Selected Acquisition Report (SAR)

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

Littoral Combat Ship Mission Modules (LCS MM)

As of FY 2020 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

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Sensitivity Originator

No originator information is available at this time.

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

CAPT Ted Zobel
1333 Isaac Hull Ave, SE
Washington Navy Yard, DC 20376

theodore.zobel@navy.mil

Phone: 202-781-2303
Fax: 202-781-4696
DSN Phone:
DSN Fax:
Date Assigned: July 15, 2016

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. The underlying strength of the LCS lies in its innovative design approach and the application of modularity for operational flexibility and enables future rapid insertion of technologies.

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 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.
• The Surface-to-Surface Missile Module (SSMM) with the Longbow Hellfire missile began operational testing (OT) and has achieved a 100% target engagement rate during OT events. Overall, through integration testing, Developmental Testing, TECHEVAL, and OT the SSMM has an accuracy of greater than 91%. IOC is scheduled for Q2 FY 2019.
• Following IOC, the program will transition SSMM to production and sustainment followed with a deployment on USS Detroit (LCS 7) in late FY 2019.

ASW MP:
• The Navy accepted delivery of the Escort Mission Module (EMM) Pre-Production Test Article (PPTA) in November 2018.
• The Navy completed design of the ASW MP Ship Modifications and plans to complete ASW MP testing on USS Fort Worth (LCS 3) in FY 2019 with IOC in Q2 FY2019.
• The Navy is conducting at-sea testing of the EMM PPTA aboard white ship.

MCM MP:
• Final aviation module (Coastal Mine Reconnaissance) certified for deployment on Independence variant ships.
• Completed Knifefish Linemapping events and initiated Unmanned Influence Sweep System and Knifefish integration testing on LCS 2.
• The Navy plans to conduct MCM MP developmental and operational testing in FY 2021 and achieve IOC in FY 2022.

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

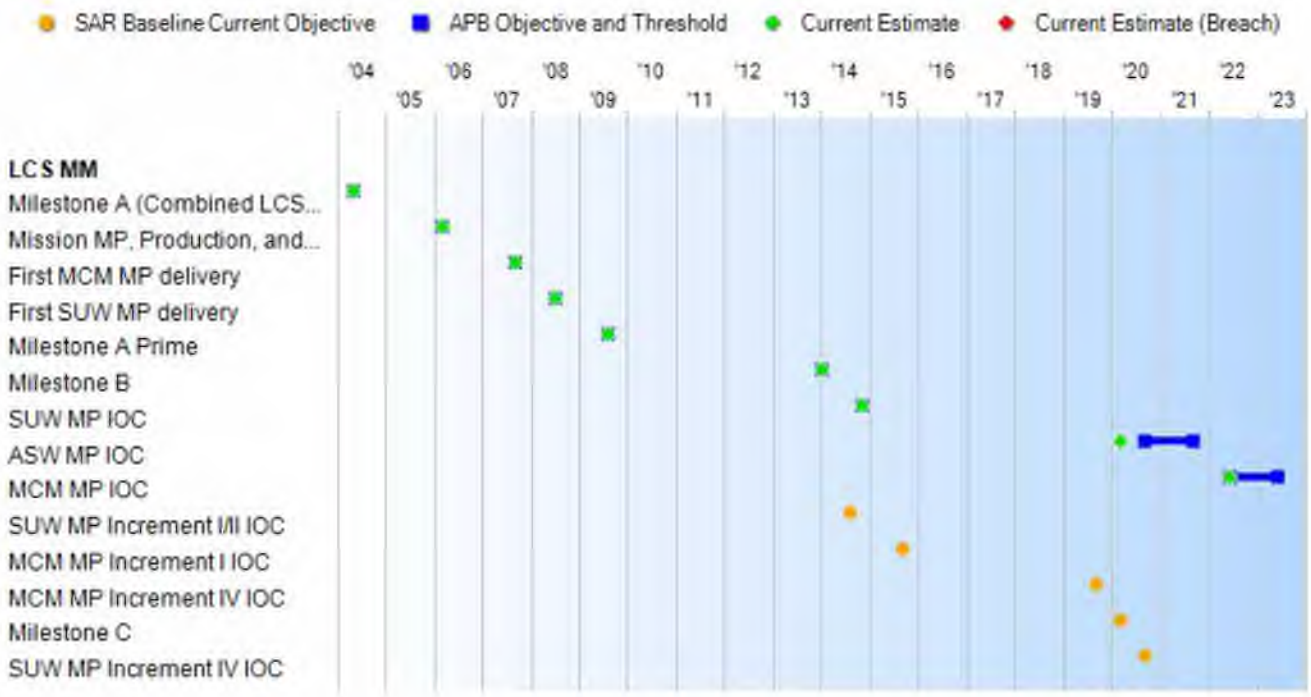
History of Significant Developments Since Program Initiation	
Date	**Significant Development Description**
May 2004	Milestone A / Program Initiation for the LCS Seaframes and Mission Modules.
April 2011	ADM signed splitting the LCS Seaframe and LCS MMs into two separate MDAPs.
October 2012	USD(AT&L) 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		
Schedule		☐
Performance		☐
Cost	RDT&E	☐
	Procurement	☐
	MILCON	☐
	Acq O&M	☐
O&S Cost		☐
Unit Cost	PAUC	☐
	APUC	☐

Nunn-McCurdy Breaches		
Current UCR Baseline		
	PAUC	None
	APUC	None
Original UCR Baseline		
	PAUC	None
	APUC	None

Schedule



Schedule Events					
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	(Ch-6)
SUW MP IOC	N/A	Nov 2014	Nov 2014	Nov 2014	(Ch-1)
ASW MP IOC	Sep 2016	Sep 2020	Sep 2021	Mar 2020	(Ch-2)
MCM MP IOC	N/A	Jun 2022	Jun 2023	Jun 2022	(Ch-3)
SUW MP Increment I/II IOC	Aug 2014	N/A	N/A	N/A	(Ch-1)
MCM MP Increment I IOC	Sep 2015	N/A	N/A	N/A	(Ch-3)
MCM MP Increment IV IOC	Sep 2019	N/A	N/A	N/A	(Ch-3)
Milestone C	Mar 2020	N/A	N/A	N/A	(Ch-4)
SUW MP Increment IV IOC	Sep 2020	N/A	N/A	N/A	(Ch-5)

Change Explanations

(Ch-1) The SUW MP with Gun Mission Module and Maritime Security Module (previously referred to as SUW MP Increment I/II) achieved IOC in November 2014. This schedule milestone was added as part of APB Change 1.
(Ch-2) ASW MP IOC changed from September 2019 to September 2020, due to a $15M reduction to ASW RDT&E in the FY 2018 Defense Appropriation. Due to a reduction in test scope for the ASW MP, the schedule reflects the program's current planned IOC date of Q2 FY 2019.
(Ch-3) The original program baseline had planned to deliver MCM MP capability via an incremental acquisition approach (MCM MP Increment I-IV). With the program re-baseline, the program consolidated MCM MP Increment I/II and MCM Increment IV into a single milestone.
(Ch-4) The MDA has removed the Milestone C requirement for the LCS MM Program
(Ch-5) The original baseline included an SUW MP Increment IV to address the counter-Fast Inshore Attack Craft (FIAC) long range additional attribute. The SUW MP will no longer address the counter-FIAC long range additional attribute as it will be addressed by the LCS over-the-horizon missile and the armed helicopter. This schedule milestone was removed as part of APB Change 1.
(Ch-6) The program achieved Milestone B in January 2014. This schedule milestone was updated as part of APB Change 1.

Notes

The program has updated the Schedule Events in accordance with the revised APB (APB Change 1) approved September 2018.

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	.673	.712
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	.814	.712
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	.712
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

None

Notes

Interoperability Information Exchange Requirement KPP replaced by Net Ready KPP.

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

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	
	Line Item		**Name**	
	4221		LCS Module Weapons	
		Notes:	For procurement of surface-to-surface missiles for the SUW MP.	
Navy	1810	01	0204230N	
	Line Item		**Name**	
	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

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	2374.7	2415.6	2514.9	2524.1
Procurement	4116.7	3279.6	3634.3	3221.5	4995.0	4047.2	4038.1
Flyaway	--	--	--	3088.1	--	--	3868.3
Recurring	--	--	--	3088.1	--	--	3868.3
Non Recurring	--	--	--	0.0	--	--	0.0
Support	--	--	--	133.4	--	--	169.8
Other Support	--	--	--	0.0	--	--	0.0
Initial Spares	--	--	--	133.4	--	--	169.8
MILCON	29.1	36.1	39.7	29.7	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	5625.9	7448.3	6606.5	6597.9

Current APB Cost Estimate Reference

Cost Notes

The program performed a risk assessment on the remaining drivers of acquisition cost impacting PAUC and 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.

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 2020 President's Budget / December 2018 SAR (TY$ M)									
Appropriation	Prior	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
RDT&E	2147.0	103.6	108.5	44.7	45.7	28.3	28.9	17.4	2524.1
Procurement	871.9	151.2	312.7	332.5	321.9	320.3	309.0	1418.6	4038.1
MILCON	16.2	19.5	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 2020 Total	3035.1	274.3	421.2	377.2	367.6	348.6	337.9	1436.0	6597.9
PB 2019 Total	3189.0	356.9	412.4	376.1	343.0	329.1	290.3	1181.9	6478.7
Delta	-153.9	-82.6	8.8	1.1	24.6	19.5	47.6	254.1	119.2

Funding Notes

The Prior Year funding has been updated from the PB 2019 Submission to account for reductions in the FY 2018 Defense Appropriations as well as phase prior year procurement dollars in alignment with APB Change 1. Previous submissions included all procurement dollars prior to FY 2010 in FY 2010. APB Change 1 re-phased this funding in accordance with when the dollars were funded in FY 2006 - FY 2010.

The FY 2019 funding has been updated to reflect the FY 2019 Defense Appropriations.

Quantity Summary FY 2020 President's Budget / December 2018 SAR (TY$ M)										
Quantity	Undistributed	Prior	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
Development	5	0	0	0	0	0	0	0	0	5
Production	0	10	1	5	3	3	3	2	17	44
PB 2020 Total	5	10	1	5	3	3	3	2	17	49
PB 2019 Total	5	9	4	4	4	3	3	3	13	48
Delta	0	1	-3	1	-1	0	0	-1	4	1

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	--	--	--	--	--	--	103.6
2020	--	--	--	--	--	--	108.5
2021	--	--	--	--	--	--	44.7
2022	--	--	--	--	--	--	45.7
2023	--	--	--	--	--	--	28.3
2024	--	--	--	--	--	--	28.9
2025	--	--	--	--	--	--	4.5
2026	--	--	--	--	--	--	0.7
2027	--	--	--	--	--	--	9.8
2028	--	--	--	--	--	--	2.4
Subtotal	5	--	--	--	--	--	2524.1

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	--	--	--	--	--	--	157.5
2016	--	--	--	--	--	--	169.2
2017	--	--	--	--	--	--	135.1
2018	--	--	--	--	--	--	86.6
2019	--	--	--	--	--	--	87.5
2020	--	--	--	--	--	--	89.9
2021	--	--	--	--	--	--	36.3
2022	--	--	--	--	--	--	36.4
2023	--	--	--	--	--	--	22.1
2024	--	--	--	--	--	--	22.1
2025	--	--	--	--	--	--	3.4
2026	--	--	--	--	--	--	0.5
2027	--	--	--	--	--	--	7.1
2028	--	--	--	--	--	--	1.7
Subtotal	5	--	--	--	--	--	2374.7

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 one 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 2020 budget controls.

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	--	14.6	--	--	14.6	--	14.6
2021	--	3.7	--	--	3.7	--	3.7
2022	--	3.6	--	--	3.6	--	3.6
2023	--	6.6	--	--	6.6	--	6.6
2024	--	3.7	--	--	3.7	--	3.7
2025	--	0.7	--	--	0.7	--	0.7
2026	--	0.3	--	--	0.3	--	0.3
Subtotal	--	58.0	--	--	58.0	--	58.0

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	--	11.9	--	--	11.9	--	11.9
2021	--	3.0	--	--	3.0	--	3.0
2022	--	2.8	--	--	2.8	--	2.8
2023	--	5.1	--	--	5.1	--	5.1
2024	--	2.8	--	--	2.8	--	2.8
2025	--	0.5	--	--	0.5	--	0.5
2026	--	0.2	--	--	0.2	--	0.2
Subtotal	--	47.2	--	--	47.2	--	47.2

These are initial procurement costs for the Longbow Hellfire Missile for the Surface-to-Surface Missile Module (SSMM). Beginning in FY 2021, 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	5	287.4	--	--	287.4	10.7	298.1
2021	3	320.4	--	--	320.4	8.4	328.8
2022	3	311.6	--	--	311.6	6.7	318.3
2023	3	309.8	--	--	309.8	3.9	313.7
2024	2	300.5	--	--	300.5	4.8	305.3
2025	4	411.6	--	--	411.6	29.0	440.6
2026	5	412.1	--	--	412.1	29.0	441.1
2027	4	325.6	--	--	325.6	22.7	348.3
2028	4	102.5	--	--	102.5	6.8	109.3
2029	--	32.4	--	--	32.4	1.5	33.9
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	3810.3	--	--	3810.3	169.8	3980.1

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	55.2	--	--	55.2	3.6	58.8
2018	1	72.9	--	--	72.9	4.6	77.5
2019	1	114.3	--	--	114.3	2.7	117.0
2020	5	235.9	--	--	235.9	8.7	244.6
2021	3	257.8	--	--	257.8	6.7	264.5
2022	3	245.8	--	--	245.8	5.3	251.1
2023	3	239.6	--	--	239.6	3.0	242.6
2024	2	227.8	--	--	227.8	3.7	231.5
2025	4	305.9	--	--	305.9	21.6	327.5
2026	5	300.3	--	--	300.3	21.1	321.4
2027	4	232.6	--	--	232.6	16.2	248.8
2028	4	71.8	--	--	71.8	4.8	76.6
2029	--	22.2	--	--	22.2	1.1	23.3
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	3040.9	--	--	3040.9	133.4	3174.3

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 2020 controls, however, OP,N for this SAR submission deviates from the PB 2020 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	39.8
2011	1	39.8
2012	1	39.8
2013	2	79.6
2014	1	39.8
2015	--	--
2016	2	79.6
2017	1	39.8
2018	1	39.8
2019	1	95.7
2020	5	417.4
2021	3	164.8
2022	3	226.0
2023	3	226.0
2024	2	130.3
2025	4	321.7
2026	5	356.3
2027	4	321.7
2028	4	383.0
2029	--	--
2030	--	--
2031	--	--
2032	--	--
2033	--	--
Subtotal	44	3040.9

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	13.9
2017	--
2018	--
2019	15.8
Subtotal	29.7

MILCON funds the construction of four Mission Module Readiness Centers in various locations. Construction of the Mission Module Readiness Center in Mayport, Florida was funded in FY 2016. In PB 2020, construction of Outside the Continental United States (OCONUS) Mission Modules Readiness Centers is funded in FY 2019. The Naval Facilities Command manages, executes, and reports on these funds.

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 (12th LRIP mission system procured in FY 2023), 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

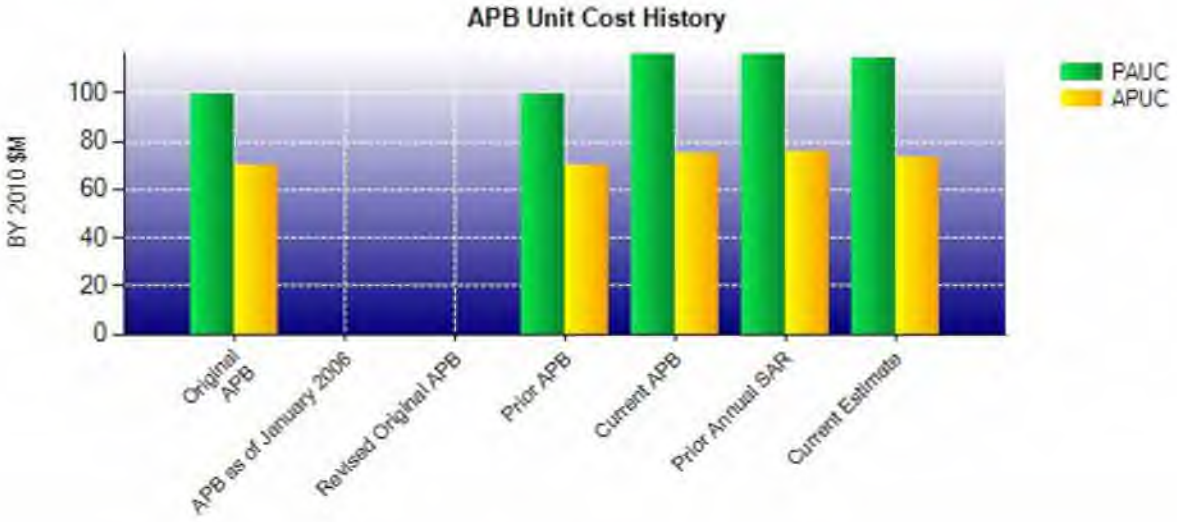
Nuclear Costs

None

Unit Cost

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2010 $M Current UCR Baseline (Sep 2018 APB)	BY 2010 $M Current Estimate (Dec 2018 SAR)	% Change
Program Acquisition Unit Cost			
Cost	5685.0	5625.9	
Quantity	49	49	
Unit Cost	116.020	114.814	-1.04
Average Procurement Unit Cost			
Cost	3279.6	3221.5	
Quantity	44	44	
Unit Cost	74.536	73.216	-1.77

Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2010 $M Original UCR Baseline (Nov 2013 APB)	BY 2010 $M Current Estimate (Dec 2018 SAR)	% Change
Program Acquisition Unit Cost			
Cost	6379.5	5625.9	
Quantity	64	49	
Unit Cost	99.680	114.814	+15.18
Average Procurement Unit Cost			
Cost	4116.7	3221.5	
Quantity	59	44	
Unit Cost	69.775	73.216	+4.93



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 2017	116.262	75.791	134.973	93.695
Current Estimate	Dec 2018	114.814	73.216	134.651	91.775

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	-2.700	1.039	38.969	-0.049	-22.453	0.000	3.465	18.271	134.651

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	-2.398	-9.656	41.741	-0.450	-25.982	0.000	3.859	7.114	91.775

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	Mar 2020
Total Cost (TY $M)	N/A	7448.3	N/A	6597.9
Total Quantity	N/A	64	N/A	49
PAUC	N/A	116.380	N/A	134.651

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	-30.4	-138.6	-0.6	-169.6
Quantity	--	-1694.8	--	-1694.8
Schedule	-17.6	+1846.3	-0.2	+1828.5
Engineering	--	-19.8	--	-19.8
Estimating	+46.5	-959.2	-1.2	-913.9
Other	--	--	--	--
Support	--	--	--	--
Subtotal	-1.5	-966.1	-2.0	-969.6
Current Changes				
Economic	+3.8	+33.1	+0.4	+37.3
Quantity	--	--	--	--
Schedule	+91.0	-9.7	-0.3	+81.0
Engineering	+17.4	--	--	+17.4
Estimating	-2.2	-184.0	-0.1	-186.3
Other	--	--	--	--
Support	--	+169.8	--	+169.8
Subtotal	+110.0	+9.2	--	+119.2
Total Changes	+108.5	-956.9	-2.0	-850.4
CE - Cost Variance	2524.1	4038.1	35.7	6597.9
CE - Cost & Funding	2524.1	4038.1	35.7	6597.9

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	-15.1	+1245.3	+0.3	+1230.5
Engineering	--	-17.1	--	-17.1
Estimating	+73.3	-837.0	+0.3	-763.4
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+58.2	-857.7	+0.6	-798.9
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	+72.1	-0.2	+0.1	+72.0
Engineering	+12.7	--	--	+12.7
Estimating	-2.0	-170.7	-0.1	-172.8
Other	--	--	--	--
Support	--	+133.4	--	+133.4
Subtotal	+82.8	-37.5	--	+45.3
Total Changes	+141.0	-895.2	+0.6	-753.6
CE - Cost Variance	2374.7	3221.5	29.7	5625.9
CE - Cost & Funding	2374.7	3221.5	29.7	5625.9

Previous Estimate: December 2017

RDT&E	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+3.8
Schedule variance for Surface Warfare Mission Package Testing on both hull variants; Freedom variant effort moved from FY 2018 to FY 2019 due to ship availability. (Schedule)	+14.6	+17.6
Schedule variance due to a Congressional reduction in FY 2018 which shifts ACB 19.18L to ACB 19.20L for the Anti-Submarine Warfare Mission Package schedule and includes additional testing requirements per LCS Test and Evaluation Master Plan Revision B. (Schedule)	+31.6	+40.4
Congressional reduction in FY 2018 to the Mine Countermeasures (MCM) Unmanned Surface Vehicle program resulting in a schedule shift of the MCM Mission Package schedule. (Schedule)	+25.9	+33.0
Additional funding for Coastal Battlefield and Reconnaissance Analysis Block II in the MCM Mission Package to provide surf-zone and night detection capabilities. (Engineering)	+12.7	+17.4
Adjustment for current and prior escalation. (Estimating)	-2.2	-2.5
Revised estimate to reflect actuals. (Estimating)	+0.2	+0.3
RDT&E Subtotal	+82.8	+110.0

Procurement	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+33.1
Acceleration of Mission Package profile due to changes in Mission System buy profiles (Other Procurement, Navy (OPN)). (Schedule)	-0.2	-9.7
Revised estimate to reflect actuals (OPN). (Estimating)	-111.1	-133.8
Removed funds the LCS MM Program does not execute to align to September 28, 2018 APB (Procurement of Ammunition, Navy and Marine Corps (PANMC)). (Estimating)	-5.9	-7.1
Revised estimate to align to September 28, 2018 APB cost estimate assumptions (Weapons Procurement, Navy (WPN)). (Estimating)	+12.2	+15.2
Revised estimate to align to September 28, 2018 APB cost estimate assumptions (OPN). (Estimating)	-61.4	-53.0
Adjustment for current and prior escalation. (Estimating)	-4.5	-5.3
Increase in Initial Spares to correct prior submission estimate which did not include all initial spares requirements. (Support)	+133.4	+169.8
Procurement Subtotal	-37.5	+9.2

MILCON	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+0.4
Accelerated schedule for construction of Outside Continental United States (OCONUS) Mission Modules Readiness Centers (MMRCs). (Schedule)	+0.1	-0.3
Adjustment for current and prior escalation. (Estimating)	-0.1	-0.1
MILCON Subtotal	0.0	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

EVM reported in last SAR was for a specific CLIN that was cost plus, which has ended. All active CLINS are firm fixed price and no EVM is being collected. No variance to cost or schedule to report.

Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	5	5	5	100.00%
Production	6	6	44	13.64%
Total Program Quantity Delivered	11	11	49	22.45%

Expended and Appropriated (TY $M)			
Total Acquisition Cost	6597.9	Years Appropriated	16
Expended to Date	2964.9	Percent Years Appropriated	53.33%
Percent Expended	44.94%	Appropriated to Date	3309.4
Total Funding Years	30	Percent Appropriated	50.16%

The above data is current as of March 11, 2019.

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: six 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

Date of Estimate:	September 28, 2018
Source of Estimate:	APB Change 1
Quantity to Sustain:	44
Unit of Measure:	Mission Package (MP)
Service Life per Unit:	25.00 Years
Fiscal Years in Service:	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

The LCS Fleet Introduction and Sustainment Program Office (PMS 505) is responsible for the sustainment of LCS MMs. The sustainment strategy closely couples the development and production role of the LCS MM Program Office (PMS 420) with that of PMS 505, particularly in the near term. LCS carries limited onboard resources to maintain and repair mission systems. The assignment of significant maintenance and repair work to a dedicated off-ship, shore-based workforce with significant reliance on distance support is a new approach. Thus, product support of LCS requires a departure from the support approach seen in other surface combatants.

The mission modules are maintained, stored, and centrally managed through the Mission Package Support Facility (MPSF). The MPSF is responsible for providing or coordinating maintenance, providing technical support, and managing spares as systems (mission modules, mission systems, or other equipment) are delivered to the MPSF. The MPSF was designed to receive requests from the deployed or embarked mission packages and to translate that into required actions for organic Navy, original equipment manufacturer, or other contractor effort, while maintaining a seamless process and a single interface to Fleet units.

PMS 505, through the MPSF, coordinates all actions requiring shore-based personnel in support of maintenance and repair actions on an embarked mission package, particularly those that require travel to an Outside Continental United States (OCONUS)-deployed ship. Individual mission system maintenance plans describe specific mission system requirements and tasks to be accomplished to achieve, maintain, or restore operational capability. Maintenance is accomplished by the crew, by the MPSF, by organic Navy resources, or by a contractor, as appropriate. The MPSF plans, arranges, schedules, coordinates, and manages the execution of all maintenance and modernization tasks. The permanent MPSF workforce is augmented with government and contractor personnel to handle surge, low volume, and specialized tasks.

In addition to the MPSF, Mission Module Readiness Centers (MMRCs) are being established at other Continental United

States sites and at forward OCONUS locations as deployed operations require. MMRCs are designed to have appropriate maintenance, administrative, and storage capabilities. To support significant maintenance or other events, MMRC staffing is augmented from the MPSF and/or other Navy or contractor surge forces. MMRCs provide support forces a base for specific operations (*e.g.*, embarkation/debarkation evolutions and major maintenance availabilities).

A hybrid Performance Based Logistics (PBL) system with a Program Support Integrator (PSI) arrangement has been adopted as a near-term solution for early support. The PSI monitors and reports failures of performance against Participating Acquisition Resource Manager (PARM)-initiated support contracts requirements, assesses existing contractual requirements against needs and experience, and seeks alternatives where contractual adjustments are not possible or feasible to improve performance. The PSI is responsible for data identification and collection and analyzes and correlates hardware and sustainment systems performance. This analysis helps determine which issues demand product improvement, which demand process improvement, what near-term mitigation is possible and affordable, and what long-term solutions are needed and recommended. PMS 505 is making use of support contracts arranged by mission system program offices, as well as In-Service Engineering Agents and other organic Navy support to provide maintenance, technical, training, and spares support.

PMS 505 is pursuing a long-range PBL strategy, with PMS 505 as lead and contractors in a supporting role. PMS 505 has initiated a formal process to transition support from interim support to full MPSF support. This process is designed to ensure that approved logistics products, which are critical to establishing and maintaining mission modules sustainment support, are complete, comprehensive, and current. Ultimately, PMS 505 will ensure that specific plans with firm delivery dates are in place and that approved draft products are available in the interim.

Additionally, PMS 505 ensures that version and configuration control is in place, configuration changes consider logistics impacts, and the costs of updates to applicable products are included in the costs of the change.

Antecedent Information

No Antecedent

Annual O&S Costs BY2010 $M		
Cost Element	**LCS MM Average Annual Cost Per Mission Package (MP)**	**No Antecedent (Antecedent)**
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 2017 SAR	13626.0	
Programmatic/Planning Factors	575.9	Updated to reflect revised sustainment strategy per LCS Review Team recommendations (Blue/Gold fused crew manning construct, semi-permanent installation of MPs, mission focused LCS divisions, etc.); Aligned in-service profiles to reflect current procurement profiles; Updated LCS MM Program vs. Participating Acquisition Resource Manager share of Mine Countermeasures sustainment based on Independent Review Team outcome; Removed Mission Funded Personnel; Added Replacement Spare Rigid Hull Inflatable Boats, Replenishment Missiles, and Replacement Facility for Mission Package Support Facility Annex to align to September 28, 2018 APB.
Cost Estimating Methodology	1467.7	Revised estimate to align to September 28, 2018 APB cost estimate methodology (Updated Maintenance and Modernization estimating methodologies from Historical Ship Class Cost Estimating Relationship to System-Level build-up).

Cost Data Update	-415.2	Additional Navy Visibility and Management of Operating and Support Costs data added to Cost Estimating Relationships; Added data based on new contract obligations; Updated Escalation Guidance.
Labor Rate	458.1	Updated OSD Military Standard Composite Rates, Government Stabilized Billing Rates, Contractor Labor Rates; Updated Indirect Support Rates via Manpower cost Estimating Tool for Enhanced Online Reporting data.
Energy Rate	0.0	
Technical Input	955.0	Revised mission system service life and attrition assumptions; Updated Offboard Vehicle Fuel requirements per revised sustainment strategy.
Other	0.0	
Total Changes	3041.5	
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.