Selected Acquisition Report (SAR)

CVN 78 Gerald R. Ford Class Nuclear Aircraft Carrier (CVN 78)

FY 2024 President's Budget

Defense Acquisition Visibility Environment (DAVE)

Table of Contents

Common Acronyms and Abbreviations

$B - Billions of Dollars
$K - Thousands of Dollars
$M - Millions of Dollars
ACAT - Acquisition Category
Acq O&M - Acquisition-Related Operations and Maintenance
ADM - Acquisition Decision Memorandum
APB - Acquisition Program Baseline
APPN - Appropriation
APUC - Average Procurement Unit Cost
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
FMS - Foreign Military Sales
FOC - Full Operational Capability
FRP - Full Rate Production
FY - Fiscal Year
FYDP - Future Years Defense Program
ICE - Independent Cost Estimate
Inc - Increment
IOC - Initial Operational Capability
JROC - Joint Requirements Oversight Council
KPP - Key Performance Parameter
LRIP - Low Rate Initial Production
MDA - Milestone Decision Authority
MDAP - Major Defense Acquisition Program
MILCON - Military Construction
N/A - Not Applicable
O&M - Operations and Maintenance
O&S - Operating and Support
ORD - Operational Requirements Document
OSD - Office of the Secretary of Defense
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
U.S. - United States
UCR - Unit Cost Reporting
USD(A&S) - Under Secretary of Defense (Acquisition and Sustainment)
USD(AT&L) - Under Secretary of Defense (Acquisition, Technology and Logistics)

Program Information

Program Name

CVN 78

DoD Component

Navy

Program Name

EMALS

DoD Component

Navy

Responsible Office: PMS 378

Program Manager

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Mission and Description

The CVN 78 Gerald R. Ford Class Nuclear Aircraft Carrier (CVN 78) is the successor to the NIMITZ Class (CVN 68) aircraft carrier. The CVN 78 mission is to provide credible, sustainable, independent forward presence during peacetime without access to land bases; operate as the cornerstone of a joint and/or allied maritime expeditionary force in response to crisis; and carry the war to the enemy through joint multi-mission offensive operations by: (a) being able to operate and support aircraft in attacks on enemy forces ashore, afloat, or submerged independent of forward-based land facilities, (b) protecting friendly forces from enemy attack through the establishment and maintenance of battle space dominance independent of forward-based land facilities, and (c) engaging in sustained operations in support of the United States and its allies independent of forward-based land facilities. The CVN 78 Class Aircraft Carrier program includes major efforts for Nuclear Propulsion/Electric Plant Design, Electromagnetic Aircraft Launching System (EMALS) and all electric auxiliary systems. Additional design features and new technologies have been added, including a new/enlarged flight deck, improved weapons handling capabilities, and improved survivability.

Executive Summary

CVN 78

Program Highlights Since Last Report

GERALD R. FORD (CVN 78)
CVN 78 reached Obligation Work Limiting Date in July 2022. The Test and Evaluation Master Plan was signed by Director, Operational Test and Evaluation and CVN 78 entered the Initial Operational Test and Evaluation period in September 2022. In October 2022 CVN 78 departed its homeport for a service retained deployment and returned to its homeport in November. While underway the ship completed more than 1,250 sorties, expended 78 tons of ordnance, and completed 13 underway replenishments. In 2023, CVN 78 will depart for her planned operational deployment.

JOHN F. KENNEDY (CVN 79)
CVN 79 is 89 percent complete. The Navy has transitioned CVN 79 from a two-phase delivery to a single- phase delivery, which will deliver the ship from the current construction period with its complete warfare systems and deliver F- 35C capability in accordance with the FY 2020 NDAA. The CVN 79 delivery date is being adjusted to July 2025 to support a capability-based ship delivery/post-delivery strategy. The Navy is shifting work from the Post-Shakedown Availability (PSA) into the construction period to incorporate CVN 78 lessons learned focused on improving the capability of the ship at delivery. This approach will prepare CVN 79 as the first FORD Class aircraft carrier to operate in the Indo-Pacific region and decrease the amount of time CVN 79 would be required to be at the shipyard after ship delivery to conduct the PSA. CVN 79's PSA will align to a traditional period of resolving discrepancies discovered during trials. The revised strategy maintains the overall "ready for deployment workups" milestone for CVN 79. Under this revised ship delivery/post-delivery strategy, sufficient cost to complete funding is available in FY 2024 to continue construction on CVN 79. The Navy will address any funding adjustments as part of the PB 2025 submission.

ENTERPRISE (CVN 80) / DORIS MILLER (CVN 81)
The Navy awarded the CVN 80/81 Detail Design and Construction contract on January 31, 2019. CVN 80 is 28 percent complete. Key to achieving the cost targets of the two-ship buy is implementation of Integrated Digital Shipbuilding (iDS) which is a new set of tools that will improve the efficiency of the construction planning and execution process. The development of the toolset requires coordination between the shipbuilder's engineering, planning and production departments to produce the ship's design, build plan, and trade production instructions. These iDS products will be used on FORD Class and the shipbuilder's other production lines, including the COLUMBIA Class submarine. The development of these products precedes ship construction and is currently at 99 percent to schedule requirements. The two-ship acquisition strategy delivers significant savings to the government – exceeding $4 billion when compared to the Navy's cost estimate to procure these CVNs separately. CVN 81 Ceremonial First Cut of Steel was conducted on August 25, 2021. The CVN 80 keel laying ceremony was held on August 27, 2022 and the CVN 81 keel laying is planned for FY 2026. A Capital Expenditure (CAPEX) incentive for upgrades to Dry Dock 12 was awarded in October 2022. This CAPEX project installs a new watertight intermediate gate lodge to split the dry dock into two sections and enables simultaneous construction of two aircraft carriers in the same dry dock. As a result of this CAPEX project, the ability to deliver FORD Class aircraft carriers on time is increased by reducing risk in the legacy heel-to-toe schedule within the dry dock between the lead and follow-on ship in a two-ship buy. This critical public-private partnership agreement established favorable conditions for keeping aircraft carrier construction on schedule and sets the groundwork for executing a potential future two-ship award. The Navy's share of this CAPEX incentive is valued up to $36.9 million. The shipbuilder satisfied the first evaluation event of the incentive, detail design complete, which resulted in awarding $5 million of the $36.9 million value in November 2022. After completion of detail design, the shipbuilder negotiated and placed the purchase order with the vendor in December 2022 which enabled construction on the CAPEX project to begin in January 2023.

Electromagnetic Aircraft Launch System (EMALS) - major subprogram
To date, more than 12,500 EMALS launches have been completed aboard CVN 78. Logistics products are maturing and are being prioritized for high use components to support phased depot stand-up which commenced in FY 2022. Logistics contracts are in place with General Atomics (GA) for EMALS sustainment support, fleet interim training and interim spares. NAVAIR awarded the CVN 81 Advanced Arresting Gear (AAG)/EMALS Pre-production Planning contract to GA on December 28, 2021 and plans to award a contract modification for full production in FY 2023. NAVAIR also plans to award a contract for the CVN 81 EMALS Energy Storage Subsystem Motor Generators in FY 2023. There are no significant software-related issues with this program at this time.

History of Significant Developments Since Program Initiation	
Date	**Significant Development Description**
Oct - 2022	CVN 78 conducted a service retained deployment from October to November 2022.
Sep - 2022	Initial Operational Test and Evaluation period commenced.
Jul - 2022	CVN 78 reached Obligation Work Limiting Date.
Feb - 2022	CVN 78 completed Planned Incremental Availability one day early on February 28, 2022.
Dec - 2021	CVN 78 Class IOC achieved with an achievement date of December 22, 2021.
Sep - 2021	CVN 78 began Planned Incremental Availability at Newport News Shipbuilding on September 01, 2021.
Aug - 2021	CVN 78 completed Full Ship Shock Trials on August 08, 2021.
Apr - 2021	AAG and EMALS IOC achieved with an achievement date of April 30, 2021.
Apr - 2021	CVN 78 completed Post-Delivery Test and Trials phase on April 30, 2021.
Dec - 2020	CVN 78 set a new single-day record of 170 launches and 175 arrestments in an 8.5-hour period, an average of 20 sorties per hour, highlighting the increasing capability and growing confidence that a fully trained crew and embarked air wing will achieve the required sortie generation rate.
Jan - 2020	Acting Secretary of the Navy announced on January 20, 2020 that the nuclear-powered aircraft carrier CVN 81 would be named the DORIS MILLER.
Dec - 2019	CVN 79 was christened by the ship's sponsor and daughter of President Kennedy, Ambassador Caroline Kennedy, on December 07, 2019 and launched on December 16, 2019, more than two months ahead of the baseline schedule.
Nov - 2019	CVN 78 commenced Post-Delivery Test and Trials phase in November 2019.
Oct - 2019	CVN 78 completed Post Shakedown Availability/Selected Restricted Availability on October 30, 2019.
Jan - 2019	CVN 80/81 two-ship buy Detail Design and Construction contract awarded on January 31, 2019.
Dec - 2018	On December 31, 2018 the Secretary of Defense provided Congressional notification in accordance with Section 121 of the FY 2019 National Defense Authorization Act (Public Law 115- 232) certifying the CVN 80/81 two-ship buy cost savings and provided the Secretary of the Navy the authority to enter into a contract for the procurement of CVN 80/81 under a single contract.
Jul - 2018	CVN 78 commenced Post Shakedown Availability/Selected Restricted Availability on July 15, 2018.
Jun - 2018	CVN 78 completed the eighth Independent Steaming Event and completed 747 total successful Electromagnetic Aircraft Launch System catapult launches and 747 successful Advanced Arresting Gear arrestments, including 135 launches and recoveries while underway on January 19, 2018
Apr - 2018	CVN 79 reached the 75% structurally erected milestone with 341 of the 447 total erectables landed in the dry dock.
Jan - 2018	On January 08, 2018 USD(AT&L) designated the CVN 78 Class Acquisition Category 1C (ACAT 1C) and delegated MDA to the Navy.
Jul - 2017	CVN 78 formally entered in the active fleet following her commissioning ceremony on July 22, 2017.
Jul - 2017	CVN 78 made Naval Aviation history by successfully recovering and launching its first fixed-wing aircraft on July 28, 2017. A total of four launches were conducted on the Electromagnetic Aircraft Launching System and four arrestments on the Advanced Arresting Gear.

Jun - 2017	CVN 79 reached the 50% structurally erected milestone with 224 of the 447 total erectables landed in the dry dock.
Jun - 2017	The Electromagnetic Aircraft Launch System completed land-based Aircraft Compatibility Testing, to correct deficiencies with launching the F/A-18E/F with external fuel tanks.
May - 2017	CVN 78 delivered to the Navy on May 31, 2017 after successfully completing Builder's Sea Trials in April 2017 and Acceptance Trials in May 2017. With delivery of CVN 78, the carrier force returned to 11 ships as required by 10 U.S.C. 5062(b).
Jan - 2017	The Electromagnetic Aircraft Launch System (EMALS) aboard CVN 78 was turned over to Ship's force. To mitigate future cost growth, EMALS and Advanced Arresting Gear (AAG) CVN 80 Firm Fixed Price options to the CVN 79 EMALS/AAG shipset contract with General Atomics were exercised in January 2017 and May 2017, locking in dual ship savings.
Oct - 2016	CVN 79 delivery date revised from June 2022 to September 2024 as required by Section 121 of the FY 2017 National Defense Authorization Act (Public Law 114-328). Completion of the CVN 79 Detail Design and Construction contract in June 2022 will represent preliminary acceptance from the shipbuilder.
May - 2016	Navy awarded a $152M initial contract for CVN 80 long lead time procurements; workload and layout planning; material tracking; development of an integrated master schedule and work packages; as well as other activities necessary to support start of construction in FY 2018.
Aug - 2015	CVN 78 crew moved aboard as scheduled.
Aug - 2015	USD(AT&L) ADM directed the Navy to conduct Full Ship Shock Trials on CVN 78 prior to first deployment.
Jun - 2015	Electromagnetic Aircraft Launching System shipboard catapult testing commenced on schedule, with testing of the bow catapults.

Jun - 2015	Navy awarded Huntington Ingalls Industries - Newport News Shipbuilding a Fixed Price Incentive Firm target contract in the amount of $3.35B for the JOHN F. KENNEDY (CVN 79) Detail Design & Construction effort. The contract represents an 18 percent reduction in man-hours needed to construct CVN 79 as compared to CVN 78. Additionally, a $941M modification to the Construction Preparation contract was awarded the same day. Navy awarded the Electromagnetic Aircraft Launch System CVN 79 shipset contract to General Atomics.
May - 2014	Navy awarded the Electromagnetic Aircraft Launch System CVN 79 Long Lead Time Material contract to General Atomics.
Apr - 2014	The Electromagnetic Aircraft Launch System completes land-based Aircraft Compatibility Testing.
Feb - 2014	In President's Budget 2015 the Navy modified CVN 79 acquisition strategy to a two-phased delivery strategy, the basic ship to be constructed and tested in the most efficient manner by the shipbuilder (Phase I). Select ship systems and compartments to be completed in a second phase, wherein the work can be completed more affordably. This approach enables the Navy to replace the Dual Band Radar with the Enterprise Radar Suite, increase competitive opportunities, reduce obsolescence at delivery and increase Government Furnished Equipment cost savings through common purchases of equipment with follow-on ship CVN 80.
Nov - 2013	CVN 78 was christened by the ship's sponsor and daughter of President Ford, Susan Ford Bales, on November 09, 2013 and launched on November 17, 2013 and weighed 77,000 tons. The ship was 70% complete - the highest level attained in aircraft carrier new construction.
Apr - 2013	Electromagnetic Aircraft Launch System designation as a major subprogram approved by USD (AT&L) on April 02, 2013.
Mar - 2013	An extension to the CVN 79 Construction Preparation contract for efforts through FY 2013 was awarded.
Jan - 2013	FY 2013 National Defense Authorization Act extended the full funding period for CVN 79 and CVN 80 from five to six years.
Dec - 2012	Secretary of Navy announced at the December 01, 2012 de-activation ceremony of the ENTERPRISE (CVN 65) that the CVN 80 would be named ENTERPRISE.
Aug - 2012	Navy awarded the Electromagnetic Aircraft Launch System Logistics Product Development contract to General Atomics.
Dec - 2011	FY 2012 National Defense Authorization Act extended the full funding period for CVN 79 from four years to five years and directed the Electromagnetic Aircraft Launch System be designated as a major subprogram.
Jun - 2011	Electromagnetic Aircraft Launch System Aircraft Compatibility Testing began.
May - 2011	Secretary of the Navy announced on May 29, 2011 that the nuclear-powered aircraft carrier CVN 79 would be named the JOHN F. KENNEDY.
Dec - 2010	Electromagnetic Aircraft Launch System successfully performed land-based F/A-18E risk reduction launches.
Nov - 2009	General Atomics Electromagnetic Systems division, along with the U.S. Navy Naval Air Systems Command (NAVAIR), celebrated the opening of the Electromagnetic Aircraft Launch System test track at Joint Base McGuire-Dix-Lakehurst, N.J., with a ribbon-cutting ceremony.
Jun - 2009	Navy awarded the Electromagnetic Aircraft Launch System CVN 78 shipset contract to General Atomics.

Apr - 2009	Department of Defense announced the CVN 21 Program would shift from a four-year to a five- year build cycle, thereby placing the program on a more fiscally sustainable path while continuing to support a minimum of 11 aircraft carriers through FY 2040. This change, which was reflected in the FY 2010 President's Budget, moved the ship authorization year for the CVN 79 from FY 2012 to FY 2013 and the ship authorization year for CVN 80 from FY 2016 to FY 2018.
Jan - 2009	CVN 79 Construction Preparation contract awarded.
Sep - 2008	CVN 78 Detail Design and Construction contract awarded.
Aug - 2008	USD(AT&L) chaired Defense Acquisition Board authorized Navy to enter the production phase for CVN 78 and enter the construction preparation phase for the first follow ship, CVN 79.
Apr - 2008	Navy awarded the Electromagnetic Aircraft Launch System CVN 78 Long Lead Time Material contract to General Atomics.
Oct - 2006	FY 2007 National Defense Authorization Act provides contract authority for construction of a CVN 21 Class (subsequently re-designated the CVN 78 Class) aircraft carrier designated CVN 78, CVN 79, or CVN 80. The Navy received authority for the ships to be split funded across four years. The act also provided a sense of Congress that the first ship of the class, CVN 78, should be named U.S.S. GERALD R. FORD.
Feb - 2005	President's Budget FY 2006 moves full funding of the lead ship (CVN 78) from FY 2007 to FY 2008. Key event and acquisition dates have been adjusted to accommodate the change in program funding. Construction contract award delayed from FY 2007 to FY 2008. The overall change to the program is a one year slip in delivery for both the lead ship (CVN 78) and the second ship (CVN 79) which is 2015 and 2019, respectively.
May - 2004	Program Office awarded the Construction Preparation contract which funds the Research, Development, Test, and Evaluation), Long Lead Time Material, integrated design, advance procurement and advance construction of components in support of FY 2007 CVN 21 Construction contract.
Apr - 2004	CVN 78 Construction Preparation contract awarded.
Apr - 2004	Milestone B Defense Acquisition Board Decision Review held on April 02, 2004. Program major milestones construction contract award in FY 2007 and ship delivery planned for FY 2014 remained unchanged. Approved Acquisition Program Baseline low rate initial production quantity not to exceed three ships. Navy down selected General Atomics as the Electromagnetic Aircraft Launch System Prime Contractor and awarded the System Development and Demonstration contract.
Jun - 2003	Program reports delay to Early Operational Assessment (from June 2003 to March 2004) and an additional delay to Milestone B to April 2004.
Dec - 2002	Program Decision Memorandum dated December 12, 2002 redesignated CVNX as CVN 21, pulling forward technologies originally planned for CVNX-2. Increases in sortie generation rate requirements and additional manpower reduction requirements previously slated for CVNX-2, such as advanced weapons handling and material movement were pulled forward into the lead ship, the follow on CVN 21 is now considered a modified repeat. Additional design features/new technologies were also added and include: improved/enlarged flight deck, advanced arresting gear, improved weapons handling capabilities, and improved survivability.
Sep - 2002	Milestone B schedule date has been delayed five months from September 2002 to February 2003 due to a delay in the release of the Operational Requirements Document.
Feb - 2002	President's Budget FY 2003 slips the original CVNX-1 program of record for design start construction and delivery by one year to FY 2007, and reflects split funding of CVNX construction over FY 2007 and FY 2008.

Apr - 2001	Completion of the CVNX-1 Systems Requirement Review marked a major milestone toward commencement of design activities to support the Milestone B Defense Acquisition Board planned for September 2002.
Oct - 2000	Northrop Grumman Newport News was awarded a cost-plus-fixed-fee contract for research and design development engineering services in support of the CVNX. Design and integration efforts for the class began with the Integrated Product and Process Development contract.
Jun - 2000	Future Aircraft Carrier program (CVNX), the planned successor to the NIMITZ Class aircraft carrier, was granted Milestone I approval on June 15, 2000.
Dec - 1999	Navy awarded two Electromagnetic Aircraft Launch System Program Definition and Risk Reduction contracts to General Atomics and Northrop Grumman.
Oct - 1998	USD(AT&L) approved the Navy request for a large-capacity (75 aircraft) carrier with new nuclear propulsion plant and electric plant design, employing an evolutionary acquisition approach. The first ship of the class (CVNX-1) to be based upon a NIMITZ Class hull.
Mar - 1996	Milestone 0 approval.

Schedule

CVN 78

Events	Milestone Baseline Objective	Current Baseline Objective/Threshold		Current Estimate/Actual	Deviation
Milestone B	Apr 2004	Apr 2004	Apr 2004	Apr 2004	
DAB Program Review (PR)	Jan 2006	Jul 2008	Jul 2008	Jul 2008	
Early Operational Assessment	Mar 2004	Mar 2004	Mar 2004	Mar 2004	
Start Construction	Jan 2007	Sep 2008	Sep 2008	Sep 2008	
Launch	Nov 2012	Nov 2013	Nov 2013	Nov 2013	
Combat Systems Trial Rehearsal (CSTR)	Jul 2014	Jan 2017	Jan 2017	Jan 2017	
Delivery	Sep 2014	May 2017	May 2017	May 2017	
Initial Operational Capability (IOC)	Sep 2015	Jul 2021	Jan 2022	Dec 2021	
Follow-on Ship-DAB Program Review	Jan 2010	Apr 2015	Apr 2015	Apr 2015	
Follow-on Ship-Start Construction (2)	Jan 2011	Jun 2015	Jun 2015	Jun 2015	
Follow-on Ship-Delivery (2)	Sep 2018	Sep 2024	Mar 2025	Jul 2025	Yes
IOT&E-IOT&E Start		Aug 2022	Feb 2023	Sep 2022	
IOT&E-IOT&E Complete		Nov 2023	May 2024	Mar 2025	Yes
Platform-Level Integration DT Period Complete		May 2023	Nov 2023	May 2023	
Follow-on Ship (CVN 80)-Delivery (3)		Mar 2028	Mar 2029	Mar 2028	
Follow-on Ship (CVN 81)-Delivery (4)		Feb 2032	Feb 2033	Feb 2032	

Notes

CVN 79 Delivery Current Estimate changed from September 2024 to July 2025.
IOT&E Start Current Estimate changed from August 2022 to Actual September 2022.
IOT&E Complete Current Estimate changed from November 2023 to March 2025.
Obligation Work Limiting Date for:
CVN 79 - 10/2026
CVN 80 - 04/2029
CVN 81 - 03/2033

Deviation Explanation

The CVN 79 delivery date is being adjusted to July 2025 to support a capability-based ship delivery/post-delivery strategy. The Navy is shifting work from the Post-Shakedown Availability (PSA) into the construction period to incorporate CVN 78 lessons learned focused on improving the capability of the ship at delivery. This approach will prepare CVN 79 as the first FORD Class aircraft carrier to operate in the Indo-Pacific region and decrease the amount of time CVN 79 would be required to be at the shipyard after ship delivery to conduct the PSA. CVN 79's PSA will align to a traditional period of resolving discrepancies discovered during trials. The revised strategy maintains the overall "ready for deployment workups" milestone for CVN 79. IOT&E Complete is being adjusted to March 2025 to integrate the CVN 78 operational deployment with the IOT&E schedule. March 2025 is based on the projected future COMPTUEX schedule which incorporates sortie generation rate demonstration.

EMALS

Events	Milestone Baseline Objective	Current Baseline Objective/Threshold		Current Estimate/Actual	Deviation
Delivery (with Ship)	Sep 2015	May 2017	May 2017	May 2017	
IOC	Sep 2016	Jul 2021	Jan 2022	Apr 2021	
IOT&E-IOT&E Start	Feb 2017	Aug 2022	Feb 2023	Sep 2022	
IOT&E-IOT&E Complete	Aug 2019	Nov 2023	May 2024	Mar 2025	Yes
EMALS-Platform-Level Integration DT Period Complete	Sep 2017	May 2023	Nov 2023	May 2023	

Notes

IOT&E Start Current Estimate changed from August 2022 to Actual September 2022.

IOT&E Complete Current Estimate changed from November 2023 to March 2025.

Deviation Explanation

IOT&E Complete is being adjusted to March 2025 to integrate the CVN 78 operational deployment with the IOT&E schedule. March 2025 is based on the projected future COMPTUEX schedule which incorporates sortie generation rate demonstration.

Performance

CVN 78

Performance Characteristics				
Milestone Baseline	**Current Baseline Objective/Threshold**		**Demonstrated Performance**	**Current Estimate/Actual**	**Deviation**
Net-Ready					
	Meets 100% of top level IERs	Meets 100% of top level IERs designated as critical	TBD	Meets 100% of top level IERs designated as critical	
CVN 78 Class - Ship Service Electrical Generating Capacity (times NIMITZ Class capacity in MW) (2)					
	3.0	2.5	3.25	3.25	
CVN 78 Class - Ship's Force Manpower (billets) (2)					
	2391	2791	TBD	2716	
CVN 78 Class - Stability Service Life Allowance (feet) (1)					
	2.5	1.5	1.62	1.62	
CVN 78 Class - Surge Sortie Rate (1)					
	310	270	TBD	284	
Force Protection and Survivability in an Asymmetric Threat Environment - Survivability					
	Level III as defined by OPNAV Instruction 9070.1	Level II as defined by OPNAV Instruction 9070.1 with the exception of Collective Protection System	TBD	Level II as defined by OPNAV Instruction 9070.1with the exception of Collective Protection System	
CVN 78 Class - Sustained Sortie Rate (1)					
	220	160	TBD	172	
CVN 78 Class - Weight Service Life Allowance (% of full load displacement in long tons) (1)					
	7.5	5	5.82	5.82	

Requirement Reference

ORD Change 2 dated June 22, 2007 was revalidated by the JROC on April 27, 2015

Deviation Explanation

No deviations for this program/subprogram

Notes

Performance Notes:
Classified Performance Table is available in the Classified Annex.

CVN 78 performance Threshold and Objectives apply to all ships in the class. Current estimates for the follow-on ship will be updated, if different from the lead ship, when they become available.

For additional description regarding CVN 78 and follow-on ship Interoperability and other Performance Characteristics, see Table 4.4, KPPs, contained in the Future Aircraft Carrier (CVN 21) ORD Change 2 dated June 22, 2007.

EMALS

Performance Characteristics					
Milestone Baseline	**Current Baseline Objective/Threshold**		**Demonstrated Performance**	**Current Estimate/Actual**	**Deviation**
See Note					
N/A	N/A	N/A	N/A	N/A	N/A

Requirement Reference

ORD Change 2 dated June 22, 2007 was revalidated by the JROC on April 27, 2015

Deviation Explanation

No deviations for this program/subprogram

Notes

CVN 78 performance Threshold and Objectives apply to all ships in the class.

Current estimates for the follow-on ship will be updated, if different from the lead ship, when they become available.

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Acquisition Budget Estimate

CVN 78

Total Acquisition Cost

		Milestone APB	Current Baseline		Budget Estimate PB 2024		
Category	**Base Year**	**Objective (BY$M)**	**Objective (BY$M)**	**Threshold (BY$M)**	**BY$M**	**TY$M**	**Deviation**
RDT&E	2000	3,875.3	3,704.4	4,074.8	3,837.7	4,857.5	
Procurement	2000	24,825.9	28,800.2	31,680.2	30,313.2	56,118.8	
MILCON	2000	0	283.9	312.3	196.7	338.1	
Acq. O&M	2000	0	98.1	107.9	138.3	210.2	**Yes**
Total		28,701.2	32,886.6		34,485.9	61,524.6	
PAUC	2000	9,567.067	8,221.650	9,043.815	8,621.475	15,381.143	
APUC	2000	8,275.300	7,200.050	7,920.055	7,578.300	14,029.700	

Appropriation Category Deviation Explanations

O&M	CVN 78 Class Acquisition O&M PB 2024 budget estimate adjustment is in accordance with Navy policy for new construction berthing.

PAUC Deviation Explanation

APUC Deviation Explanation

Budget Notes

Total End Item Quantity

Quantity Category	Current APB Quantity	Current Estimate Quantity
Development	0	0
Procurement	4	4
O&M-Acquired	0	0

Quantity Notes

EMALS

Total Acquisition Cost

		Milestone APB	Current Baseline		Budget Estimate PB 2024		
Category	**Base Year**	**Objective (BY$M)**	**Objective (BY$M)**	**Threshold (BY$M)**	**BY$M**	**TY$M**	**Deviation**
RDT&E	2000	651.2	1,000.5	1,100.6	875.2	1,063.2	
Procurement	2000	1,593.4	1,510.5	1,661.6	1,522.3	2,834.8	
MILCON	2000	18.8	18.8	20.7	18.7	20.6	
Acq. O&M	2000	0	0	0			
Total		2,263.4	2,529.8		2,416.2	3,918.6	
PAUC	2000	754.467	632.450	695.695	604.050	979.640	
APUC	2000	531.133	377.625	415.388	380.575	708.697	

Appropriation Category Deviation Explanations

PAUC Deviation Explanation

APUC Deviation Explanation

Budget Notes

Total End Item Quantity

Quantity Category	Current APB Quantity	Current Estimate Quantity
Development	0	0
Procurement	4	4
O&M-Acquired	0	0

Quantity Notes

Unit Cost
CVN 78

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Category ($M) Base Year:2000	**Current UCR Baseline**	**Current Estimate**	**% Change**
Program Acquisition Unit Cost			
Cost	32,886.6	34,485.9	
Quantity	4	4	
Unit Cost	8221.650	8621.475	4.86%
Average Procurement Unit Cost			
Cost	28,800.2	30,313.2	
Quantity	4	4	
Unit Cost	7200.050	7578.300	5.25%

Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Category ($M) Base Year:2000	**Original UCR Baseline**	**Current Estimate**	**% Change**
Program Acquisition Unit Cost			
Cost	28,701.2	34,485.9	
Quantity	3	4	
Unit Cost	9567.067	8621.475	-9.88%
Average Procurement Unit Cost			
Cost	24,825.9	30,313.2	
Quantity	3	4	
Unit Cost	8275.300	7578.300	-8.42%

Cost Growth Details

Current Baseline PAUC Breach Explanation

Current Baseline APUC Breach Explanation

Original Baseline PAUC Breach Explanation

Original Baseline APUC Breach Explanation

Impacts of Schedule Changes on Unit Cost

Impacts of Performance Changes on Unit Cost

Actions Taken or Proposed to Control Future Cost Growth

EMALS

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Category ($M) Base Year:2000	**Current UCR Baseline**	**Current Estimate**	**% Change**
Program Acquisition Unit Cost			
Cost	2,529.8	2,416.2	
Quantity	4	4	
Unit Cost	632.450	604.050	-4.49%
Average Procurement Unit Cost			
Cost	1,510.5	1,522.3	
Quantity	4	4	
Unit Cost	377.625	380.575	0.78%

Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Category ($M) Base Year:2000	**Original UCR Baseline**	**Current Estimate**	**% Change**
Program Acquisition Unit Cost			
Cost	2,263.4	2,416.2	
Quantity	3	4	
Unit Cost	754.467	604.050	-19.94%
Average Procurement Unit Cost			
Cost	1,593.4	1,522.3	
Quantity	3	4	
Unit Cost	531.133	380.575	-28.35%

Cost Growth Details

Current Baseline PAUC Breach Explanation

Current Baseline APUC Breach Explanation

Original Baseline PAUC Breach Explanation

Original Baseline APUC Breach Explanation

Impacts of Schedule Changes on Unit Cost

Impacts of Performance Changes on Unit Cost

Actions Taken or Proposed to Control Future Cost Growth

Risk and Sensitivity Analysis

CVN 78

Risk and Sensitivity Analysis
Current Procurement Cost (December - 2022)
In accordance with Section 121(b) of the Fiscal Year 2019 NDAA (Public Law 115-232), the Secretary of Defense provided a detailed certification package in support of the CVN 80/81 two-ship buy Detailed Design and Construction contract to the Congressional defense committees on December 31, 2018. The two-ship acquisition strategy resulted in $4 billion in procurement savings on CVN 80 and CVN 81 compared to the Navy single-ship estimates. The Navy's projected cost of CVN 80 and CVN 81, as negotiated with the shipbuilder, and the estimated cost avoidance described in the Department's certification package are realistic; informed by a thorough review with the Navy's cost estimating, engineering, and contracting organizations. Also, the Department of Defense's Office of CAPE developed an Independent Estimate of Savings for the two- ship procurement and forecast savings of $3.1 billion (Then-Year), or approximately 11 percent. The Navy projects $4 billion in savings. The primary differences between CAPE and Navy estimates of savings are in Government Furnished Equipment and production change orders.
Original Baseline Estimate (April - 2004)
The Cost Analysis Improvement Group (CAIG) and Navy life cycle cost estimates differed by $1.55 billion (FY04) or 5.6%. The majority of the delta resides in the production effort. There were three important contributors to the production effort: production labor, the hourly billing rates applied to production labor, and the cost of the material to be incorporated in the ship. The Research, Development, Test and Evaluation (RDT&E) estimates and Operations and Support (O&S) estimates differences are not considered significant.
Current Baseline Estimate (February - 2020)
In accordance with Section 121(b) of the Fiscal Year 2019 National Defense Authorization Act (NDAA) (Public Law 115-232), the Secretary of Defense provided a detailed certification package in support of the CVN 80/81 two-ship buy Detailed Design and Construction contract to the Congressional defense committees on December 31, 2018. The two-ship acquisition strategy resulted in $4 billion in procurement savings on CVN 80 and CVN 81 compared to the Navy single-ship estimates. The Navy's projected cost of CVN 80 and CVN 81, as negotiated with the shipbuilder, and the estimated cost avoidance described in the Department's certification package are realistic; informed by a thorough review with the Navy's cost estimating, engineering, and contracting organizations. Also, the Department of Defense's Office of Cost Assessment and Program Evaluation (CAPE) developed an Independent Estimate of Savings for the two-ship procurement and forecast savings of $3.1 billion (Then-Year), or approximately 11 percent. The Navy projects $4 billion in savings. The primary differences between CAPE and Navy estimates of savings are in Government Furnished Equipment and production change orders.

Schedule Risk		
Current	2022-12-31	CVN 79. If SPY-6(V)3 Enterprise Air Surveillance Radar integration with Ship Self-Defense System (SSDS) requires more testing then planned at either the land-based test site or shipboard, then Combat System Light Off and later ship milestones may be delayed.
Current	2022-12-31	CVN80/81: Shipyard and supplier performance requires improvement to prevent cost and schedule impacts. Specifically, there are Contractor Furnished Equipment (CFE) components for CVN 80 that are under review for delays due to COVID and other global supply chain challenges which have the potential to impact the overall planned work schedule. Combined Navy and shipbuilder evaluation of component lead time impacts and required schedule mitigation is in progress.
MS B	2006-09-01	CVN 78. Schedule Risk: Contracts. Driver: Ship design maturity. Mitigation: Alpha contracting process implemented. Date: December 2007.
MS B	2006-09-01	CVN 78. Schedule Risk: Lack of Build Contract for the Dual Band Radar potential impacts to Lead Design Yard construction. Driver: Technology maturity. Mitigation: Award contract to build carrier version of the Dual Band Radar, control of common array power system and common array cooling system, unique power, unique cooling design, air traffic control, and firm delivery dates
Technical Risks		
Current	2022-12-31	There are no risks identified with this program

MS B	2006-09-01	CVN 78. Performance Risk: Critical Technology Maturity and Ship Integration. Advanced Arresting Gear - Risk: Funding reductions will cause schedule delays. Drivers: Funding Deficiencies. Mitigation: Restore marks. Date: April 2007. Dual Band Radar - Risk: Integration with carrier systems may not support CVN 78 delivery dates. Drivers: Integration complexity. Mitigation: Integration studies, analysis, testing and monitoring of the DDG 1000 radar development effort. Date: June 2008. Electromagnetic Aircraft Launch System - Risk: Component delivery dates may miss required in yard dates for ship. Driver: Land-based testing schedule. Mitigation: Manage scheduled events leading to Low Rate Initial Production decision. Date: September 2009.
MS B	2006-09-01	CVN 78. Performance Risk: Meeting Threshold Key Performance Parameters. Driver: Performance vs Cost trade-off. Mitigation: Balanced whole ship design supported by timely technical decisions. Date: February 2007 (Interim Weight Report # 16).

EMALS

Risk and Sensitivity Analysis

Current Procurement Cost (December - 2022)

In accordance with Section 121(b) of the Fiscal Year 2019 NDAA (Public Law 115-232), the Secretary of Defense provided a detailed certification package in support of the CVN 80/81 two-ship buy Detailed Design and Construction contract to the Congressional defense committees on December 31, 2018. The two-ship acquisition strategy resulted in $4 billion in procurement savings on CVN 80 and CVN 81 compared to the Navy single-ship estimates. The Navy's projected cost of CVN 80 and CVN 81, as negotiated with the shipbuilder, and the estimated cost avoidance described in the Department's certification package are realistic; informed by a thorough review with the Navy's cost estimating, engineering, and contracting organizations. Also, the Department of Defense's Office of CAPE developed an Independent Estimate of Savings for the two- ship procurement and forecast savings of $3.1 billion (Then-Year), or approximately 11 percent. The Navy projects $4 billion in savings. The primary differences between CAPE and Navy estimates of savings are in Government Furnished Equipment and production change orders.

Original Baseline Estimate (April - 2013)

No cost estimate conforming to the Enhanced SAR guidelines for developing a risk statement was performed associated with the Original Baseline, April 2013. The Original Baseline reflects APB Change 3 which established EMALS as a major sub-program as directed by Section 221 of the National Defense Authorization Act (NDAA) for FY 2012 and updated selected program schedule dates to reflect the known schedule changes.

Current Baseline Estimate (February - 2020)

In accordance with Section 121(b) of the Fiscal Year 2019 National Defense Authorization Act (NDAA) (Public Law 115-232), the Secretary of Defense provided a detailed certification package in support of the CVN 80/81 two-ship buy Detailed Design

and Construction contract to the Congressional defense committees on December 31, 2018. The two-ship acquisition strategy resulted in $4 billion in procurement savings on CVN 80 and CVN 81 compared to the Navy single-ship estimates. The Navy's projected cost of CVN 80 and CVN 81, as negotiated with the shipbuilder, and the estimated cost avoidance described in the Department's certification package are realistic; informed by a thorough review with the Navy's cost estimating, engineering, and contracting organizations. Also, the Department of Defense's Office of Cost Assessment and Program Evaluation (CAPE) developed an Independent Estimate of Savings for the two-ship procurement and forecast savings of $3.1 billion (Then-Year), or approximately 11 percent. The Navy projects $4 billion in savings. The primary differences between CAPE and Navy estimates of savings are in Government Furnished Equipment and production change orders.

Schedule Risk		
Current	2022-12-31	There are no risks identified with this program.
MS B	2006-09-01	Electromagnetic Aircraft Launch System (EMALS). Performance Risk: EMALS - Risk: Component delivery dates may miss required in yard dates for ship. Driver: Land-based testing schedule. Mitigation: Manage scheduled events leading to Low Rate Initial Production decision. Date: September 2009
Technical Risks		
Current	2022-12-31	There are no risks identified with this program.
MS B	2006-09-01	Electromagnetic Aircraft Launch System (EMALS). Performance Risk: EMALS - Risk: Component delivery dates may miss required in yard dates for ship. Driver: Land-based testing schedule. Mitigation: Manage scheduled events leading to Low Rate Initial Production decision. Date: September 2009

CVN 78

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	**April 26, 2004**	**April 26, 2004**
Approved Quantity Reference	**Milestone B ADM**	**Milestone B ADM**
Start Year	**2004**	**2004**
End Year	**2018**	**2018**

Rationale if quantity exceeds 10% of the total number of articles to be procured:

The Current Total LRIP Quantity is more than 10% of the total production quantity due to the Acquisition Decision Memorandum (ADM) dated April 26, 2004 approving three ships.

Notes

The current LRIP quantity reflects three ships as approved by the CVN 21 (Future Aircraft Carrier) Program ADM of April 26, 2004.

On December 31, 2018 the Secretary of Defense provided Congressional notification in accordance with Section 121 of the FY 2019 National Defense Authorization Act (Public Law 115-232) certifying the CVN 80/81 two-ship buy cost savings and provided the Secretary of the Navy the authority to enter into a contract for the procurement of CVN 80/81 under a single contract.

A fourth ship was awarded in January 2019 with award of the CVN 80/81 two-ship buy Detail Design and Construction contract awarded on January 31, 2019.

EMALS

Item	Initial LRIP Decision	Current Total LRIP
Approval Date		
Approved Quantity		
Reference		
Start Year		
End Year		

Rationale if quantity exceeds 10% of the total number of articles to be procured:

Notes

EMALS has no LRIP quantities because the current LRIP decision occurred prior to the establishment of EMALS as a major subprogram.

Contracts & Efforts

Contract Data	
Contract Number	N00024-09-C-2116
Effort Number	1
Modification Number	P00164
Award Date	01/15/2009
Definitization Date	12/08/2010
Order Number	
CAGE Code/CAGE Legal Name	43689/Huntington Ingalls Industries (HII) Newport News Shipbuilding (NNS)
Contract Title	CVN 79 Construction Preparation (CP)
Contract Address	Newport News, VA
Contracting Office	
Supported Phase	Production
Contract Strategy	
Contract Type	Other
Modification Date	
Work Start Date	
Technical Data Rights	
Work Completed	96.84%

Contracts/Effort Price, Quantity, and Performance (TY$M)		
Initial Target Price	Current Target Price	
$373.5	$4,320.5	
Initial Ceiling Price	Current Ceiling Price	
$0		
Contractor EAC	PM EAC	
$4,180.7	$4,180.7	
Initial Quantity	Current Quantity	Delivered Quantity
0	0	0
BAC	BCWP	ACWP
$3,900.2	$3,777.1	$4,064.4

BCWS	Cost Variance	Schedule Variance
$3,875.2	-$287.3	-$98.1

Contract Notes:

Contract Notes: The CVN 79 CP contract is 96.8 percent complete based on dollars. Cost Variance: The unfavorable net change in the cost variance is due to material and overhead overruns including overhead rates, outside services, production leased labor, electrical, maintenance material, complex machinery and valves. Schedule Variance: The unfavorable net change in the schedule variance is due to various direct buy material commodities arriving late, including stock, paint, raw materials and support material.

Factors Contributing to Cost Variance and Projected Effects on Program Costs

The unfavorable net change in the cost variance is due to the increase in overhead rates, direct buy material such as electrical, complex machinery, maintenance material, valves, leases/rental, and services such as outside services and production leased labor.

Factors Contributing to Schedule Variance and Projected Effects on Program Schedule

The unfavorable net change in the schedule variance is due to various direct buy material commodities arriving late, including electrical, complex machinery, valves, stock, paint, raw materials and support material.

Contract Data	
Contract Number	N00024-15-C-2114
Effort Number	1
Modification Number	P00118
Award Date	06/05/2015
Definitization Date	06/05/2015
Order Number	
CAGE Code/CAGE Legal Name	43689/Huntington Ingalls Industries (HII) Newport News Shipbuilding (NNS)
Contract Title	CVN 79 Detail Design & Construction (DD&C)
Contract Address	Newport News, VA
Contracting Office	
Supported Phase	Production
Contract Strategy	
Contract Type	Other
Modification Date	
Work Start Date	
Technical Data Rights	
Work Completed	81.55%

Contracts/Effort Price, Quantity, and Performance (TY$M)		
Initial Target Price	Current Target Price	
$3,352.6	$3,923.1	
Initial Ceiling Price	Current Ceiling Price	
$0		
Contractor EAC	PM EAC	
$4,089.3	$4,089.3	
Initial Quantity	Current Quantity	Delivered Quantity
1	1	0
BAC	BCWP	ACWP
$3,419.3	$2,788.4	$3,436.4
BCWS	Cost Variance	Schedule Variance

$3,023.4	-$647.9	-$235

Contract Notes:

Contract Notes: On November 02, 2020 NAVSEA awarded a not-to-exceed modification to the CVN 79 DD&C contract, which will shift the CVN 79 to a single-phase delivery in 2024 and definitized previously awarded efforts associated with warfare systems that accomplish CVN 79 single-phase delivery with F-35C capabilities on January 20, 2022. The CVN 79 DD&C contract is 81.5 percent complete based on dollars. Cost Variance: The unfavorable net change in the cost variance is due to labor performance and resolving first-ship-of-class technical issues. The cost variance is driven by challenges in support trades, structural fabrication, assembly (sheet metal fabrication, production trades, electrical, machinery install), as well as resequencing deferred and delayed work, green labor, and continued constrained shared labor resources across all shipbuilding programs at NNS. Schedule Variance: The unfavorable net change in the schedule variance is due to assembly trades (production trades, cleaners, machinery install), facilities trades, test engineering, nuclear engineering, test, and facilities. Similar to the cost variance, resequencing deferred and delayed work, green labor, and continued constrained shared labor resources across all shipbuilding programs at NNS impacts the schedule variance.

Factors Contributing to Cost Variance and Projected Effects on Program Costs

The unfavorable net change in the cost variance is due to labor performance, increased overhead rates and resolving first-of-class technical issues. The cost variance is driven by execution and performance challenges in assembly trades (CVN 79 production/construction trades, machinery install, sheet metal, ship welders), nuclear engineering, outside services, quality and process division, and platform engineering. These trades are experiencing resequencing deferred/delayed work, rework, green labor, and constrained shared labor resources across all shipbuilding programs at the shipbuilder.

Factors Contributing to Schedule Variance and Projected Effects on Program Schedule

The unfavorable net change in the schedule variance is due to outside services, assembly trades (sheet metal and production trades), and facilities. These trades are experiencing resequencing deferred/delayed work, rework, green labor, and constrained shared labor resources across all shipbuilding programs at the shipbuilder.

Contract Data	
Contract Number	N00024-16-C-2116/2
Effort Number	2
Modification Number	P00101
Award Date	01/31/2019
Definitization Date	01/31/2019
Order Number	
CAGE Code/CAGE Legal Name	43689/Huntington Ingalls Industries (HII) Newport News Shipbuilding (NNS)
Contract Title	CVN 80 Detail Design & Construction (DD&C)
Contract Address	Newport News, VA
Contracting Office	
Supported Phase	Production
Contract Strategy	
Contract Type	Other
Modification Date	January 26, 2023
Work Start Date	
Technical Data Rights	
Work Completed	35.78%

Contracts/Effort Price, Quantity, and Performance (TY$M)		
Initial Target Price	Current Target Price	
$152	$8,400.8	
Initial Ceiling Price	Current Ceiling Price	
	$9,410.7	
Contractor EAC	PM EAC	
$8,275	$8,275	
Initial Quantity	Current Quantity	Delivered Quantity
0	1	0
BAC	BCWP	ACWP
$7,356.3	$2,631.9	$3,150.2
BCWS	Cost Variance	Schedule Variance

$3,052.7	-$518.3	-$420.9

Contract Notes:

Contract Notes: On January 31, 2019, a $14,917,738,145 fixed-price-incentive-firm target modification to previously awarded contract N00024-16-C-2116 for DD&C efforts for CVN 80 and CVN 81 was awarded. The CVN 80 DD&C contract is 28 percent complete based on CLIN 0001 dollars.

Factors Contributing to Cost Variance and Projected Effects on Program Costs

The unfavorable net change in the cost variance is due to poor shop construction performance and the shipyard spending above the plan because digital shipbuilding products have been harder to produce than planned and tool enhancements targeted to reduce efforts have been slower than planned. Poor shop construction performance and poor material availability led to an unfavorable assembly construction labor variance, driven by out of sequence work, green labor, and poor services spending control. Negative material cost variance was driven by outside services, steel, electrical material, valves and complex machinery.

Factors Contributing to Schedule Variance and Projected Effects on Program Schedule

The unfavorable net change in the schedule variance is due to poor shop schedule performance and material availability in addition to engineering and planning departments not meeting their schedule due to start-up issues associated with Integrated Digital Shipbuilding. Poor shop schedule performance is driven by labor resource shortages, material availability, structural fabrication and component fabrication.

Contract Data	
Contract Number	N00024-16-C-2116/3
Effort Number	3
Modification Number	P00101
Award Date	01/31/2019
Definitization Date	01/31/2019
Order Number	
CAGE Code/CAGE Legal Name	43689/Huntington Ingalls Industries (HII) Newport News Shipbuilding (NNS)
Contract Title	CVN 81 Detail Design & Construction (DD&C)
Contract Address	Newport News, VA
Contracting Office	
Supported Phase	Production
Contract Strategy	
Contract Type	Fixed-Price Incentive (Firm Target)
Modification Date	January 26, 2023
Work Start Date	
Technical Data Rights	
Work Completed	

Contracts/Effort Price, Quantity, and Performance (TY$M)		
Initial Target Price	Current Target Price	
$7,954.3	$7,954.3	
Initial Ceiling Price	Current Ceiling Price	
$8,926.7	$8,926.7	
Contractor EAC	PM EAC	
Initial Quantity	Current Quantity	Delivered Quantity
1	1	0
BAC	BCWP	ACWP
BCWS	Cost Variance	Schedule Variance

Contract Notes:

Contract Notes: On January 31, 2019, a $14,917,738,145 Fixed-Price-Incentive-Firm (FPIF) target modification to previously awarded contract N00024-16-C-2116 for DD&C efforts for CVN 80 and CVN 81 was awarded.

Factors Contributing to Cost Variance and Projected Effects on Program Costs

Factors Contributing to Schedule Variance and Projected Effects on Program Schedule

Contract Data	
Contract Number	N00019-22-C-0033
Effort Number	1
Modification Number	P00006
Award Date	12/28/2021
Definitization Date	12/28/2021
Order Number	
CAGE Code/CAGE Legal Name	4V360/General Atomics (GA) Electromagnetic Systems
Contract Title	CVN 81 Advanced Arresting Gear (AAG)/EMALS Pre-production
Contract Address	San Diego, CA
Contracting Office	
Supported Phase	Production
Contract Strategy	
Contract Type	Firm-Fixed-Price
Modification Date	January 31, 2023
Work Start Date	
Technical Data Rights	
Work Completed	

Contracts/Effort Price, Quantity, and Performance (TY$M)		
Initial Target Price	Current Target Price	
$37.8	$37.5	
Initial Ceiling Price	Current Ceiling Price	
Contractor EAC	PM EAC	
$37.8	$37.8	
Initial Quantity	Current Quantity	Delivered Quantity
0	0	0
BAC	BCWP	ACWP
BCWS	Cost Variance	Schedule Variance

Contract Notes:

Contract N00019-22-C-0033 is a combined CVN 81 EMALS and AAG Pre-production contract with a total contract value of $69.3 million. The PM's estimated price reflects the EMALS-pre production related funding only. Naval Air Systems Command will modify this base contract to add CVN 81 EMALS and AAG shipset production.

Factors Contributing to Cost Variance and Projected Effects on Program Costs

Factors Contributing to Schedule Variance and Projected Effects on Program Schedule

Contract Data	
Contract Number	N00019-14-C-0037
Effort Number	1
Modification Number	P00084
Award Date	05/08/2014
Definitization Date	12/22/2016
Order Number	
CAGE Code/CAGE Legal Name	4V360/General Atomics (GA) Electromagnetic Systems
Contract Title	EMALS CVN 79/CVN 80 Production
Contract Address	San Diego, CA
Contracting Office	
Supported Phase	Production
Contract Strategy	
Contract Type	Firm-Fixed-Price
Modification Date	January 31, 2023
Work Start Date	
Technical Data Rights	
Work Completed	

Contracts/Effort Price, Quantity, and Performance (TY$M)		
Initial Target Price	Current Target Price	
$1,072.5	$1,137	
Initial Ceiling Price	Current Ceiling Price	
Contractor EAC	PM EAC	
Initial Quantity	Current Quantity	Delivered Quantity
2	2	0
BAC	BCWP	ACWP
BCWS	Cost Variance	Schedule Variance

Contract Notes:

Contract Notes: Contract N00019-14-C-0037 is a combined EMALS and Advanced Arresting Gear (AAG) CVN 79/CVN 80 Production contract with a total contract value of $1,629.0M. The Current Target Price reflects EMALS-related funding only.

The Advanced Arresting Gear (AAG) program submitted a FY 2024 annual SAR that included procurement funding which is also reported in the CVN 78 Class SAR.

Factors Contributing to Cost Variance and Projected Effects on Program Costs

Factors Contributing to Schedule Variance and Projected Effects on Program Schedule

External Government Activities

Activity Title		Government Entity	Supported Phase
CAGE		Work Start Date	
City		State/Province:	
Notes			

Deliveries and Expenditures

CVN 78

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	0	0	0	0.00%
Production	1	1	4	25.00%
Total Program Quantity Delivered	1	1	4	25.00%

Expended and Appropriated (TY $M)

Years Appropriated to date: 26

Total Years Appropriated Funding (Current Baseline): 37

Percent Years Appropriated: 70.3

Then-Year Funding Appropriated as Percentage of Total Acquisition Estimate: 70.6

Then-Year Funding Expended as Percentage of Total Acquisition Estimate: 57.3

Total Acquisition Cost: 61,524.57

Deliveries & Expenditures Notes: The above data is current as of March 13, 2023.

EMALS

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	0	0	0	0.00%
Production	1	1	4	25.00%
Total Program Quantity Delivered	1	1	4	25.00%

Expended and Appropriated (TY $M)

Years Appropriated to date: 23

Total Years Appropriated Funding (Current Baseline): 29

Percent Years Appropriated: 79.3

Then-Year Funding Appropriated as Percentage of Total Acquisition Estimate: 87.9%

Then-Year Funding Expended as Percentage of Total Acquisition Estimate: 69.7%

Total Acquisition Cost: 3,918.56

Deliveries & Expenditures Notes: The above data is current as of March 13, 2023.

Operating and Support Costs

CVN 78

O&S Cost Breakdown:

Category (BY$ Million)	CVN 78
Unit-Level Manpower	142.6
Unit Operations	14.7
Maintenance	108.9
Sustaining Support	14.7
Continued System Improvements	18.9
Other	0.0
Total	299.8

Cost Estimate Source: POE dated January 10, 2020

O&S Cost Notes:

Total Program O&S Cost Compared with Baseline					
	Current Baseline				
	Objective (BY$M)	Threshold (BY$M)	Current Estimate (BY$M)	Current Estimate (TY$M)	Deviation
Total O&S	88,360.2	97,196.2	59,960.0		

Note:
Total O&S cost for 4 ships would be 59,960 BY00$M
299.8 BY00$M X 4 X 50 = 59,960 BY00$M
Total Ship O&S = unitized cost X number of ships X service life per ship

O&S Cost Deviation Explanation

EMALS

O&S Cost Breakdown:

Category (BY$ Million)	EMALS
Unit-Level Manpower	4.9
Unit Operations	0.0
Maintenance	9.5
Sustaining Support	2.5
Continued System Improvements	4.0
Other	0.0
Total	20.8

Cost Estimate Source: POE dated January 10, 2020
O&S Cost Notes:

Total Program O&S Cost Compared with Baseline					
	Current Baseline				
	Objective (BY$M)	Threshold (BY$M)	Current Estimate (BY$M)	Current Estimate (TY$M)	Deviation
Total O&S	4,899.6	5,389.6	4,162		

Note:
Total O&S cost for 4 shipsets would be 4,162 BY00$M
20.811 BY00$M X 4 X 50 = 4,162 BY00$M
Total Ship O&S = unitized cost X number of ships X service life per ship

O&S Cost Deviation Explanation

Operating and Support Costs - Disposal and Unitized Costs

CVN 78

Annual Unitized O&S Cost Definition and Calculation Relative to Total O&S Cost:

Sustainment Factors	System Name: CVN 78 Class	Antecedent System Name: CVN 68 Class
Quantity to Sustain	4	10
Unit of Measure	BY00$M	BY00$M
Unit Expected Service Life	50	50

Base Year:

	System Name: CVN 78 Class	Antecedent System Name: CVN 68 Class
Unit-Level Manpower	142.6	169.2
Unit Operations	14.7	10.5
Maintenance	108.9	141.0
Sustaining Support	14.7	14.2
Continued System Improvements	18.9	20.3
Other	0.0	0.0
Total O&S	299.8	355.2

Disposal/Demilitarization Cost Estimate

(Base Year $Millions)	System Name: CVN 78 Class	Antecedent System Name: CVN 68 Class
Total Disposal	6,789.1	

Cost Estimate Source - Disposal	
Type:	Program Office Estimate
Approval Authority and Date:	PMS 378 / 12/31/2022
Note:	
Disposal Cost Notes:	
Disposal Cost is included in the Operating and Support Cost of the current APB objective and threshold for this program. Disposal/demilitarization total cost would be 6,789.1 in BY00$M. Costs include inactivation and disposal of the ship, including EMALS, Advanced Arresting Gear (AAG), and the nuclear reactor core.	
Additional O&S Estimate Assumptions:	
Sustainment Strategy:	

Sustainment strategy includes nuclear aircraft carrier certified Naval Shipyards (Norfolk Naval Shipyard (NNSY), Puget Sound Naval Shipyard (PSNSY) & Intermediate Maintenance Facility (IMF) and/or Huntington-Ingalls, Inc - Newport News Shipyard (HII-NNS) for depot-level maintenance in concert with regional multi-ship/multi-option (MSMO) contractors, Intermediate-level activities (e.g., Mid-Atlantic Regional Maintenance Center (MARMC), Southwest Regional Maintenance Center (SWRMC)), organizational-level maintenance strategies, and the employment of existing shore support to the maximum extent possible.

Antecedent Estimate Assumptions:

The CVN 68 Class is the antecedent for the CVN 78 Class. The CVN 68 O&S costs were derived from requirements, actual returns, and the Naval Visibility and Management of Operating and Support Costs (VAMOSC) database, with the primary focus using requirements. Unit level manpower was based on authorized billets (3,354) as detailed in the CVN 68 Ship Manpower Document (SMD); the billets were multiplied against the OSD composite rates for calculating the unit level manpower. Depot Maintenance (3.4) was derived from OPNAVLTR 4700 (dated June 6, 2022).

Unit operations, intermediate maintenance, sustaining support, and continuing system improvements were derived from VAMOSC, with data pulled from FY 2000 through FY 2020, using full year data and excluding forward deployed ships.

EMALS

Annual Unitized O&S Cost Definition and Calculation Relative to Total O&S Cost:

Sustainment Factors	System Name: EMALS	Antecedent System Name: No antecedent
Quantity to Sustain	4	
Unit of Measure	BY00$M	
Unit Expected Service Life	50	

Base Year:

Annual Unitized O&S Cost by Category Base Year $ Unit:($M)	System Name: EMALS	Antecedent System Name: No antecedent
Unit-Level Manpower	4.9	
Unit Operations	0	
Maintenance	9.5	
Sustaining Support	2.5	
Continued System Improvements	4.0	
Other	0.0	
Total O&S	20.8	0.0

Disposal/Demilitarization Cost Estimate

(Base Year $Millions)	System Name: EMALS	Antecedent System Name: No antecedent
Total Disposal	N/A	

Cost Estimate Source - Disposal	
Type:	Program Office Estimate
Approval Authority and Date:	12/31/2022
Note:	
Disposal Cost Notes: EMALS inactivation and disposal costs are included in the CVN 78 Class inactivation and disposal cost.	

Additional O&S Estimate Assumptions:
Sustainment Strategy:
EMALS will be under a blended support and sustainment scenario by the Original Equipment Manufacturer (OEM), General Atomics (GA), and Navy support from Naval Air Systems Command (NAVAIR) PMA 251 as applicable. The intention is for GA to provide support and have the shipyards and the Navy to provide both industrial level support, (i.e. cranes, lifts, power (including step down backup) and air) as well as shop modifications, equipment to support motor repairs, equipment storage areas, and temperature controls. Final maintenance planning information was approved in the first quarter FY 2018 as part of Naval Supply Systems Command approval of the Provisioning Technical Data.
Antecedent Estimate Assumptions:
EMALS is specifically designed to meet the requirements of the CVN 78 Class. The advanced technologies and capabilities, and unique ship interface requirements of EMALS do not exist in any legacy launcher systems. As such, there are no comparable antecedent systems.