RCS: DD-A&T(Q&A)823-333

LHA 6 America Class Amphibious Assault Ship (LHA 6)

As of FY 2021 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

Table of Contents

Common Acronyms and Abbreviations for MDAP Programs

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

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

Program Information

Program Name
LHA 6 America Class Amphibious Assault Ship (LHA 6)

DoD Component
Navy

In accordance with Section 830(a)(2) of the FY 2020 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 information that is ~~For Official Use Only.~~

Responsible Office

Mr. Thomas Rivers
Program Executive Office, Ships
Amphibious Warfare Program Office
1333 Isaac Hull Avenue
Washington, DC 20376-2101

thomas.m.rivers@navy.mil

Phone: 202-781-0940
Fax: 202-781-4567
DSN Phone: 326-0940
DSN Fax: 326-4596
Date Assigned: September 28, 2015

References

SAR Baseline (Development Estimate)

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated January 12, 2006

Approved APB

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated October 20, 2016

Mission and Description

The LHA(R) Program replaces the Tarawa Class (LHA 1) Amphibious Assault Ships and the retiring Wasp Class (LHD 1) Amphibious Assault Class Ships.

The LHA (R) will be the key platform in the Expeditionary Strike Group (ESG)/Amphibious Ready Group (ARG) of the future and will provide the Joint Force Commander options to project expeditionary power. The LHA 6 America Class, the first ship of the LHA (R) Program, will embark and support all of the Short Take-off Vertical Landing (STOVL) and Vertical Take-off Landing Marine expeditionary aviation assets in the ESG/ARG, including the MV-22 and the F-35B, the STOVL model of the Joint Strike Fighter. The LHA 6 America Class is an LHD 8 gas turbine variant with enhanced aviation capability. The Flight 0 ships will embark over 1,600 Marines and transport them and their equipment ashore by rotary-wing aircraft when the situation requires. The Flight I ships maintains an aviation centric capability with the addition of a well deck that will accommodate two Landing Craft, Air Cushion. The Flight I ship will embark over 1,400 Marines and transport them and their equipment ashore by rotary-wing or surface connector.

Executive Summary

Program Highlights Since Last Report

The LHA (R) program completed another successful year, with each of the three ships of the LHA (R) Program achieving significant milestones.

LHA Flight 0 is composed of two ships: LHA 6 (USS America) and LHA 7 (TRIPOLI). LHA Flight 1 is currently composed of two ships LHA 8 (BOUGAINVILLE) and LHA 9.

LHA 6 is currently forward deployed in Sasebo, Japan.

LHA 7 production and testing continued at Huntington Ingalls Industries (HII), Ingalls Shipbuilding Division. LHA 7 Builder's Sea Trials successfully completed on July 19, 2019. Acceptance Trials (AT) successfully completed on October 25, 2019. Ship Service Diesel Generators (SSDG), Main Reduction Gear (MRG), Controllable Pitch Propeller (CPP), and Electric Anchor Windlass (EAW) production/test issues have impacted ship delivery. The SSDG and MRG were repaired and performed satisfactorily during AT. The ship was dry-docked to correct the CPP issue and ensure systems' ability to satisfy lifecycle requirements. Ship Delivery is anticipated in February 2020, pending compartment fit and finish completion and turnover, stern tube bearing repair, EAW solution, lube oil piping weld repair, and starred trial card closures.

LHA 8 production continued at HII. Keel was laid in March 2019. With Detail Design complete, fabrication has started on 159 of 218 production units and 24 units have been erected.

Actions were initiated for procurement for LHA 9, the second Flight 1 ship. LHA 9 will be a rollover of the LHA 8 design with obsolescence related changes incorporated. PB 2021 has accelerated the procurement of LHA 9 from FY 2024 to FY 2023. There has been Congressional interest to accelerate LHA 9 further in order to provide stability and predictability for the shipbuilder and its vendor base, and to mitigate the gap in large deck amphibious capability when LHD 1 is decommissioned in FY 2029. In support of accelerated actions, FY 2019 Defense Appropriations Bill appropriated $350M for LHA 9 Advance Procurement, FY 2020 National Defense Authorization Act authorizes +$650M Shipbuilding and Conversion, Navy (SCN) and incremental funding authority for SCN appropriated in FY 2019 through FY 2025, and FY 2020 Defense Appropriations Bill adds $650M SCN in FY 2020.

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**
March 2001	Mission Need Statement for the LHA(R) program was approved by JROC.
September 2002	Analysis of Alternatives was completed.
February 2005	CDD was validated by JROC. Subsequent validations/revalidations occurred which added Survivability and Force Protection KPPs in December 2005.
January 2006	Milestone B was completed. The ADM was signed and the LHA 6 contract was awarded in June 2007.
May 2012	The LHA 7, a repeat of the LHA 6 design configuration with fact of life updates for equipment obsolescence, Detail Design and Construction (DD&C) contract was awarded to Huntington Ingalls Industries(HII) Ingalls Shipbuilding in May 2012. LHA 7 began sustained production on July 15, 2013 and the Keel Laying Ceremony was held on June 20, 2014. A contract modification was awarded in October 2014 to incorporate flight deck strengthening and other design changes necessary for the F-35B as part of the initial production rather than after delivery as discussed on LHA 6 above. This contract modification included a six month schedule extension, with a revised delivery date of December 4, 2018.
February 2014	The LHA(R) CDD was updated to include LHA(R) Flight 1 capabilities. These include the reincorporation of the well deck, increased vehicle stowage square footage, provide for a surface connector lift capability, and to increase overall operational flexibility.
April 2014	On April 10, 2014 HII successfully delivered the LHA 6 to the Navy, marking the completion of the first ship in the LHA(R) program. The ship completed its post-delivery availability efforts on July 10, 2014 and commenced transit to her homeport of San Diego on July 11, 2014. During the transit, the LHA 6 traveled 15,300 miles on their journey around South America. Port visits included Colombia, Guantanamo Bay, Cuba, Brazil, and Peru. Various exercises and operations with foreign navies helped to bolster cooperative maritime security and partnerships. Additional training evolutions throughout the transit strengthened the crew's readiness and understanding of the ship's systems and capabilities. LHA 6 arrived in San Diego on September 15, 2014 and was commissioned on October 11, 2014 in San Francisco, CA. After completing Fitting Out Availability, Final Contract Trials and Post Shakedown Availability the ship was transferred to the Fleet in March 2016 and achieved IOC.
May 2016	The LHA(R) program's delegation was changed from ACAT ID to ACAT IC.
June 2016	On June 30, 2016, HII was awarded the contract for Planning, Advanced Engineering and Procurement of Long Lead Time Material (LLTM) with option for DD&C. The second increment of Advanced Procurement of LLTM was added to the contract on October 3, 2016. The contract option for the execution of DD&C of LHA 8 was awarded on June 16, 2017.
July 2017	LHA 6 (USS AMERICA) is the first new construction ship with full F-35B capability, Cornerstone and Environmental Effect alterations. She completed her Initial Operational Test and Evaluation in Q4 FY 2017 and deployed as the centerpiece of the AMERICA Amphibious Ready Group/Marine Expeditionary Unit.

Threshold Breaches

APB Breaches		
Schedule		☑
Performance		☐
Cost	RDT&E	☐
	Procurement	☑
	MILCON	☐
	Acq O&M	☑
O&S Cost		☐
Unit Cost	PAUC	☐
	APUC	☐

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

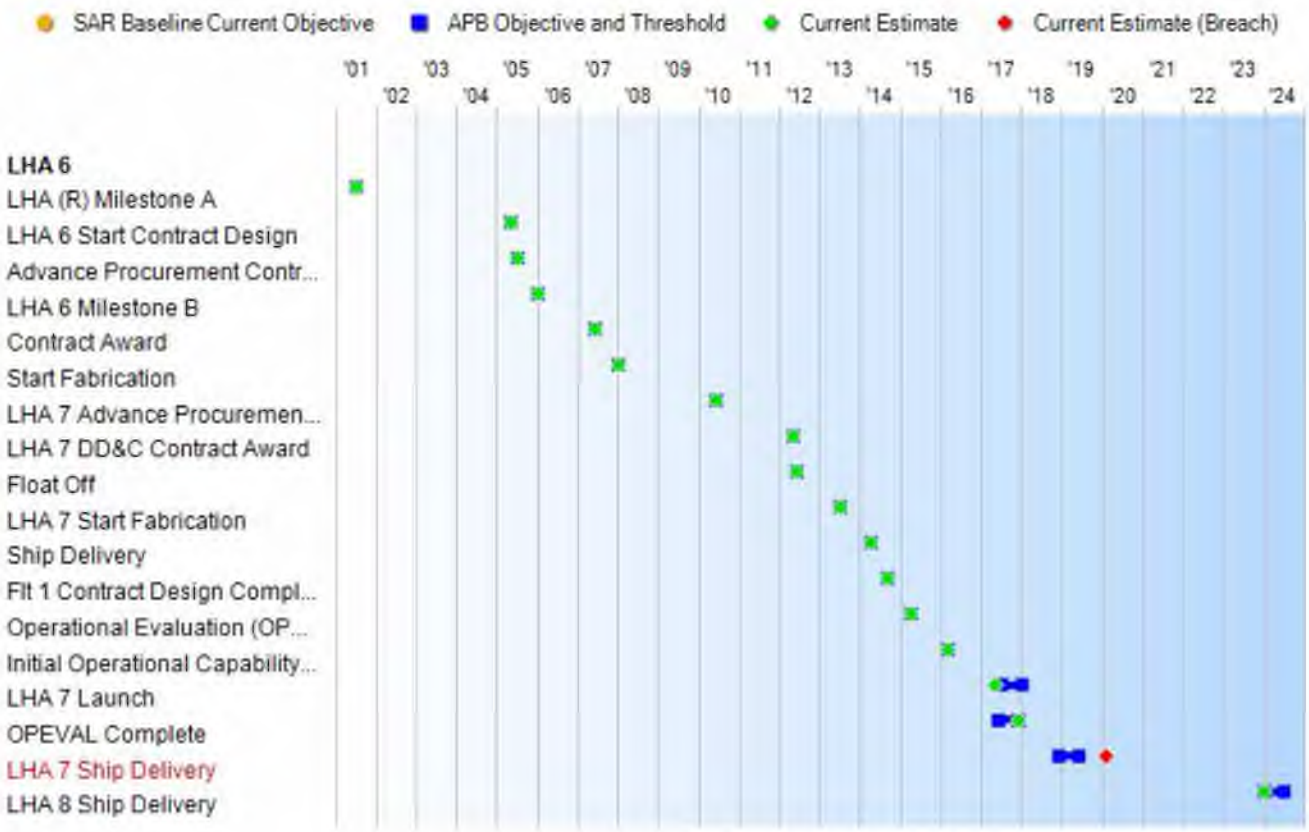
Explanation of Breach

The Schedule Breach is due to the LHA 7 Ship Delivery event. A Program Deviation Report was routed and approved in August 2019. The schedule delay is attributed to the delayed completion of the required Shipbuilder testing to support trials, and the scope of rework to Ship Service Diesel Generators, Main Reduction Gear, Controllable Pitch Propeller and Electric Anchor Windlass system.

Cost Breach of Procurement was previously reported in December 2018 SAR.

Cost Breach of Acq O&M was previously reported in December 2017 SAR.

Schedule


SAR Baseline Current Objective
APB Objective and Threshold
Current Estimate
Current Estimate (Breach)
'01
'02
'03
'04
'05
'06
'07
'08
'09
'10
'11
'12
'13
'14
'15
'16
'17
'18
'19
'20
'21
'22
'23
'24
LHA 6
LHA (R) Milestone A
LHA 6 Start Contract Design
Advance Procurement Contr...
LHA 6 Milestone B
Contract Award
Start Fabrication
LHA 7 Advance Procuremen...
LHA 7 DD&C Contract Award
Float Off
LHA 7 Start Fabrication
Ship Delivery
Flt 1 Contract Design Compl...
Operational Evaluation (OP...
Initial Operational Capability...
LHA 7 Launch
OPEVAL Complete
LHA 7 Ship Delivery
LHA 8 Ship Delivery

Schedule Events					
Events	SAR Baseline Development Estimate	Current APB Development Objective/Threshold		Current Estimate	
LHA (R) Milestone A	Jul 2001	Jul 2001	Jul 2001	Jul 2001	
LHA 6 Start Contract Design	May 2005	May 2005	May 2005	May 2005	
Advance Procurement Contract	Jul 2005	Jul 2005	Jul 2005	Jul 2005	
LHA 6 Milestone B	Jan 2006	Jan 2006	Jan 2006	Jan 2006	
Contract Award	Dec 2006	Jun 2007	Jun 2007	Jun 2007	
Start Fabrication	Nov 2007	Jan 2008	Jan 2008	Jan 2008	
LHA 7 Advance Procurement Contract Award	N/A	Jun 2010	Jun 2010	Jun 2010	
LHA 7 DD&C Contract Award	N/A	May 2012	May 2012	May 2012	
Float Off	Aug 2010	Jun 2012	Jun 2012	Jun 2012	
LHA 7 Start Fabrication	N/A	Jul 2013	Jul 2013	Jul 2013	
Ship Delivery	Dec 2011	Apr 2014	Apr 2014	Apr 2014	
Flt 1 Contract Design Complete	N/A	Sep 2014	Sep 2014	Sep 2014	
Operational Evaluation (OPEVAL) Start	Aug 2012	Apr 2015	Apr 2015	Apr 2015	
Initial Operational Capability (IOC)	Sep 2013	Mar 2016	Mar 2016	Mar 2016	
LHA 7 Launch	N/A	Jul 2017	Jan 2018	May 2017	
OPEVAL Complete	Sep 2013	Jun 2017	Dec 2017	Dec 2017	
LHA 7 Ship Delivery	N/A	Dec 2018	Jun 2019	**Feb 2020**[1]	(Ch-1)
LHA 8 Ship Delivery	N/A	Jan 2024	Jul 2024	Jan 2024	

[1] *APB Breach*

Change Explanations

(Ch-1) The LHA 7 Ship Delivery current estimate has changed from June 2019 to February 2020 due to delayed completion of required Shipbuilder testing to support trials and the scope of rework to Ship Service Diesel Generators, Main Reduction Gear and Controllable Pitch Propeller system.

Notes

Obligation Work Limiting Date for:

LHA 7 - Oct 2021

LHA 8 - Aug 2025

Acronyms and Abbreviations

DD&C - Detail Design and Construction
Flt - Flight

Performance

Performance Characteristics				
SAR Baseline Development Estimate	**Current APB Development Objective/Threshold**		**Demonstrated Performance**	**Current Estimate**
Net Ready				
100% of interfaces; services; policy-enforcement controls; and data correctness, availability and processing requirements in the joint integrated architecture	100% of interfaces; services; policy-enforcement controls; and data correctness, availability and processing requirements in the joint integrated architecture	100% of interfaces; services; policy-enforcement controls; and data correctness, availability and processing requirements designated as enterprise level or critical in the joint integrated architecture	LHA 6 has partially met the Net Ready KPP per Joint Interoperability Test Command Certification letter of January 23, 2018.	LHA 6 has partially met the Net Ready KPP per Joint Interoperability Test Command Certification letter of January 23, 2018.
Vertical Take Off and Landing land/launch spots				
9 CH-53E/MV-22	9 CH-53E/MV-22	(T=O) 9 CH-53E/MV-22	9 CH-53E/MV-22	9 CH-53E/MV-22
F-35B capacity				
23 Aircraft	23 Aircraft	20 Aircraft	TBD	23 Aircraft
Aviation operations				
6 Spots 12 hrs/day (Sustained) 6 Spots 24 hrs/day for six consecutive days (Surge)	6 Spots 10 hrs/day 12 hrs/day of flight quarters to support 10 hrs/day of flight operations	(T=O) 6 Spots 10 hrs/day 12 hrs/day of flight quarters to support 10 hrs/day of flight operations	6 spots 10 hrs/day 12 hrs/day of flight quarters to support 10 hrs/days of flight operations	6 spots 10 hrs/day 12 hrs/day of flight quarters to support 10 hrs/day of flight operations
Vehicles Flt 0 (sq. ft.)				
12,000 sq. ft.	12,000 sq. ft.	10,000 sq. ft.	12,055 sq. ft.	12,055 sq. ft.
Vehicles Flt 1 (sq. ft.)				
N/A	16,000 sq. ft.	(T=O) 16,000 sq. ft.	TBD	16,000 sq. ft.
Total Manpower Flt 0 (includes Ship's Force and all embarked elements such as troops, staffs, detachments, etc.)				
2,891 Persons	2,891 Persons	2,831 Persons	2,891 Persons	2,891 Persons
Total Manpower Flt 1 (Includes Ship's Force and all embarked elements: troops, staffs, detachments, etc.)				
N/A	2,666 (1,204 Navy + 1,462 Troop)	(T=O) 2,666 (1,204 Navy + 1,462 Troop)	TBD	2,666 (1,204 Navy + 1,462 Troop)
Cargo (cu. ft.)				

160,000 cu. ft.	160,000 cu. ft.	130,000 cu. ft.	155,153 cu. ft.	155,153 cu. ft.
Troop Accommodations Flt 0				
1,686 Persons	1,686 Persons	1,626 Persons	1,686 Persons	1,686 Persons
Troop Accommodations Flt 1				
N/A	1,462 Persons	(T=O) 1,462 Persons	TBD	1,462 Persons
Survivability: Navy Survivability Policy for Surface Ships				
Equals threshold, implement recommendations of the NAVSEA USS COLE Survivability Review Group Phase II Analysis Report of Amphibious Ships, April 2003	In addition to threshold, implement recommendations of the NAVSEA COLE Survivability Review Group Phase II Analysis Report of Amphibious Ships, April 2003	Level II per OPNAV-INST 9070.1 of September 23, 1988 (LHA(R)) cargo magazine protection as stated in para. 6.b.17 of the CDD	T-plus some Cole Survivability Review Group mods	T-plus some Cole Survivability Review Group mods
Force Protection: Collective Protection System (CPS)				
Expanded CBR protection that provides a toxic-free environment (where it is not necessary to wear protective clothing or masks) for 40% of crew in berthing, messing, sanitary, and battle dressing facilities as well as key operational spaces that can be affordably integrated into ship design	Expanded CBR protection that provides a toxic-free environment (where it is not necessary to wear protective clothing or masks) for 40% of crew in berthing, messing, sanitary, and battle dressing facilities as well as key operational spaces that can be affordably integrated into ship design	CBR protection that provides a toxic-free environment (where it is not necessary to wear protective clothing or masks) for 40% of crew in berthing, messing, sanitary, and battle dressing facilities	CBR protection that provides a toxic-free environment (where it is not necessary to wear protective clothing or masks) for 40% of crew in berthing, messing, sanitary, and battle dressing facilities	CBR protection that provides a toxic-free environment (where it is not necessary to wear protective clothing or masks) for 40% of crew in berthing, messing, sanitary, and battle dressing facilities
Force Protection: Decontamination Stations				
Four decontamination stations (two CPS, one casualty, and one conventional) providing a capability of decontamination an avg of ten people per hr per station	Four decontamination stations (two CPS, one casualty, and one conventional) providing a capability of decontamination an avg of ten people per hr per station	(T=O) Four decontamination stations (two CPS, one casualty, and one conventional) providing a capability of decontamination an avg of ten people per hr per station	Four decontamination stations (two CPS, one casualty, and one conventional) providing a capability of decontamination an avg of ten people per hr. per station	Four decontamination stations (two CPS, one casualty, and one conventional) providing a capability of decontamination an avg of ten people per hr. per station

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

Requirements Reference

CDD dated February 26, 2014

Change Explanations

None

Acronyms and Abbreviations

avg - average
CBR - Chemical, Biological, and Radiological
cu - cubic
etc. - etcetera
Flt - Flight
ft. - feet
hr. - hour
hrs - hours
INST. - Instruction
JITC - Joint Interoperability Test Command
NAVSEA - Naval Sea Systems Command
O - Objective
OPNAV - Office of the Chief of Naval Operations
sq. - square
T - Threshold

Track to Budget

RDT&E

Appn	BA	PE
Navy	04	0603564N

Project	Name		
0408	Ship Preliminary Design & Feasibility Studies/Ship Development	(Shared)	(Sunk)

Appn	BA	PE
Navy	05	0604567N

Project	Name		
2465	Ship Contract Design/Live Fire T&E		
9235	Ship Contract Design/Live Fire Test & Evaluation/LHA (R) DESIGN	(Shared)	(Sunk)
9236	Ship Contract Design/Live Fire Test & Evaluation/LHA(R) DESIGN	(Shared)	(Sunk)
9999	Congressional Add		(Sunk)
C467	Planning to Support FY 2021 Award of LHA 9		(Sunk)

Procurement

Appn	BA	PE
Navy	03	0204411N

Line Item	Name	
3041	LHA Replacement	
Notes:	LHA Replacement End Cost	

Appn	BA	PE
Navy	05	0204411N

Line Item	Name	
5110	Outfitting	(Shared)
5300	Completion of Prior Year Shipbuilding Programs	(Shared)
Notes:	Budget realigned to line item 3041 during year of execution.	

Notes

Completion of Prior Year Shipbuilding Programs (Line Item 5300) for LHA 7 Procurement appropriation will transfer into LHA Replacement (Line Item 3041) in the year of execution.

Acq O&M

Appn	BA	PE
Navy	01	0204411N

Subactivity Group	Name	
1C6C	Combat Support Forces	(Shared)

Notes: LHA(R) TADTAR

Cost and Funding

Cost Summary

Total Acquisition Cost							
Appropriation	BY 2006 $M			BY 2006 $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	199.9	408.1	448.9	422.8	197.5	447.6	466.9
Procurement	2677.5	8025.6	8828.2	10399.7[1]	2896.0	10539.0	14483.0
Flyaway	--	--	--	10399.7	--	--	14483.0
Recurring	--	--	--	10399.7	--	--	14483.0
Non Recurring	--	--	--	0.0	--	--	0.0
Support	--	--	--	0.0	--	--	0.0
Other Support	--	--	--	0.0	--	--	0.0
Initial Spares	--	--	--	0.0	--	--	0.0
MILCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Acq O&M	0.0	1.9	2.1	2.3[1]	0.0	1.9	2.7
Total	2877.4	8435.6	N/A	10824.8	3093.5	10988.5	14952.6

[1] *APB Breach*

Current APB Cost Estimate Reference

Program Office Estimate (POE) for the LHA 8 dated May 09, 2016

Cost Notes

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

Total Quantity			
Quantity	SAR Baseline Development Estimate	Current APB Development	Current Estimate
RDT&E	0	0	0
Procurement	1	3	4
Total	1	3	4

Cost and Funding

Funding Summary

Appropriation Summary FY 2021 President's Budget / December 2019 SAR (TY$ M)									
Appropriation	Prior	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	To Complete	Total
RDT&E	392.6	2.3	5.9	8.5	7.7	6.2	6.4	37.3	466.9
Procurement	10806.1	661.4	27.2	0.0	1248.6	1624.9	0.0	114.8	14483.0
MILCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Acq O&M	1.7	0.1	0.1	0.2	0.2	0.2	0.2	0.0	2.7
PB 2021 Total	11200.4	663.8	33.2	8.7	1256.5	1631.3	6.6	152.1	14952.6
PB 2020 Total	11206.0	13.9	13.6	6.3	176.9	1624.3	2072.3	49.8	15163.1
Delta	-5.6	649.9	19.6	2.4	1079.6	7.0	-2065.7	102.3	-210.5

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

Cost and Funding

Annual Funding By Appropriation

Annual Funding 1319 | RDT&E | Research, Development, Test, and Evaluation, Navy							
Fiscal Year	Quantity	TY $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2001	--	--	--	--	--	--	15.2
2002	--	--	--	--	--	--	4.9
2003	--	--	--	--	--	--	38.1
2004	--	--	--	--	--	--	52.9
2005	--	--	--	--	--	--	43.0
2006	--	--	--	--	--	--	21.6
2007	--	--	--	--	--	--	12.9
2008	--	--	--	--	--	--	10.9
2009	--	--	--	--	--	--	7.6
2010	--	--	--	--	--	--	8.7
2011	--	--	--	--	--	--	10.0
2012	--	--	--	--	--	--	20.4
2013	--	--	--	--	--	--	24.3
2014	--	--	--	--	--	--	76.5
2015	--	--	--	--	--	--	7.1
2016	--	--	--	--	--	--	8.3
2017	--	--	--	--	--	--	9.4
2018	--	--	--	--	--	--	8.1
2019	--	--	--	--	--	--	12.7
2020	--	--	--	--	--	--	2.3
2021	--	--	--	--	--	--	5.9
2022	--	--	--	--	--	--	8.5
2023	--	--	--	--	--	--	7.7
2024	--	--	--	--	--	--	6.2
2025	--	--	--	--	--	--	6.4
2026	--	--	--	--	--	--	29.1
2027	--	--	--	--	--	--	4.2
2028	--	--	--	--	--	--	2.0
2029	--	--	--	--	--	--	2.0
Subtotal	--	--	--	--	--	--	466.9

Annual Funding 1319 | RDT&E | Research, Development, Test, and Evaluation, Navy							
Fiscal Year	Quantity	BY 2006 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2001	--	--	--	--	--	--	16.6
2002	--	--	--	--	--	--	5.3
2003	--	--	--	--	--	--	40.7
2004	--	--	--	--	--	--	55.0
2005	--	--	--	--	--	--	43.5
2006	--	--	--	--	--	--	21.2
2007	--	--	--	--	--	--	12.4
2008	--	--	--	--	--	--	10.3
2009	--	--	--	--	--	--	7.1
2010	--	--	--	--	--	--	8.0
2011	--	--	--	--	--	--	8.9
2012	--	--	--	--	--	--	17.9
2013	--	--	--	--	--	--	21.1
2014	--	--	--	--	--	--	65.6
2015	--	--	--	--	--	--	6.0
2016	--	--	--	--	--	--	6.9
2017	--	--	--	--	--	--	7.7
2018	--	--	--	--	--	--	6.5
2019	--	--	--	--	--	--	9.9
2020	--	--	--	--	--	--	1.8
2021	--	--	--	--	--	--	4.4
2022	--	--	--	--	--	--	6.3
2023	--	--	--	--	--	--	5.6
2024	--	--	--	--	--	--	4.4
2025	--	--	--	--	--	--	4.5
2026	--	--	--	--	--	--	19.8
2027	--	--	--	--	--	--	2.8
2028	--	--	--	--	--	--	1.3
2029	--	--	--	--	--	--	1.3
Subtotal	--	--	--	--	--	--	422.8

Annual Funding 1611 | Procurement | Shipbuilding and Conversion, Navy							
Fiscal Year	Quantity	TY $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2005	--	149.2	--	--	149.2	--	149.2
2006	--	350.1	--	--	350.1	--	350.1
2007	1	1131.1	--	--	1131.1	--	1131.1
2008	--	1365.8	--	--	1365.8	--	1365.8
2009	--	190.7	--	--	190.7	--	190.7
2010	--	169.3	--	--	169.3	--	169.3
2011	1	937.6	--	--	937.6	--	937.6
2012	--	1942.1	--	--	1942.1	--	1942.1
2013	--	173.6	--	--	173.6	--	173.6
2014	--	66.0	--	--	66.0	--	66.0
2015	--	65.6	--	--	65.6	--	65.6
2016	--	489.2	--	--	489.2	--	489.2
2017	1	1633.5	--	--	1633.5	--	1633.5
2018	--	1739.2	--	--	1739.2	--	1739.2
2019	--	403.1	--	--	403.1	--	403.1
2020	--	661.4	--	--	661.4	--	661.4
2021	--	27.2	--	--	27.2	--	27.2
2022	--	--	--	--	--	--	--
2023	1	1248.6	--	--	1248.6	--	1248.6
2024	--	1624.9	--	--	1624.9	--	1624.9
2025	--	--	--	--	--	--	--
2026	--	93.6	--	--	93.6	--	93.6
2027	--	21.2	--	--	21.2	--	21.2
Subtotal	4	14483.0	--	--	14483.0	--	14483.0

Annual Funding 1611 | Procurement | Shipbuilding and Conversion, Navy							
Fiscal Year	Quantity	BY 2006 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2005	--	141.6	--	--	141.6	--	141.6
2006	--	321.0	--	--	321.0	--	321.0
2007	1	991.6	--	--	991.6	--	991.6
2008	--	1157.9	--	--	1157.9	--	1157.9
2009	--	156.9	--	--	156.9	--	156.9
2010	--	134.6	--	--	134.6	--	134.6
2011	1	721.7	--	--	721.7	--	721.7
2012	--	1461.5	--	--	1461.5	--	1461.5
2013	--	128.0	--	--	128.0	--	128.0
2014	--	47.7	--	--	47.7	--	47.7
2015	--	46.5	--	--	46.5	--	46.5
2016	--	339.5	--	--	339.5	--	339.5
2017	1	1110.3	--	--	1110.3	--	1110.3
2018	--	1158.2	--	--	1158.2	--	1158.2
2019	--	263.2	--	--	263.2	--	263.2
2020	--	423.4	--	--	423.4	--	423.4
2021	--	17.1	--	--	17.1	--	17.1
2022	--	--	--	--	--	--	--
2023	1	753.1	--	--	753.1	--	753.1
2024	--	960.9	--	--	960.9	--	960.9
2025	--	--	--	--	--	--	--
2026	--	53.2	--	--	53.2	--	53.2
2027	--	11.8	--	--	11.8	--	11.8
Subtotal	4	10399.7	--	--	10399.7	--	10399.7

Cost Quantity Information 1611 | Procurement | Shipbuilding and Conversion, Navy		
Fiscal Year	**Quantity**	**End Item Recurring Flyaway (Aligned With Quantity) BY 2006 $M**
2005	--	--
2006	--	--
2007	1	2834.9
2008	--	--
2009	--	--
2010	--	--
2011	1	2548.9
2012	--	--
2013	--	--
2014	--	--
2015	--	--
2016	--	--
2017	1	2657.3
2018	--	--
2019	--	--
2020	--	--
2021	--	--
2022	--	--
2023	1	2358.6
2024	--	--
2025	--	--
2026	--	--
2027	--	--
Subtotal	4	10399.7

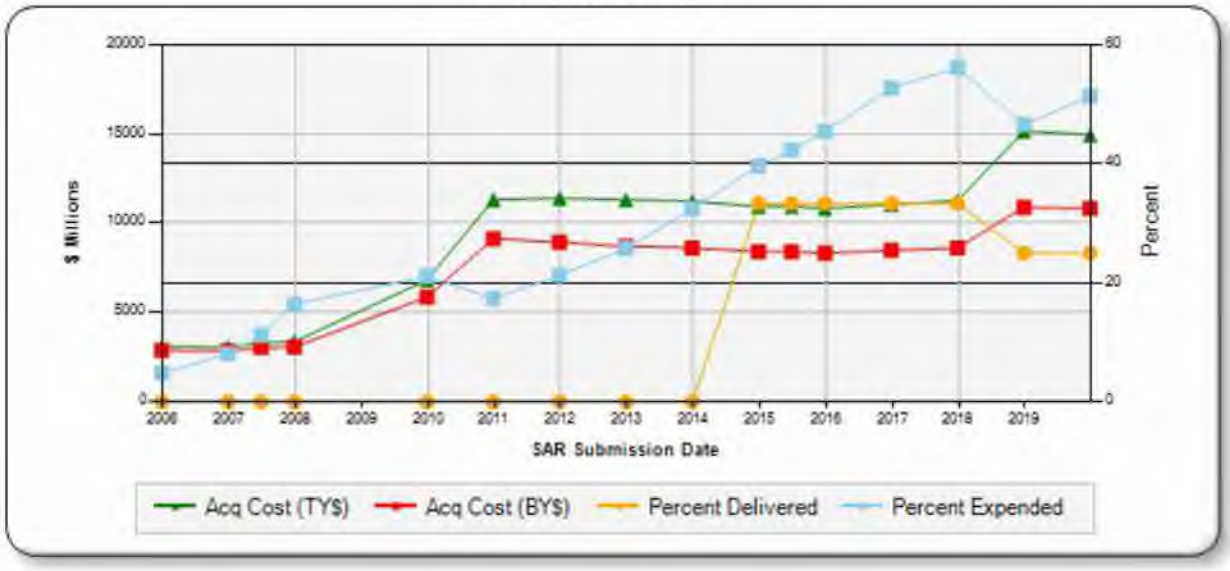
Annual Funding 1804 | Acq O&M | Operation and Maintenance, Navy	
Fiscal Year	TY $M Total Program
2010	0.2
2011	0.2
2012	0.2
2013	0.1
2014	0.1
2015	0.2
2016	0.2
2017	0.2
2018	0.2
2019	0.1
2020	0.1
2021	0.1
2022	0.2
2023	0.2
2024	0.2
2025	0.2
Subtotal	2.7

Annual Funding 1804 | Acq O&M | Operation and Maintenance, Navy	
Fiscal Year	BY 2006 $M Total Program
2010	0.2
2011	0.2
2012	0.2
2013	0.1
2014	0.1
2015	0.2
2016	0.2
2017	0.2
2018	0.2
2019	0.1
2020	0.1
2021	0.1
2022	0.1
2023	0.1
2024	0.1
2025	0.1
Subtotal	2.3

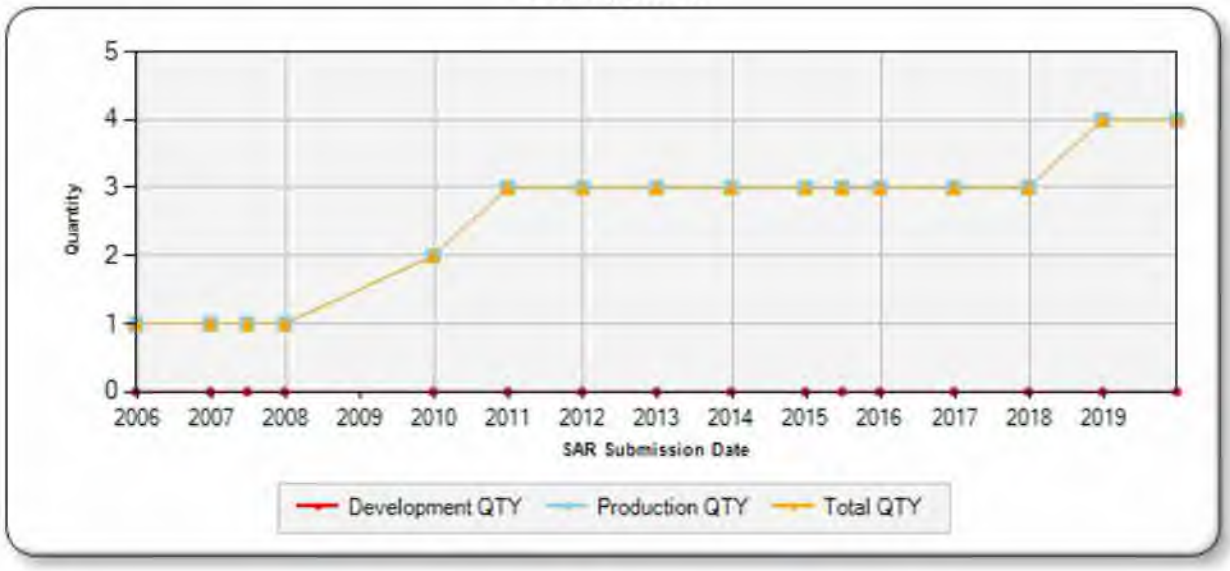
Charts

LHA 6 first began SAR reporting in December 2005

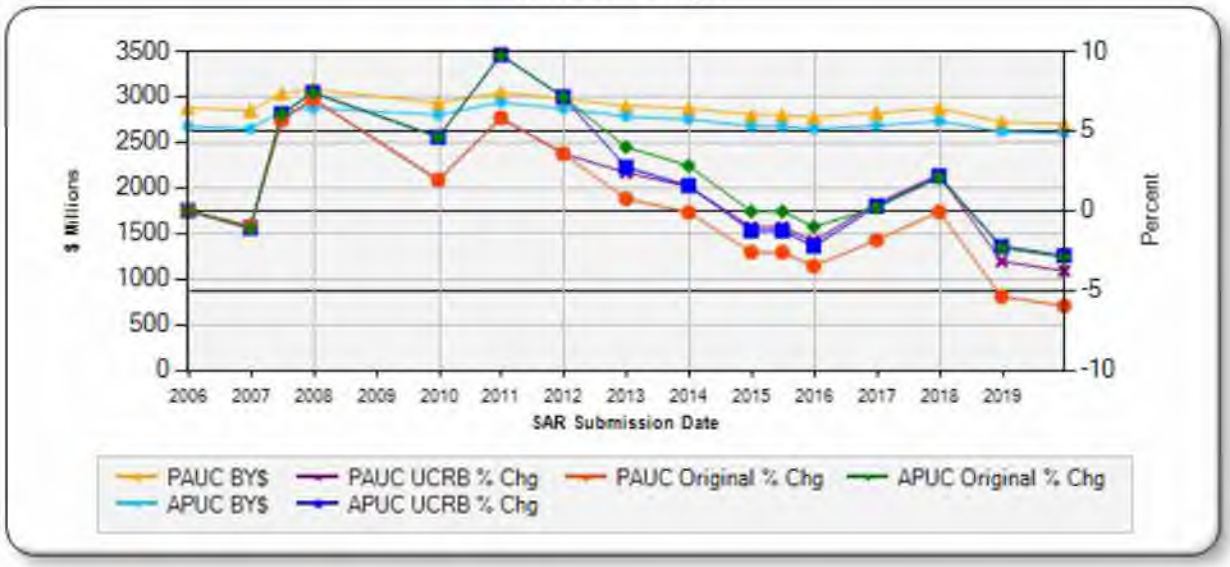
Program Acquisition Cost - LHA 6
Base Year 2006 $M



Quantity - LHA 6



Unit Cost - LHA 6
Base Year 2006 $M



Risks

Significant Schedule and Technical Risks

Significant Schedule and Technical Risks	
Milestone A (July 2001)	
1.	N/A
Milestone B (January 2006)	
1.	N/A
Current Estimate (December 2019)	
1.	LHA (R) Change (Cost/Schedule/Technical): If LHA (R) is subject to a higher degree of design change than anticipated and/or planned due to design changes from and within Flight 0/1, Flight 0 lessons learned, and Fact of Life obsolescence, then cost may exceed Program Change Order budget and resultant ship incorporation could impact ship capability at sail away. MITIGATION: Early Identification of technical changes; Identify most cost-efficient point of incorporation.
2.	Enterprise Air Search Radar (EASR) (Cost/Schedule/Technical): If the EASR development, production and test schedule slips, then LHA 8 Government Furnished Information/Government Furnished Equipment may be delayed which would cause out of sequence design, delayed installation and ship integration testing resulting in LHA 8 Detail Design and Construction cost and schedule impacts. MITIGATION: Program Approval, Review and Modification Oversight, EASR Integration Working Group Participation.
3.	LHA (R) Shipyard Resources (Cost/Schedule): If the proper labor resources are not available and sequenced properly for LHA (R) platforms in accordance with the approved Program Management Baseline/Integrated Master Schedule, then slips are likely to occur with negative impacts to Shipbuilder's contract cost and schedule. MITIGATION: Contract Incentives, Navy/Shipbuilder Program Management Office weekly reviews.

Risks

Risk and Sensitivity Analysis

Risks and Sensitivity Analysis	
Current Baseline Estimate (October 2016)	
1.	The Current Baseline Estimate was updated to include the LHA 8. Costs are inclusive of both Flight 0 (LHA 6 & 7) and Flight 1 (LHA 8) ships.
Original Baseline Estimate (January 2006)	
1.	The Original Baseline Estimate reflects the single Flight 0 ship, LHA 6 only.
Revised Original Estimate (N/A)	
None	
Current Procurement Cost (December 2019)	
1.	The Current Procurement Cost remains the Current Baseline Estimate (October 2016). Please see above for details.

Low Rate Initial Production

There is no LRIP for this program.

Foreign Military Sales

None

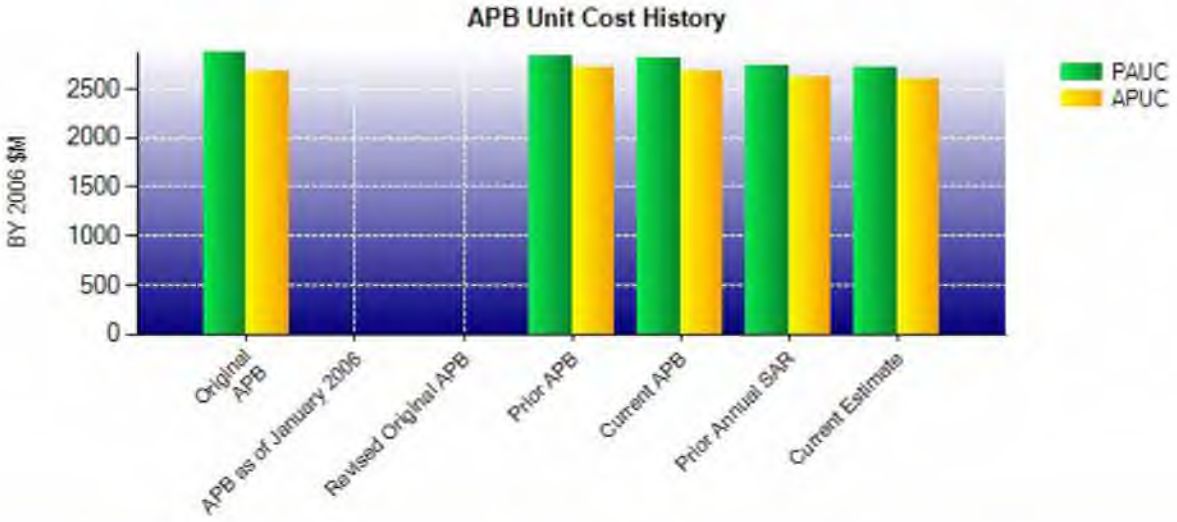
Nuclear Costs

None

Unit Cost

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2006 $M Current UCR Baseline (Oct 2016 APB)	BY 2006 $M Current Estimate (Dec 2019 SAR)	% Change
Program Acquisition Unit Cost			
Cost	8435.6	10824.8	
Quantity	3	4	
Unit Cost	2811.867	2706.200	-3.76
Average Procurement Unit Cost			
Cost	8025.6	10399.7	
Quantity	3	4	
Unit Cost	2675.200	2599.925	-2.81

Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2006 $M Original UCR Baseline (Jan 2006 APB)	BY 2006 $M Current Estimate (Dec 2019 SAR)	% Change
Program Acquisition Unit Cost			
Cost	2877.4	10824.8	
Quantity	1	4	
Unit Cost	2877.400	2706.200	-5.95
Average Procurement Unit Cost			
Cost	2677.5	10399.7	
Quantity	1	4	
Unit Cost	2677.500	2599.925	-2.90



APB Unit Cost History					
Item	Date	BY 2006 $M		TY $M	
		PAUC	APUC	PAUC	APUC
Original APB	Jan 2006	2877.400	2677.500	3093.500	2896.000
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	May 2012	2831.550	2710.450	3402.450	3281.700
Current APB	Oct 2016	2811.867	2675.200	3662.833	3513.000
Prior Annual SAR	Dec 2018	2723.075	2615.600	3790.775	3671.925
Current Estimate	Dec 2019	2706.200	2599.925	3738.150	3620.750

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	
3093.500	215.000	784.725	-16.625	14.625	-421.075	68.000	0.000	644.650	3738.150

Current SAR Baseline to Current Estimate (TY $M)									
Initial APUC Development Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2896.000	215.050	932.850	-18.125	0.000	-473.025	68.000	0.000	724.750	3620.750

SAR Baseline History				
Item	SAR Planning Estimate	SAR Development Estimate	SAR Production Estimate	Current Estimate
Milestone A	N/A	Jul 2001	N/A	Jul 2001
Milestone B	N/A	Jan 2006	N/A	Jan 2006
Milestone C	N/A	N/A	N/A	N/A
IOC	N/A	Sep 2013	N/A	Mar 2016
Total Cost (TY $M)	N/A	3093.5	N/A	14952.6
Total Quantity	N/A	1	N/A	4
PAUC	N/A	3093.500	N/A	3738.150

Cost Variance

Summary TY $M					
Item	RDT&E	Procurement	MILCON	Acq O&M	Total
SAR Baseline (Development Estimate)	197.5	2896.0	--	--	3093.5
Previous Changes					
Economic	-0.4	+847.4	--	+0.1	+847.1
Quantity	--	+12419.4	--	--	+12419.4
Schedule	+6.0	+9.4	--	--	+15.4
Engineering	+58.5	--	--	--	+58.5
Estimating	+211.3	-1756.5	--	+2.4	-1542.8
Other	--	+272.0	--	--	+272.0
Support	--	--	--	--	--
Subtotal	+275.4	+11791.7	--	+2.5	+12069.6
Current Changes					
Economic	+0.1	+12.8	--	--	+12.9
Quantity	--	--	--	--	--
Schedule	--	-81.9	--	--	-81.9
Engineering	--	--	--	--	--
Estimating	-6.1	-135.6	--	+0.2	-141.5
Other	--	--	--	--	--
Support	--	--	--	--	--
Subtotal	-6.0	-204.7	--	+0.2	-210.5
Total Changes	+269.4	+11587.0	--	+2.7	+11859.1
Current Estimate	466.9	14483.0	--	2.7	14952.6

Summary BY 2006 $M					
Item	RDT&E	Procurement	MILCON	Acq O&M	Total
SAR Baseline (Development Estimate)	199.9	2677.5	--	--	2877.4
Previous Changes					
Economic	--	--	--	--	--
Quantity	--	+8827.3	--	--	+8827.3
Schedule	+4.4	-33.3	--	--	-28.9
Engineering	+49.5	--	--	--	+49.5
Estimating	+173.8	-1258.8	--	+2.3	-1082.7
Other	--	+249.7	--	--	+249.7
Support	--	--	--	--	--
Subtotal	+227.7	+7784.9	--	+2.3	+8014.9
Current Changes					
Economic	--	--	--	--	--
Quantity	--	--	--	--	--
Schedule	--	--	--	--	--
Engineering	--	--	--	--	--
Estimating	-4.8	-62.7	--	--	-67.5
Other	--	--	--	--	--
Support	--	--	--	--	--
Subtotal	-4.8	-62.7	--	--	-67.5
Total Changes	+222.9	+7722.2	--	+2.3	+7947.4
Current Estimate	422.8	10399.7	--	2.3	10824.8

Previous Estimate: December 2018

RDT&E	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+0.1
Schedule variance due to LHA 6 F-35 test moved from FY 2021 to FY 2022 because resources are not available. (Schedule)	0.0	0.0
Revised estimate to reflect Executive Realignment of Small Business Innovation Research. (Estimating)	-0.2	-0.2
Revised estimate due to the removal of FY2021 F-35B Test Ahead of Need. (Estimating)	-2.8	-3.6
Revised estimate for LHA 8 for FY 2025 and FY 2026.. (Estimating)	-1.7	-2.2
Adjustment for current and prior escalation. (Estimating)	-0.1	-0.1
RDT&E Subtotal	-4.8	-6.0

Procurement	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+12.8
Acceleration of procurement buy profile for LHA 9 from FY 2024 to FY 2023. (Schedule)	0.0	-81.9
Revised estimate to include increase in FY20 NDAA/APPN Act. (Estimating)	+416.1	+650.0
Revised estimate to reflect Navy Working Capital Fund, Inflation Rates, unliquidated Federal Employee Retirement System (Estimating)	-2.9	-4.8
Revised estimate to reflect the removal of excess funding due to FY 2020 Congressional add. (Estimating)	-392.1	-650.0
Revised estimate to reflect the shift in LHA 9 procurement from FY 2024 to FY 2023. (Estimating)	-75.6	-118.2
Adjustment for current and prior escalation. (Estimating)	-4.4	-6.4
Revised estimate due to application of new outyear inflation indices. (Estimating)	-3.8	-6.2
Procurement Subtotal	-62.7	-204.7

Acq O&M	$M	
Current Change Explanations	Base Year	Then Year
Revised estimate to include an additional year of acquisition support funding for LHA 8 and 9. (Estimating)	0.0	+0.2
Acq O&M Subtotal	0.0	+0.2

Contracts

Contract Identification

Appropriation: Procurement
Contract Name: LHA 8 Detail Design and Construction Contract (DD&C)
Contractor: Huntington Ingalls Incorporated
Contractor Location: 1000 Access Road
Pascagoula, MS 39567-4485
Contract Number: N00024-16-C-2427/1
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: June 30, 2016
Definitization Date: June 30, 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
N/A	N/A	N/A	N/A	N/A	N/A		

Cost and Schedule Variance Explanations

Cost and Schedule Variance reporting is not required on this (FPIF) contract.

General Contract Variance Explanation

In accordance with Section 830(a)(2) of the FY 2020 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 information that is ~~For Official Use Only~~.

Notes

The December 2019 Contract Performance Report is used in this report.

The PM Estimated Price at Completion reflects the Current Target Price of the contract.

Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	0	0	0	--
Production	4	1	4	25.00%
Total Program Quantity Delivered	4	1	4	25.00%

Expended and Appropriated (TY $M)			
Total Acquisition Cost	14952.6	Years Appropriated	20
Expended to Date	7672.6	Percent Years Appropriated	68.97%
Percent Expended	51.31%	Appropriated to Date	11864.2
Total Funding Years	29	Percent Appropriated	79.35%

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

Notes

The planned delivery to date was increased to four ships due to funding added for LHA 9.

Operating and Support Cost

Cost Estimate Details

Date of Estimate:	May 09, 2016
Source of Estimate:	POE
Quantity to Sustain:	3
Unit of Measure:	Ship
Service Life per Unit:	40.00 Years
Fiscal Years in Service:	FY 2017 - FY 2064

The LHA (R) program is currently comprised of the LHA 6, LHA 7 and LHA 8 ships. LHA 6 was delivered to the Navy in April 2014. LHA 7 and LHA 8 are under construction.

The O&S cost estimate will be updated when a new APB is approved with 4 ships as Program of Record.

The intent is to estimate the normal costs of O&S for periods when the ship in typical peacetime operations. Additional costs that might be incurred under wartime operating scenarios are not included. Potential costs of currently unplanned and unknown future upgrades or configuration changes are assumed to occur in the same proportion as modernization work that has occurred on the LHD 1 ship class. Nominal OPTEMPO is assumed to be 2700 hours steaming underway and 1200 hours steaming not underway, based on the fuel burn rates and time profiles provided by the LHA 6 design team.

Sustainment Strategy

The LHA (R) sustainment strategy includes the use of commercial shipyards for depot maintenance in concert with Organizational (O) and Intermediate (I) level maintenance strategies. Existing shore support and infrastructure will be used to the maximum extent possible. Life cycle cost savings are anticipated from fuel savings realized from the propulsion system and Manpower savings expected from operations and maintenance of the Gas Turbine engines.

Antecedent Information

The antecedent system designated for the LHA (R) program is LHD 1. LHD 1 Unitized O&S Costs (BY 2006 $M) reflect the Operating and Support Cost Analysis Model (OSCAM) historical average dataset for LHD 1. Visibility and Management of Operating and Support Costs (VAMOSC) data reflects average O&S return data for active ships (LHD1-7) between FY 1992 and FY 2016. Open Architecture Retrieval System (OARS) 3-M data includes the years FY 2001 through FY 2016. Like the LHA (R) program Unitized O&S Costs, antecedent costs reflect a 40 year life cycle. Projected manning includes approximately 24 fewer officer and 55 fewer enlisted personnel than the average historical manning on LHD 1-7. However, FY 2006 Military Pay Rates utilized to estimate Personnel are approximately 12 percent higher than the average LHD 1-7 historical rates, which were inflated to FY 2006. Therefore, Unit Level Personnel costs do not reflect expected savings due to reduction in crew size. If personnel rates were normalized, it would show an approximate 10 percent savings when compared to the antecedent class. The discrepancy between historical rates and the FY 2006 set could be driven in part by actual crews being manned with lower ranking personnel than that assumed in the baseline estimate. For comparative purposes, the FY 2006 cost per barrel of Diesel Fuel, Marine (DFM) was substituted for the historical average cost of DFM observed in LHD 1 class data. This methodology better aligns LHD 1 historical requirements for Unit Operations with estimated requirements. In line with LHA (R) Maintenance requirements, antecedent Maintenance costs reflect requirements laid out in the Office of the Chief of Navel Operations (OPNAV) 4700.

Annual O&S Costs BY2006 $M		
Cost Element	**LHA 6 Average Annual Cost Per Ship**	**LHD 1 (Antecedent) Average Annual Cost Per Ship**
Unit-Level Manpower	68.694	71.983
Unit Operations	12.102	18.910
Maintenance	31.178	34.882
Sustaining Support	8.997	9.276
Continuing System Improvements	9.749	8.978
Indirect Support	40.464	45.227
Other	0.000	0.000
Total	171.184	189.256

Item	Total O&S Cost $M			
	LHA 6			LHD 1 (Antecedent)
	Current Development APB Objective/Threshold		Current Estimate	
Base Year	20542.0	22596.2	20542.0	22710.8
Then Year	38382.5	N/A	38382.5	0.0

Equation to Translate Annual Cost to Total Cost

Total O&S Cost = 3 Ships X 40 Service Life X $171.184M Average Annual Cost Per Ship = $20,542.0M.

O&S Cost Variance		
Category	**BY 2006 $M**	**Change Explanations**
Prior SAR Total O&S Estimates - Dec 2018 SAR	20542.0	
Programmatic/Planning Factors	0.0	
Cost Estimating Methodology	0.0	
Cost Data Update	0.0	
Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	0.0	
Other	0.0	
Total Changes	0.0	
Current Estimate	20542.0	

Disposal Estimate Details

Date of Estimate: May 09, 2016
Source of Estimate: POE
Disposal/Demilitarization Total Cost (BY 2006 $M): 28.6

The CG class of ship was determined by the Naval Sea Systems Command (NAVSEA) Inactive Ships Program Office (PMS 21I) as most comparable to the LHA 7 out of those vessels historically disposed of by NAVSEA. The decision to use the CG class of ships was based upon the comparison of warship compartmentalization, hazardous materials to remove and hull weight, influenced by scrap metal commodity prices.