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
84.661	-2.409	-9.656	42.916	-0.230	-25.409	0.000	4.091	9.303	93.964

SAR Baseline History				
Item	SAR Planning Estimate	SAR Development Estimate	SAR Production Estimate	Current Estimate
Milestone A	N/A	May 2004	N/A	May 2004
Milestone B	N/A	Aug 2013	N/A	Jan 2014
Milestone C	N/A	Mar 2020	N/A	N/A
IOC	N/A	Aug 2014	N/A	Jun 2020
Total Cost (TY \$M)	N/A	7448.3	N/A	6716.3
Total Quantity	N/A	64	N/A	49
PAUC	N/A	116.380	N/A	137.067



**Cost Variance**

Summary TY \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Development Estimate)	2415.6	4995.0	37.7	7448.3
Previous Changes				
Economic	-26.6	-105.5	-0.2	-132.3
Quantity	--	-1694.8	--	-1694.8
Schedule	+73.4	+1836.6	-0.5	+1909.5
Engineering	+17.4	-19.8	--	-2.4
Estimating	+44.3	-1143.2	-1.3	-1100.2
Other	--	--	--	--
Support	--	+169.8	--	+169.8
Subtotal	+108.5	-956.9	-2.0	-850.4
Current Changes				
Economic	+1.1	-0.5	-0.1	+0.5
Quantity	--	--	--	--
Schedule	+21.0	+51.7	--	+72.7
Engineering	+19.4	+9.7	--	+29.1
Estimating	-19.4	+25.2	+0.1	+5.9
Other	--	--	--	--
Support	--	+10.2	--	+10.2
Subtotal	+22.1	+96.3	--	+118.4
Total Changes	+130.6	-860.6	-2.0	-732.0
Current Estimate	2546.2	4134.4	35.7	6716.3



Summary BY 2010 \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Development Estimate)	2233.7	4116.7	29.1	6379.5
Previous Changes				
Economic	--	--	--	--
Quantity	--	-1248.9	--	-1248.9
Schedule	+57.0	+1245.1	+0.4	+1302.5
Engineering	+12.7	-17.1	--	-4.4
Estimating	+71.3	-1007.7	+0.2	-936.2
Other	--	--	--	--
Support	--	+133.4	--	+133.4
Subtotal	+141.0	-895.2	+0.6	-753.6
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	+15.7	+18.0	--	+33.7
Engineering	+15.6	+7.2	--	+22.8
Estimating	-16.3	+13.2	+0.1	-3.0
Other	--	--	--	--
Support	--	+5.9	--	+5.9
Subtotal	+15.0	+44.3	+0.1	+59.4
Total Changes	+156.0	-850.9	+0.7	-694.2
Current Estimate	2389.7	3265.8	29.8	5685.3

Previous Estimate: December 2018

RDT&E	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+1.1
Schedule variance for testing of Barracuda Near Surface Neutralization capability on both hull variants. (Schedule)	+15.7	+21.0
Funding for Surface Warfare (SUW) Mission Package (MP) Cyber Security testing. (Engineering)	+6.6	+8.1
Funding to align Anti-Submarine Warfare (ASW) MP testing to approved Test and Evaluation Master Plan (TEMP). (Engineering)	+9.0	+11.3
Revised estimate to reflect prior year actuals. (Estimating)	-3.3	-3.9
Revised estimate to reflect prior year actuals for Advanced Capability Build (ACB) / Technology Insertion (TI) tech refresh development. (Estimating)	-11.6	-13.8
Revised estimate due to Navy wide rate adjustments. (Estimating)	-0.8	-1.0
Adjustment for current and prior escalation. (Estimating)	-0.6	-0.7
RDT&E Subtotal	+15.0	+22.1

Procurement	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-0.5
Stretch-out of mission system buy profile for Mine Countermeasures (MCM) Mission Package (MP) (Other Procurement, Navy (OPN)). (Schedule)	0.0	+5.2
Additional Schedule variance due to FY 2020 Congressional reductions to Knifefish and the Unmanned Surface Vehicles (USVs) and associated Payload Delivery Systems (PDSs). Systems re-phased to FY 2028-2029 (OPN). (Schedule)	+9.3	+37.8
Additional schedule variance due to FY 2020 Congressional reductions of one Surface-to-Surface Missile Module (SSMM). Procurement re-phased to FY 2026 (OPN). (Schedule)	0.0	+1.5
Additional schedule variance due to FY 2020 Congressional reduction to the Anti-Submarine Warfare (ASW) MP. Results in re-phase of the Multi-Function Towed Array (MFTA) and Support Equipment/Containers (OPN). (Schedule)	+5.6	+8.2
Additional schedule variance due to FY 2020 Congressional reduction for Training Equipment. Procurements re-phased to FY 2026 (OPN). (Schedule)	0.0	+1.6
Navy acceleration of two SSMMs from FY 2025 to FY 2021-2022 (OPN). (Schedule)	-0.9	-2.9
Navy acceleration of three ASW MPs from FY 2025-2027 to FY 2022-2023 (OPN). (Schedule)	+5.3	+1.8
Schedule variance due to FY 2020 Congressional reduction. Longbow Hellfire missile procurements re-phased to FY 2021-2025 (Weapons Procurement, Navy (WPN)). (Schedule) (QR)	-1.1	-1.2
Additional Schedule Variance due to re-phasing following FY 2020 Congressional reduction (WPN). (Schedule)	-0.2	-0.3
Adjusted Variable Depth Sonar (VDS) Engineering Proposals (ECPs) and reflected Navy transition of MFTA to TB-37(X) (Engineering)	+7.2	+9.7
Revised estimate due to out-year (FY 2025-2029) mission system re-phasing for MCM MP (OPN). (Estimating)	+13.0	+25.2
Adjustment for current and prior escalation. (Estimating)	+0.2	0.0

Adjustment for current and prior escalation. (Support)	-0.1	+0.1
Increase in Initial Spares due to mission system and MP re-phasing. (Support)	+6.0	+10.1
Procurement Subtotal	+44.3	+96.3

(QR) Quantity Related

MILCON	\$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
MILCON Subtotal	+0.1	0.0



## Contracts

### Contract Identification

**Appropriation:** Procurement  
**Contract Name:** Design, Engineering, Production, and Sustainment  
**Contractor:** Northrop Grumman Systems Corp  
**Contractor Location:** 600 Grumman Road, West, M/S Z24-25  
 Bethpage, NY 11714-3583  
**Contract Number:** N00024-17-C-6311  
**Contract Type:** Firm Fixed Price (FFP), Cost Plus Fixed Fee (CPFF), Fixed Price Incentive (Successive Targets) (FPIS), Cost (CR)  
**Award Date:** March 16, 2017  
**Definitization Date:** March 16, 2017

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
77.3	N/A	N/A	84.6	N/A	N/A	195.6	195.6

### Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to the program exercising contract modifications for engineering services for the delivery of a light weight support container Technical Data Package and for ASW MP Design Services.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (11/14/2017)	+0.2	+0.1
Previous Cumulative Variances	+0.2	+0.1
Net Change	+0.0	+0.0

### Cost and Schedule Variance Explanations

None

### General Contract Variance Explanation

Cost and Schedule variances are not reported for this contract, because all active CLINS are firm fixed price and no earned value management (EVM) reporting is required because the threshold requirements for EVM reporting are not met.



## Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	5	5	5	100.00%
Production	9	9	44	20.45%
Total Program Quantity Delivered	14	14	49	28.57%

Expended and Appropriated (TY \$M)			
Total Acquisition Cost	6716.3	Years Appropriated	17
Expended to Date	3163.0	Percent Years Appropriated	56.67%
Percent Expended	47.09%	Appropriated to Date	3541.8
Total Funding Years	30	Percent Appropriated	52.73%

The above data is current as of February 10, 2020.

### Notes

RDT&E, Navy funded Mission Package (MP) deliveries: two Surface Warfare (SUW) MPs, one Mine Countermeasures MP, and two Anti-Submarine Warfare MPs. These quantities are non-deployable Engineering Development Model MPs.

Other Procurement, Navy funded MP deliveries: nine SUW MPs. The first deployable SUW MP was partially funded with RDT&E, Navy funds, however since it is a production representative, deployable asset, this asset is shown in the Other Procurement, Navy deliveries.

## Operating and Support Cost

### Cost Estimate Details

<b>Date of Estimate:</b>	September 28, 2018
<b>Source of Estimate:</b>	APB Change 1
<b>Quantity to Sustain:</b>	44
<b>Unit of Measure:</b>	Mission Package (MP)
<b>Service Life per Unit:</b>	25.00 Years
<b>Fiscal Years in Service:</b>	FY 2009 - FY 2047

The Chief of Navy Operations-directed LCS Review Team obtained approval for their recommendations and briefed Congressional committees on those recommendations in September 2016. These recommendations included a shift in LCS crew structure, training, maintenance, and operations to support mission focused LCS divisions and semi-permanent installation of Mission Packages (MPs). In conjunction with this review, the total quantity of mission packages required for LCS was reviewed to address ship quantity changes and changes in employment approach.

In FY 2018, the Navy re-baselined the LCS Mission Modules program due to significant changes to the program since Milestone B. The O&S costs in this SAR are based on the O&S estimate from the revised September 28, 2018 APB (APB Change 1) minus Disposal costs (\$152.4M). The September 28, 2018 APB includes Disposal costs, however these costs are broken out separately in this SAR and captured in the Disposal Estimate Details section the SAR.

Note: O&S costs for the LCS MM Program are not included in the LCS seaframe SAR.

### Sustainment Strategy

Based on the outcome of the LCS Review Team, the LCS Seaframes are stood-up into mission focused divisions. Each LCS will be a single focused mission ship capable of defeating conventional and asymmetric access-denial threats. These mission focused divisions will maintain the modular architecture of the MPs while allowing the use of dedicated, fused crews. Once embarked, the modular MPs provide the main warfighting capability to mitigate gaps in littoral MCM, SUW, and ASW missions. The LCS Seaframes will retain the flexibility to adjust this division structure as needed to address changing Fleet operational requirements. The concept of employment for LCS, which includes routine deployments overseas and prepositioned support structures in potential theaters of operation [Mission Module Readiness Centers (MMRCs)], contributes to strategic deterrence.

LCS carries limited onboard resources to maintain and repair the mission systems that make up the MPs. Because of this, significant maintenance and repair work is assigned to an off-ship, shore-based workforce. The LCS MMs are maintained, stored, and centrally managed through the Mission Package Support Facility (MPSF). The MPSF provides and coordinates maintenance, provides technical support, manages spares, and ensures components (mission systems, mission modules, support containers, support equipment, or other equipment) are delivered to the MPSF. The MPSF plans, arranges, schedules, coordinates, and manages the execution of all maintenance and modernization tasks. The MPSF receives requests from the deployed or embarked MPs and translates the requests into required actions – this results in seamless process and a single interface to Fleet units. Individual mission systems maintenance plans describe specific mission system requirements and tasks necessary to sustain, maintain, or restore operational capability. Maintenance is performed by the crew, by the MPSF, by organic Navy resources, or by a contractor, as appropriate. The MPSF workforce is augmented with government and contractor personnel to handle surge, low volume, and specialized tasks.

As an extension of the MPSF, the LCS MM Program is establishing Mission Module Readiness Centers (MMRCs) at Continental United States (CONUS) sites and forward Outside Continental United States (OCONUS) locations as



required by deployed operations. The MMRCs are designed to have appropriate maintenance, administrative, and storage capabilities. The MMRCs will provide support forces a base for specific operations (e.g., embarkation/debarkation evolutions and major maintenance availabilities).

The LCS MM Program has a dedicated Product Support Manager (PSM) who responsible for managing the support functions to ensure the mission modules that make-up and MPs are available. The PSM monitors and reports failures of system-level performance against Participating Acquisition Resource Manager (PARM)-initiated support contract requirements, assessing existing contractual requirements against needs and experiences, and seeks alternatives where contractual adjustments are not possible or feasible to improve performance. The PSM is responsible data identification, collection, and analysis that correlates hardware and sustainment systems performance. This analysis determines which issues demand product and/or process improvement, what near-term mitigation is possible, and what long-term solutions are needed. In addition to the system contracts made available by the PARMs, the LCS MM Program utilizes In-Service Engineer Agents (ISEAs) and other organic Navy support to provide maintenance, technical, training, and spares support. The LCS MM Program has initiated a process to transition from interim to full MPSF support.

#### Antecedent Information

No Antecedent

Annual O&S Costs BY2010 \$M			
Cost Element	LCS MM		No Antecedent (Antecedent)
	Average Annual Cost Per Mission Package (MP)		
Unit-Level Manpower	3.141		--
Unit Operations	0.189		--
Maintenance	4.025		--
Sustaining Support	0.955		--
Continuing System Improvements	4.954		--
Indirect Support	1.888		--
Other	--		--
Total	15.152		

Consistent with the Milestone B Service Cost Position, costs associated with RDT&E, Navy and Other Procurement, Navy replacement, attrition, technology refreshes is included in Continuing System Improvements.

Item	Total O&S Cost \$M			
	LCS MM			No Antecedent (Antecedent)
	Current Development APB Objective/Threshold		Current Estimate	
Base Year	16819.9	18501.9	16667.5	N/A
Then Year	26013.5	N/A	25726.2	N/A

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

The O&S Costs in this SAR are based on the program's revised APB (APB Change 1) approved September 2018 for 44 deployable mission packages.

### Equation to Translate Annual Cost to Total Cost

Total LCS Mission Module (MM) Program O&S = unitized cost (Unit Level Manpower + Unit Operations + Maintenance + Sustaining Support + Continuing System Improvements + Indirect Support) x 44 mission packages (MP) x 25-year service life per MP = \$15.152M x 44 x 25 = \$16,667.5M.

The value provided in the "Continuing System Improvements" cost element includes the projected average annual cost of replacing or refreshing individual mission systems, as well as attrition systems and technology refreshes. Generally, individual mission systems within the mission packages have a projected service life of less than 25 years.

The LCS MM Program O&S cost of \$16,667.5M does not include Disposal costs (\$152.4M).

O&S Cost Variance		
Category	BY 2010 \$M	Change Explanations
Prior SAR Total O&S Estimates - Dec 2018 SAR	16667.5	
Programmatic/Planning Factors	0.0	
Cost Estimating Methodology	0.0	
Cost Data Update	0.0	
Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	0.0	
Other	0.0	
Total Changes	0.0	
Current Estimate	16667.5	

### Disposal Estimate Details

**Date of Estimate:** September 28, 2018  
**Source of Estimate:** APB Change 1  
**Disposal/Demilitarization Total Cost (BY 2010 \$M):** 152.4

Disposal costs in this SAR submission reflect the revised APB (APB Change 1) approved September 2018.