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## Selected Acquisition Report (SAR)

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



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

As of FY 2019 President's Budget

Defense Acquisition Management  
Information Retrieval  
(DAMIR)

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## **Sensitivity Originator**

No originator info 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)

## Program Information

**Program Name**

Littoral Combat Ship Mission Modules (LCS MM)

**DoD Component**

Navy

## Responsible Office

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**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**

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

## 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.

The original LCS Program of Record (PoR) requirements for mission packages was 64 mission packages (MPs) and was established in 2013 at Milestone B which supported a 52-ship LCS class. The Navy's 2016 Force Structure Assessment revalidated a warfighting requirement for a minimum of 52 Small Surface Combatants (SSCs). As maritime threats continue to grow, the Navy is placing a greater emphasis on distributed operations, highlighting the need for a full complement of SSCs. At the same time, the Navy continues to refine LCS crew structure, training, maintenance and operations as directed by the Chief of Naval Operations (CNO) in his 2016 LCS Review Team (LRT). In response to Section 123(b) of the National Defense Authorization Act for FY 2017 (Public Law 114-328), the Navy has reviewed the mission package (MP) quantity requirements and the Office of the Secretary of Defense certified revised package quantities for the LCS MM PoR. The revised quantities are based on 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 (VOOs)) to host the Mine Countermeasures (MCM) MP. The revised quantities of deployable MPs for the LCS Mission Modules program are as follows: 10 Surface Warfare (SUW) MPs, 10 Anti-Submarine Warfare (ASW) MPs, and 24 MCM MPs, for a total of 44 deployable MPs. The 44 deployable MPs will be used as follows:

- 24 MPs (8 SUW, 8 ASW, 8 MCM) to outfit the focused mission LCS ships that make up the LCS divisions of 3 deployable ships and 1 training ship
- 3 MPs (1 SUW, 1 ASW, 1 MCM) to ensure high operational availability (Ao) of the training systems for the training ships in the LCS divisions and to provide spare systems for each focused mission area
- 4 MPs (1 SUW, 1 ASW, 2 MCM) to outfit the test ships (LCS 1-4) and provide additional spare capacity for training ships and deployers
- 4 MPs (4 MCM) to outfit LCS 29-32 to mitigate warfighting capability needs across the MCM mission area
- 9 MCM MPs for use on other Vessels of Opportunity (VOOs) to meet the warfighting capability requirements and account for MCM maintenance cycles.

An overall total of 24 MCM MPs are required to comply with Section 1046 of the FY 2018 NDAA which prohibits the retirement of legacy MCM forces until the Navy has identified replacement capability and procured a quantity of such systems to meet combatant MCM operational requirements that are currently being met by legacy forces.

The program will procure production representative systems for the 44 deployable mission packages. One SUW MP was procured as a production representative Engineering Development Model (EDM) with RDT&E, Navy funds and is included in the inventory objective of 10 SUW MPs. The program has procured four non-deployable EDM assets (one MCM MP, two SUW MPs, and one ASW MP) which are not included in the deployable MP quantities.

The quantity in prior years has decreased since the previous SAR submission due to no longer counting partially delivered MCM MPs as the primary tow platform for the AN/AQS-20 minehunting sonar is being replaced following the cancellation of the Remote Multi-Mission Vehicle. The Navy has selected the Mine Countermeasures (MCM) Unmanned Surface Vehicle (USV) as the replacement vehicle for the RMMV. Procurements of the MCM USV begin in FY 2019.

This SAR is based on the Program Manager's estimate for the newly certified MP quantities. 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 4 non-deployable Engineering Development Model MPs equate to 48 total MPs. The reduction in quantities from 64 to 48 total MPs and correspondingly increasing the proportion of the most expensive MP (MCM) relative to the less expensive MPs (ASW and SUW), increasing the average MP cost, has triggered a significant Nunn-McCurdy breach due to a 16.6% increase in the program's PAUC. Had the MP quantity remained 64 MPs, the Program's PAUC would have been approximately \$96.3M (a 3% decrease to the original APB baseline).

The Navy is in the process of re-baselining the program based on direction from the USD (AT&L) and the MDA. A formal



Component Cost Position is underway and will include changes in quantities and the 2016 LCS Review Team recommendations. The Component Cost Position will be incorporated into the program re-baseline APB which will be completed in CY 2018. The updated costs as approved in the Component Cost Position will be reflected in the next SAR submission. In addition, the Navy routinely assesses evolving warfighting needs to optimize capacity across mission areas which may impact MP quantities. Any changes to MP quantities will be addressed in future SAR submissions.

#### 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 in production.
- The Surface-to-Surface Missile Module (SSMM) with the Longbow Hellfire missile is currently in testing and exceeding threshold requirements. To date, the SSMM has achieved an 83% successful engagement rate.
- The LCS MM Program obtained Weapons Safety Explosives Safety Review Board approval to start SSMM testing and embarked SSMM on USS Milwaukee (LCS 5) in August 2017.
- USS Milwaukee's post shakedown availability has been extended to prepare the ship to support pre-deployment training for scheduled deployments at the end of FY 2018 limiting ship availability. At present, the Navy expects to conduct the initial phase of developmental testing from USS Milwaukee in March 2018. Then, in July 2018 the SSMM will be transitioned to USS Detroit (LCS 7) to continue developmental testing and begin operational testing with IOC in early FY 2019.
- Based on integration activities (including embark of SSMM) on both LCS variants, formal testing on LCS 5 and LCS 7, and a Production Readiness Review, the LCS MM Program plans to transition SSMM to production in late FY 2018. Once transitioned, all elements of the SUW MP will be in production.

#### ASW MP:

- Raytheon is on track to deliver the Escort Mission Module (EMM) Pre-Production Test Article in Q1 FY 2019.
- The Navy plans to complete operational testing of the ASW MP in Q4 FY 2019.

#### MCM MP:

- The Navy achieved IOC for the Airborne Laser Mine Detection System (ALMDS) and the Airborne Mine Neutralization System (AMNS) in November 2016. ALMDS provides the capability to search and detect mines in the near surface region of the water column, while AMNS provides the capability to identify and neutralize volume and bottom mines. These systems, coupled with their associated support equipment and support containers, make up the Near Surface Detection (NSD) Module and Airborne Mine Neutralization (AMN) Module respectively. These systems are mature, have entered production, and the Navy has certified the MCM MP with NSD and AMN capabilities as ready for deployment on Independence variant ships.
- The Vertical Take-off Unmanned Aerial Vehicle-borne Coastal Battlefield Reconnaissance and Analysis (COBRA) system is the primary system of the Coastal Mine Reconnaissance (CMR) module and provides a beach zone mine detection capability. COBRA achieved system-level IOC in July 2017. A CMR developmental test will be conducted aboard USS Coronado (LCS 4) in FY 2018 to support CMR IOC in Q4 FY 2018.
- The Unmanned Mine Sweeping Module, featuring the Unmanned Influence Sweep System (UISS), is in development. This module provides an acoustic and magnetic influence mine sweeping capability. UISS is undergoing contractor testing and the Navy expects to achieve system-level UISS IOC in FY 2019.
- The Buried Minehunting Module, featuring the Knifefish Unmanned Undersea Vehicle, is also in development. This module provides additional volume minehunting capability while providing a unique capability to hunt buried and bottom mines in high clutter environments. Enactment of the 2017 Consolidated Appropriations included a \$6.45M reduction to LCS MM RDT&E, Navy resulting in a one year delay to integration of Knifefish into the MCM MP. The Navy expects to achieve Knifefish IOC in FY 2020.
- The Navy plans to complete operational testing of the MCM MP in FY 2020 and achieve IOC by FY 2021.
- The Near Surface Neutralization Module, featuring the Barracuda mine neutralization system, is pre-Milestone B and anticipated to achieve IOC in FY 2024.
- The LCS MM Program plans to add a surf-zone detection capability via COBRA Block II, as part of the Coastal Mine Reconnaissance Module. COBRA Block II is pre-Milestone B and anticipated to achieve IOC in FY 2027.

#### Torpedo Defense Mission Module (TDMM):

- The TDMM features the Light Weight Tow torpedo countermeasure. The Navy has built Engineering Development Models and has begun performance testing.

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 2019 submission supports procurement of 24 MCM MPs, 10 Surface Warfare (SUW) MPs, and 10 Anti-Submarine (ASW) MPs. |



## Threshold Breaches

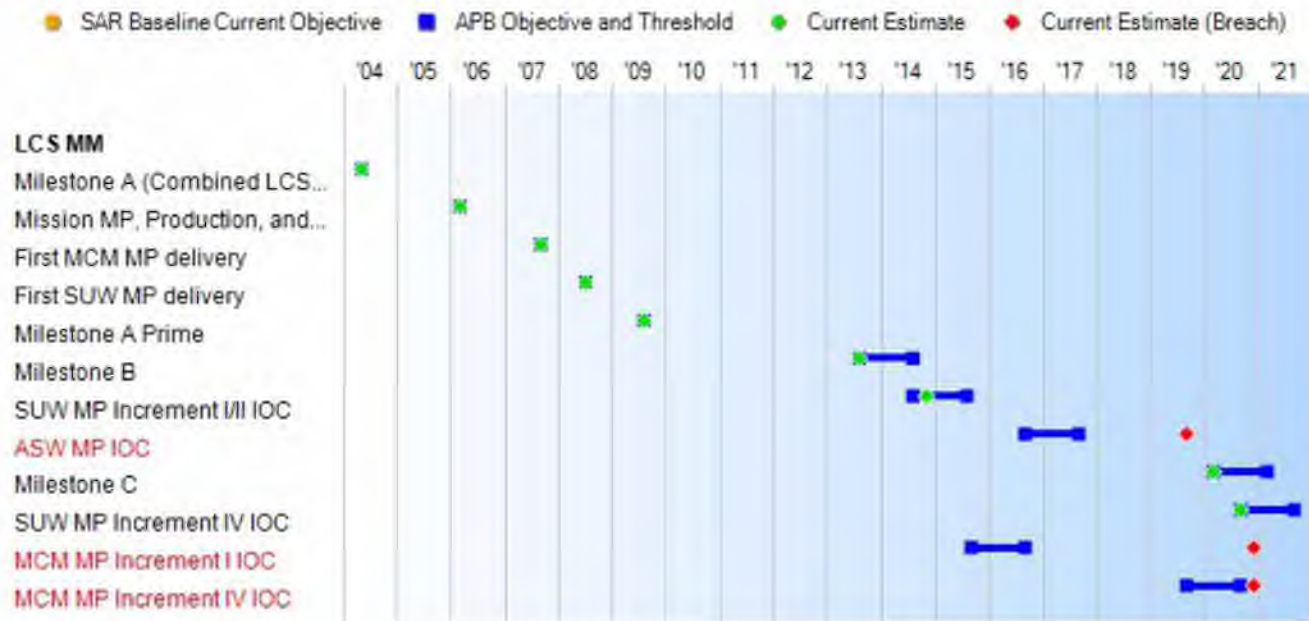
| APB Breaches          |             |                                     | Explanation of Breach |
|-----------------------|-------------|-------------------------------------|-----------------------|
| Schedule              |             | <input checked="" type="checkbox"/> |                       |
| Performance           |             | <input type="checkbox"/>            |                       |
| Cost                  | RDT&E       | <input type="checkbox"/>            |                       |
|                       | Procurement | <input type="checkbox"/>            |                       |
|                       | MILCON      | <input type="checkbox"/>            |                       |
|                       | Acq O&M     | <input type="checkbox"/>            |                       |
| O&S Cost              |             | <input type="checkbox"/>            |                       |
| Unit Cost             | PAUC        | <input checked="" type="checkbox"/> |                       |
|                       | APUC        | <input type="checkbox"/>            |                       |
| Nunn-McCurdy Breaches |             |                                     |                       |
| Current UCR Baseline  |             |                                     |                       |
|                       | PAUC        | Significant                         |                       |
|                       | APUC        | None                                |                       |
| Original UCR Baseline |             |                                     |                       |
|                       | PAUC        | None                                |                       |
|                       | APUC        | None                                |                       |

The Navy previously reported schedule breaches for the Anti-Submarine Warfare (ASW) and Mine Countermeasures (MCM) Mission Packages (MPs). The schedule breach for the ASW MP was reported in the December 2015 SAR, a schedule breach for MCM MP Increment I was reported in the September 2016 SAR, and a schedule breach for MCM MP Increment IV was reported in the September 2017 SAR.

This SAR is based on the Program Manager's estimate for the newly certified MP quantities. 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 4 non-deployable Engineering Development Model MPs equate to 48 total MPs. The reduction in quantities from 64 to 48 total MPs and correspondingly increasing the proportion of the most expensive MP (MCM) relative to the less expensive MPs (ASW and SUW), increasing the average MP cost, has triggered a significant Nunn-McCurdy breach due to a 16.6% increase in the program's PAUC. Had the MP quantity remained 64 MPs, the Program's PAUC would have been approximately \$96.3M (a 3% decrease to the original APB baseline).

The MDA has been notified of the cost parameter breach via a Program Deviation Report (in accordance with DoD regulations). Updated cost and schedule milestones will be documented in the 2018 APB for the program re-baseline.

## 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                          | Aug 2013                                    | Aug 2014 | Aug 2013              |
| SUW MP Increment I/II IOC                           | Aug 2014                          | Aug 2014                                    | Aug 2015 | Nov 2014              |
| ASW MP IOC  | Sep 2016                          | Sep 2016                                    | Sep 2017 | Sep 2019 <sup>1</sup> |
| Milestone C   | Mar 2020                          | Mar 2020                                    | Mar 2021 | Mar 2020              |
| SUW MP Increment IV IOC                             | Sep 2020                          | Sep 2020                                    | Sep 2021 | Sep 2020              |
| MCM MP Increment I IOC                              | Sep 2015                          | Sep 2015                                    | Sep 2016 | Dec 2020 <sup>1</sup> |
| MCM MP Increment IV IOC                             | Sep 2019                          | Sep 2019                                    | Sep 2020 | Dec 2020 <sup>1</sup> |

(Ch-1)

<sup>1</sup> APB Breach

**Change Explanations**

(Ch-1) The ASW MP IOC has shifted from Q1 FY 2020 to Q4 FY 2019. This change was a result of the Raytheon Escort Mission Module (EMM) Pre-Production Test Article maintaining its scheduled delivery and the confirmed scheduling of an ASW test window on USS Fort Worth (LCS 3). The confirmed test window will allow completion of testing in August 2019 and achievement of ASW MP IOC by the end of FY 2019.

**Acronyms and Abbreviations**

ASW - Anti-Submarine Warfare  
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        |
|      | <b>Project</b> | <b>Name</b>                                  |                 |
|      | 3096           | LCS MP Development                           | (Shared) (Sunk) |
|      | 3129           | LCS MP Development                           | (Shared) (Sunk) |
| Navy | 1319           | 04   | 0603596N        |
|      | <b>Project</b> | <b>Name</b>                                  |                 |
|      | 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 | 1508             | 01   | 0204229N |
|      | <b>Line Item</b> | <b>Name</b>  |          |
|      | 0270             | Other Ship Gun Ammunition                                      |          |
|      | <b>Notes:</b>    | For procurement of SUW MP 30mm ammunitions.                    |          |
| 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**

| 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                            | 2233.7                                      | 2457.1 | 2291.9           | 2415.6                            | 2415.6                            | 2414.1           |
| Procurement            | 4116.7                            | 4116.7                                      | 4528.4 | 3259.0           | 4995.0                            | 4995.0                            | 4028.9           |
| Flyaway                | --                                | --  | --     | 3259.0           | --                                | --                                | 4028.9           |
| Recurring              | --                                | --  | --     | 3259.0           | --                                | --                                | 4028.9           |
| Non Recurring          | --                                | --  | --     | 0.0              | --                                | --                                | 0.0              |
| Support                | --                                | --  | --     | 0.0              | --                                | --                                | 0.0              |
| Other Support          | --                                | --  | --     | 0.0              | --                                | --                                | 0.0              |
| Initial Spares         | --                                | --  | --     | 0.0              | --                                | --                                | 0.0              |
| MILCON                 | 29.1                              | 29.1  | 32.0   | 29.7             | 37.7                              | 37.7                              | 35.7             |
| Acq O&M                | 0.0                               | 0.0   | --     | 0.0              | 0.0                               | 0.0                               | 0.0              |
| Total                  | 6379.5                            | 6379.5                                      | N/A    | 5580.6           | 7448.3                            | 7448.3                            | 6478.7           |



| Total Quantity |                                   |                         |                  |
|----------------|-----------------------------------|-------------------------|------------------|
| Quantity       | SAR Baseline Development Estimate | Current APB Development | Current Estimate |
| RDT&E          | 5                                 | 5                       | 5                |
| Procurement    | 59                                | 59                      | 43               |
| Total          | 64                                | 64                      | 48               |

#### 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 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, pending FY 2018 and FY 2019 budget approvals, and the Chief of Naval Operations (CNO) direction to use other Navy platforms (Vessels of Opportunity (VOOs)) to host the 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 SUW MPs for the LCS ships
- 10 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 4 non-deployable Engineering Development Model MPs equate to 48 total MPs. The 44 total deployable MPs are comprised of production representative systems (one deployable SUW MP is procured with RDT&E, Navy and included in the inventory objective of 10 SUW MPs). The four non-deployable EDM assets are comprised of one MCM MP, two SUW MPs, and one ASW MP, which are not included in the deployable MP quantities.

Note that the quantity in prior years has decreased since the previous SAR submission due to no longer counting partially delivered MCM MPs as the primary tow platform for the AN/AQS-20 minehunting sonar is being replaced given the cancelation of the Remote Multi-Mission Vehicle.

## Cost and Funding

### Funding Summary

| Appropriation Summary                                   |        |         |         |         |         |         |         |             |         |
|---|--------|---------|---------|---------|---------|---------|---------|-------------|---------|
| FY 2019 President's Budget / December 2017 SAR (TY\$ M) |        |         |         |         |         |         |         |             |         |
| Appropriation   | Prior  | FY 2018 | FY 2019 | FY 2020 | FY 2021 | FY 2022 | FY 2023 | To Complete | Total   |
| RDT&E   | 2046.2 | 116.9   | 103.6   | 70.5    | 26.4    | 27.9    | 10.8    | 11.8        | 2414.1  |
| Procurement   | 871.0  | 138.7   | 253.3   | 322.4   | 349.7   | 315.1   | 318.3   | 1460.4      | 4028.9  |
| MILCON  | 16.2   | 0.0     | 0.0     | 19.5    | 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 2019 Total   | 2933.4 | 255.6   | 356.9   | 412.4   | 376.1   | 343.0   | 329.1   | 1472.2      | 6478.7  |
| PB 2018 Total   | 2846.2 | 274.3   | 334.6   | 257.2   | 332.4   | 355.6   | 447.3   | 2983.5      | 7831.1  |
| Delta   | 87.2   | -18.7   | 22.3    | 155.2   | 43.7    | -12.6   | -118.2  | -1511.3     | -1352.4 |

#### Funding Notes

The quantity in prior years has decreased since the previous SAR submission due to no longer counting partially delivered MCM MPs as the primary tow platform for the AN/AQS-20 minehunting sonar is being replaced given the cancelation of the Remote Multi-Mission Vehicle. The Navy has selected the Mine Countermeasures (MCM) Unmanned Surface Vehicle (USV) as the replacement vehicle for the RMMV. Procurements of the MCM USV begin in FY 2019.

| Quantity Summary  |               |       |         |         |         |         |         |         |             |       |
|---|---------------|-------|---------|---------|---------|---------|---------|---------|-------------|-------|
| FY 2019 President's Budget / December 2017 SAR (TY\$ M) |               |       |         |         |         |         |         |         |             |       |
| Quantity  | Undistributed | Prior | FY 2018 | FY 2019 | FY 2020 | FY 2021 | FY 2022 | FY 2023 | To Complete | Total |
| Development   | 5             | 0     | 0       | 0       | 0       | 0       | 0       | 0       | 0           | 5     |
| Production  | 0             | 8     | 1       | 4       | 4       | 4       | 3       | 3       | 16          | 43    |
| PB 2019 Total   | 5             | 8     | 1       | 4       | 4       | 4       | 3       | 3       | 16          | 48    |
| PB 2018 Total   | 5             | 14    | 2       | 5       | 3       | 5       | 5       | 6       | 19          | 64    |
| Delta   | 0             | -6    | -1      | -1      | 1       | -1      | -2      | -3      | -3          | -16   |



## 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<br>Recurring<br>Flyaway | Non End<br>Item<br>Recurring<br>Flyaway | Non<br>Recurring<br>Flyaway | Total<br>Flyaway | Total<br>Support | Total<br>Program |
| 2004   | --       | --                               | --                                      | --                          | --               | --               | 42.6             |
| 2005   | --       | --                               | --                                      | --                          | --               | --               | 81.3             |
| 2006   | --       | --                               | --                                      | --                          | --               | --               | 193.5            |
| 2007   | --       | --                               | --                                      | --                          | --               | --               | 168.4            |
| 2008   | --       | --                               | --                                      | --                          | --               | --               | 98.1             |
| 2009   | --       | --                               | --                                      | --                          | --               | --               | 168.1            |
| 2010   | --       | --                               | --                                      | --                          | --               | --               | 157.9            |
| 2011   | --       | --                               | --                                      | --                          | --               | --               | 80.7             |
| 2012   | --       | --                               | --                                      | --                          | --               | --               | 139.7            |
| 2013   | --       | --                               | --                                      | --                          | --               | --               | 196.7            |
| 2014   | --       | --                               | --                                      | --                          | --               | --               | 204.1            |
| 2015   | --       | --                               | --                                      | --                          | --               | --               | 172.6            |
| 2016   | --       | --                               | --                                      | --                          | --               | --               | 188.9            |
| 2017   | --       | --                               | --                                      | --                          | --               | --               | 153.6            |
| 2018   | --       | --                               | --                                      | --                          | --               | --               | 116.9            |
| 2019   | --       | --                               | --                                      | --                          | --               | --               | 103.6            |
| 2020   | --       | --                               | --                                      | --                          | --               | --               | 70.5             |
| 2021   | --       | --                               | --                                      | --                          | --               | --               | 26.4             |
| 2022   | --       | --                               | --                                      | --                          | --               | --               | 27.9             |
| 2023   | --       | --                               | --                                      | --                          | --               | --               | 10.8             |
| 2024   | --       | --                               | --                                      | --                          | --               | --               | 11.8             |
| Subtotal   | 5        | --                               | --                                      | --                          | --               | --               | 2414.1           |

| Annual Funding<br>1319   RDT&E   Research, Development, Test, and Evaluation, Navy |          |                                  |   |                             |                  |                  |                  |
|--|----------|----------------------------------|---|-----------------------------|------------------|------------------|------------------|
| Fiscal Year  | Quantity | BY 2010 \$M                      |   |                             |                  |                  |                  |
|  |          | End Item<br>Recurring<br>Flyaway | Non End<br>Item<br>Recurring<br>Flyaway | Non<br>Recurring<br>Flyaway | Total<br>Flyaway | Total<br>Support | Total<br>Program |
| 2004   | --       | --                               | --                                      | --                          | --               | --               | 47.6             |
| 2005   | --       | --                               | --                                      | --                          | --               | --               | 88.5             |
| 2006   | --       | --                               | --                                      | --                          | --               | --               | 204.4            |
| 2007   | --       | --                               | --                                      | --                          | --               | --               | 173.6            |
| 2008   | --       | --                               | --                                      | --                          | --               | --               | 99.3             |
| 2009   | --       | --                               | --                                      | --                          | --               | --               | 168.0            |
| 2010   | --       | --                               | --                                      | --                          | --               | --               | 155.5            |
| 2011   | --       | --                               | --                                      | --                          | --               | --               | 77.6             |
| 2012   | --       | --                               | --                                      | --                          | --               | --               | 132.2            |
| 2013   | --       | --                               | --                                      | --                          | --               | --               | 184.2            |
| 2014   | --       | --                               | --                                      | --                          | --               | --               | 188.5            |
| 2015   | --       | --                               | --                                      | --                          | --               | --               | 157.5            |
| 2016   | --       | --                               | --                                      | --                          | --               | --               | 169.4            |
| 2017   | --       | --                               | --                                      | --                          | --               | --               | 135.5            |
| 2018   | --       | --                               | --                                      | --                          | --               | --               | 101.4            |
| 2019   | --       | --                               | --                                      | --                          | --               | --               | 88.2             |
| 2020   | --       | --                               | --                                      | --                          | --               | --               | 58.9             |
| 2021   | --       | --                               | --                                      | --                          | --               | --               | 21.6             |
| 2022   | --       | --                               | --                                      | --                          | --               | --               | 22.4             |
| 2023   | --       | --                               | --                                      | --                          | --               | --               | 8.5              |
| 2024   | --       | --                               | --                                      | --                          | --               | --               | 9.1              |
| Subtotal   | 5        | --                               | --                                      | --                          | --               | --               | 2291.9           |



The PB 2019 budget separated RDTE, Navy funds into four projects for common LCS Mission Package development, Mine Countermeasures development, Surface Warfare development, and Anti-Submarine Warfare development.

Five MPs have been procured with RDT&E, Navy as test and training assets. Of these five MPs, one is deployable and counts towards the inventory objective of 44 deployable MPs (remaining 43 deployable MPs will be procured with OP,N).

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 2019 budget controls, however beginning in FY 2021, RDT&E for this SAR submission deviates from the PB 2019 budget due to RAT costs for the Mission Package Computing Environment (MPCE), Multi-Vehicle Communications System, and MPCE Sonar Signal Processing technology refreshes which are being captured under O&S. At the time of this report, PB 2018 has been submitted but not passed by Congress.

| Annual Funding<br>1507   Procurement   Weapons Procurement, Navy |          |                                  |   |                             |                  |                  |                  |  |
|--|----------|----------------------------------|---|-----------------------------|------------------|------------------|------------------|--|
| Fiscal Year  | Quantity | TY \$M                           |   |                             |                  |                  |                  |  |
|  |          | End Item<br>Recurring<br>Flyaway | Non End<br>Item<br>Recurring<br>Flyaway | Non<br>Recurring<br>Flyaway | Total<br>Flyaway | Total<br>Support | Total<br>Program |  |
| 2017   | --       | 2.8                              | --                                      | --                          | 2.8              | --               | 2.8              |  |
| 2018   | --       | 13.1                             | --                                      | --                          | 13.1             | --               | 13.1             |  |
| 2019   | --       | 5.0                              | --                                      | --                          | 5.0              | --               | 5.0              |  |
| 2020   | --       | 6.4                              | --                                      | --                          | 6.4              | --               | 6.4              |  |
| 2021   | --       | 3.1                              | --                                      | --                          | 3.1              | --               | 3.1              |  |
| 2022   | --       | 3.0                              | --                                      | --                          | 3.0              | --               | 3.0              |  |
| 2023   | --       | 9.2                              | --                                      | --                          | 9.2              | --               | 9.2              |  |
| Subtotal   | --       | 42.6                             | --                                      | --                          | 42.6             | --               | 42.6             |  |

| Annual Funding<br>1507   Procurement   Weapons Procurement, Navy |          |                                  |   |                             |                  |                  |                  |  |
|--|----------|----------------------------------|---|-----------------------------|------------------|------------------|------------------|--|
| Fiscal Year  | Quantity | BY 2010 \$M                      |   |                             |                  |                  |                  |  |
|  |          | End Item<br>Recurring<br>Flyaway | Non End<br>Item<br>Recurring<br>Flyaway | Non<br>Recurring<br>Flyaway | Total<br>Flyaway | Total<br>Support | Total<br>Program |  |
| 2017   | --       | 2.4                              | --                                      | --                          | 2.4              | --               | 2.4              |  |
| 2018   | --       | 11.2                             | --                                      | --                          | 11.2             | --               | 11.2             |  |
| 2019   | --       | 4.2                              | --                                      | --                          | 4.2              | --               | 4.2              |  |
| 2020   | --       | 5.3                              | --                                      | --                          | 5.3              | --               | 5.3              |  |
| 2021   | --       | 2.5                              | --                                      | --                          | 2.5              | --               | 2.5              |  |
| 2022   | --       | 2.4                              | --                                      | --                          | 2.4              | --               | 2.4              |  |
| 2023   | --       | 7.1                              | --                                      | --                          | 7.1              | --               | 7.1              |  |
| Subtotal   | --       | 35.1                             | --                                      | --                          | 35.1             | --               | 35.1             |  |

These are initial procurement costs for the Longbow Hellfire Missile for the Surface-to-Surface Missile Module (SSMM). 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<br>Recurring<br>Flyaway | Non End<br>Item<br>Recurring<br>Flyaway | Non<br>Recurring<br>Flyaway | Total<br>Flyaway | Total<br>Support | Total<br>Program |
| 2010   | 1        | 201.7                            | --                                      | --                          | 201.7            | --               | 201.7            |
| 2011   | --       | 41.1                             | --                                      | --                          | 41.1             | --               | 41.1             |
| 2012   | 1        | 65.8                             | --                                      | --                          | 65.8             | --               | 65.8             |
| 2013   | 2        | 87.2                             | --                                      | --                          | 87.2             | --               | 87.2             |
| 2014   | 1        | 90.3                             | --                                      | --                          | 90.3             | --               | 90.3             |
| 2015   | --       | 61.0                             | --                                      | --                          | 61.0             | --               | 61.0             |
| 2016   | 2        | 178.8                            | --                                      | --                          | 178.8            | --               | 178.8            |
| 2017   | 1        | 139.4                            | --                                      | --                          | 139.4            | --               | 139.4            |
| 2018   | 1        | 124.9                            | --                                      | --                          | 124.9            | --               | 124.9            |
| 2019   | 4        | 247.6                            | --                                      | --                          | 247.6            | --               | 247.6            |
| 2020   | 4        | 315.4                            | --                                      | --                          | 315.4            | --               | 315.4            |
| 2021   | 4        | 345.9                            | --                                      | --                          | 345.9            | --               | 345.9            |
| 2022   | 3        | 311.4                            | --                                      | --                          | 311.4            | --               | 311.4            |
| 2023   | 3        | 308.4                            | --                                      | --                          | 308.4            | --               | 308.4            |
| 2024   | 3        | 278.5                            | --                                      | --                          | 278.5            | --               | 278.5            |
| 2025   | 1        | 294.1                            | --                                      | --                          | 294.1            | --               | 294.1            |
| 2026   | 4        | 296.2                            | --                                      | --                          | 296.2            | --               | 296.2            |
| 2027   | 2        | 296.8                            | --                                      | --                          | 296.8            | --               | 296.8            |
| 2028   | 2        | 167.9                            | --                                      | --                          | 167.9            | --               | 167.9            |
| 2029   | 2        | 68.2                             | --                                      | --                          | 68.2             | --               | 68.2             |
| 2030   | 2        | 40.4                             | --                                      | --                          | 40.4             | --               | 40.4             |
| 2031   | --       | 10.9                             | --                                      | --                          | 10.9             | --               | 10.9             |
| 2032   | --       | 7.4                              | --                                      | --                          | 7.4              | --               | 7.4              |
| Subtotal                                     | 43       | 3979.3                           | --                                      | --                          | 3979.3           | --               | 3979.3           |



| Annual Funding                               |          |                                  |   |                             |                  |                  |                  |
|--|----------|----------------------------------|---|-----------------------------|------------------|------------------|------------------|
| 1810   Procurement   Other Procurement, Navy |          |                                  |   |                             |                  |                  |                  |
| Fiscal Year                                  | Quantity | BY 2010 \$M                      |   |                             |                  |                  |                  |
|  |          | End Item<br>Recurring<br>Flyaway | Non End<br>Item<br>Recurring<br>Flyaway | Non<br>Recurring<br>Flyaway | Total<br>Flyaway | Total<br>Support | Total<br>Program |
| 2010   | 1        | 195.9                            | --                                      | --                          | 195.9            | --               | 195.9            |
| 2011   | --       | 39.3                             | --                                      | --                          | 39.3             | --               | 39.3             |
| 2012   | 1        | 62.0                             | --                                      | --                          | 62.0             | --               | 62.0             |
| 2013   | 2        | 81.1                             | --                                      | --                          | 81.1             | --               | 81.1             |
| 2014   | 1        | 82.9                             | --                                      | --                          | 82.9             | --               | 82.9             |
| 2015   | --       | 55.2                             | --                                      | --                          | 55.2             | --               | 55.2             |
| 2016   | 2        | 159.4                            | --                                      | --                          | 159.4            | --               | 159.4            |
| 2017   | 1        | 122.2                            | --                                      | --                          | 122.2            | --               | 122.2            |
| 2018   | 1        | 107.6                            | --                                      | --                          | 107.6            | --               | 107.6            |
| 2019   | 4        | 209.3                            | --                                      | --                          | 209.3            | --               | 209.3            |
| 2020   | 4        | 261.4                            | --                                      | --                          | 261.4            | --               | 261.4            |
| 2021   | 4        | 281.0                            | --                                      | --                          | 281.0            | --               | 281.0            |
| 2022   | 3        | 248.1                            | --                                      | --                          | 248.1            | --               | 248.1            |
| 2023   | 3        | 240.8                            | --                                      | --                          | 240.8            | --               | 240.8            |
| 2024   | 3        | 213.2                            | --                                      | --                          | 213.2            | --               | 213.2            |
| 2025   | 1        | 220.8                            | --                                      | --                          | 220.8            | --               | 220.8            |
| 2026   | 4        | 218.0                            | --                                      | --                          | 218.0            | --               | 218.0            |
| 2027   | 2        | 214.1                            | --                                      | --                          | 214.1            | --               | 214.1            |
| 2028   | 2        | 118.8                            | --                                      | --                          | 118.8            | --               | 118.8            |
| 2029   | 2        | 47.3                             | --                                      | --                          | 47.3             | --               | 47.3             |
| 2030   | 2        | 27.5                             | --                                      | --                          | 27.5             | --               | 27.5             |
| 2031   | --       | 7.3                              | --                                      | --                          | 7.3              | --               | 7.3              |
| 2032   | --       | 4.8                              | --                                      | --                          | 4.8              | --               | 4.8              |
| Subtotal                                     | 43       | 3218.0                           | --                                      | --                          | 3218.0           | --               | 3218.0           |

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 4 non-deployable Engineering Development Model MPs equate to 48 total MPs. Forty-three (43) of the deployable MPs are procured with OP,N and 1 is procured with RDT&E, Navy.

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 2019 controls, however, OP,N for this SAR submission deviates from the PB 2019 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. At the time of this report, PB 2018 has been submitted but not passed by Congress.

The quantity in prior years has decreased since the previous SAR submission due to no longer counting partially delivered MCM MPs as the primary tow platform for the AN/AQS-20 minehunting sonar is being replaced given the cancelation of the Remote Multi-Mission Vehicle. The Navy has selected the Mine Countermeasures (MCM) Unmanned Surface Vehicle (USV) as the replacement vehicle for the RMMV. Procurements of the MCM USV begin in FY 2019.

| Annual Funding  |          |                                  |   |                             |                  |                  |                  |  |
|---|----------|----------------------------------|---|-----------------------------|------------------|------------------|------------------|--|
| 1508   Procurement   Procurement of Ammunition, Navy and Marine Corps |          |                                  |   |                             |                  |                  |                  |  |
| Fiscal Year   | Quantity | TY \$M                           |   |                             |                  |                  |                  |  |
|   |          | End Item<br>Recurring<br>Flyaway | Non End<br>Item<br>Recurring<br>Flyaway | Non<br>Recurring<br>Flyaway | Total<br>Flyaway | Total<br>Support | Total<br>Program |  |
| 2014  | --       | 0.7                              | --                                      | --                          | 0.7              | --               | 0.7              |  |
| 2015  | --       | 0.7                              | --                                      | --                          | 0.7              | --               | 0.7              |  |
| 2016  | --       | 0.9                              | --                                      | --                          | 0.9              | --               | 0.9              |  |
| 2017  | --       | 0.6                              | --                                      | --                          | 0.6              | --               | 0.6              |  |
| 2018  | --       | 0.7                              | --                                      | --                          | 0.7              | --               | 0.7              |  |
| 2019  | --       | 0.7                              | --                                      | --                          | 0.7              | --               | 0.7              |  |
| 2020  | --       | 0.6                              | --                                      | --                          | 0.6              | --               | 0.6              |  |
| 2021  | --       | 0.7                              | --                                      | --                          | 0.7              | --               | 0.7              |  |
| 2022  | --       | 0.7                              | --                                      | --                          | 0.7              | --               | 0.7              |  |
| 2023  | --       | 0.7                              | --                                      | --                          | 0.7              | --               | 0.7              |  |
| Subtotal  | --       | 7.0                              | --                                      | --                          | 7.0              | --               | 7.0              |  |



| Annual Funding  |          |                                  |   |                             |                  |                  |                  |  |
|---|----------|----------------------------------|---|-----------------------------|------------------|------------------|------------------|--|
| 1508   Procurement   Procurement of Ammunition, Navy and Marine Corps |          |                                  |   |                             |                  |                  |                  |  |
| Fiscal Year   | Quantity | BY 2010 \$M                      |   |                             |                  |                  |                  |  |
|   |          | End Item<br>Recurring<br>Flyaway | Non End<br>Item<br>Recurring<br>Flyaway | Non<br>Recurring<br>Flyaway | Total<br>Flyaway | Total<br>Support | Total<br>Program |  |
| 2014  | --       | 0.6                              | --                                      | --                          | 0.6              | --               | 0.6              |  |
| 2015  | --       | 0.6                              | --                                      | --                          | 0.6              | --               | 0.6              |  |
| 2016  | --       | 0.8                              | --                                      | --                          | 0.8              | --               | 0.8              |  |
| 2017  | --       | 0.5                              | --                                      | --                          | 0.5              | --               | 0.5              |  |
| 2018  | --       | 0.6                              | --                                      | --                          | 0.6              | --               | 0.6              |  |
| 2019  | --       | 0.6                              | --                                      | --                          | 0.6              | --               | 0.6              |  |
| 2020  | --       | 0.5                              | --                                      | --                          | 0.5              | --               | 0.5              |  |
| 2021  | --       | 0.6                              | --                                      | --                          | 0.6              | --               | 0.6              |  |
| 2022  | --       | 0.6                              | --                                      | --                          | 0.6              | --               | 0.6              |  |
| 2023  | --       | 0.5                              | --                                      | --                          | 0.5              | --               | 0.5              |  |
| Subtotal  | --       | 5.9                              | --                                      | --                          | 5.9              | --               | 5.9              |  |

The LCS MM Program also has an allocation of Procurement of Ammo, Navy and Marine Corps (PANMC) funding to procure high explosive 30mm rounds. However the LCS MM Program does not execute or report on these funds as ammunition is procured as part of the initial ship outfitting process.

| Annual Funding<br>1205   MILCON   Military Construction, Navy and Marine Corps |               |      |
|--|---------------|------|
| Fiscal Year  | TY \$M        |      |
|  | Total Program |      |
| 2016   |               | 16.2 |
| 2017   |               | --   |
| 2018   |               | --   |
| 2019   |               | --   |
| 2020   |               | 19.5 |
| Subtotal   |               | 35.7 |

| Annual Funding<br>1205   MILCON   Military Construction, Navy and Marine Corps |               |
|--|---------------|
| Fiscal Year  | BY 2010 \$M   |
|  | Total Program |
| 2016   | 14.0          |
| 2017   | --            |
| 2018   | --            |
| 2019   | --            |
| 2020   | 15.7          |
| 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 2019, construction of Outside the Continental United States (OCONUS) Mission Modules Readiness Centers is funded in FY 2020. 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                  | 2020               |

The Current Total LRIP Quantity is more than 10% of the total production quantity due to the requirement to have enough mission packages 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 MCM MPs (12th LRIP procured in FY 2025), 12 SUW MPs (Only 9 LRIPs are planned to be procured), and 3 ASW MPs (3rd procured in FY 2020).

**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 (Nov 2013 APB)  | Current Estimate (Dec 2017 SAR) |             |
| Program Acquisition Unit Cost                                  |                                      |                                 |             |
| Cost   | 6379.5                               | 5580.6                          |             |
| Quantity   | 64                                   | 48                              |             |
| Unit Cost  | 99.680                               | 116.262                         | +16.64¹     |
| Average Procurement Unit Cost                                  |                                      |                                 |             |
| Cost   | 4116.7                               | 3259.0                          |             |
| Quantity   | 59                                   | 43                              |             |
| Unit Cost  | 69.775                               | 75.791                          | +8.62       |
| 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 2017 SAR) |             |
| Program Acquisition Unit Cost                                  |                                      |                                 |             |
| Cost   | 6379.5                               | 5580.6                          |             |
| Quantity   | 64                                   | 48                              |             |
| Unit Cost  | 99.680                               | 116.262                         | +16.64      |
| Average Procurement Unit Cost                                  |                                      |                                 |             |
| Cost   | 4116.7                               | 3259.0                          |             |
| Quantity   | 59                                   | 43                              |             |
| Unit Cost  | 69.775                               | 75.791                          | +8.62       |
| Current UCR Baseline and Current Estimate (Then-Year Dollars)  |                                      |                                 |             |
| Item   | TY \$M                               |                                 | TY % Change |
|  | Current UCR Baseline (Nov 2013 APB)  | Current Estimate (Dec 2017 SAR) |             |
| Program Acquisition Unit Cost (PAUC)                           |                                      |                                 |             |
| Cost   | 7448.3                               | 6478.7                          |             |
| Unit Cost  | 116.380                              | 134.973                         | +15.98      |
| Average Procurement Unit Cost (APUC)                           |                                      |                                 |             |
| Cost   | 4995.0                               | 4028.9                          |             |
| Unit Cost  | 84.661                               | 93.695                          | +10.67      |



| Original UCR Baseline and Current Estimate (Then-Year Dollars) |  |                                    |                |
|--|--|------------------------------------|----------------|
| Item   | TY \$M                                     |                                    | TY<br>% Change |
|  | Original UCR<br>Baseline<br>(Nov 2013 APB) | Current Estimate<br>(Dec 2017 SAR) |                |
| Program Acquisition Unit Cost (PAUC)                           |  |                                    |                |
| Cost   | 7448.3                                     | 6478.7                             |                |
| Unit Cost  | 116.380                                    | 134.973                            | +15.98         |
| Average Procurement Unit Cost (APUC)                           |  |                                    |                |
| Cost   | 4995.0                                     | 4028.9                             |                |
| Unit Cost  | 84.661                                     | 93.695                             | +10.67         |

<sup>1</sup> Nunn-McCurdy Breach

| Unit Cost Breach Data     |          |         |
|---------------------------|----------|---------|
| Changes From Previous SAR | \$M/Qty. | Percent |
| PAUC (BY \$M)             | 16.018   | +15.98  |
| APUC (BY \$M)             | 8.108    | +11.98  |
| PAUC Quantity             | -16      | 0.00    |
| PAUC (TY \$M)             | 12.612   | +10.31  |
| APUC (TY \$M)             | 5.198    | +5.87   |

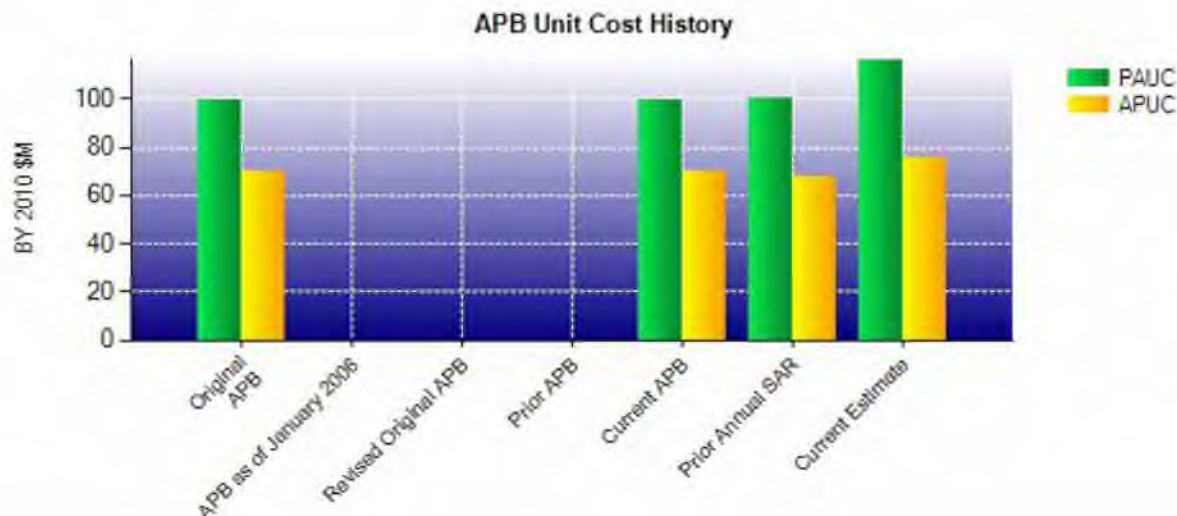
| Initial SAR Information            |            |        |
|------------------------------------|------------|--------|
| Initial SAR Information - Dec 2013 | BY2010 \$M | TY \$M |
| Program Acquisition Cost           | 6164.7     | 7299.9 |

#### Unit Cost PAUC Changes

PAUC increased 16.6% (from \$99.68M to \$116.262M) which causes a significant Nunn-McCurdy breach. This is due to reduction to MP quantities (from 64 to 48 total MPs consisting of 44 deployable and 4 non-deployable Engineering Development Model MPs) and correspondingly increasing the proportion of the most expensive MP (MCM) relative to the less expensive MPs (ASW and SUW), increasing the average MP cost. Program development cost and production unit costs remain below the original baseline despite the quantity change. Had the MP quantity remained 64 MPs, the Program's PAUC would have been approximately \$96.3M (a 3% decrease to the original APB baseline).

#### Unit Cost APUC Changes

APUC increased 8.6% (from \$69.775M to \$75.791M) due to increasing the proportion of the most expensive MP (MCM) relative to the less expensive MPs (ASW and SUW) based on the new mission package quantities.



| 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              | N/A      | N/A         | N/A    | N/A     | N/A    |
| Current APB            | Nov 2013 | 99.680      | 69.775 | 116.380 | 84.661 |
| Prior Annual SAR       | Dec 2016 | 100.244     | 67.683 | 122.361 | 88.497 |
| Current Estimate       | Dec 2017 | 116.262     | 75.791 | 134.973 | 93.695 |

PAUC increased 16.6% (from \$99.68M to \$116.262M) which causes a significant Nunn-McCurdy breach. This is due to reduction to MP quantities (from 64 to 48 total MPs consisting of 44 deployable and 4 non-deployable Engineering Development Model MPs) and correspondingly increasing the proportion of the most expensive MP (MCM) relative to the less expensive MPs (ASW and SUW), increasing the average MP cost. Program development cost and production unit costs remain below the original baseline despite the quantity change. Had the MP quantity remained 64 MPs, the Program's PAUC would have been approximately \$96.3M (a 3% decrease to the original APB baseline).

APUC increased 8.6% (from \$69.775M to \$75.791M) due to increasing the proportion of the most expensive MP (MCM) relative to the less expensive MPs (ASW and SUW) based on the new mission package quantities.

### 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   | -3.533  | 3.484 | 38.094 | -0.412 | -19.040 | 0.000 | 0.000 | 18.593 | 134.973               |



| 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  | -3.223  | -7.913 | 42.937 | -0.460 | -22.307 | 0.000 | 0.000 | 9.034 | 93.695                |

| 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                     | Aug 2013         |
| Milestone C          | N/A                   | Mar 2020                 | N/A                     | Mar 2020         |
| IOC                  | N/A                   | Aug 2014                 | N/A                     | Nov 2014         |
| Total Cost (TY \$M)  | N/A                   | 7448.3                   | N/A                     | 6478.7           |
| Total Quantity       | N/A                   | 64                       | N/A                     | 48               |
| PAUC                 | N/A                   | 116.380                  | N/A                     | 134.973          |

Total cost decreased 13.0% (from \$7,448.3M to \$6,478.0M) due to procuring 16 less total MPs over the life of the program (from 64 to 48 total MPs consisting of 44 deployable and 4 non-deployable Engineering Development Model MPs).

**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                            | -26.2  | -98.7       | -0.5   | -125.4  |
| Quantity                            | --     | --          | --     | --      |
| Schedule                            | -17.6  | +995.6      | -0.2   | +977.8  |
| Engineering                         | --     | -22.0       | --     | -22.0   |
| Estimating                          | +202.2 | -648.6      | -1.2   | -447.6  |
| Other                               | --     | --          | --     | --      |
| Support                             | --     | --          | --     | --      |
| Subtotal                            | +158.4 | +226.3      | -1.9   | +382.8  |
| Current Changes                     |        |             |        |         |
| Economic                            | -4.2   | -39.9       | -0.1   | -44.2   |
| Quantity                            | --     | -1694.8     | --     | -1694.8 |
| Schedule                            | --     | +850.7      | --     | +850.7  |
| Engineering                         | --     | +2.2        | --     | +2.2    |
| Estimating                          | -155.7 | -310.6      | --     | -466.3  |
| Other                               | --     | --          | --     | --      |
| Support                             | --     | --          | --     | --      |
| Subtotal                            | -159.9 | -1192.4     | -0.1   | -1352.4 |
| Total Changes                       | -1.5   | -966.1      | -2.0   | -969.6  |
| CE - Cost Variance                  | 2414.1 | 4028.9      | 35.7   | 6478.7  |
| CE - Cost & Funding                 | 2414.1 | 4028.9      | 35.7   | 6478.7  |

| 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                            | --     | --          | --     | --      |
| Schedule                            | -15.1  | +574.5      | -0.7   | +558.7  |
| Engineering                         | --     | -18.7       | --     | -18.7   |
| Estimating                          | +175.0 | -679.2      | +0.3   | -503.9  |
| Other                               | --     | --          | --     | --      |
| Support                             | --     | --          | --     | --      |
| Subtotal                            | +159.9 | -123.4      | -0.4   | +36.1   |
| Current Changes                     |        |             |        |         |
| Economic                            | --     | --          | --     | --      |
| Quantity                            | --     | -1248.9     | --     | -1248.9 |
| Schedule                            | --     | +670.8      | +1.0   | +671.8  |
| Engineering                         | --     | +1.6        | --     | +1.6    |
| Estimating                          | -101.7 | -157.8      | --     | -259.5  |
| Other                               | --     | --          | --     | --      |
| Support                             | --     | --          | --     | --      |
| Subtotal                            | -101.7 | -734.3      | +1.0   | -835.0  |
| Total Changes                       | +58.2  | -857.7      | +0.6   | -798.9  |
| CE - Cost Variance                  | 2291.9 | 3259.0      | 29.7   | 5580.6  |
| CE - Cost & Funding                 | 2291.9 | 3259.0      | 29.7   | 5580.6  |

Previous Estimate: September 2017



| RDT&E   | \$M       |           |
|---|-----------|-----------|
| Current Change Explanations   | Base Year | Then Year |
| Revised escalation indices. (Economic)  | N/A       | -4.2      |
| Revised estimate to reflect actuals. (Estimating)   | -19.9     | -20.5     |
| Revised estimate for development of Anti-Submarine Warfare Mission Package Computing Environment Sonar Signal Processing hardware and software. (Estimating)  | +11.7     | +13.8     |
| Revised estimate to properly align funding for technology refreshes to Operations and Support in accordance with Milestone B cost estimating methodology. (Estimating)  | -153.6    | -222.2    |
| Adjustment for current and prior escalation. (Estimating)   | +1.1      | +1.2      |
| Revised estimate to align Mine Countermeasures (MCM) MP development to replace the Remote Multi-Mission Vehicle with the MCM Unmanned Surface Vehicle, achieve IOC in FY 2021, and replace legacy MCM systems. (Estimating) | +59.0     | +72.0     |
| RDT&E Subtotal  | -101.7    | -159.9    |

| Procurement  | \$M       |           |
|--|-----------|-----------|
| Current Change Explanations  | Base Year | Then Year |
| Revised escalation indices. (Economic)   | N/A       | -39.9     |
| Stretch-out of procurement buy profile in FY 2010 through FY 2030; MCM MPs previously counted in FY 2010 through FY 2014 are no longer counted as fully procured due to cancellation/replacement of Remote Multi-Mission Vehicles. (Schedule)                                  | 0.0       | +216.4    |
| Additional schedule variance due to stretch-out of procurement profile from FY 2016 to FY 2030. (Schedule)   | +822.9    | +840.5    |
| Total quantity variance resulting from a decrease of 16 MPs from 59 to 43. (Subtotal)  | -1350.3   | -1832.3   |
| Quantity variance resulting from a decrease of 16 MPs (from 59 to 43 MPs). (Quantity)  | (-1248.9) | (-1694.8) |
| Allocation to Schedule resulting from Quantity change. (Schedule) (QR)   | (-152.1)  | (-206.2)  |
| Allocation to Engineering resulting from Quantity change. (Engineering) (QR)   | (+1.6)    | (+2.2)    |
| Allocation to Estimating resulting from Quantity change. (Estimating) (QR)   | (+49.1)   | (+66.5)   |
| Revised estimate to properly align funding for procurement of hardware for technology refresh of Mission Package Computing Environment and Mission Package Training Systems to Operations and Support in accordance with Milestone B cost estimating methodology. (Estimating) | -209.2    | -379.9    |
| Adjustment for current and prior escalation. (Estimating)  | +1.9      | +2.1      |
| Revised estimate for procurement of 30mm Armor Piercing Fin-Stabilized Discarding Sabot with Tracer and High-Explosive Incendiary rounds for the Gun Mission Module. (Estimating)  | +0.4      | +0.7      |
| Procurement Subtotal   | -734.3    | -1192.4   |

(QR) Quantity Related

| MILCON                                 | \$M       |           |
|--|-----------|-----------|
| Current Change Explanations            | Base Year | Then Year |
| Revised escalation indices. (Economic) | N/A       | -0.1      |

|   |      |      |
|---|------|------|
| Schedule variance due to accelerated construction of the Outside the Continental United States Mission Modules Readiness Centers from FY 2023 to FY 2020 to align with construction plans. (Schedule) | +1.0 | 0.0  |
| MILCON Subtotal   | +1.0 | -0.1 |



## Contracts

| Contract Identification     |  |
|-----------------------------|--|
| <b>Appropriation:</b>       | RDT&E  |
| <b>Contract Name:</b>       | Design, Engineering, Production, and Sustainment   |
| <b>Contractor:</b>          | Northrop Grumman Systems Corp  |
| <b>Contractor Location:</b> | 600 Grumman Road, West, M/S Z24-25<br>Bethpage, NY 11714-3583  |
| <b>Contract Number:</b>     | N00024-17-C-6311   |
| <b>Contract Type:</b>       | Firm Fixed Price (FFP), Cost Plus Fixed Fee (CPFF), Fixed Price Incentive (Successive Targets) (FPIS), Cost (CR) |
| <b>Award Date:</b>          | March 16, 2017   |
| <b>Definitization Date:</b> | 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             | --            | --                |
| Net Change                                | +0.2          | +0.1              |
| Percent Variance                          | +23.58%       | +13.23%           |
| Percent Complete                          | +23.77%       |                   |

| Cost and Schedule Variance Explanations  |
|--|
| The favorable cumulative cost variance is due to as the contractor plans to complete the reduced weight Support Container Technical Data Package ahead of schedule and for \$644K less than planned. |
| The favorable cumulative schedule variance is due to as the contractor plans to complete the reduced weight Support Container Technical Data Package ahead of schedule and \$644K less than planned. |

## Deliveries and Expenditures

| Deliveries                       |                 |                |                |                   |
|----------------------------------|-----------------|----------------|----------------|-------------------|
| Delivered to Date                | Planned to Date | Actual to Date | Total Quantity | Percent Delivered |
| Development                      | 4               | 4              | 5              | 80.00%            |
| Production                       | 5               | 5              | 43             | 11.63%            |
| Total Program Quantity Delivered | 9               | 9              | 48             | 18.75%            |

| Expended and Appropriated (TY \$M) |        |                            |        |
|------------------------------------|--------|----------------------------|--------|
| Total Acquisition Cost             | 6478.7 | Years Appropriated         | 15     |
| Expended to Date                   | 2807.5 | Percent Years Appropriated | 51.72% |
| Percent Expended                   | 43.33% | Appropriated to Date       | 3189.0 |
| Total Funding Years                | 29     | Percent Appropriated       | 49.22% |

The above data is current as of February 12, 2018.

RDT&E, Navy funded Mission Package (MP) deliveries: three Surface Warfare (SUW) MPs and one Mine Countermeasures (MCM) MP. One of the three SUW MPs procured with RDT&E, Navy is a deployable asset.

The quantity in prior years has decreased since the previous SAR submission due to no longer counting partially delivered MCM MPs as the primary tow platform for the AN/AQS-20 minehunting sonar is being replaced given the cancelation of the Remote Multi-Mission Vehicle. The Navy has selected the Mine Countermeasures (MCM) Unmanned Surface Vehicle (USV) as the replacement vehicle for the RMMV.



## Operating and Support Cost

### Cost Estimate Details

|                                 |                      |
|---------------------------------|----------------------|
| <b>Date of Estimate:</b>        | March 01, 2018       |
| <b>Source of Estimate:</b>      | POE                  |
| <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 (CNO) 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.

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 4 non-deployable Engineering Development Model MPs equate to 48 total MPs. The quantity of 44 deployable MPs consists of 24 Mine Countermeasures (MCM) MPs, 10 Surface Warfare (SUW) MPs, and 10 Anti-Submarine Warfare (ASW) MPs. The O&S costs in this SAR are based on a Program Manager's estimate that reflects the revised MP quantities and a service life adjustment to align with the LCS in-service profile for revised LCS quantities (25 years vs. 30 years). However, this SAR does not reflect all of the other recommendations from the 2016 LCS Review Team (i.e. changes to manning construct (Blue/Gold vs. 3:2:1), changes in operations due to semi-permanent installation of MPs, aligning MPs to mission focused LCS divisions, etc.). These changes are being captured in program cost documentation as part of the program re-baseline directed by the USD (AT&L) and the MDA, and will be formalized in a Component Cost Position and reflected in an updated APB in CY 2018 and the next SAR submission.

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, Program Manager, Ship (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 Activity Requirements 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<br>Average Annual Cost Per Mission<br>Package (MP) | No Antecedent (Antecedent) |
| Unit-Level Manpower            | 3.415   | --                         |
| Unit Operations                | 0.271   | --                         |
| Maintenance                    | 3.358   | --                         |
| Sustaining Support             | 0.673   | --                         |
| Continuing System Improvements | 3.671   | --                         |
| Indirect Support               | 1.000   | --                         |
| Other                          | 0.000   | --                         |
| Total                          | 12.388  | --                         |

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<br>(Antecedent) |
|           | Current Development APB<br>Objective/Threshold |         | Current Estimate |                               |
| Base Year | 21589.2  | 23748.1 | 13626.0          | N/A                           |
| Then Year | 33040.2  | N/A     | 19100.0          | N/A                           |

The O&S Costs in this SAR are based on a January 2018 POE, which has been updated to reflect 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 = \$12.3875M x 44 x 25 = \$13,626M.

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.

| O&S Cost Variance                            |                |  |
|--|----------------|--|
| Category                                     | BY 2010<br>\$M | Change Explanations  |
| Prior SAR Total O&S Estimates - Sep 2017 SAR | 21589.2        |  |
| Programmatic/Planning Factors                | -7963.2        | Change in quantity from 64 MPs to 44 deployable MPs.<br>Change in MP service life from 30 years to 25 years to align with the LCS seaframe in-service profile. |
| 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                                | -7963.2        |  |
| Current Estimate                             | 13626.0        |  |

#### Disposal Estimate Details

**Date of Estimate:** March 01, 2018  
**Source of Estimate:** POE  
**Disposal/Demilitarization Total Cost (BY 2010 \$M):** Total costs for disposal of all Mission Package (MP) are 122.2

Disposal costs in this SAR submission reflect change in quantity from 64 MPs to 44 deployable mission packages.