Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-223

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

As of FY 2018 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

Table of Contents

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Common Acronyms and Abbreviations for MDAP Programs

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

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

Program Information

Program Name

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

DoD Component

Navy

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References

CVN 78

SAR Baseline (Development Estimate)

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated April 23, 2004

Approved APB

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated April 2, 2013

EMALS

SAR Baseline (Development Estimate)

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated April 23, 2004

Approved APB

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated April 2, 2013

Mission and Description

The CVN 78 Gerald R. Ford Class Nuclear Aircraft Carrier (CVN 78) is the planned 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 Delivered to the Navy on May 31, 2017 after successfully completing Builder's Sea Trials in April 2017 and Acceptance Trials in May 2917. The Navy and shipbuilder are focused on activity necessary to achieve Flight Deck Certification to support fixed wing aircraft operations in August 2017.

With less than 1% of the production effort to go on CVN 78, the principal risk remains completing the shipboard test program for concurrently developed systems, such as Advanced Arresting Gear (AAG), Dual Band Radar (DBR) and Advanced Weapons Elevators (AWE). The shipboard efforts for AAG are behind schedule due to delays in system testing. System level installation and checkout testing is projected to complete in time to support initial aircraft operations. The first tailored Aircraft Recovery Bulletin (ARB) for F/A-18E/F was completed and signed February 27, 2017. The main focus of the AAG Program over the next 18 months is to support CVN 78, and to complete the testing required to develop the ARBs for the full combat air wing. These efforts will also include the required logistics products and training for the crew. DBR system activation testing is complete and it has demonstrated its capabilities to track aircraft during Builder's Sea Trials. Efforts continue supporting performance improvements, crew training, and certification events, including Air Traffic Control and Detect-to-Engage grooming. Construction and testing are complete on one of the 11 AWEs and it was operated at sea by the shipbuilder during Builder's Sea Trials. At-sea operation of the elevators by the crew prior to Post Shakedown Availability/Selected Restricted Availability (PSA/SRA) will assist in identifying any required design changes.

During the PSA/SRA, construction and testing will continue on the remaining systems to include necessary efforts to complete AAG, DBR and AWEs. One Main Turbine Generator, which experienced an issue during testing of the first-of-class electrical generation and distribution system and was not operated during sea trials, will be repaired during the PSA.

CVN 78 is the numerical replacement for USS ENTERPRISE (CVN 65), inactivated on December 1, 2012. Upon delivery of CVN 78, the Navy carrier force will return to 11 ships as required by 10 U.S.C. 5062(b). The Navy will conduct Full Ship Shock Trials (FSST) on CVN 78 prior to deployment in accordance with the ADM signed by USD(AT&L) on August 7, 2015. FSST will be conducted in FY 2019 following the completion of CVN 78 component shock qualification in FY 2016-FY 2018. Following FSST, CVN 78 will enter its scheduled maintenance availability and required training workups prior to being deployment ready in 2022.

Electromagnetic Aircraft Launch System (EMALS) (major subprogram)

Development and ship integration efforts for EMALS continue as planned. The System Development and Demonstration (SDD) program is 99% complete. Land-based aircraft compatibility testing in Lakehurst, New Jersey completed in April 2014. The Lakehurst site will remain operational through 2017 to support shipboard testing, the correction of deficiencies, CVN 78 crew training, and logistics product development which is currently 97% complete. The delivery of EMALS hardware to CVN 78 is 100% complete. Shipboard commissioning and certification testing began in August 2014 and completed November 2016.

JOHN F. KENNEDY (CVN 79)

For CVN 79, the Navy has implemented a two-phase acquisition plan which will allow the basic ship to be constructed and tested in the most efficient manner by the shipbuilder Phase I while enabling select ship systems and compartments to be completed in Phase II, where the work can be completed more affordably through competition or the use of skilled installation teams. The two-phase strategy for CVN 79 capitalizes on schedule flexibility to deliver the ship at the lowest cost and enables the Navy to procure and install at the latest date possible shipboard electronics systems which otherwise would be subject to obsolescence prior to CVN 79's first deployment in 2027. CVN 79 is the force structure replacement for USS NIMITZ (CVN 68), which is scheduled for inactivation in 2025.

CVN 79 construction is executing per the plan, however, the delivery date has been 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 (DD&C) contract in June 2022 will represent primary acceptance from the shipbuilder. All costs for both Phase 1 and Phase II are included within the CVN 79 end cost and are accounted for within the cost cap.

With 30% constructed based on total production hours, the shipbuilder's performance to date reflects a 17% reduction in production hours as compared to that needed by CVN 78 to achieve the same level of progress. The cost performance is slightly reduced from the 18% contract target. The recent degradation in cost performance stems largely from the delayed availability of certain categories of material. The Navy is actively addressing these issues through participation in the shipbuilder's sourcing meetings, with particular focus on the most time-critical and impactful material delinquencies, and is confident that the issues will be resolved and cost impacts mitigated.

The CVN 79 EMALS production ship contract was awarded as an Undefinitized Contract Action (UCA) in June 2015. Final contract definitization occurred in December 2016 that placed the CVN 79 EMALS and AAG procurement under a fixed price contract with General Atomics, and the EMALS CVN 80 Firm Fixed Price (FFP) option was exercised in January 2017 to mitigate future cost growth.

ENTERPRISE (CVN 80)

The Navy continues to seek out and implement cost reduction opportunities to ensure the ship is delivered at the lowest possible cost. To that end, Navy has established a FORD Class Design for Affordability RDT&E investment for the identification and development of initiatives to reduce construction costs.

On May 23, 2016, the 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.

On August 31, 2016, the Navy awarded a $65M undefinitized contract modification for the long lead time procurement of CVN 80 main reduction gears, main turbine generators and main condensers.

On January 31, 2017, the Navy awarded a $25.5 M contract modification for the initial advance fabrication efforts of Long Lead Time Material (LLTM) including structural sub-components, components, sub-units and pre-assemblies. The Navy is currently negotiating additional CVN 80 LLTM with a target award in third quarter of FY 2017.

On October 26, 2016, the Navy requested a proposal for the CVN 80 DD&C portion of the contract. The Navy expects a proposal form the shipbuilder in third quarter of FY 2017, with contract award projected in second quarter of FY 2018.

The EMALS CVN 80 FFP option to the CVN 79 EMALS contract with General Atomics was exercised in January 2017 to mitigate future cost growth.

The CVN 78 Class program continues to address AWE and AAG software related issues. The hardware and software baselines for each of the eleven unique AWEs are incrementally updated to address discoveries identified during the construction, grooming, and test process for each successive elevator. Further software baseline updates may be required as a result of the independent Software Verification and Validation to be conducted as part of the AWE certification process. The Government and Shipbuilder are prioritizing corrective actions for each finding to limit changes and to control the configuration management of the elevators. Software issues within the AAG program are reported in the AAG SAR.

Threshold Breaches

CVN 78

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 to CVN 78 Combat Systems Trial Rehearsal (CSTR), Delivery and IOC events were previously reported in the December 2015 SAR.

CSTR was completed in January 2017. Shipboard testing progress has continued to be slower than anticipated. As a result, Builder's Trials were completed in April 2017. The delay in sea trials has resulted in a subsequent delay to CVN 78 Delivery which completed in May 2017. IOC is now planned for November 2018.

Delay to CVN 78 Delivery has resulted in a delay to Initial Operational Test and Evaluation (IOT&E) and Platform-Level Integration Developmental Test (DT) Period. IOT&E Start, Platform-Level Integration DT Period Complete, and IOT&E Complete have been rescheduled to December 2020, September 2021, and February 2021, respectively.

CVN 79 DAB Program Review and Start Construction event breaches were previously reported in the December 2014 SAR.

The Program Office will submit a Program Deviation Report (PDR) to address these changes and an APB update will be submitted after CVN 78 Delivery.

EMALS

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	

Explanation of Breach

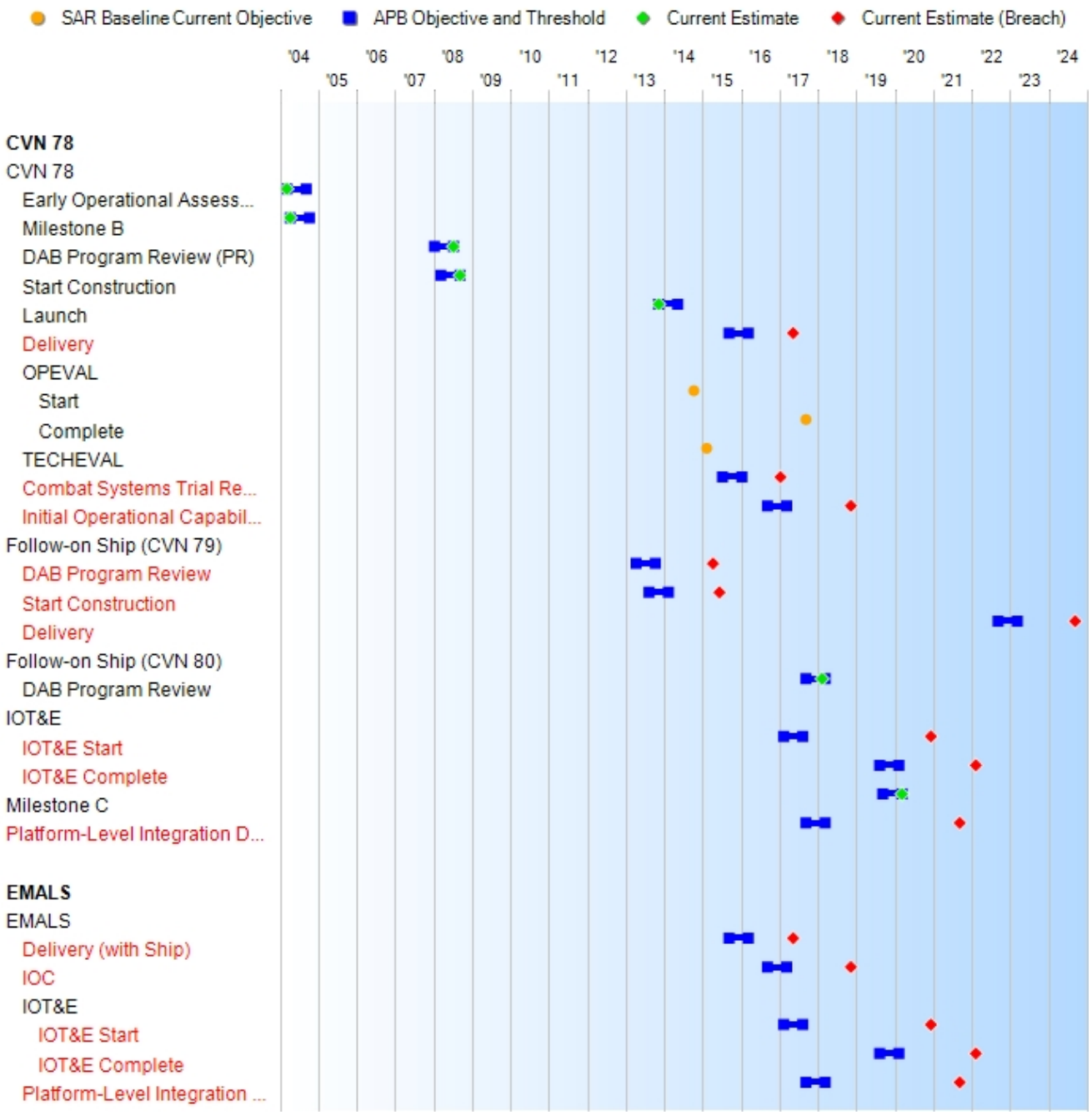
The schedule breach to IOC was a result of the ship delivery and IOC shifting to May 2017 and November 2018, respectively. EMALS will deliver and complete IOC as a component to the ship.

Additionally, EMALS will reach Initial Operational Test & Evaluation (IOT&E) Start, Platform-Level Integration DT Period Complete, and IOT&E Complete with the ship and have been rescheduled to December 2020, September 2021, and February 2022, respectively.

The cost breach to RDT&E was previously reported in the December 2014 SAR for EMALS in the amount of $5.5M. The program anticipates this breach to increase to approximately $61.9M. This cost breach is the result of additional costs associated with

PAUC	None	maintaining the EMALS shore based test site and continued land based testing efforts.
APUC	None	
Original UCR Baseline		
PAUC	None	The Program Office will submit a Program Deviation Report to address these changes and an APB update will be submitted after CVN 78 Delivery.
APUC	None	

Schedule


SAR Baseline Current Objective
APB Objective and Threshold
Current Estimate
Current Estimate (Breach)
'04
'05
'06
'07
'08
'09
'10
'11
'12
'13
'14
'15
'16
'17
'18
'19
'20
'21
'22
'23
'24
CVN 78
CVN 78
Early Operational Assess...
Milestone B
DAB Program Review (PR)
Start Construction
Launch
Delivery
OPEVAL
Start
Complete
TECHEVAL
Combat Systems Trial Re...
Initial Operational Capabil...
Follow-on Ship (CVN 79)
DAB Program Review
Start Construction
Delivery
Follow-on Ship (CVN 80)
DAB Program Review
IOT&E
IOT&E Start
IOT&E Complete
Milestone C
Platform-Level Integration D...
EMALS
EMALS
Delivery (with Ship)
IOC
IOT&E
IOT&E Start
IOT&E Complete
Platform-Level Integration ...

CVN 78

Schedule Events					
Events	**SAR Baseline Development Estimate**	**Current APB Development Objective/Threshold**		**Current Estimate**	
CVN 78					
Early Operational Assessment	Mar 2004	Mar 2004	Sep 2004	Mar 2004	
Milestone B	Apr 2004	Apr 2004	Oct 2004	Apr 2004	
DAB Program Review (PR)	Jan 2006	Jan 2008	Jul 2008	Jul 2008	
Start Construction	Jan 2007	Mar 2008	Sep 2008	Sep 2008	
Launch	Nov 2012	Nov 2013	May 2014	Nov 2013	
Delivery	Sep 2014	Sep 2015	Mar 2016	**May 2017**[1]	(Ch-1)
OPEVAL					
Start	Oct 2014	N/A	N/A	N/A	
Complete	Sep 2017	N/A	N/A	N/A	
TECHEVAL	Feb 2015	N/A	N/A	N/A	
Combat Systems Trial Rehearsal (CSTR)	Jul 2014	Jul 2015	Jan 2016	**Jan 2017**[1]	(Ch-2)
Initial Operational Capability (IOC)	Sep 2015	Sep 2016	Mar 2017	**Nov 2018**[1]	(Ch-3)
Follow-on Ship (CVN 79)					
DAB Program Review	Jan 2010	Apr 2013	Oct 2013	**Apr 2015**[1]	
Start Construction	Jan 2011	Aug 2013	Feb 2014	**Jun 2015**[1]	
Delivery	Sep 2018	Sep 2022	Mar 2023	**Sep 2024**[1]	(Ch-4)
Follow-on Ship (CVN 80)					
DAB Program Review	Jan 2015	Sep 2017	Mar 2018	Feb 2018	(Ch-5)
IOT&E					
IOT&E Start	N/A	Feb 2017	Aug 2017	**Dec 2020**[1]	(Ch-6)
IOT&E Complete	N/A	Aug 2019	Feb 2020	**Feb 2022**[1]	(Ch-7)
Milestone C	Mar 2017	Sep 2019	Mar 2020	Mar 2020	(Ch-8)
Platform-Level Integration DT Period Complete	N/A	Sep 2017	Mar 2018	**Sep 2021**[1]	(Ch-9)

[1] *APB Breach*

Change Explanations

(Ch-1) The current estimate for CVN 78 Delivery changed from September 2016 to May 2017 to document actual completion date.
(Ch-2) The current estimate for CSTR changed from May 2016 to January 2017 to document actual completion date.
(Ch-3) The current estimate for IOC changed from October 2017 to November 2018 to reflect a shift in the PSA start and completion dates.
(Ch-4) The current estimate for CVN 79 Delivery changed from June 2022 to September 2024 to reflect SECNAV's letter of February 16, 2017 to the Congressional Defense Committees certifying the delivery date of CVN 79 as required by Section 121 of the FY 2017 NDAA (Public Law 114-238). Program execution remains on track to the two phase construction plan, however, delivery is now defined as the end of the second phase of construction.
(Ch-5) The current estimate for CVN 80 DAB Program Review changed from October 2017 to February 2018 to align with the revised estimate award of the CVN 80 DD&C contract in March 2018.
(Ch-6) The current estimate for IOT&E Start changed from May 2018 to December 2020 due to a schedule shift resulting from the delay to delivery.
(Ch-7) The current estimate for IOT&E Complete changed from April 2020 to February 2022 due to a schedule shift resulting from the delay to delivery.
(Ch-8) The current estimate for Milestone C changed from October 2017 to March 2020 reverting back to the current APB threshold.
(Ch-9) The current estimate for Platform-Level Integration DT Period Complete changed from November 2018 to September 2021 due to a schedule shift resulting from the delay to delivery.

Acronyms and Abbreviations

CSTR - Combat Systems Trial Rehersal
DD&C - Detail Design and Construction
DT - Developmental Testing
IOT&E - Initial Operational Test & Evaluation
NDAA - National Defense Authorization Act
OPEVAL - Operational Evaluation
PSA - Post Shakedown Availability
SECNAV - Secretary of the Navy
TECHEVAL - Technical Evaluation

EMALS

Schedule Events					
Events	**SAR Baseline Development Estimate**	**Current APB Development Objective/Threshold**		**Current Estimate**	
EMALS					
Delivery (with Ship)	Sep 2015	Sep 2015	Mar 2016	**May 2017**[1]	(Ch-1)
IOC	Sep 2016	Sep 2016	Mar 2017	**Nov 2018**[1]	(Ch-2)
IOT&E					
IOT&E Start	Feb 2017	Feb 2017	Aug 2017	**Dec 2020**[1]	(Ch-3)
IOT&E Complete	Aug 2019	Aug 2019	Feb 2020	**Feb 2022**[1]	(Ch-4)
Platform-Level Integration DT Period Complete	Sep 2017	Sep 2017	Mar 2018	**Sep 2021**[1]	(Ch-5)

[1] *APB Breach*

Change Explanations

(Ch-1) The current estimate for CVN 78 Delivery changed from September 2016 to May 2017 to document actual completion date.
(Ch-2) The current estimate for IOC changed from October 2017 to November 2018 to reflect a shift in the PSA start and completion dates.
(Ch-3) The current estimate for IOT&E Start changed from May 2018 to December 2020 due to a schedule shift resulting from the delay to delivery.
(Ch-4) The current estimate for IOT&E Complete changed from April 2020 to February 2022 due to a schedule shift resulting from the delay to delivery.
(Ch-5) The current estimate for Platform-Level Integration DT Period changed from November 2018 to September 2021 due to a schedule shift resulting from the delay to delivery.

Acronyms and Abbreviations

DT - Developmental Test
IOT&E - Initial Operational Test & Evaluation
PSA - Post Shakedown Availability

(U//FOUO) Performance

(U//FOUO) CVN 78

(U//FOUO) Performance Characteristics				
SAR Baseline Development Estimate	**Current APB Development Objective/Threshold**		**Demonstrated Performance**	**Current Estimate**
CVN 78				
Interoperability				
Note 2	N/A	N/A	TBD	N/A
Sustained Sortie Rate				
220	220	160	TBD	172
Surge Sortie Rate				
310	310	270	TBD	284
Ship Service Electrical Generating Capacity (times NIMITZ Class capacity in MW)				
3.0	3.0	2.5	TBD	2.7
Weight Service Life Allowance (% of full load displacement in long tons)				
7.5	7.5	5.0	TBD	5.9
Stability Service Life Allowance (feet)				
2.5	2.5	1.5	TBD	1.5
Ship's Force Manpower (billets)				
2391	2391	2791	TBD	2628
Follow-on Ship				
Interoperability				
Note 2	N/A	N/A	N/A	N/A
Sustained Sortie Rate				
220	N/A	N/A	N/A	N/A
Surge Sortie Rate				
310	N/A	N/A	N/A	N/A
Service Electrical Generating Capacity (times NIMITZ Class capacity in MW)				
3.0	N/A	N/A	N/A	N/A
Weight Service Life Allowance (% of full load displacement in long tons)				
7.5	N/A	N/A	N/A	N/A
Stability Service Life Allowance (feet)				
2.5	N/A	N/A	N/A	N/A
Ship's Force Manpower (billets)				

2391	N/A	N/A	N/A	N/A
Force Protection and Survivability in an Asymmetric Threat Environment				
(U//FOUO) Survivability				
N/A	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 9070.1 with the exception of Collective Protection System
Net-Ready				
N/A	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

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

Requirements Reference

Operational Requirements Document (ORD) Change 2 dated June 22, 2007

Change Explanations

None

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.

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 dated June 22, 2007.

CVN-21 Operational Requirements Document (ORD) Change 2 dated June 22, 2007 was revalidated on April 27, 2015.

Acronyms and Abbreviations

CBR - Chemical, Biological, Radiological
IER - Interoperability Exchange Requirement
MW - Megawatt
OPNAV - Chief of Naval Operations

EMALS

Performance Characteristics				
SAR Baseline Development Estimate	**Current APB Development Objective/Threshold**		**Demonstrated Performance**	**Current Estimate**
See Note				
N/A	N/A	N/A	TBD	N/A

Requirements Reference

Operational Requirements Document (ORD) Change 2 dated June 22, 2007

Change Explanations

None

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.

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 dated June 22, 2007.

CVN-21 Operational Requirements Document (ORD) Change 2 dated June 22, 2007 was revalidated on April 27, 2015.

Track to Budget

CVN 78

RDT&E

Appn		BA	PE		
Navy	1319	04	0603512N		
	Project		**Name**		
	10C098		Composite Mast for CVN's		(Sunk)
	2208		CVN 21	(Shared)	(Sunk)
	2678		Tech Insertion		(Sunk)
	2693		Ship System Definition		(Sunk)
	4006		CVN 79		(Sunk)
	9181		Adv Battlestations/DSS		(Sunk)
	9349		Aviation Ship Integration Center		(Sunk)
	9516		Surface Ship Composite Moisture Separators		(Sunk)
	9B57A		Carrier Plant Automation and Manning Reduction		(Sunk)
Navy	1319	04	0603564N		
	Project		**Name**		
	2230		CV Feasibility Studies		(Sunk)
	4230		CVNX 1		(Sunk)
Navy	1319	04	0603570N		
	Project		**Name**		
	2692		Advance Nuclear Power System/CVN 21 Propulsion Plant Development		(Sunk)
Navy	1319	04	0604112N		
	Project		**Name**		
	2208		CVN 21		
	9999		CVN-78 Shock Trials		(Sunk)
Navy	1319	05	0604567N		
	Project		**Name**		
	2301		Contract Design		(Sunk)
	3108		CVN 80 Total Ship Integration		
	3179		CVN 79 Total Ship Integration		
	4007		CVN 21 LFT&E		
	4008		CVN 21 Total Ship Integration		(Sunk)
	9999		CVN Cost Reduction Activities		
	9C20A		Automated Fiber Optic Manufacturing Initiative		(Sunk)

Procurement

Appn		BA	PE
Navy	1611	02	07029898N

Line Item	Name	
2001	Carrier Replacement Program	(Shared)

Navy 1611 02 0204112N

Line Item	Name	
2001	Carrier Replacement Program	(Shared)

Navy 1611 05 0204112N

Line Item	Name	
5110	Outfitting	(Shared)
5300	Completion of Prior Year Shipbuilding	(Shared)

Navy 1810 01 0204112N

Line Item	Name	
5664	Surface Training Equipment	(Shared)

MILCON

Appn	BA	PE
Navy 1205	01	0203176N

Project	Name	
62688500	Pier 11 CVN-78 Power Booms	(Sunk)

Navy 1205 01 0702776N

Project	Name	
32443998	Drydock 8 Electrical Distribution Upgrade	(Sunk)

Acq O&M

Appn	BA	PE
Navy 1804	01	0204112N

Subactivity Group	Name	
1B1B	Ship Operations	(Shared)

Navy 1804 01 0702827N

Subactivity Group	Name	
1B2B	Ship Operational Support and Training	(Shared)

EMALS

RDT&E

Appn	BA	PE
Navy 1319	04	0603512N

Project	Name		
2208	CVN 21	(Shared)	(Sunk)
4004	EMALS		(Sunk)
9B58A	Improved Corrosion Protection for EMALS		(Sunk)

	9D24A		EMALS Congressional Add	(Sunk)

Navy	1319	04	0604112N

Project	Name
4004	EMALS

Procurement

Appn	BA	PE
Navy 1611	02	0204112N

Line Item	Name	
2001	Carrier Replacement Program	(Shared)

MILCON

Appn	BA	PE
Navy 1205	01	0212176N

Project	Name	
N0400024	EMALS Facility	(Sunk)

Cost and Funding

Cost Summary - Total Program

Total Acquisition Cost - Total Program							
Appropriation	BY 2000 $M			BY 2000 $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	3875.3	4123.4	--	4138.5	4333.4	4744.6	4881.7
Procurement	24825.9	24357.7	--	24656.0	31748.7	33258.8	40685.8
Flyaway	--	--	--	24632.5	--	--	40652.1
Recurring	--	--	--	21465.2	--	--	36003.3
Non Recurring	--	--	--	3167.3	--	--	4648.8
Support	--	--	--	23.5	--	--	33.7
Other Support	--	--	--	23.5	--	--	33.7
Initial Spares	--	--	--	0.0	--	--	0.0
MILCON	0.0	152.0	--	46.2	0.0	208.5	56.9
Acq O&M	0.0	0.0	--	80.5	0.0	0.0	111.1
Total	28701.2	28633.1	N/A	28921.2	36082.1	38211.9	45735.5

Cost and Funding

Cost Summary - CVN 78

Total Acquisition Cost - CVN 78							
Appropriation	BY 2000 $M			BY 2000 $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	3490.6	3472.2	3819.4	3327.7	3923.0	3999.8	3923.2
Procurement	24235.0	22764.3	25040.7	23557.0	30977.4	30808.7	38840.1
Flyaway	--	--	--	23533.5	--	--	38806.4
Recurring	--	--	--	20366.2	--	--	34157.6
Non Recurring	--	--	--	3167.3	--	--	4648.8
Support	--	--	--	23.5	--	--	33.7
Other Support	--	--	--	23.5	--	--	33.7
Initial Spares	--	--	--	0.0	--	--	0.0
MILCON	0.0	133.2	146.5	27.4	0.0	187.8	36.2
Acq O&M	0.0	0.0	--	80.5	0.0	0.0	111.1
Total	27725.6	26369.7	N/A	26992.6	34900.4	34996.3	42910.6

Cost Notes

In accordance with Section 842 of the National Defense Authorization Act for FY 2017, which amended title 10 U.S.C. § 2334, the Director of Cost Assessment and Program Evaluation, and the Secretary of the military department concerned or the head of the Defense Agency concerned, must issue guidance requiring a discussion of risk, the potential impacts of risk on program costs, and approaches to mitigate risk in cost estimates for MDAPs and major subprograms. The information required by the guidance is to be reported in each SAR. This guidance is not yet available; therefore, the information on cost risk is not contained in this SAR.

Total Quantity - CVN 78			
Quantity	SAR Baseline Development Estimate	Current APB Development	Current Estimate
RDT&E	0	0	0
Procurement	3	3	3
Total	3	3	3

Cost Summary - EMALS

Total Acquisition Cost - EMALS							
Appropriation	BY 2000 $M			BY 2000 $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	384.7	651.2	748.9	810.8[1]	410.4	744.8	958.5
Procurement	590.9	1593.4	1752.7	1099.0	771.3	2450.1	1845.7
Flyaway	--	--	--	1099.0	--	--	1845.7
Recurring	--	--	--	1099.0	--	--	1845.7
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	18.8	20.7	18.8	0.0	20.7	20.7
Acq O&M	0.0	0.0	--	0.0	0.0	0.0	0.0
Total	975.6	2263.4	N/A	1928.6	1181.7	3215.6	2824.9

[1] *APB Breach*

Cost Notes

n accordance with Section 842 of the National Defense Authorization Act for FY 2017, which amended title 10 U.S.C. § 2334, the Director of Cost Assessment and Program Evaluation, and the Secretary of the military department concerned or the head of the Defense Agency concerned, must issue guidance requiring a discussion of risk, the potential impacts of risk on program costs, and approaches to mitigate risk in cost estimates for MDAPs and major subprograms. The information required by the guidance is to be reported in each SAR. This guidance is not yet available; therefore, the information on cost risk is not contained in this SAR.

Total Quantity - EMALS			
Quantity	SAR Baseline Development Estimate	Current APB Development	Current Estimate
RDT&E	0	0	0
Procurement	3	3	3
Total	3	3	3

Cost and Funding

Funding Summary - Total Program

Appropriation Summary									
FY 2018 President's Budget / December 2016 SAR (TY$ M)									
Appropriation	Prior	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	To Complete	Total
RDT&E	4130.6	141.5	138.1	135.4	105.0	73.5	74.9	82.7	4881.7
Procurement	21488.1	2633.6	4499.9	1589.9	2245.6	2992.0	2356.9	2879.8	40685.8
MILCON	56.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	56.9
Acq O&M	30.3	35.1	14.1	9.4	8.4	6.6	7.2	0.0	111.1
PB 2018 Total	25705.9	2810.2	4652.1	1734.7	2359.0	3072.1	2439.0	2962.5	45735.5
PB 2017 Total	25721.3	2804.5	4516.0	1788.2	1830.9	3173.3	1769.2	2219.1	43822.5
Delta	-15.4	5.7	136.1	-53.5	528.1	-101.2	669.8	743.4	1913.0

Cost and Funding

Funding Summary - CVN 78

Appropriation Summary FY 2018 President's Budget / December 2016 SAR (TY$ M)									
Appropriation	Prior	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	To Complete	Total
RDT&E	3251.8	103.8	112.1	119.4	105.0	73.5	74.9	82.7	3923.2
Procurement	20389.1	2471.0	4355.4	1348.5	2125.3	2937.5	2352.3	2861.0	38840.1
MILCON	36.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.2
Acq O&M	30.3	35.1	14.1	9.4	8.4	6.6	7.2	0.0	111.1
PB 2018 Total	23707.4	2609.9	4481.6	1477.3	2238.7	3017.6	2434.4	2943.7	42910.6
PB 2017 Total	23661.4	2532.4	4312.2	1594.2	1704.0	3060.7	1681.4	2149.2	40695.5
Delta	46.0	77.5	169.4	-116.9	534.7	-43.1	753.0	794.5	2215.1

Quantity Summary FY 2018 President's Budget / December 2016 SAR (TY$ M)										
Quantity	Undistributed	Prior	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	To Complete	Total
Development	0	0	0	0	0	0	0	0	0	0
Production	0	2	0	1	0	0	0	0	0	3
PB 2018 Total	0	2	0	1	0	0	0	0	0	3
PB 2017 Total	0	2	0	1	0	0	0	0	0	3
Delta	0	0	0	0	0	0	0	0	0	0

Funding Summary - EMALS

Appropriation Summary FY 2018 President's Budget / December 2016 SAR (TY$ M)									
Appropriation	Prior	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	To Complete	Total
RDT&E	878.8	37.7	26.0	16.0	0.0	0.0	0.0	0.0	958.5
Procurement	1099.0	162.6	144.5	241.4	120.3	54.5	4.6	18.8	1845.7
MILCON	20.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.7
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2018 Total	1998.5	200.3	170.5	257.4	120.3	54.5	4.6	18.8	2824.9
PB 2017 Total	2059.9	272.1	203.8	194.0	126.9	112.6	87.8	69.9	3127.0
Delta	-61.4	-71.8	-33.3	63.4	-6.6	-58.1	-83.2	-51.1	-302.1

Quantity Summary FY 2018 President's Budget / December 2016 SAR (TY$ M)										
Quantity	Undistributed	Prior	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	To Complete	Total
Development	0	0	0	0	0	0	0	0	0	0
Production	0	2	0	1	0	0	0	0	0	3
PB 2018 Total	0	2	0	1	0	0	0	0	0	3
PB 2017 Total	0	2	0	1	0	0	0	0	0	3
Delta	0	0	0	0	0	0	0	0	0	0

Cost and Funding

Annual Funding By Appropriation - CVN 78

Annual Funding - CVN 78 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
1997	--	--	--	--	--	--	0.9
1998	--	--	--	--	--	--	46.1
1999	--	--	--	--	--	--	83.3
2000	--	--	--	--	--	--	136.8
2001	--	--	--	--	--	--	189.5
2002	--	--	--	--	--	--	240.5
2003	--	--	--	--	--	--	272.4
2004	--	--	--	--	--	--	268.8
2005	--	--	--	--	--	--	300.3
2006	--	--	--	--	--	--	245.5
2007	--	--	--	--	--	--	229.5
2008	--	--	--	--	--	--	191.5
2009	--	--	--	--	--	--	201.8
2010	--	--	--	--	--	--	179.6
2011	--	--	--	--	--	--	119.9
2012	--	--	--	--	--	--	113.3
2013	--	--	--	--	--	--	104.3
2014	--	--	--	--	--	--	103.8
2015	--	--	--	--	--	--	122.6
2016	--	--	--	--	--	--	101.4
2017	--	--	--	--	--	--	103.8
2018	--	--	--	--	--	--	112.1
2019	--	--	--	--	--	--	119.4
2020	--	--	--	--	--	--	105.0
2021	--	--	--	--	--	--	73.5
2022	--	--	--	--	--	--	74.9
2023	--	--	--	--	--	--	27.1
2024	--	--	--	--	--	--	27.6
2025	--	--	--	--	--	--	28.0
Subtotal	--	--	--	--	--	--	3923.2

Annual Funding - CVN 78 1319 | RDT&E | Research, Development, Test, and Evaluation, Navy							
Fiscal Year	Quantity	BY 2000 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
1997	--	--	--	--	--	--	0.9
1998	--	--	--	--	--	--	46.9
1999	--	--	--	--	--	--	83.7
2000	--	--	--	--	--	--	135.5
2001	--	--	--	--	--	--	185.1
2002	--	--	--	--	--	--	232.6
2003	--	--	--	--	--	--	259.6
2004	--	--	--	--	--	--	249.2
2005	--	--	--	--	--	--	271.3
2006	--	--	--	--	--	--	215.1
2007	--	--	--	--	--	--	196.2
2008	--	--	--	--	--	--	160.8
2009	--	--	--	--	--	--	167.3
2010	--	--	--	--	--	--	146.7
2011	--	--	--	--	--	--	95.7
2012	--	--	--	--	--	--	88.9
2013	--	--	--	--	--	--	81.0
2014	--	--	--	--	--	--	79.5
2015	--	--	--	--	--	--	92.7
2016	--	--	--	--	--	--	75.4
2017	--	--	--	--	--	--	75.8
2018	--	--	--	--	--	--	80.2
2019	--	--	--	--	--	--	83.8
2020	--	--	--	--	--	--	72.2
2021	--	--	--	--	--	--	49.6
2022	--	--	--	--	--	--	49.5
2023	--	--	--	--	--	--	17.6
2024	--	--	--	--	--	--	17.5
2025	--	--	--	--	--	--	17.4
Subtotal	--	--	--	--	--	--	3327.7

Annual Funding - CVN 78 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
2001	--	21.7	--	--	21.7	--	21.7
2002	--	135.3	--	--	135.3	--	135.3
2003	--	243.7	--	151.8	395.5	--	395.5
2004	--	955.2	--	207.7	1162.9	--	1162.9
2005	--	274.4	--	348.7	623.1	--	623.1
2006	--	241.6	--	377.3	618.9	--	618.9
2007	--	358.3	--	424.5	782.8	--	782.8
2008	1	1774.6	--	1008.4	2783.0	--	2783.0
2009	--	3659.1	--	58.8	3717.9	--	3717.9
2010	--	827.4	--	253.9	1081.3	--	1081.3
2011	--	1801.9	--	561.4	2363.3	--	2363.3
2012	--	453.6	--	101.2	554.8	--	554.8
2013	1	398.8	--	82.7	481.5	--	481.5
2014	--	1214.8	--	267.3	1482.1	--	1482.1
2015	--	1646.7	--	92.9	1739.6	--	1739.6
2016	--	2305.8	--	139.6	2445.4	--	2445.4
2017	--	2345.2	--	121.1	2466.3	--	2466.3
2018	1	4265.4	--	78.0	4343.4	--	4343.4
2019	--	1243.1	--	97.4	1340.5	--	1340.5
2020	--	2029.1	--	95.2	2124.3	--	2124.3
2021	--	1837.3	1004.2	91.0	2932.5	--	2932.5
2022	--	711.4	1586.1	51.8	2349.3	--	2349.3
2023	--	2389.6	--	38.1	2427.7	--	2427.7
2024	--	101.9	--	--	101.9	--	101.9
2025	--	95.8	--	--	95.8	--	95.8
2026	--	77.7	--	--	77.7	--	77.7
2027	--	140.2	--	--	140.2	--	140.2
2028	--	17.7	--	--	17.7	--	17.7
Subtotal	3	31567.3	2590.3	4648.8	38806.4	--	38806.4

Annual Funding - CVN 78 1611 | Procurement | Shipbuilding and Conversion, Navy							
Fiscal Year	Quantity	BY 2000 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2001	--	19.7	--	--	19.7	--	19.7
2002	--	122.0	--	--	122.0	--	122.0
2003	--	207.7	--	129.4	337.1	--	337.1
2004	--	785.7	--	170.9	956.6	--	956.6
2005	--	216.1	--	274.7	490.8	--	490.8
2006	--	183.8	--	287.1	470.9	--	470.9
2007	--	260.6	--	308.8	569.4	--	569.4
2008	1	1248.4	--	709.3	1957.7	--	1957.7
2009	--	2497.7	--	40.1	2537.8	--	2537.8
2010	--	545.8	--	167.5	713.3	--	713.3
2011	--	1151.5	--	358.7	1510.2	--	1510.2
2012	--	283.6	--	63.2	346.8	--	346.8
2013	1	244.5	--	50.7	295.2	--	295.2
2014	--	731.4	--	161.0	892.4	--	892.4
2015	--	972.4	--	54.9	1027.3	--	1027.3
2016	--	1336.0	--	80.9	1416.9	--	1416.9
2017	--	1332.3	--	68.8	1401.1	--	1401.1
2018	1	2375.7	--	43.5	2419.2	--	2419.2
2019	--	678.8	--	53.2	732.0	--	732.0
2020	--	1086.3	--	50.9	1137.2	--	1137.2
2021	--	964.3	527.0	47.8	1539.1	--	1539.1
2022	--	366.1	816.1	26.7	1208.9	--	1208.9
2023	--	1205.5	--	19.2	1224.7	--	1224.7
2024	--	50.4	--	--	50.4	--	50.4
2025	--	46.5	--	--	46.5	--	46.5
2026	--	36.9	--	--	36.9	--	36.9
2027	--	65.3	--	--	65.3	--	65.3
2028	--	8.1	--	--	8.1	--	8.1
Subtotal	3	19023.1	1343.1	3167.3	23533.5	--	23533.5

Navy plans to build 11 CVN 78 Class ships to replace CVN 65 and CVN 68 Class ships.

Cost Quantity Information

The Navy and shipbuilder have made fundamental changes in the manner in which the CVN 79 will be built to incorporate lessons learned from CVN 78 and eliminate the key contributors to cost performance challenges realized in the construction of CVN 78. Further improvements are planned for CVN 80 and have been incorporated into the CVN 80 cost estimates and budgets. The CVN 80 Funding includes $12.89B for construction of the ship and $105.3M for FORD Class Battle Spares and AAG Interim spares.

The FY 2018 PB introduces the second year of funding for CVN 81; however, it is not in the current APB. An update to the APB will be needed at a later to date to add CVN 81 to the program baseline. With the addition of CVN 81 into the FYDP, unit costs will appear to have increased until CVN 81 is added to the APB and the unit cost is adjusted to reflect four ships.

Cost Quantity Information - CVN 78 1611 | Procurement | Shipbuilding and Conversion, Navy		
Fiscal Year	**Quantity**	**End Item Recurring Flyaway (Aligned With Quantity) BY 2000 $M**
2001	--	--
2002	--	--
2003	--	--
2004	--	--
2005	--	--
2006	--	--
2007	--	--
2008	1	6368.3
2009	--	--
2010	--	--
2011	--	--
2012	--	--
2013	1	6077.9
2014	--	--
2015	--	--
2016	--	--
2017	--	--
2018	1	6576.9
2019	--	--
2020	--	--
2021	--	--
2022	--	--
2023	--	--
2024	--	--
2025	--	--
2026	--	--
2027	--	--
2028	--	--
Subtotal	3	19023.1

Annual Funding - CVN 78 1810 | Procurement | Other Procurement, Navy							
Fiscal Year	Quantity	TY $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2017	--	--	--	--	--	4.7	4.7
2018	--	--	--	--	--	12.0	12.0
2019	--	--	--	--	--	8.0	8.0
2020	--	--	--	--	--	1.0	1.0
2021	--	--	--	--	--	5.0	5.0
2022	--	--	--	--	--	3.0	3.0
Subtotal	--	--	--	--	--	33.7	33.7

Annual Funding - CVN 78 1810 | Procurement | Other Procurement, Navy							
Fiscal Year	Quantity	BY 2000 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2017	--	--	--	--	--	3.4	3.4
2018	--	--	--	--	--	8.5	8.5
2019	--	--	--	--	--	5.6	5.6
2020	--	--	--	--	--	0.7	0.7
2021	--	--	--	--	--	3.3	3.3
2022	--	--	--	--	--	2.0	2.0
Subtotal	--	--	--	--	--	23.5	23.5

Annual Funding - CVN 78 1205 | MILCON | Military Construction, Navy and Marine Corps	
Fiscal Year	**TY $M**
	Total Program
2013	32.8
2014	3.4
Subtotal	36.2

Annual Funding - CVN 78 1205 | MILCON | Military Construction, Navy and Marine Corps	
Fiscal Year	**BY 2000 $M**
	Total Program
2013	24.9
2014	2.5
Subtotal	27.4

Annual Funding - CVN 78 1804 | Acq O&M | Operation and Maintenance, Navy	
Fiscal Year	**TY $M**
	Total Program
2015	4.8
2016	25.5
2017	35.1
2018	14.1
2019	9.4
2020	8.4
2021	6.6
2022	7.2
Subtotal	111.1

Annual Funding - CVN 78 1804 | Acq O&M | Operation and Maintenance, Navy	
Fiscal Year	**BY 2000 $M**
	Total Program
2015	3.7
2016	19.1
2017	25.8
2018	10.2
2019	6.6
2020	5.8
2021	4.5
2022	4.8
Subtotal	80.5

Annual Funding By Appropriation - EMALS

Annual Funding - EMALS 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
2000	--	--	--	--	--	--	41.0
2001	--	--	--	--	--	--	41.0
2002	--	--	--	--	--	--	41.0
2003	--	--	--	--	--	--	44.2
2004	--	--	--	--	--	--	37.2
2005	--	--	--	--	--	--	49.4
2006	--	--	--	--	--	--	56.8
2007	--	--	--	--	--	--	108.2
2008	--	--	--	--	--	--	40.5
2009	--	--	--	--	--	--	113.2
2010	--	--	--	--	--	--	90.9
2011	--	--	--	--	--	--	59.1
2012	--	--	--	--	--	--	31.0
2013	--	--	--	--	--	--	54.9
2014	--	--	--	--	--	--	46.9
2015	--	--	--	--	--	--	11.3
2016	--	--	--	--	--	--	12.2
2017	--	--	--	--	--	--	37.7
2018	--	--	--	--	--	--	26.0
2019	--	--	--	--	--	--	16.0
Subtotal	--	--	--	--	--	--	958.5

Annual Funding - EMALS 1319 | RDT&E | Research, Development, Test, and Evaluation, Navy							
Fiscal Year	Quantity	BY 2000 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2000	--	--	--	--	--	--	40.6
2001	--	--	--	--	--	--	40.0
2002	--	--	--	--	--	--	39.6
2003	--	--	--	--	--	--	42.1
2004	--	--	--	--	--	--	34.5
2005	--	--	--	--	--	--	44.6
2006	--	--	--	--	--	--	49.8
2007	--	--	--	--	--	--	92.5
2008	--	--	--	--	--	--	34.0
2009	--	--	--	--	--	--	93.9
2010	--	--	--	--	--	--	74.3
2011	--	--	--	--	--	--	47.2
2012	--	--	--	--	--	--	24.3
2013	--	--	--	--	--	--	42.6
2014	--	--	--	--	--	--	35.9
2015	--	--	--	--	--	--	8.5
2016	--	--	--	--	--	--	9.1
2017	--	--	--	--	--	--	27.5
2018	--	--	--	--	--	--	18.6
2019	--	--	--	--	--	--	11.2
Subtotal	--	--	--	--	--	--	810.8

Annual Funding - EMALS 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
2007	--	5.8	--	--	5.8	--	5.8
2008	1	25.6	--	--	25.6	--	25.6
2009	--	177.2	--	--	177.2	--	177.2
2010	--	138.6	--	--	138.6	--	138.6
2011	--	251.7	--	--	251.7	--	251.7
2012	--	--	--	--	--	--	--
2013	1	12.6	--	--	12.6	--	12.6
2014	--	65.3	--	--	65.3	--	65.3
2015	--	212.5	--	--	212.5	--	212.5
2016	--	209.7	--	--	209.7	--	209.7
2017	--	162.6	--	--	162.6	--	162.6
2018	1	144.5	--	--	144.5	--	144.5
2019	--	241.4	--	--	241.4	--	241.4
2020	--	120.3	--	--	120.3	--	120.3
2021	--	54.5	--	--	54.5	--	54.5
2022	--	4.6	--	--	4.6	--	4.6
2023	--	18.8	--	--	18.8	--	18.8
Subtotal	3	1845.7	--	--	1845.7	--	1845.7

Annual Funding - EMALS 1611 | Procurement | Shipbuilding and Conversion, Navy							
Fiscal Year	Quantity	BY 2000 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2007	--	4.2	--	--	4.2	--	4.2
2008	1	18.0	--	--	18.0	--	18.0
2009	--	121.0	--	--	121.0	--	121.0
2010	--	91.4	--	--	91.4	--	91.4
2011	--	160.8	--	--	160.8	--	160.8
2012	--	--	--	--	--	--	--
2013	1	7.7	--	--	7.7	--	7.7
2014	--	39.3	--	--	39.3	--	39.3
2015	--	125.5	--	--	125.5	--	125.5
2016	--	121.5	--	--	121.5	--	121.5
2017	--	92.4	--	--	92.4	--	92.4
2018	1	80.5	--	--	80.5	--	80.5
2019	--	131.8	--	--	131.8	--	131.8
2020	--	64.4	--	--	64.4	--	64.4
2021	--	28.6	--	--	28.6	--	28.6
2022	--	2.4	--	--	2.4	--	2.4
2023	--	9.5	--	--	9.5	--	9.5
Subtotal	3	1099.0	--	--	1099.0	--	1099.0

Cost Quantity Information

The Navy was successful in using Firm Fixed Price (FFP) Contracting for EMALS on the CVN 78 to control costs and has utilized the same contracting approach on the CVN 79.

Cost Quantity Information - EMALS 1611 | Procurement | Shipbuilding and Conversion, Navy		
Fiscal Year	**Quantity**	**End Item Recurring Flyaway (Aligned With Quantity) BY 2000 $M**
2007	--	--
2008	1	434.7
2009	--	--
2010	--	--
2011	--	--
2012	--	--
2013	1	349.3
2014	--	--
2015	--	--
2016	--	--
2017	--	--
2018	1	315.0
2019	--	--
2020	--	--
2021	--	--
2022	--	--
2023	--	--
Subtotal	3	1099.0

Annual Funding - EMALS 1205 | MILCON | Military Construction, Navy and Marine Corps	
Fiscal Year	**TY $M**
	Total Program
2004	20.7
Subtotal	20.7

Annual Funding - EMALS 1205 | MILCON | Military Construction, Navy and Marine Corps	
Fiscal Year	**BY 2000 $M**
	Total Program
2004	18.8
Subtotal	18.8

Low Rate Initial Production

CVN 78

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	4/26/2004	4/26/2004
Approved Quantity	3	3
Reference	Milestone B ADM	Milestone B ADM
Start Year	2004	2004
End Year	2018	2018

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

EMALS

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

Foreign Military Sales

CVN 78

Notes

The Navy and the Government of India conducted several face to face meetings and continued monthly discussions under their Information Exchange Agreement on Aircraft Carrier Technologies. The Navy is in receipt of a Letter of Request for Pricing and Availability for a training capsule on ship design aspects related to aviation.

EMALS

Notes

The EMALS/AAG Technology Transfer and Security Assistance Review Board documentation is complete and an Exception to National Disclosure Policy is in place. A Pricing and Availability Rough Order of Magnitude for EMALS/AAG is in process for India.

Acronyms and Abbreviations

AAG - Advanced Arresting Gear

Nuclear Costs

CVN 78

Nuclear Research and Development and Reactor Plant Government Furnished Equipment costs are included within the program costs in this report; however, Department of Energy nuclear costs are not included in this report.

Shipbuilding & Conversion Navy Nuclear Propulsion Equipment Cost is $6,199.0M in TY dollars for the CVN 78 Class Aircraft Carriers (CVN 78-80).

EMALS

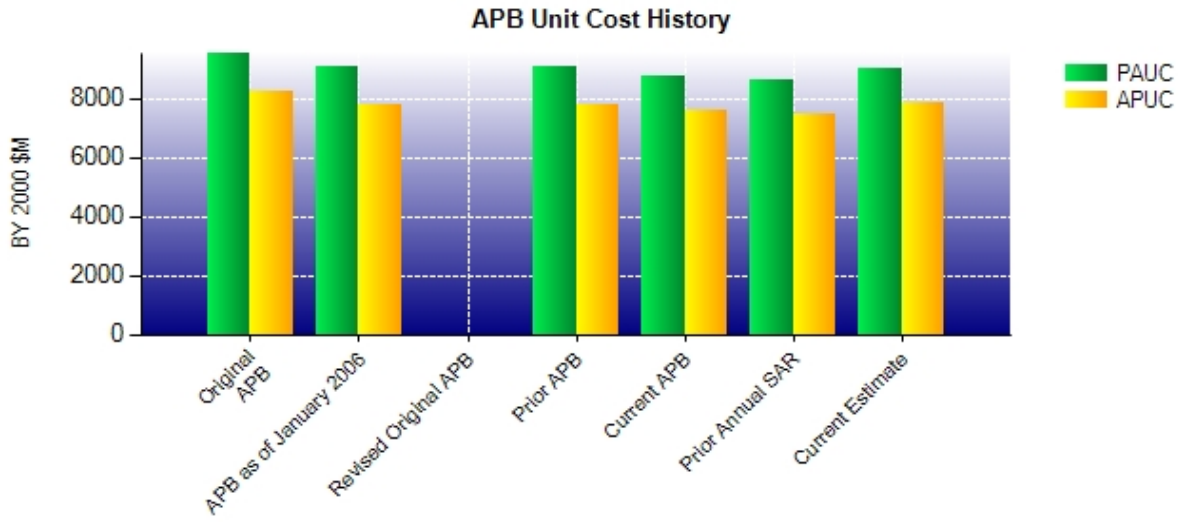
None

Unit Cost

CVN 78

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2000 $M Current UCR Baseline (Apr 2013 APB)	BY 2000 $M Current Estimate (Dec 2016 SAR)	% Change
Program Acquisition Unit Cost			
Cost	26369.7	26992.6	
Quantity	3	3	
Unit Cost	8789.900	8997.533	+2.36
Average Procurement Unit Cost			
Cost	22764.3	23557.0	
Quantity	3	3	
Unit Cost	7588.100	7852.333	+3.48

Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2000 $M Original UCR Baseline (Apr 2004 APB)	BY 2000 $M Current Estimate (Dec 2016 SAR)	% Change
Program Acquisition Unit Cost			
Cost	28701.2	26992.6	
Quantity	3	3	
Unit Cost	9567.067	8997.533	-5.95
Average Procurement Unit Cost			
Cost	24825.9	23557.0	
Quantity	3	3	
Unit Cost	8275.300	7852.333	-5.11



APB Unit Cost History					
Item	Date	BY 2000 $M		TY $M	
		PAUC	APUC	PAUC	APUC
Original APB	Apr 2004	9567.067	8275.300	12027.367	10582.900
APB as of January 2006	Aug 2005	9068.800	7778.000	12004.400	10526.633
Revised Original APB	N/A	N/A	N/A	N/A	N/A
Prior APB	Nov 2007	9068.800	7778.000	12004.400	10526.633
Current APB	Apr 2013	8789.900	7588.100	11665.433	10269.567
Prior Annual SAR	Dec 2015	8609.767	7492.667	13565.167	12250.033
Current Estimate	Dec 2016	8997.533	7852.333	14303.533	12946.700

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	
11633.467	2152.867	0.000	286.833	-27.067	246.200	0.000	11.233	2670.066	14303.533

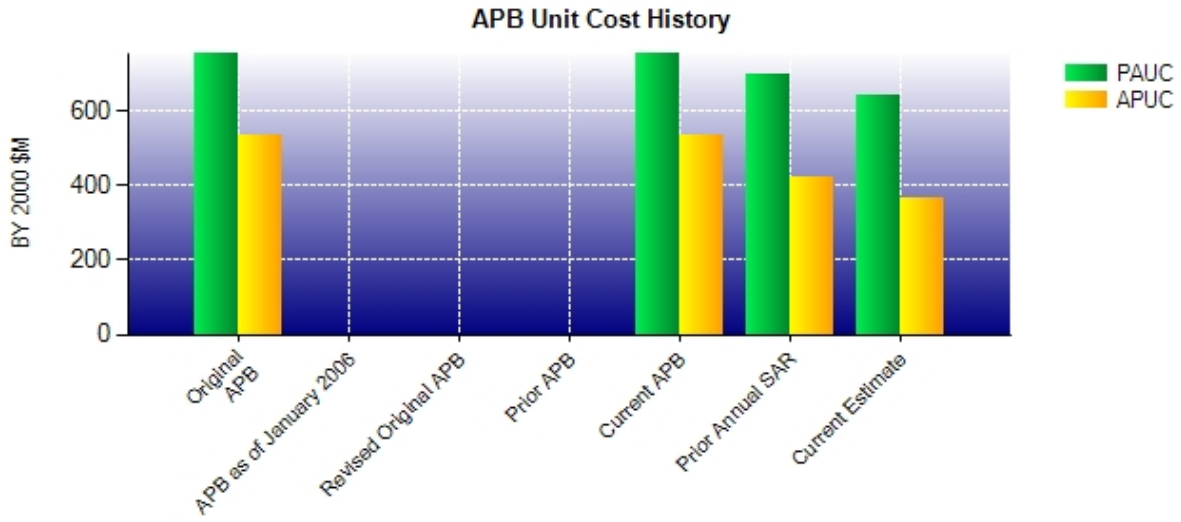
Current SAR Baseline to Current Estimate (TY $M)									
Initial APUC Development Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
10325.800	2120.400	0.000	222.467	132.967	133.833	0.000	11.233	2620.900	12946.700

SAR Baseline History				
Item	SAR Planning Estimate	SAR Development Estimate	SAR Production Estimate	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone B	N/A	Apr 2004	N/A	Apr 2004
Milestone C	N/A	Mar 2017	N/A	Mar 2020
IOC	N/A	Sep 2015	N/A	Nov 2018
Total Cost (TY $M)	N/A	34900.4	N/A	42910.6
Total Quantity	N/A	3	N/A	3
PAUC	N/A	11633.467	N/A	14303.533

EMALS

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2000 $M Current UCR Baseline (Apr 2013 APB)	BY 2000 $M Current Estimate (Dec 2016 SAR)	% Change
Program Acquisition Unit Cost			
Cost	2263.4	1928.6	
Quantity	3	3	
Unit Cost	754.467	642.867	-14.79
Average Procurement Unit Cost			
Cost	1593.4	1099.0	
Quantity	3	3	
Unit Cost	531.133	366.333	-31.03

Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2000 $M Original UCR Baseline (Apr 2013 APB)	BY 2000 $M Current Estimate (Dec 2016 SAR)	% Change
Program Acquisition Unit Cost			
Cost	2263.4	1928.6	
Quantity	3	3	
Unit Cost	754.467	642.867	-14.79
Average Procurement Unit Cost			
Cost	1593.4	1099.0	
Quantity	3	3	
Unit Cost	531.133	366.333	-31.03



APB Unit Cost History					
Item	Date	BY 2000 $M		TY $M	
		PAUC	APUC	PAUC	APUC
Original APB	Apr 2013	754.467	531.133	1071.867	816.700
APB as of January 2006	N/A	N/A	N/A	N/A	N/A
Revised Original APB	N/A	N/A	N/A	N/A	N/A
Prior APB	N/A	N/A	N/A	N/A	N/A
Current APB	Apr 2013	754.467	531.133	1071.867	816.700
Prior Annual SAR	Dec 2015	697.567	420.900	1042.333	715.800
Current Estimate	Dec 2016	642.867	366.333	941.633	615.233

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	
393.900	165.500	0.000	0.000	0.000	382.233	0.000	0.000	547.733	941.633

Current SAR Baseline to Current Estimate (TY $M)									
Initial APUC Development Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
257.100	156.900	0.000	0.000	0.000	201.233	0.000	0.000	358.133	615.233

SAR Baseline History				
Item	SAR Planning Estimate	SAR Development Estimate	SAR Production Estimate	Current Estimate
Milestone A	N/A	N/A	N/A	N/A
Milestone B	N/A	N/A	N/A	N/A
Milestone C	N/A	N/A	N/A	N/A
IOC	N/A	Sep 2016	N/A	Nov 2018
Total Cost (TY $M)	N/A	1181.7	N/A	2824.9
Total Quantity	N/A	3	N/A	3
PAUC	N/A	393.900	N/A	941.633

Cost Variance

CVN 78

Summary TY $M					
Item	**RDT&E**	**Procurement**	**MILCON**	**Acq O&M**	**Total**
SAR Baseline (Development Estimate)	3923.0	30977.4	--	--	34900.4
Previous Changes					
Economic	+97.3	+6339.9	+0.2	-1.0	+6436.4
Quantity	--	--	--	--	--
Schedule	+172.1	+667.4	--	--	+839.5
Engineering	-480.1	+398.9	--	--	-81.2
Estimating	+123.1	-1642.2	+36.0	+74.8	-1408.3
Other	--	--	--	--	--
Support	--	+8.7	--	--	+8.7
Subtotal	-87.6	+5772.7	+36.2	+73.8	+5795.1
Current Changes					
Economic	+1.0	+21.3	--	-0.1	+22.2
Quantity	--	--	--	--	--
Schedule	--	--	--	+21.0	+21.0
Engineering	--	--	--	--	--
Estimating	+86.8	+2043.7	--	+16.4	+2146.9
Other	--	--	--	--	--
Support	--	+25.0	--	--	+25.0
Subtotal	+87.8	+2090.0	--	+37.3	+2215.1
Total Changes	+0.2	+7862.7	+36.2	+111.1	+8010.2
CE - Cost Variance	3923.2	38840.1	36.2	111.1	42910.6
CE - Cost & Funding	3923.2	38840.1	36.2	111.1	42910.6

Summary BY 2000 $M					
Item	**RDT&E**	**Procurement**	**MILCON**	**Acq O&M**	**Total**
SAR Baseline (Development Estimate)	3490.6	24235.0	--	--	27725.6
Previous Changes					
Economic	--	--	--	--	--
Quantity	--	--	--	--	--
Schedule	+120.2	--	--	--	+120.2
Engineering	-352.4	+187.7	--	--	-164.7
Estimating	+11.1	-1951.1	+27.4	+54.4	-1858.2
Other	--	--	--	--	--
Support	--	+6.4	--	--	+6.4
Subtotal	-221.1	-1757.0	+27.4	+54.4	-1896.3
Current Changes					
Economic	--	--	--	--	--
Quantity	--	--	--	--	--
Schedule	-0.3	--	--	+15.4	+15.1
Engineering	--	--	--	--	--
Estimating	+58.5	+1061.9	--	+10.7	+1131.1
Other	--	--	--	--	--
Support	--	+17.1	--	--	+17.1
Subtotal	+58.2	+1079.0	--	+26.1	+1163.3
Total Changes	-162.9	-678.0	+27.4	+80.5	-733.0
CE - Cost Variance	3327.7	23557.0	27.4	80.5	26992.6
CE - Cost & Funding	3327.7	23557.0	27.4	80.5	26992.6

Previous Estimate: December 2015

RDT&E	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+1.0
Schedule variance due to Operational Test (OT) & Evaluation re-phasing due to schedule shift in Initial Operational Test & Evaluation from FY 2018 to FY 2020. (Schedule)	-0.3	0.0
Revised estimates in the out years for Operational Test & Evaluation and Live Fire Test & Evaluation due to CVN 78 Delivery shift from September 2016 to May 2017. (Estimating)	+20.7	+31.3
Revised estimate for CVN 78 Class due to Small Business Innovative Research (SBIR) adjustment. (Estimating)	-2.1	-2.8
Revised estimate for CVN 78 Component Shock testing. (Estimating)	+3.9	+5.2
Revised estimate for CVN 78 due to miscellaneous adjustments. (Estimating)	+2.5	+3.5
Revised estimate for CVN 79 due to miscellaneous adjustments. (Estimating)	+0.5	+0.7
Revised estimate for CVN 80 due to miscellaneous adjustments. (Estimating)	+0.9	+1.4
Revised out year estimates for CVN 78 Class for the identification and development of initiatives to reduce construction costs. (Estimating)	+17.5	+27.5
Congressional increase in FY 2017 for CVN 78 Class cost reduction initiatives. (Estimating)	+14.6	+20.0
RDT&E Subtotal	+58.2	+87.8

Procurement	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+21.3
Adjustment for current and prior escalation. (Estimating)	+1.5	+1.8
Revised estimate for CVN 78 Post Delivery. (Estimating)	+14.6	+26.2
Re-allocation of funds from EMALS to CVN 78. (Estimating)	+3.7	+5.8
Refined estimates for CVN 78 due to miscellaneous adjustments. (Estimating)	+0.1	+0.2
Increase to CVN 78 for the repairs to the Number 1 Main Turbine Generator. (Estimating)	+11.1	+20.0
Revised cost estimate for CVN 79 outfitting and post delivery. (Estimating)	+26.7	+54.2
Reallocation of funds from EMALS to CVN 79. (Estimating)	+74.3	+129.4
Revised estimate to CVN 79 due to service wide funding adjustments. (Estimating)	-11.5	-20.6
Reallocation of funds from EMALS to CVN 80. (Estimating)	+84.9	+166.3
Additional funding for CVN 78 Class Battle Spares. (Estimating)	+39.4	+74.5
Additional funding for CVN 78 Class Advanced Arresting Gear interim spares. (Estimating)	+16.9	+30.7
Revised estimate to CVN 80 due to service wide funding adjustments. (Estimating)	-1.8	-7.5
Revised estimate for the first year of CVN 81 Advanced Procurement (AP). (Estimating)	+18.7	+35.7
Revised estimate due to application of new out year escalation indices. (Estimating)	-12.3	-23.1
Congressional reduction in FY 2017 due to CVN 79 Change Orders growth. (Estimating)	-9.1	-16.0
Congressional reduction in FY 2017 due to CVN 79 excess cost growth. (Estimating)	-11.4	-20.0
Revised estimate due to addition of the second year of AP for CVN 81. (Estimating)	+816.1	+1586.1
Increase in Other Support to procure additional classroom training equipment for CVN 78's twenty-nine class specific systems vital to achieve Ready for Training(Navy). (Support)	+17.1	+25.0
Procurement Subtotal	+1079.0	+2090.0

Acq O&M	$M

Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-0.1
Schedule variance to support CVN 78 to cover repair, maintenance, and support costs incurred to provide a safe and habitable ship environment to the 2,500 plus crew members due to delay in ship delivery. (Schedule)	+15.4	+21.0
Adjustment for current and prior escalation. (Estimating)	+0.1	+0.1
Revised estimate for first-of-class sustainment and training of CVN 78 Class In-Service Engineering Agents (ISEAs) engineers and Norfolk Naval Shipyard (NNSY) engineers, production personnel, and managers to support the lead ship of the GERALD R. FORD Class. (Estimating)	+3.0	+4.1
Revised estimate for completion of CVN 78 life cycle training systems development. (Estimating)	+16.8	+24.6
Revised estimate for procurement of CVN 78 initial spares. (Estimating)	-9.5	-12.6
Refined estimate due to miscellaneous adjustments. (Estimating)	+0.3	+0.2
Acq O&M Subtotal	+26.1	+37.3

Cost Variance

EMALS

Summary TY $M				
Item	**RDT&E**	**Procurement**	**MILCON**	**Total**
SAR Baseline (Development Estimate)	410.4	771.3	--	1181.7
Previous Changes				
Economic	+25.7	+469.2	--	+494.9
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+522.8	+906.9	+20.7	+1450.4
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+548.5	+1376.1	+20.7	+1945.3
Current Changes				
Economic	+0.1	+1.5	--	+1.6
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-0.5	-303.2	--	-303.7
Other	--	--	--	--
Support	--	--	--	--
Subtotal	-0.4	-301.7	--	-302.1
Total Changes	+548.1	+1074.4	+20.7	+1643.2
CE - Cost Variance	958.5	1845.7	20.7	2824.9
CE - Cost & Funding	958.5	1845.7	20.7	2824.9

Summary BY 2000 $M				
Item	**RDT&E**	**Procurement**	**MILCON**	**Total**
SAR Baseline (Development Estimate)	384.7	590.9	--	975.6
Previous Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+426.5	+671.8	+18.8	+1117.1
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+426.5	+671.8	+18.8	+1117.1
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-0.4	-163.7	--	-164.1
Other	--	--	--	--
Support	--	--	--	--
Subtotal	-0.4	-163.7	--	-164.1
Total Changes	+426.1	+508.1	+18.8	+953.0
CE - Cost Variance	810.8	1099.0	18.8	1928.6
CE - Cost & Funding	810.8	1099.0	18.8	1928.6

Previous Estimate: December 2015

RDT&E	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+0.1
Adjustment for current and prior escalation. (Estimating)	-0.1	-0.1
Revised estimate for CVN 78 Class as a result of SBIR adjustment. (Estimating)	-0.2	-0.3
Refined estimate due to miscellaneous adjustments. (Estimating)	-0.1	-0.1
RDT&E Subtotal	-0.4	-0.4

Procurement	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+1.5
Adjustment for current and prior escalation. (Estimating)	0.0	-0.1
Re-allocation of funds from EMALS to CVN 78. (Estimating)	-3.7	-5.8
Re-allocation of funds from EMALS to CVN 79. (Estimating)	-74.3	-129.4
Re-allocation of funds from EMALS to CVN 80. (Estimating)	-84.8	-166.3
Revised estimate due to application off new out year escalation indices. (Estimating)	-0.7	-1.4
Refined estimate due to miscellaneous adjustments. (Estimating)	-0.2	-0.2
Procurement Subtotal	-163.7	-301.7

Contracts

Contract Identification

Appropriation: Procurement
Contract Name: CVN 78 DETAIL DESIGN & CONSTRUCTION (DD&C)
Contractor: Huntington Ingalls Industries (HII) Newport News Shipbuilding (NNS)
Contractor Location: 4101 Washington Avenue
Newport News, VA 23607-2734
Contract Number: N00024-08-C-2110
Contract Type: Cost Plus Award Fee (CPAF), Cost Plus Incentive Fee (CPIF), Cost Plus Fixed Fee (CPFF)
Award Date: September 10, 2008
Definitization Date: September 10, 2008

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
4910.5	N/A	1	6174.2	N/A	1	7172.2	6983.2

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to the award of a new contract structure for Non-Recurring Engineering (NRE) and adjudicated change orders, procurement of special tooling and test equipment, and NRE associated with design and integration of developmental systems.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (3/26/2017)	-1209.7	-44.6
Previous Cumulative Variances	-1063.1	-79.5
Net Change	-146.6	+34.9

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to A Cost Variance Explanation is not required. an evaluation of the Shipbuilder's Contract Performance Report (CPR) for CLIN 0001 (Construction) data through March 26, 2017. The shipbuilder reports that the CVN 78 Detail Design & Construction (DD&C) efforts have a negative cumulative Cost Variance (CV) of $1,209.7M. The CPR reflects the Over Target Schedule (OTS) that was agreed to by Navy in August 2013. The associated construction effort for the CVN 78 is 98.7% complete based on dollars. The construction portion of the cumulative CV is negative $1,107.4M and is attributed to material cost growth of $539.3M and construction inefficiencies of $803.0M which are offset by a favorable CV with labor/overhead rate impacts of $235.0M. Target price does not include the Estimated Authorized Cost of Unpriced Work. As of the CPR ending March 26, 2017, the CVN 78 DD&C total contract is 97.4% complete. Government Share is reported as the government portion of the construction CLIN share ratio.

PM's Estimated Price at Completion of $6983.2M for CVN 78 DD&C contract includes CVN 79 funds for NRE associated with revising CVN 78 drawings to incorporate Inspection Reports for work already physically completed on CVN 78 for use on CVN 79.

The favorable net change in the schedule variance is due to A Schedule Variance Explanation is not required. a reflection of the nearly complete status of the program. According to Earned Value Management gold card methodology, Schedule Variance (SV) is zero at completion of the program. Since the program is >97% complete SV is trending towards zero. The trend will continue until completion when SV will equal zero.

Notes

The Program Manager's Estimated Price at Completion (PMEPAC) of $6,911M exceeds the current Target Price of $6,063M by $848M. This total includes $740M of contractor performance based variance and $108M of authorized work that has not yet been adjudicated. Both the PMEPAC and the current cumulative cost variance include this $108M of authorized unadjudicated work. Upon adjudication, this work will be moved to target leaving a Price Variance at Completion of $740M. The Cost VAC has increased to $1,018M for the reasons described above. The government liability for this cost variance is $740M based on share line ratios which reduce the contractor's target fee as cost increases.

This contract is more than 90% complete; therefore, this is the final report for this contract.

Contract Identification

Appropriation: Procurement

Contract Name: CVN 79 Construction Preparation (CP)

Contractor: Huntington Ingalls Industries (HII) Newport News Shipbuilding (NNS)

Contractor Location: 4101 Washington Avenue
Newport News, VA 23607-2734

Contract Number: N00024-09-C-2116

Contract Type: Cost Plus Fixed Fee (CPFF), Cost Plus Incentive Fee (CPIF)

Award Date: January 15, 2009

Definitization Date: December 08, 2010

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
373.5	N/A	N/A	4237.7	N/A	N/A	4281.4	4302.9

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to award of CVN 79 CP contract extensions for FY 2011 through FY 2014 efforts, a modification awarded on June 5, 2015 which includes the remaining component and steel fabrication and, multiple modifications for procurement of additional material to support the CVN 79 procurement strategy.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (3/26/2017)	-103.3	+29.2
Previous Cumulative Variances	+57.3	+3.5
Net Change	-160.6	+25.7

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to A Cost Variance Explanation is not required. (primarily) overhead rates (47%), long lead time material (42%), and construction spare materials (11%). The overhead rate increase is due primarily to increased pension rates and workload variations. The long lead time material increase is a recognition of incurred variances in first time production (new vendor) of major complex components which have been delivered. The construction spare material variance will be reduced as material is consumed by the class.

The favorable net change in the schedule variance is due to A Schedule Variance Explanation is not required. the timely delivery of material, primarily Non-nuclear propulsion plant material (99%).

Contract Identification

Appropriation: Procurement

Contract Name: CVN 79 Detail Design & Construction (DD&C)

Contractor: Huntington Ingalls Industries (HII) Newport News Shipbuilding (NNS)

Contractor Location: 4101 Washington Ave
Newport News, VA 23607

Contract Number: N00024-15-C-2114

Contract Type: Fixed Price Incentive(Firm Target) (FPIF)

Award Date: June 05, 2015

Definitization Date: June 05, 2015

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
3352.6	N/A	1	3356.6	3613.8	1	3359.4	3315.6

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to contract modifications to incorporate approved change orders in support of CVN 79 construction.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (3/26/2017)	-9.9	+7.1
Previous Cumulative Variances	-4.9	+13.1
Net Change	-5.0	-6.0

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to A Cost Variance Explanation is not required. (primarily) overhead rate increases resulting from increased pension rates and variability in workload.

The unfavorable net change in the schedule variance is due to A Schedule Variance Explanation is not required. (primarily) labor delays associated with material availability shortfalls in limited specific areas.

Notes

The Navy awarded a FPIF contract in the amount of $3.35B for the CVN 79 Detail Design & Construction effort. As of December 31, 2015, the DD&C contract is 2.6% complete based on dollars.

Contract Identification

Appropriation: Procurement
Contract Name: CVN 80 Advanced Procurement (AP)
Contractor: Huntington Ingalls Industries (HII) Newport News Shipbuilding (NNS)
Contractor Location: 4101 Washington Avenue
Newport News, VA 23607
Contract Number: N00024-16-C-2116
Contract Type: Cost Plus Fixed Fee (CPFF)
Award Date: May 23, 2016
Definitization Date: May 23, 2016

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
152.0	N/A	1	242.8	N/A	1	242.8	544.6

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to the award of a UCA that added Main Reduction Gears and Main Turbine Generators to the contract

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (3/26/2017)	0.0	0.0
Previous Cumulative Variances	--	--
Net Change	+0.0	+0.0

Cost and Schedule Variance Explanations

None

Notes

This is the first time this contract is being reported.

Contract Identification

Appropriation: Procurement

Contract Name: EMALS CVN 79/CVN 80 Production

Contractor: General Atomics (GA) Electromagnetic Systems

Contractor Location: 3550 General Atomics Court
San Diego, CA 92121

Contract Number: N00019-14-C-0037

Contract Type: Firm Fixed Price (FFP)

Award Date: May 08, 2014

Definitization Date: December 22, 2016

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
1072.5	N/A	2	1072.5	N/A	2	1072.5	1072.5

Cost and Schedule Variance Explanations

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

Notes

This is the first time this contract is being reported.

Contract Number N00019-C-0037 is a combined EMALS and Advanced Arresting Gear (AAG) CVN 79/CVN 80 Production contract with a total contract value of $1,449.8M. This contract was initially awarded for the production of CVN 79 ship set hardware only with an initial price of $539.9M for the EMALS specific CVN 79 ship set. During negotiations, options were added for the CVN 80 ship set hardware for both EMALS and AAG. The current awarded prices for each ship set are as follows:

CVN 79

AAG = $182.1M

EMALS = $539.9M

CVN 80

AAG = $195.2M

EMALS = $532.6M

The AAG program will submit an initial SAR this year that includes procurement funding which is also reported in the CVN 78 Class SAR.

Contract Identification

Appropriation: RDT&E
Contract Name: EMALS Basic Ordering Agreement (BOA) Logistics Development Order
Contractor: General Atomics (GA) Electromagnetic Systems Group
Contractor Location: San Diego, CA 92121-1122
Contract Number: N68335-11-G-0003
Contract Type: Cost Plus Fixed Fee (CPFF)
Award Date: August 12, 2012
Definitization Date: August 12, 2012

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
44.5	N/A	1	44.6	N/A	1	50.2	51.2

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to contract modifications to incorporate changes to logistics products due to two EMALS specification change notices.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (3/31/2017)	-5.7	0.0
Previous Cumulative Variances	-1.6	-1.5
Net Change	-4.1	+1.5

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to A Cost Variance Explanation is not required. (was mostly due to) technical manual development which required significant rework and more resources than planned to address quality issues and safety critical comments identified by the Government during In Process Reviews. Provisioning Technical Documentation development was also a cost driver as additional engineering resources were required for the final release of the engineering data for provisioning.

The favorable net change in the schedule variance is due to A Schedule Variance Explanation is not required. is due to the submission of the final technical manual deliverable, the final Provisioning Technical Documentation and a majority of the other contract tasks nearing completion.

Notes

The Program Manager's Estimated Price at Completion (PMEPAC) currently exceeds the Current Contract Price by $6.6M. The major contributor is the cumulative cost variance to date. This order was 97% complete as of March 2017 and there is limited tasking remaining through November 30, 2017, mostly related to Formal Training Development. As such, the cumulative cost variance is not recoverable.

This contract is more than 90% complete; therefore, this is the final report for this contract.

Deliveries and Expenditures

CVN 78

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	0	0	0	--
Production	1	1	3	33.33%
Total Program Quantity Delivered	1	1	3	33.33%

Expended and Appropriated (TY $M)			
Total Acquisition Cost	42910.6	Years Appropriated	21
Expended to Date	21139.2	Percent Years Appropriated	65.63%
Percent Expended	49.26%	Appropriated to Date	26317.3
Total Funding Years	32	Percent Appropriated	61.33%

The above data is current as of May 23, 2017.

EMALS

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	0	0	0	--
Production	1	1	3	33.33%
Total Program Quantity Delivered	1	1	3	33.33%

Expended and Appropriated (TY $M)			
Total Acquisition Cost	2824.9	Years Appropriated	18
Expended to Date	1446.3	Percent Years Appropriated	75.00%
Percent Expended	51.20%	Appropriated to Date	2198.8
Total Funding Years	24	Percent Appropriated	77.84%

The above data is current as of May 23, 2017.

Operating and Support Cost

CVN 78

Cost Estimate Details

Date of Estimate:	May 03, 2017
Source of Estimate:	POE
Quantity to Sustain:	3
Unit of Measure:	Ship
Service Life per Unit:	50.00 Years
Fiscal Years in Service:	FY 2017 - FY 2077

The current APB Objective/Threshold values and current estimate reflects Total O&S costs for three ships in accordance with the current Program of Record. The CVN 78 Class Program is planned for a total of 11 ships over a 50 year service life.

O&S costs are developed at the ship level, on an annual cost per ship basis by cost category and appropriation, with total and annual average cost over the ship's expected service life. Costs are estimated for all categories listed in the CAPE Operating and Support Cost Estimating Guide using historical data from operating carrier classes and the Chief of Naval Operations (OPNAV) "Maintenance" Notices. Maintenance and Personnel costs are the major contributors to the total O&S Program costs.

Sustainment Strategy

Sustainment strategy includes nuclear aircraft carrier certified Naval Shipyards (Newport News 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 Information

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 (3,291) 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. Indirect Support (6.0) was based on authorized billets (3,291) as detailed in the CVN 68 SMD; the billets were multiplied against the Naval Center for Cost Analysis (NCCA) Manpower Cost Estimating Tool for Enhanced Online Reporting (METEOR) rates for calculating the indirect support cost. Depot Maintenance (3.3) was derived from OPNAV Note 4700 (dated June 8, 2015).

Unit Operations, Intermediate Maintenance, Sustaining Support, and Continuing System Improvements were derived from VAMOSC, with data pulled from FY 2000 through FY 2014; using full year data and excluding CVN 73 which was a forward deployed ship starting in 2008.

Annual O&S Costs BY2000 $M		
Cost Element	**CVN 78 Average Annual Cost Per Ship**	**CVN 68 Class (Antecedent) Average Annual Cost Per Ship**
Unit-Level Manpower	129.019	162.738
Unit Operations	10.130	10.241
Maintenance	101.789	130.099
Sustaining Support	11.177	11.818
Continuing System Improvements	18.842	23.600
Indirect Support	120.179	151.083
Other	0.000	0.000
Total	391.136	489.579

Costs in the CVN 78 SAR include Advanced Arresting Gear (AAG) and are identical to those reported in the AAG SAR.

Item	Total O&S Cost $M			
	CVN 78			CVN 68 Class (Antecedent)
	Current Development APB Objective/Threshold		Current Estimate	
Base Year	55600.0	61160.0	58670.4	244789.7
Then Year	251600.0	N/A	182676.0	N/A

Total O&S cost for 11 ships would be $214,410/9M BY 2000 dollars/$1,057,770.44M in TY dollars.

Equation to Translate Annual Cost to Total Cost

Total Cost = Average Annual Cost Per Ship * Number of Ships * Service Life = $391.136M * 3 * 50 = $58,670.4M

O&S Cost Variance		
Category	**BY 2000 $M**	**Change Explanations**
Prior SAR Total O&S Estimates - Dec 2015 SAR	58645.8	
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	24.6	The December 2015 SAR reflected an AAG Average Annual Cost per ship based on 4 ships. The December 2016 SAR reflects an AAG Average Annual Cost per ship based on 3 ships. The difference between the two Average Annual Costs per ship for 3 hulls for 50 years yields the $26.4M cost variance.

Total Changes	24.6
Current Estimate	58670.4

Disposal Estimate Details

Date of Estimate:	July 18, 2007
Source of Estimate:	POE
Disposal/Demilitarization Total Cost (BY 2000 $M):	Total costs for disposal of all Ship are 1612.2

Disposal costs for CVN 78 include disposal of the ship, including EMALS and AAG.

The current estimate for disposal costs for the CVN 78 Class ships is $5,911.4M for eleven ships in BY 2000 dollars. Disposal costs include disposal of EMALS.

EMALS

Cost Estimate Details

Date of Estimate:	March 02, 2016
Source of Estimate:	POE
Quantity to Sustain:	3
Unit of Measure:	Ship
Service Life per Unit:	50.00 Years
Fiscal Years in Service:	FY 2017 - FY 2077

The current APB Objective/Threshold values and current estimate reflects Total O&S costs for three shipsets in accordance with the current Program of Record. The CVN 78 Class Program is planned for a total of 11 shipsets over a 50 year service life.

O&S Costs are developed at the ship level, on an annual cost per ship basis by cost category and appropriation, with total and annual average cost over the ship's expected service life. Costs are estimated for all categories listed in the CAPE Operating and Support Cost Estimating Guide using historical data from operating carrier classes and the OPNAV "Maintenance" Notices. Maintenance and Personnel costs are the major contributors to the total O&S Program.

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 is applicable. The intention is for GA to provide support and have the shipyards and the Navy to provide the 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 is expected to be approved in the fourth quarter FY 2017 as part of Naval Supply Systems Command's approval of the Provisioning Technical Data. Depot planning to support out year requirements is slated to begin in FY 2019 with an estimated completion date of FY 2020/2021.

Antecedent Information

No antecedent.

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.

Annual O&S Costs BY2000 $M		
Cost Element	**EMALS Average Annual Cost Per Ship**	**No Antecedent (Antecedent)**
Unit-Level Manpower	3.948	0.000
Unit Operations	0.000	0.000
Maintenance	6.050	0.000
Sustaining Support	1.765	0.000
Continuing System Improvements	4.509	0.000
Indirect Support	1.703	0.000
Other	0.000	0.000
Total	17.975	--

Item	Total O&S Cost $M			
	EMALS			No Antecedent (Antecedent)
	Current Development APB Objective/Threshold		Current Estimate	
Base Year	2574.3	2831.7	2696.2	0.0
Then Year	6422.6	N/A	7196.1	N/A

Total O&S cost for 11 Shipsets would be $7,892.45M in BY2000 dollars/$30,062.78M in TY dollars.

Equation to Translate Annual Cost to Total Cost

Total Cost = Average Annual Cost Per Shipset * number of Shipsets * Service Life = $17.975M * 3 * 50 = $2,696.2M

O&S Cost Variance		
Category	**BY 2000 $M**	**Change Explanations**
Prior SAR Total O&S Estimates - Dec 2015 SAR	2595.6	
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	100.6	The December 2015 SAR reflected an EMALS Average Annual Cost per ship based on 4 ships. The December 2016 SAR reflects an EMALS Average Annual Cost per ship based on 3 ships. The difference between the 2 Average Annual costs per ship for 3 hulls 50 years yields

		the $100.6M cost variance.
Total Changes	100.6	
Current Estimate	2696.2	

Disposal Estimate Details

Date of Estimate: July 18, 2007

Source of Estimate: POE

Disposal/Demilitarization Total Cost (BY 2000 $M): Total costs for disposal of all Ship are 0.0

EMALS disposal costs are included in the CVN 78 Class Disposal Cost.