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Department of Defense
OFFICE OF PREPUBLICATION AND SECURITY REVIEW



LITTORAL COMBAT SHIP (LCS)

December 2021 Selected Acquisition Report (SAR)



DECEMBER 31, 2021
DEPARTMENT OF THE NAVY

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Common Acronyms and Abbreviations

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(A&S) - Under Secretary of Defense (Acquisition and Sustainment)
USD(AT&L) - Under Secretary of Defense (Acquisition, Technology and Logistics)

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Program Manager**Name:** CAPT Andy Gold**Date Assigned:** November 29, 2021**Address:** 1333 Isaac Hull Ave SE, Washington Navy Yard, DC 20376-7003**Phone:** 202-781-1918**DSN:** 326-1918**Email:** robert.a.gold.mil@us.navy.mil**Mission and Description**

The role of the Littoral Combat Ship (LCS) is to provide joint forces access in the littoral. LCS is designed to be a fast, agile, and networked surface combatant. It will focus on two primary anti-access mission areas within Littoral Surface Warfare operations: prosecution of small boats and mine warfare. Its high speed and ability to operate at economical loiter speeds will enable fast and calculated responses to small boat threats and adversary mine laying. LCS employment of networked sensors for Intelligence, Surveillance, and Reconnaissance in support of Special Operations Forces will directly enhance littoral mobility. Its shallow draft will allow easier excursion into shallower areas for both mine countermeasures and small boat prosecution. Using LCS against these asymmetric threats will enable Joint Commanders to concentrate multi-mission combatants on primary missions such as precision strike, battle group escort and theater air defense.

Executive Summary

Significant Accomplishments:

This is the final submission of the SAR for the LCS program.

In 2020 and 2021, the LCS Program continued to validate and deliver capability for combat-ready ships to the Fleet. Of the 35 LCS Seaframes that have been awarded to date, 26 have delivered to the Navy, and nine are in various stages of production. The LCS program constantly reviews lessons learned from construction, testing, and fleet operation for incorporation into ships in construction, ships in post-delivery, and ships already in the fleet.

In 2020, LCS 19, LCS 22, LCS 24, and LCS 26 delivered to the Navy; in 2021, LCS 21, LCS 28, and LCS 30 delivered to the Navy.

In 2020, LCS 11, LCS 13, LCS 14, LCS 16, LCS 18 and LCS 20 transitioned to sustainment; in 2021, LCS 15, LCS 17, and LCS 22 transitioned to sustainment. LCS 24 transitioned to sustainment in January 2022. A total of 21 LCS have transitioned to date: LCS 1 through LCS 18, LCS 20, LCS 22, and LCS 24. By the end of 2022, LCS 19 and LCS 26 are also planned to transition to sustainment. LCS 1 and 2 were placed Out of Commission and In Reserve (OCIR) in 2021.

LCS 23, LCS 25, LCS 27, LCS 29, LCS 31, LCS 32, LCS 34, LCS 36, and LCS 38 are in various stages of production. At this time, the LCS program has delivered 74 percent of the ships and transitioned 60 percent to sustainment.

LCS has delivered the last 18 ships with zero starred cards open at Delivery and is achieving outstanding Figure of Merit scores from the Navy's Board of Inspection and Survey team.

In April 2011, in conjunction with the LCS Seaframe Milestone B decision, USD(AT&L) certified the LCS Seaframe program pursuant to section 2366b of title 10, United States Code (U.S.C.), with waivers. Specifically, USD(AT&L) was unable to certify three provisions, and without these waivers the Department would be unable to meet critical national security objectives. Provisions (a)1(B) (affordability) and 1(D) (funding available) were waived due to a total resource and funding shortfall in the period covered by the FYDP submitted in FY 2011 when the certification was made. The required remaining resources are now included within the FYDP as submitted in PB 2023. For the waiver to provision (a)1(C) (reasonable cost estimates with concurrence of Director, Cost Assessment & Program Evaluation (D,CAPE), the D,CAPE continues to monitor the cost estimates as the program progresses through the budget cycles.

In 2020, the LCS program conducted Combat System Ship Qualification Test (CSSQT) events on LCS 17, LCS 19, and LCS 22. LCS 17 successfully conducted a SeaRAM (Rolling Airframe Missile) firing event, scoring a mission success against its intended Unmanned Aerial Vehicle (UAV) drone target. This test firing was the first ever full-up demonstration of SeaRAM capability aboard the Freedom-variant LCS. In 2021, the program conducted successful CSSQT events on LCS 22, LCS 24, and LCS 26.

FREEDOM variant (LCS 1) and INDEPENDENCE variant (LCS 2) have each attained Initial Operational Capability (IOC). Future mission package test and evaluation will be conducted on both in-service and new construction LCS.

Significant Issues:

LCS Program COVID-19 Statement:

The LCS Program is working with Austal USA, Lockheed Martin, and BAE Jacksonville Ship Repair to ensure continuity of operations and the continuation of ship construction, trials and delivery of LCS as planned. Further, the Navy has issued directions to accelerate progress payments and accelerate the release of retentions to protect the defense industrial base prime and subcontractors. These actions to accelerate progress payments and retentions release remove typically effective contract management and control tools to drive contractor performance. Ships in post-delivery are continuing with their post-shakedown availabilities in order to meet fleet schedules. COVID-19 did affect the shipbuilder's manning

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resources and schedule. As COVID-19 mutates and creates new virus variants, the potential for further cost and schedule impacts associated with the pandemic may be realized. The Navy will continue to assess and monitor shipbuilder performance during the pandemic.

Multiple combining gear (CG) failures on several Freedom-variant LCS indicated defective equipment preventing Freedom-variant ships from fully meeting their operational and deployment requirements. The Navy and industry conducted a Root Cause Analysis (RCA) to determine the source of the problem and develop a solution. The analysis team included representatives from the Government, the shipbuilder team of Lockheed Martin (LM), and the Original Equipment Manufacturer (OEM), RENK AG. The RCA identified a class (Freedom-variant, LCS 5, and follow) design problem with the CG high-speed clutch bearings. A design modification was developed, reviewed, approved, and successfully tested in a land based environment. The design modification was installed on LCS 21 and LCS 23 in Escanaba, MI, and successfully completed underway testing.

Based on the results of land-based and at-sea testing, both LM and the Navy assessed the CG design modification satisfactorily corrects the issue and, once installed, will allow unrestricted operations of Freedom-variant ships. Additionally, the Navy resumed delivery of new construction Freedom-variant ships with the gear modification installed, beginning with LCS 21, in November 2021. LCS 19 is currently undergoing its Combining Gear modification in an extended Post Shakedown Availability. New construction ships LCS 25, LCS 27, and LCS 29 will receive the modification prior to Government acceptance. LCS 31, the last ship of the Freedom-variant, design fix is incorporated in the CG as delivered from the OEM. Specific plans for incorporating the fix in in-service ships are under Navy assessment. Until the fix is accomplished, measures remain in effect for Freedom-variant ships to allow continued operations while mitigating the risk of CG failures.

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

PEO Comments:

The LCS program is at 89.44% expenditures. As such, this will be the last SAR submission.

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 LCS Seaframes and Mission Modules.
December 2004	Detail Design and Construction contract option for LCS 1 awarded, funded with RDT&E to Lockheed Martin. The contract also included an option for LCS 3, funded with Ship Construction, Navy (SCN).
October 2005	Detail Design and Construction contract option for LCS 2 awarded, funded with RDT&E to Bath Iron Works. The contract also included an option for LCS 4, funded with SCN.
1st Quarter FY 2007	Contract options for the construction of LCS 3 and LCS 4 terminated in part for convenience, in April and November 2007 respectively.
1st Quarter FY 2009	Contract award for the construction of LCS 3 and LCS 4.
January 2010	Acquisition Strategy for the down select, block buy of 10 LCS of one design with a second source for the construction of five more LCS was approved by USD (AT&L) on January 25, 2010.
December 2010	Acquisition Strategy modified by the Navy and approved by USD(AT&L) to continue procurement of both designs in a Block Buy. Block Buy contracts for up to 10 ships each awarded to Lockheed Martin and Austal USA.
February 2011	Milestone B DAB conducted for the Seaframe portion of the LCS program.

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April 2011	Milestone B DAB ADM approved the 55 LCS Seaframe program's entry into EMD and the split of Seaframes and Mission Modules management into two separate MDAPs.
January 2013	Chief of Naval Operations (CNO) Navy Combatant Vessel Force Structure Requirement reduced LCS total program procurement quantity from 55 to 52, consistent with the 2012 Defense Strategic Guidance.
February 2014	Secretary of Defense (SECDEF) Memo of February 24, 2014 directed no contract negotiations beyond 32 LCS will go forward. Directed Navy to complete a study to support future procurement of a capable and lethal small surface combatant. Navy submitted a 32 ship SAR.
April 2014	USS FORT WORTH (LCS 3) completed Initial Operational Test and Evaluation (IOT&E) events and achieved IOC of the FREEDOM variant.
October 2014	As a result of the fiscal constraints under the Bipartisan Budget Act, which shifted funding for one LCS from FY 2015 to FY 2016, the Navy had to modify its Acquisition Strategy. USD (AT&L) approved revision 2 of the LCS Acquisition Strategy on October 17, 2014 for the procurement of three ships in FY 2015 and three ships in FY 2016. The 2016 National Defense Authorization Act authorized the extension of the Block Buy contract to support the award of the two FY 2016 LCS (LCS 25 and LCS 26).
December 2014	SECDEF Memo of December 24, 2014 approved the Navy plan to procure a small surface combatant (SSC) based on an upgraded Flight 0+ LCS for a total of 52 Flight 0+ LCS and SSC. Navy submitted a 32 LCS SAR.
March 2015	On March 31, 2015, the Block Buy contracts were modified to add FY 2016 LCS as options.
4th Quarter FY 2015	USS CORONADO (LCS 4) completed IOT&E events and achieved IOC of the INDEPENDENCE variant.
December 2015	SECDEF Memo of December 14, 2015 directed the Navy to build no more than 40 LCS and Frigate and to down select to one variant not later than FY 2019. Navy submitted a 40 ship SAR (29 LCS/11 Frigate), consistent with PB 2017 and SECDEF guidance.
February 2016	CNO directed the establishment of the LCS Review Team.
March 2016	USD(AT&L) approved a revised LCS and Frigate Acquisition Strategy on March 29, 2016 reflecting SECDEF direction to procure a total LCS/Frigate inventory of 40 ships.
4th Quarter FY 2016	In 2016, the LCS Program completed Full Ship Shock Trials on LCS 6 (USS JACKSON, INDEPENDENCE variant) and LCS 5 (USS MILWAUKEE, FREEDOM variant), as part of the Director, Operational Test and Evaluation approved Live Fire Test and Evaluation Plan.
May 2017	PB 2018 submission supports Navy's strategy to transition to a new Frigate by FY 2020 and procure additional LCS in FY 2018 and FY 2019. Navy submitted a 32 LCS SAR, an increase of three LCS from the December 2015 SAR, consistent with PB 2018 and supporting transition to a Frigate in FY 2020.
June 2017	USD(AT&L) approved a revised LCS Acquisition Strategy on June 09, 2017 authorizing the Navy to procure a third LCS in FY 2017 as authorized by Congress.
February 2018	CNO memo of February 08, 2018 stated the LCS Seaframe program of record is 32 ships.

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March 2018	USD(A&S) approved a revised LCS Acquisition Strategy on March 28, 2018 authorizing the Navy to procure three ships in FY 2018 and FY 2019 as authorized by Congress.
December 2018	USD(A&S) memo of December 19, 2018 delegated MDA for LCS from USD(A&S) to ASN (RD&A)
January 2019	On January 15, 2019 the Navy awarded the remaining FY 2019 LCS. All LCS ships have been awarded and are on contract. FY 2019 was the final year programmed for LCS with a 35 ship program total.
April 2019	In April 2019, the Final Survivability Assessment Report was approved which completed the Survivability/Live Fire Test & Evaluation program for LCS.
3rd Quarter FY 2020	LCS 17 successfully conducted a SeaRAM (Rolling Airframe Missile) firing event, scoring a mission success against its intended Unmanned Aerial Vehicle (UAV) drone target. This test firing was the first ever full-up demonstration of SeaRAM capability aboard the Freedom- variant LCS.
January 2021	The Navy identified a latent defect in the Combining Gear (CG) bearings of Freedom class LCS and suspended further deliveries pending correction of the defect.
November 2021	The Navy developed a design solution and successfully installed and tested at Sea the Combining Gear modification on LCS 21 and LCS 23. Navy accepted delivery of LCS 21 in November 2021. The remaining Freedom variant LCS, LCS 25 through LCS 31, will have the Combining Gear modification implemented prior to delivery.

Schedule

Schedule Events

Schedule Events					
Events	Development APB Objective	Current APB Development Objective/Threshold		Current Estimate/Actual	Deviation
Milestone A/Program Initiation	May 2004	May 2004	May 2004	May 2004	
Final Design and Construction Contract Award	May 2004	May 2004	May 2004	May 2004	
Lead Ship Award	Dec 2004	Dec 2004	Dec 2004	Dec 2004	
First Ship Delivery	Sep 2008	Sep 2008	Sep 2008	Sep 2008	
FY 2010 Contract Award	Dec 2010	Dec 2010	Jun 2011	Dec 2010	
Milestone B	Feb 2011	Feb 2011	Aug 2011	Feb 2011	
Milestone C	Jan 2012	Jan 2012	Jul 2012	Jan 2012	
Initial Operational Capability	Jan 2014	Jan 2014	Jul 2014	Apr 2014	
IOT&E LCS 1 with one Mission Package	Dec 2013	Dec 2013	Jun 2014	Apr 2014	
IOT&E LCS 2 with one Mission Package	Dec 2013	Dec 2013	Jun 2014	Oct 2015	Y
IOC LCS 2	Jan 2014	Jan 2014	Jul 2014	Oct 2015	Y

Schedule Notes:

Both variants of LCS have achieved IOC.

Deviation Explanations:

December 2015:

- IOT&E LCS 2 with one Mission Package changed from August 2015, as previously reported, to October 2015 to reflect the completion of IOT&E for the LCS 2 (INDEPENDENCE) variant in support of declaration of IOC.
- IOC LCS 2 changed from September 2015, as previously reported, to October 2015 to reflect the completion of IOT&E for the LCS 2 (INDEPENDENCE) variant in support of declaration of IOC.

Acronyms and Abbreviations

IOT&E - Initial Operational Test and Evaluation

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Significant Schedule Risks

Significant Schedule Risks	
Current Estimate (December 2021)	
1.	There is cost and schedule risk due to a latent defect in the Combining Gear (CG) on Freedom variant LCS. A redesigned solution has passed rigorous land-based and at-sea testing, and the design solution was installed on LCS 21 and LCS 23. The Navy accepted delivery of LCS 21 in November 2021. New construction ships LCS 25, LCS 27, and LCS 29 will receive the modification prior to delivery. LCS 31 has received the new CG in line during construction. Schedules have been adjusted to accommodate repairs, and the cost impact was addressed in PB 2023.

Performance

Performance Characteristics					Deviation
Development APB Objective	Current APB Development Objective/Threshold	Demonstrated Performance (include Date of Demonstration)	Current Estimate/Actual		
Navigational Draft (ft)					
10	10	20	15.7 / 15.4 Oct '13 (FRE) / Oct '14 (IND)	15.7 / 15.4	
Sprint Speed (kts)					
50	50	40	38.7 / 41.4 Jul '14 (FRE) / Apr '16 (IND)	40 / 41.4	
Range at Transit Speed (includes payload)					
4,300 nm @ 16 kts	4,300 nm @ 16 kts	3,500 nm @ 14 kts	3878nm / 6040nm @ 14 kts May '20 (FRE) / Dec '14 (IND)	3878nm / 6040nm @ 14 kts	
Mission Package Payload (Weight)					
210 MT (130 MT mission package/80 MT mission package fuel)	210 MT (130 MT mission package/80 MT mission package fuel)	180 MT (105 MT mission package/75 MT mission package fuel)	180 MT / 180 MT Oct '13 (FRE) / Jan '13 (IND)	180 MT / 180 MT (105 MT mission package/75 MT mission package fuel)	
Net-Ready: The system must support Net-Centric military operations. The system must be able to enter and be managed in the network, and exchange data in a secure manner to enhance mission effectiveness. The system must continuously provide survivable, interoperable, secure, and operationally effective information exchanges to enable a Net-Centric military capability.					
The system must fully support execution of all operational activities identified in the applicable joint and system integrated architectures and the system must satisfy the technical	The system must fully support execution of all operational activities identified in the applicable joint and system integrated architectures and the system must satisfy the technical	The system must fully support execution of joint critical operational activities identified in the applicable joint and system integrated architectures and the system must satisfy the	TBD / TBD	The system for both LCS variants will fully support execution of all operational activities identified in the applicable joint and system integrated architectures and the system must satisfy the technical	

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Performance Characteristics					Deviation
Development APB Objective	Current APB Development Objective/Threshold		Demonstrated Performance (include Date of Demonstration)	Current Estimate/Actual	
requirements for Net- Centric military operations to include 1) DISR mandated GIG IT standards and profiles identified in the TV-1, 2) DISR mandated GIG KIPs identified in the KIP declaration table, 3) NCOW RM Enterprise Services 4) IA requirements including availability, integrity, authentication, confidentiality, and nonrepudiation, and issuance of an ATO by the DAA, And 5) Operationally effective information exchanges; and mission critical performance and IA attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views.	requirements for Net- Centric military operations to include 1) DISR mandated GIG IT standards and profiles identified in the TV-1, 2) DISR mandated GIG KIPs identified in the KIP declaration table, 3) NCOW RM Enterprise Services 4) IA requirements including availability, integrity, authentication, confidentiality, and nonrepudiation, and issuance of an ATO by the DAA, And 5) Operationally effective information exchanges; and mission critical performance and IA attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views.	technical requirements for transition to Net-Centric military operations to include 1) DISR mandated GIG IT standards and profiles identified in the TV-1, 2) DISR mandated GIG KIPs identified in the KIP declaration table, 3) NCOW RM Enterprise Services 4) IA requirements including availability, integrity, authentication, confidentiality, and nonrepudiation, and issuance of an IATO by the DAA, and 5) Operationally effective information exchanges; and mission critical performance and IA attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views.		requirements for Net- Centric military operations to include 1) DISR mandated GIG IT standards and profiles identified in the TV-1, 2) DISR mandated GIG KIPs identified in the KIP declaration table, 3) NCOW RM Enterprise Services 4) IA requirements including availability, integrity, authentication, confidentiality, and nonrepudiation, and issuance of an ATO by the DAA, And 5) Operationally effective information exchanges; and mission critical performance and IA attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views.	
Core Crew Manning (# Core Crew Members)					

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Performance Characteristics					Deviation
Development APB Objective	Current APB Development Objective/Threshold		Demonstrated Performance (include Date of Demonstration)	Current Estimate/Actual	
15	15	50	50 Core Crew / 50 Core Crew Oct '13	50 Core Crew / 50 Core Crew	
Materiel Availability					
0.712	0.712	0.64	TBD / TBD	0.64 / 0.64	
Systems Training (Core Crew)					
Trained-to-Certify at all Team (Watch Section) levels	Trained-to-Certify at all Team (Watch Section) levels	Trained-to-Qualify at individual level (billet/watch station)	TBD / TBD	Trained-to-Qualify at Individual level (billet/watch station) / Trained-to-Qualify at Individual level (billet/watch station)	

Performance Notes:

Demonstrated Performance and Current Estimate are shown by variant (Freedom / Independence).

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

Requirements Source:

Flight 0+ Capability Development Document (CDD) dated June 17, 2008

Acronyms and Abbreviations

ATO - Authority to Operate
DAA - Designated Approval Authority
DISR - DoD IT Standards Registry
ft - Feet
GIG - Global Information Grid
IA - Information Assurance
IATO - Interim Authority to Operate
IT - Information Technology
KIP - Key Interface Profile
kts - Knots
MT - Metric Ton
NCOW RM - Net-Centric Operations Warfare Reference Model
nm - Nautical Miles
TV - Technical View

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Acquisition Budget Estimate

Total Acquisition Cost

Category	Base Year	Development APB	Current APB 04/07/2011		Budget Estimate PB 2023		Deviation
		Objective (BY\$M)	Objective (BY\$M)	Threshold (BY\$M)	BY\$M	TY\$M	
RDT&E	2010	3,433.3	3,433.3	3,776.6	3,057.3	3,041.9	
Procurement	2010	28,369.2	28,369.2	31,206.1	15,867.6	19,030.1	
MILCON	2010	208.5	208.5	229.4	226.9	267.1	
Acq. O&M	2010	0.0	0.0	0.0	0.0	0.0	
Total							
PAUC	2010	582.018	582.018	640.220	547.194	638.260	
APUC	2010	535.268	535.268	588.795	480.836	576.670	

Total End Item Quantity

Quantity Category	Current APB Quantity	Current Estimate Quantity
Development	2	2
Procurement	53	33

Quantity Notes:

The Total Program Cost Estimate detailed above represents the cost for the 35 LCS program.

Risk and Sensitivity Analysis

Risks and Sensitivity Analysis	
Current Procurement Cost (December 2021)	
1.	PB 2023 presents risk at Austal, USA, related to future workload at the shipyard. Without additional work, the Navy expects to see higher overhead rates at the shipyard as fixed costs are spread over a smaller workload.
2.	There is cost and schedule risk due to a latent defect in the Combining Gear (CG) on Freedom variant LCS. A redesigned solution passed rigorous land-based and at-sea testing, and the design solution was installed on LCS 21 and LCS 23. The Navy accepted delivery of LCS 21 in November 2021. New construction ships LCS 25, LCS 27, and LCS 29 will receive the modification prior to delivery. LCS 31 has received the new CG in line during construction. Schedules have been adjusted to accommodate repairs, and the cost impact was addressed in PB 2023.
Original Baseline Estimate (April 2011)	
1.	The Navy accepted full funding responsibility in accordance with the Service Cost Position policy in support of the FY 2010 – FY 2015 Dual Block Buy Awards.
Revised Original Estimate (N/A)	
None	
Current Baseline Estimate (April YYYY)	
1.	The Navy accepted full funding responsibility in accordance with the Service Cost Position policy in support of the FY 2010 – FY 2015 Dual Block Buy Awards.

Unit Cost

Current Baseline Compared with Current Estimate

Category (\$M)	Current APB	Current Estimate	% Change	NMC Breach
PAUC				
Cost	32,011.0	19,151.8	-	-
Quantity	55	35	-	-
Unit Cost	582.018	547.194	-5.98	N
APUC				
Cost	28,369.2	15,867.6	-	-
Quantity	53	33	-	-
Unit Cost	535.268	480.836	-10.17	N

Original Baseline Compared with Current Estimate

Category (\$M)	Current APB	Current Estimate	% Change	NMC Breach
PAUC				
Cost	32,011.0	19,151.8	-	-
Quantity	55	35	-	-
Unit Cost	582.018	547.194	-5.98	N
APUC				
Cost	28,369.2	15,867.6	-	-
Quantity	53	33	-	-
Unit Cost	535.268	480.836	-10.17	N

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Contracts

Contract Data (\$TYM)		
Contract Number	N00024-11-C-2300	
Effort Number	11	
Modification Number	P00174 - 01/19/2022	
Award Date	03/31/2016	
Definitization Date	03/31/2016	
Order Number	N/A	
CAGE Code/CAGE Legal Name	38597/Lockheed Martin Corporation	
Contract Title	Construction – LCS 25	
Contract Address	2323 Eastern Boulevard, Middle River, MD 21220	
Contracts/Effort Price, Quantity, and Performance (\$M)		
Initial Target Price	Current Target Price	
N/A	N/A	
Initial Ceiling Price	Current Ceiling Price	
N/A	N/A	
Contract's EAC	PM's EAC	
N/A	N/A	
Initial Quantity	Current Quantity	Delivered Quantity
1	1	0
BAC	BCWP	ACWP
N/A	N/A	N/A
BCWS	Cost Variance	Schedule Variance
N/A	N/A	N/A

Contract Notes:

In accordance with Section 2432(i) of the FY 2022 National Defense Authorization Act, which requires a SAR to be submitted "in unclassified form without any designation relating to dissemination control" this SAR section has omitted Controlled Unclassified Information.

Contract Data (\$TYM)		
Contract Number	N00024-18-C-2300	
Effort Number	27	
Modification Number	P00049 - 01/18/2022	
Award Date	10/06/2017	
Definitization Date	10/06/2017	
Order Number	N/A	
CAGE Code/CAGE Legal Name	38597/Lockheed Martin Corporation	
Contract Title	Construction – LCS 27	
Contract Address	2323 Eastern Boulevard, Middle River, MD 21220	
Contracts/Effort Price, Quantity, and Performance (\$M)		
Initial Target Price		Current Target Price
N/A		N/A
Initial Ceiling Price		Current Ceiling Price
N/A		N/A
Contract's EAC		PM's EAC
N/A		N/A
Initial Quantity	Current Quantity	Delivered Quantity
1	1	0
BAC	BCWP	ACWP
N/A	N/A	N/A
BCWS	Cost Variance	Schedule Variance
N/A	N/A	N/A

Contract Notes:

In accordance with Section 2432(i) of the FY 2022 National Defense Authorization Act, which requires a SAR to be submitted "in unclassified form without any designation relating to dissemination control" this SAR section has omitted Controlled Unclassified Information.

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Contract Data (\$TYM)		
Contract Number	N00024-18-C-2300	
Effort Number	29	
Modification Number	P00049 - 01/18/2022	
Award Date	09/18/2018	
Definitization Date	09/18/2018	
Order Number	N/A	
CAGE Code/CAGE Legal Name	38597/Lockheed Martin Corporation	
Contract Title	Construction – LCS 29	
Contract Address	2323 Eastern Boulevard, Middle River, MD 21220	
Contracts/Effort Price, Quantity, and Performance (\$M)		
Initial Target Price	Current Target Price	
N/A	N/A	
Initial Ceiling Price	Current Ceiling Price	
N/A	N/A	
Contract's EAC	PM's EAC	
N/A	N/A	
Initial Quantity	Current Quantity	Delivered Quantity
1	1	0
BAC	BCWP	ACWP
N/A	N/A	N/A
BCWS	Cost Variance	Schedule Variance
N/A	N/A	N/A

Contract Notes:

This is the first time that this contract is being reported.

In accordance with Section 2432(i) of the FY 2022 National Defense Authorization Act, which requires a SAR to be submitted "in unclassified form without any designation relating to dissemination control" this SAR section has omitted Controlled Unclassified Information.

UNCLASSIFIED

Contract Data (\$TYM)		
Contract Number	N00024-18-C-2300	
Effort Number	31	
Modification Number	P00049 - 01/18/2022	
Award Date	09/18/2018	
Definitization Date	09/18/2018	
Order Number	N/A	
CAGE Code/CAGE Legal Name	38597/Lockheed Martin Corporation	
Contract Title	Construction – LCS 31	
Contract Address	2323 Eastern Boulevard, Middle River, MD 21220	
Contracts/Effort Price, Quantity, and Performance (\$M)		
Initial Target Price		Current Target Price
N/A		N/A
Initial Ceiling Price		Current Ceiling Price
N/A		N/A
Contract's EAC		PM's EAC
N/A		N/A
Initial Quantity	Current Quantity	Delivered Quantity
1	1	0
BAC	BCWP	ACWP
N/A	N/A	N/A
BCWS	Cost Variance	Schedule Variance
N/A	N/A	N/A

Contract Notes:

This is the first time that this contract is being reported.

In accordance with Section 2432(i) of the FY 2022 National Defense Authorization Act, which requires a SAR to be submitted "in unclassified form without any designation relating to dissemination control" this SAR section has omitted Controlled Unclassified Information.

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Contract Data (\$TYM)		
Contract Number	N00024-17-C-2301	
Effort Number	32	
Modification Number	P00045 – 11/03/2021	
Award Date	09/19/2018	
Definitization Date	09/19/2018	
Order Number	N/A	
CAGE Code/CAGE Legal Name	1T3Z4 – Austal USA	
Contract Title	Construction – LCS 32	
Contract Address	1 Dunlap Drive, Mobile AL 36602	
Contracts/Effort Price, Quantity, and Performance (\$M)		
Initial Target Price		Current Target Price
N/A		N/A
Initial Ceiling Price		Current Ceiling Price
N/A		N/A
Contract's EAC		PM's EAC
N/A		N/A
Initial Quantity	Current Quantity	Delivered Quantity
1	1	0
BAC	BCWP	ACWP
N/A	N/A	N/A
BCWS	Cost Variance	Schedule Variance
N/A	N/A	N/A

Contract Notes:

This is the first time that this contract is being reported.

In accordance with Section 2432(i) of the FY 2022 National Defense Authorization Act, which requires a SAR to be submitted "in unclassified form without any designation relating to dissemination control" this SAR section has omitted Controlled Unclassified Information.

UNCLASSIFIED

Contract Data (\$TYM)		
Contract Number	N00024-17-C-2301	
Effort Number	36	
Modification Number	P00045 – 11/03/2021	
Award Date	12/14/2018	
Definitization Date	12/14/2018	
Order Number	N/A	
CAGE Code/CAGE Legal Name	1T3Z4 – Austal USA	
Contract Title	Construction – LCS 36	
Contract Address	1 Dunlap Drive, Mobile AL 36602	
Contracts/Effort Price, Quantity, and Performance (\$M)		
Initial Target Price		Current Target Price
N/A		N/A
Initial Ceiling Price		Current Ceiling Price
N/A		N/A
Contract's EAC		PM's EAC
N/A		N/A
Initial Quantity	Current Quantity	Delivered Quantity
1	1	0
BAC	BCWP	ACWP
N/A	N/A	N/A
BCWS	Cost Variance	Schedule Variance
N/A	N/A	N/A

Contract Notes:

This is the first time that this contract is being reported.

In accordance with Section 2432(i) of the FY 2022 National Defense Authorization Act, which requires a SAR to be submitted "in unclassified form without any designation relating to dissemination control" this SAR section has omitted Controlled Unclassified Information.

Technologies and Systems Engineering

Significant Technical Risks

Significant Technical Risks	
Current Estimate (December 2021)	
1.	Multiple combining gear (CG) failures on several Freedom-variant Littoral Combat Ships (LCS) indicated defective equipment that is preventing Freedom-variant ships from fully meeting their operational and deployment requirements. A design solution has passed rigorous land-based and at-sea testing, and the design solution was installed on LCS 21 and LCS 23. The Navy accepted delivery of LCS 21 in November 2021. New construction ships LCS 25, LCS 27, and LCS 29 will receive the modification prior to delivery. LCS 31 has received the new CG in line during construction.
2.	The navigation system for LCS 27 and follow (Freedom variant) requires modification and testing in order to achieve certification by the Navigator of the Navy. The estimated completion date for NAVCERT approval is 4Q FY 2022.

Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	2	2	2	100.00%
Production	24	24	33	72.73%
Total Program Quantity Delivered	26	26	35	74.29%

Expended and Appropriated (TY \$M)

Total Acquisition Cost: **22,339.14**

Expended to Date: **19,980.88**

Percent Expended: **89.44%**

Total Funding Years: **23**

Years Appropriated: **20**

Percent Years Appropriated: **86.96%**

Appropriated to Date: **21,777.77**

Percent Appropriated: **97.49%**

The above data is current as of April 18, 2022.

Deliveries and Expenditures Notes:

The LCS program is at 89.44% expenditures. As such, this will be the last SAR submission.

Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	02/28/2011	03/28/2018
Approved Quantity	24	35
Reference	Milestone B ADM	LCS 2018 Acquisition Strategy
Start Year	2005	2005
End Year	2015	2019

Rationale if Current Total LRIP Quantity exceeds 10% of the total Procurement quantities:

The Current Total LRIP Quantity is more than 10% of the total production quantity due to the Milestone B decision that includes the ships through FY 2015, and subsequent extension, in order to cover the LCS Seaframe program requirements.

Operating and Support Costs

Total Program O&S Cost Compared with Baseline

	Current APB Objective (BY\$M)	Current APB Threshold (BY\$M)	Current Estimate (BY\$M)	Current Estimate (TY\$M)	Deviation
Total O&S (\$Millions)	50,479.0	55,526.9	43,915.0	65,072.0	

O&S Cost Breakdown

Category (BY\$ Million)	Annual Cost per Ship
Unit-Level Manpower	11.4
Unit Operations	7.8
Maintenance	24.9
Sustaining Support	4.9
Continued System Improvements	15.7
Indirect Support	4.7
Other	0.0
Total O&S	69.4

Cost Estimate Source: POE, March 2022

Disposal/Demilitarization Cost Estimate and Source of Estimate:

Date of Estimate: **March 2022**

Source of Estimate: **POE**

Disposal Total Cost (BY 2010 \$M): **114.0**

Sustainment Strategy:

The PEO USC Fleet Introduction and Sustainment branch is responsible for the operation, maintenance, and support of the LCS Seaframe systems.

LCS are minimally manned by rotational crews following a blue/gold crew construct. Shore support is required to manage some functions traditionally assigned to ship's force. Shore personnel are required to support LCS administrative functions, supply support, training, and ship specific preventive maintenance. Additionally, the LCS concept of operations and fleet requirements call for greater deployed time than other ship classes, allowed by rotational crewing.

Sustainment execution includes maintenance execution planning, planned and emergent maintenance; planning for scheduled availabilities, facilities maintenance; on-site support; modernization and engineering support services of LCS ships homeported in San Diego, California, Mayport, Florida, and deploying worldwide. Full transition to In-Service sustainment under a Product Support Plan is ongoing.

Lifecycle Cost Calculation:

Based on current decommissioning plans, the 35 delivered ships will have an average service life of 18.1 years.

Quantity to Sustain: **35**

First Operational Fiscal Year: **2009**

Final Operational Fiscal Year: **2049**

Unit Expected Service Life: **25 years**

Average Service Life: **18.1 years**

Total Lifecycle Cost = **\$69.4M** annual cost per ship x **35** ships x **18.1** years = **\$43.9B**

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