



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 2016 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

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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

Responsible Office

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Date

Assigned: June 9, 2011

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

The construction effort for the CVN 78 is 87.7% complete based on dollars as of December 31, 2014.

In transitioning from construction to test centric production efforts, the shipbuilder has commenced turnover of completed systems to the crew, turned over 37% of the ship's compartments to the crew (ahead of contractual requirements), and begun retiring the backlog of incomplete work packages. The Electromagnetic Aircraft Launch System (EMALS) shipboard test program is on schedule (critical path), Dual Band Radar (DBR) testing has started and supports Initial Light Off in March 2015, and one third of the Hull, Mechanical, and Electrical (HM&E) test program is complete. The ship remains on track for a March 2016 delivery.

With 12% of the production effort to go, the principal risk on CVN 78 remains completion of the shipboard test program. Risks associated with first time operation of new systems and components have been retired with the light off and initial operation of below decks EMALS equipment, Advanced Weapons Elevators, the ship's 13.8kVA electrical distribution system, and newly designed air conditioning plants. EMALS and DBR land based test programs continue to burn down risk prior to shipboard operations. Concurrency of Advanced Arresting Gear (AAG) land based testing and shipboard certification and testing represents a significant risk to the shipboard test program.

The program office and shipbuilder are continuing efforts to identify cost reductions and drive improved cost performance on CVN 78. Assembly trades cost performance improved over the last 12 months. Shipbuilder cost performance remains stable at 0.81.

CVN 79, which is a modified repeat of CVN 78, is limiting design changes to those that improve producibility, reduce cost, and address system obsolescence or fact-of-life changes.

With work progressing under the CVN 79 Construction Preparation (CP) contract with the shipbuilder, the Navy and shipbuilder continue to negotiate the remaining work scope to award the CVN 79 Detail Design and Construction (DD&C) contract as a Fixed Price Incentive (FPI) contract in third quarter FY 2015.

CVN 79 construction performance continues to improve. The gains can be attributed to improved planning activities that directly support on-time accomplishment of production work as well as improved production performance. With 95% of the ship's total direct material on contract, the shipbuilder is able to procure material more affordably and in time to support earlier and more cost efficient construction and outfitting, key elements of the CVN 79 build strategy improvements. The benefits of changes in build strategy and resolution of first-of-class impacts on CVN 79 are evident in metrics showing significantly reduced man-hours for completed work as compared to CVN 78. The CP effort is 53.6% complete based on dollars.

The Navy is executing a two-phased delivery strategy for CVN 79, which will allow the basic ship to be constructed and tested in the most efficient manner by the shipbuilder (Phase I). This strategy also enables select ship systems and compartments to be completed in a second phase, wherein the work can be completed more affordably through competition or the use of skilled installation teams responsible for these activities. Critically, this two-phased approach also enables the Navy to procure and install at the latest date possible shipboard electronic systems which otherwise would be subject to obsolescence prior to CVN 79's first deployment in the 2027 timeframe. The costs to deliver the completed ship at the end of Phase II are included within the \$11.348B Shipbuilding and Conversion, Navy (SCN) end cost.

Development and ship integration efforts for EMALS continue as planned. The System Development and Demonstration program is 98% complete. Land based Aircraft compatibility testing in Lakehurst, NJ completed in April 2014 and continued land testing with deadloads is expected to complete in June 2015. The site will remain operational through 2017 to support shipboard testing, the correction of deficiencies, CVN 78 Crew training, a Maintainability Demonstration and Logistics product development which is currently 59% complete. The delivery of EMALS hardware to CVN 78 is 99% complete. Shipboard commissioning began on schedule in August 2014 and remains on schedule.

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 Congressionally mandated by law.

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

Threshold Breaches

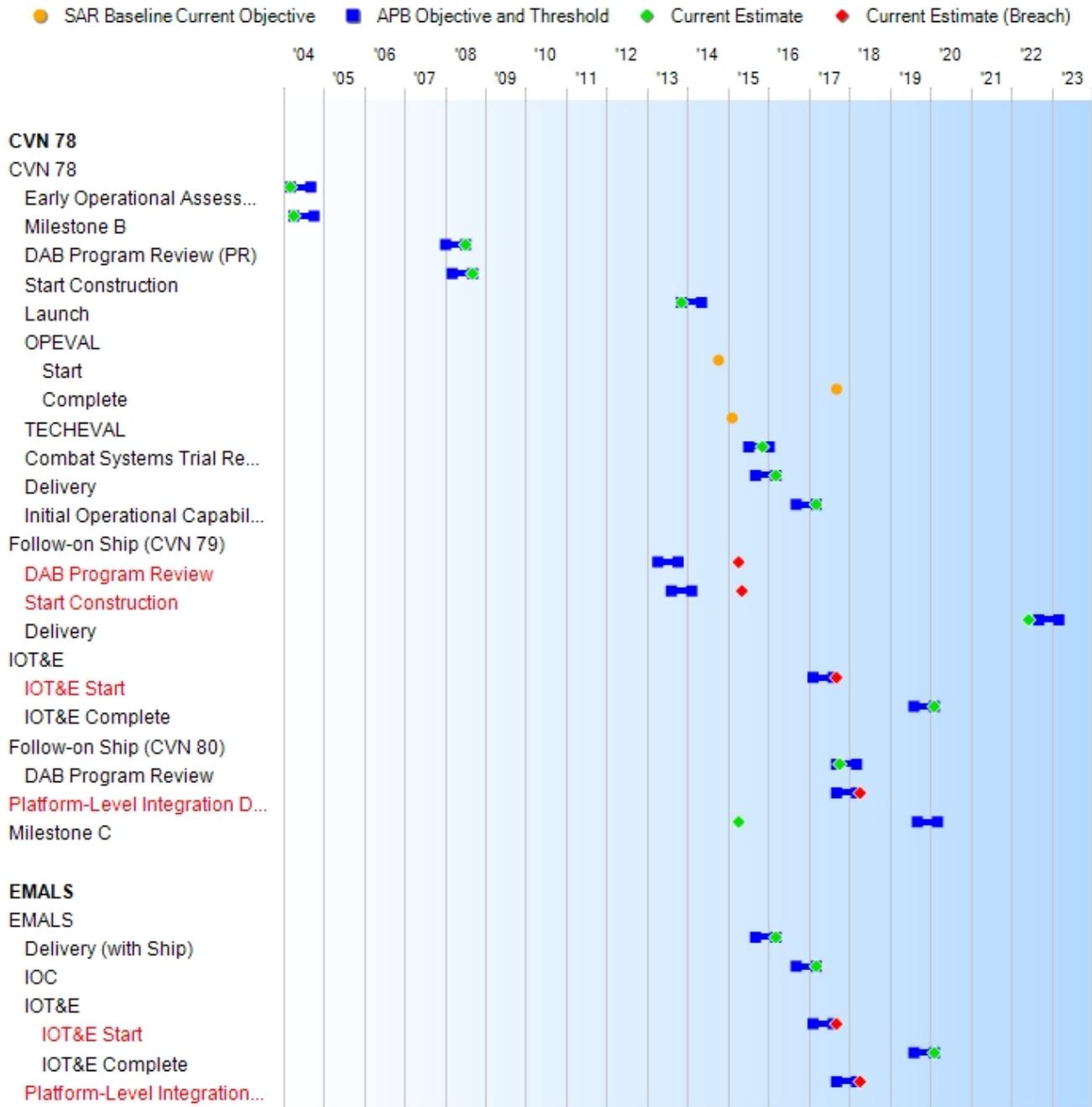
CVN 78

APB Breaches		Explanation of Breach
Schedule	<input checked="" type="checkbox"/>	In order to afford an opportunity for Navy and the shipbuilder to incorporate further construction process improvements and Government Furnished Equipment cost reductions into the construction plan while continuing negotiations for the Detail Design and Construction (DD&C) contract award, the CVN 78 Class Aircraft Carrier Program has changed its estimates for the CVN 79 DAB Program Review and DD&C contract award dates.
Performance	<input type="checkbox"/>	
Cost	<input type="checkbox"/>	
RDT&E	<input type="checkbox"/>	
Procurement	<input type="checkbox"/>	
MILCON	<input type="checkbox"/>	As a result of continued refinement of the program's testing schedule with Director, Operational Test and Evaluation (DOT&E), the CVN 78 Class Aircraft Carrier Program has changed its estimates for Initial Operational Test & Evaluation (IOT&E) Start and Platform-Level Integration Developmental Testing (DT) Period Complete dates.
Acq O&M	<input type="checkbox"/>	
O&S Cost	<input type="checkbox"/>	
Unit Cost	<input type="checkbox"/>	
PAUC	<input type="checkbox"/>	
APUC	<input type="checkbox"/>	The Program Office is currently revising the APB to correct these breaches.
Nunn-McCurdy Breaches		
Current UCR Baseline		
PAUC	None	
APUC	None	
Original UCR Baseline		
PAUC	None	
APUC	None	

EMALS

APB Breaches		Explanation of Breach
Schedule	<input checked="" type="checkbox"/>	In order to maintain the EMALS shore based test site and continue land based testing efforts, a total of \$20M was added to the EMALS budget across FY 2016 and FY 2017. As a result, the program has a RDT&E Cost breach of \$5.5M in BY 2000 dollars.
Performance	<input type="checkbox"/>	
Cost	<input checked="" type="checkbox"/>	
RDT&E	<input checked="" type="checkbox"/>	
Procurement	<input type="checkbox"/>	
MILCON	<input type="checkbox"/>	As a result of continued refinement of the program's testing schedule with DOT&E, the CVN 78 Class Aircraft Carrier Program has changed its estimates for IOT&E Start and Platform-Level Integration DT Period Complete dates.
Acq O&M	<input type="checkbox"/>	
O&S Cost	<input type="checkbox"/>	
Unit Cost	<input type="checkbox"/>	
PAUC	<input type="checkbox"/>	
APUC	<input type="checkbox"/>	The program is currently revising the APB to correct this breach.
Nunn-McCurdy Breaches		
Current UCR Baseline		
PAUC	None	
APUC	None	
Original UCR Baseline		
PAUC	None	
APUC	None	

Schedule



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
OPEVAL				
Start	Oct 2014	N/A	N/A	N/A
Complete	Sep 2017	N/A	N/A	N/A
TECHEVAL				
Combat Systems Trial Rehearsal (CSTR)	Jul 2014	Jul 2015	Jan 2016	Nov 2015
Delivery	Sep 2014	Sep 2015	Mar 2016	Mar 2016
Initial Operational Capability (IOC)	Sep 2015	Sep 2016	Mar 2017	Mar 2017
Follow-on Ship (CVN 79)				
DAB Program Review	Jan 2010	Apr 2013	Oct 2013	Apr 2015¹ (Ch-1)
Start Construction	Jan 2011	Aug 2013	Feb 2014	May 2015¹ (Ch-2)
Delivery	Sep 2018	Sep 2022	Mar 2023	Jun 2022 (Ch-3)
IOT&E				
IOT&E Start	N/A	Feb 2017	Aug 2017	Sep 2017¹ (Ch-4)
IOT&E Complete	N/A	Aug 2019	Feb 2020	Feb 2020
Follow-on Ship (CVN 80)				
DAB Program Review	Jan 2015	Sep 2017	Mar 2018	Oct 2017 (Ch-5)
Platform-Level Integration DT Period Complete	N/A	Sep 2017	Mar 2018	Apr 2018¹ (Ch-6)
Milestone C	Mar 2017	Sep 2019	Mar 2020	Apr 2015 (Ch-7)

¹ APB Breach

Change Explanations

(Ch-1) DAB Program Review rescheduled from October 2014 to April 2015 to reflect revised contract award schedule for CVN 79.

(Ch-2) Start Construction rescheduled from December 2014 to May 2015 to reflect revised contract award schedule for CVN 79.

(Ch-3) CVN 79 Delivery revised from March 2023 to June 2022 to reflect a revised delivery schedule for CVN 79.

(Ch-4) IOT&E Start rescheduled from August 2017 to September 2017 to reflect continued refinement of program test schedule with DOT&E.

(Ch-5) CVN 80 DAB Program Review rescheduled from September 2017 to October 2017 to reflect revised contract award schedule for CVN 80.

(Ch-6) Platform-Level Integration DT Period Complete rescheduled from March 2018 to April 2018 to reflect continued refinement of program test schedule with the Director, Operational Test and Evaluation (DOT&E).

(Ch-7) Milestone C rescheduled from March 2020 to April 2015 per the direction of the Office of the Secretary of Defense for Acquisition, Technology and Logistics (OSD(AT&L)).

Notes

The CVN 78 SAR Baseline was based on CVN 78 being an FY 2007 ship prior to the Navy budget decision to slip to a FY 2008 ship.

Acronyms and Abbreviations

DT - Developmental Testing

IOT&E - Initial Operational Test and Evaluation

OPEVAL - Operational Evaluation

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	Mar 2016
IOC	Sep 2016	Sep 2016	Mar 2017	Mar 2017
IOT&E				
IOT&E Start	Feb 2017	Feb 2017	Aug 2017	Sep 2017¹ (Ch-1)
IOT&E Complete	Aug 2019	Aug 2019	Feb 2020	Feb 2020
Platform-Level Integration DT Period Complete	Sep 2017	Sep 2017	Mar 2018	Apr 2018¹ (Ch-2)

¹ APB Breach

Change Explanations

(Ch-1) IOT&E Start rescheduled from August 2017 to September 2017 to reflect continued refinement of program test schedule with the Director, Operational Test and Evaluation (DOT&E).

(Ch-2) Platform-Level Integration DT Period Complete rescheduled from March 2018 to April 2018 to reflect continued refinement of program test schedule with DOT&E.

Acronyms and Abbreviations

DT - Developmental Test

IOT&E - Initial Operational Test & Evaluation

Performance

CVN 78

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	TBD	N/A
Sustained Sortie Rate				
220	N/A	N/A	TBD	N/A
Surge Sortie Rate				
310	N/A	N/A	TBD	N/A
Service Electrical Generating Capacity (times NIMITZ Class capacity in MW)				
3.0	N/A	N/A	TBD	N/A
Weight Service Life Allowance (% of full load displacement in long tons)				
7.5	N/A	N/A	TBD	N/A
Stability Service Life Allowance (feet)				
2.5	N/A	N/A	TBD	N/A
Ship's Force Manpower (billets)				

2391	N/A	N/A	TBD	N/A
Force Protection and Survivability in an Asymmetric Threat Environment				
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

Acronyms and Abbreviations

CBR - Chemical, Biological and 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

The JROC has not established KPPs specific to the EMALS subprogram. All existing CVN 78 Class KPPs will be managed in the CVN 78 Class ship subprogram section.

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
Navy	1319	04	0604112N
	Project		Name
	2208		CVN 21
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)
	9C20A		Automated Fiber Optic Manufacturing Initiative (Sunk)

Procurement

Appn	BA	PE	
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)

MILCON

Appn	BA	PE
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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
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Navy 1804 01 0702827N

Project	Name
1B2B	Ship Operational Support and Training (Shared)

EMALS**RDT&E**

Appn	BA	PE
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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
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Navy 1611 02 0204112N

Line Item	Name
2001	Carrier Replacement Program (Shared)

MILCON

Appn	BA	PE
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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	--	3803.9	4333.4	4744.6	4404.5
Procurement	24825.9	24357.7	--	23481.2	31748.7	33258.8	38409.1
Flyaway	--	--	--	23481.2	--	--	38409.1
Recurring	--	--	--	20262.4	--	--	33670.7
Non Recurring	--	--	--	3218.8	--	--	4738.4
Support	--	--	--	0.0	--	--	0.0
Other Support	--	--	--	0.0	--	--	0.0
Initial Spares	--	--	--	0.0	--	--	0.0
MILCON	0.0	152.0	--	46.1	0.0	208.5	56.9
Acq O&M	0.0	0.0	--	66.5	0.0	0.0	90.7
Total	28701.2	28633.1	N/A	27397.7	36082.1	38211.9	42961.2

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	3049.5	3923.0	3999.8	3523.7
Procurement	24235.0	22764.3	25040.7	22100.4	30977.4	30808.7	36017.2
Flyaway	--	--	--	22100.4	--	--	36017.2
Recurring	--	--	--	18881.6	--	--	31278.8
Non Recurring	--	--	--	3218.8	--	--	4738.4
Support	--	--	--	0.0	--	--	0.0
Other Support	--	--	--	0.0	--	--	0.0
Initial Spares	--	--	--	0.0	--	--	0.0
MILCON	0.0	133.2	146.5	27.3	0.0	187.8	36.2
Acq O&M	0.0	0.0	--	66.5	0.0	0.0	90.7
Total	27725.6	26369.7	N/A	25243.7	34900.4	34996.3	39667.8

Confidence Level

Confidence Level of cost estimate for current APB: 50%

The estimate to support this program, like most cost estimates, is built upon a product-oriented work breakdown structure based on historical actual cost information to the maximum extent possible, and, most importantly, based on conservative assumptions that are consistent with actual demonstrated contractor and government performance for a series of acquisition programs in which we have been successful.

It is difficult to calculate mathematically the precise confidence levels associated with life-cycle cost estimates prepared for Major Defense Acquisition Programs (MDAPs). Based on the rigor in methods used in building estimates, the strong adherence to the collection and use of historical cost information, and the review of applied assumptions, we project that it is about as likely the estimate will prove too low or too high for the program as described.

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	754.4 ¹	410.4	744.8	880.8
Procurement	590.9	1593.4	1752.7	1380.8	771.3	2450.1	2391.9
Flyaway	--	--	--	1380.8	--	--	2391.9
Recurring	--	--	--	1380.8	--	--	2391.9
Non Recurring	--	--	--	0.0	--	--	0.0
Support	--	--	--	0.0	--	--	0.0
Other Support	--	--	--	0.0	--	--	0.0
Initial Spares	--	--	--	0.0	--	--	0.0
MILCON	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	2154.0	1181.7	3215.6	3293.4

¹ APB Breach

Confidence Level

Confidence Level of cost estimate for current APB: 50%

The estimate to support this program, like most cost estimates, is built upon a product-oriented work breakdown structure based on historical actual cost information to the maximum extent possible, and, most importantly, based on conservative assumptions that are consistent with actual demonstrated contractor and government performance for a series of acquisition programs in which we have been successful.

It is difficult to calculate mathematically the precise confidence levels associated with life-cycle cost estimates prepared for major complex systems. Based on the rigor in methods used in building estimates, the strong adherence to the collection and use of historical cost information, and the review of applied assumptions, we project that it is about as likely the estimate will prove too low or too high for the program as described.

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 2016 President's Budget / December 2014 SAR (TY\$ M)									
Appropriation	Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	To Complete	Total
RDT&E	3877.9	122.9	75.8	75.4	64.2	53.1	51.8	83.4	4404.5
Procurement	16877.8	1928.4	2732.7	2957.4	3530.7	2076.0	875.3	7430.8	38409.1
MILCON	56.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	56.9
Acq O&M	0.0	4.9	38.4	35.6	3.9	3.9	4.0	0.0	90.7
PB 2016 Total	20812.6	2056.2	2846.9	3068.4	3598.8	2133.0	931.1	7514.2	42961.2
PB 2015 Total	20812.0	2136.7	3164.2	2352.7	2902.1	1909.3	3380.4	6693.8	43351.2
Delta	0.6	-80.5	-317.3	715.7	696.7	223.7	-2449.3	820.4	-390.0

Cost and Funding

Funding Summary - CVN 78

Appropriation Summary									
FY 2016 President's Budget / December 2014 SAR (TY\$ M)									
Appropriation	Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	To Complete	Total
RDT&E	3027.8	114.7	63.3	65.4	64.2	53.1	51.8	83.4	3523.7
Procurement	16192.6	1731.1	2543.4	2812.1	3249.9	1926.0	810.3	6751.8	36017.2
MILCON	36.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.2
Acq O&M	0.0	4.9	38.4	35.6	3.9	3.9	4.0	0.0	90.7
PB 2016 Total	19256.6	1850.7	2645.1	2913.1	3318.0	1983.0	866.1	6835.2	39667.8
PB 2015 Total	19147.3	1931.2	2972.4	2207.4	2699.1	1909.3	3070.3	6060.0	39997.0
Delta	109.3	-80.5	-327.3	705.7	618.9	73.7	-2204.2	775.2	-329.2

Quantity Summary										
FY 2016 President's Budget / December 2014 SAR (TY\$ M)										
Quantity	Undistributed	Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	To Complete	Total
Development	0	0	0	0	0	0	0	0	0	0
Production	0	2	0	0	0	1	0	0	0	3
PB 2016 Total	0	2	0	0	0	1	0	0	0	3
PB 2015 Total	0	2	0	0	0	1	0	0	0	3
Delta	0	0	0	0	0	0	0	0	0	0

Funding Summary - EMALS

Appropriation Summary									
FY 2016 President's Budget / December 2014 SAR (TY\$ M)									
Appropriation	Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	To Complete	Total
RDT&E	850.1	8.2	12.5	10.0	0.0	0.0	0.0	0.0	880.8
Procurement	685.2	197.3	189.3	145.3	280.8	150.0	65.0	679.0	2391.9
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 2016 Total	1556.0	205.5	201.8	155.3	280.8	150.0	65.0	679.0	3293.4
PB 2015 Total	1664.7	205.5	191.8	145.3	203.0	0.0	310.1	633.8	3354.2
Delta	-108.7	0.0	10.0	10.0	77.8	150.0	-245.1	45.2	-60.8

Quantity Summary										
FY 2016 President's Budget / December 2014 SAR (TY\$ M)										
Quantity	Undistributed	Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	To Complete	Total
Development	0	0	0	0	0	0	0	0	0	0
Production	0	2	0	0	0	1	0	0	0	3
PB 2016 Total	0	2	0	0	0	1	0	0	0	3
PB 2015 Total	0	2	0	0	0	1	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	--	--	--	--	--	--	114.7
2016	--	--	--	--	--	--	63.3
2017	--	--	--	--	--	--	65.4
2018	--	--	--	--	--	--	64.2
2019	--	--	--	--	--	--	53.1
2020	--	--	--	--	--	--	51.8
2021	--	--	--	--	--	--	32.9
2022	--	--	--	--	--	--	33.1
2023	--	--	--	--	--	--	17.4
Subtotal	--	--	--	--	--	--	3523.7

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	--	--	--	--	--	--	95.6
2012	--	--	--	--	--	--	88.9
2013	--	--	--	--	--	--	80.6
2014	--	--	--	--	--	--	79.4
2015	--	--	--	--	--	--	86.4
2016	--	--	--	--	--	--	46.8
2017	--	--	--	--	--	--	47.5
2018	--	--	--	--	--	--	45.7
2019	--	--	--	--	--	--	37.1
2020	--	--	--	--	--	--	35.5
2021	--	--	--	--	--	--	22.1
2022	--	--	--	--	--	--	21.8
2023	--	--	--	--	--	--	11.2
Subtotal	--	--	--	--	--	--	3049.5

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	1772.2	--	1010.7	2782.9	--	2782.9
2009	--	3663.0	--	54.9	3717.9	--	3717.9
2010	--	830.3	--	251.0	1081.3	--	1081.3
2011	--	1815.6	--	541.8	2357.4	--	2357.4
2012	--	453.6	--	101.2	554.8	--	554.8
2013	1	394.3	--	82.7	477.0	--	477.0
2014	--	1228.3	--	252.8	1481.1	--	1481.1
2015	--	1618.4	--	112.7	1731.1	--	1731.1
2016	--	2376.0	--	167.4	2543.4	--	2543.4
2017	--	2692.9	--	119.2	2812.1	--	2812.1
2018	1	3161.2	--	88.7	3249.9	--	3249.9
2019	--	1711.3	--	214.7	1926.0	--	1926.0
2020	--	669.4	--	140.9	810.3	--	810.3
2021	--	2130.5	--	26.2	2156.7	--	2156.7
2022	--	2066.8	--	29.5	2096.3	--	2096.3
2023	--	2101.5	--	34.0	2135.5	--	2135.5
2024	--	70.9	--	--	70.9	--	70.9
2025	--	56.8	--	--	56.8	--	56.8
2026	--	77.7	--	--	77.7	--	77.7
2027	--	140.2	--	--	140.2	--	140.2
2028	--	17.7	--	--	17.7	--	17.7
Subtotal	3	31278.8	--	4738.4	36017.2	--	36017.2

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	1246.7	--	710.9	1957.6	--	1957.6
2009	--	2500.4	--	37.5	2537.9	--	2537.9
2010	--	547.8	--	165.6	713.4	--	713.4
2011	--	1160.5	--	346.4	1506.9	--	1506.9
2012	--	283.7	--	63.3	347.0	--	347.0
2013	1	241.9	--	50.7	292.6	--	292.6
2014	--	740.4	--	152.4	892.8	--	892.8
2015	--	958.4	--	66.7	1025.1	--	1025.1
2016	--	1380.8	--	97.3	1478.1	--	1478.1
2017	--	1535.0	--	67.9	1602.9	--	1602.9
2018	1	1766.7	--	49.6	1816.3	--	1816.3
2019	--	937.6	--	117.7	1055.3	--	1055.3
2020	--	359.6	--	75.7	435.3	--	435.3
2021	--	1122.0	--	13.8	1135.8	--	1135.8
2022	--	1067.1	--	15.2	1082.3	--	1082.3
2023	--	1063.8	--	17.2	1081.0	--	1081.0
2024	--	35.2	--	--	35.2	--	35.2
2025	--	27.6	--	--	27.6	--	27.6
2026	--	37.1	--	--	37.1	--	37.1
2027	--	65.6	--	--	65.6	--	65.6
2028	--	8.1	--	--	8.1	--	8.1
Subtotal	3	18881.6	--	3218.8	22100.4	--	22100.4

Current estimate reflects the first 3 ships in the program through 2075. 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 are beginning to be incorporated into the CVN 80 cost estimates and budgets. The FY 2016 PB for CVN 80 is \$402.2M in TY\$ (\$291.6M in BY\$) less than the FY 2015 PB. The Navy is committed to driving down aircraft carrier construction costs, and fully expects future estimates and budgets for CVN 80 to reflect a continued downward trend.

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	6338.0
2009	--	--
2010	--	--
2011	--	--
2012	--	--
2013	1	5974.3
2014	--	--
2015	--	--
2016	--	--
2017	--	--
2018	1	6569.3
2019	--	--
2020	--	--
2021	--	--
2022	--	--
2023	--	--
2024	--	--
2025	--	--
2026	--	--
2027	--	--
2028	--	--
Subtotal	3	18881.6

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	24.8
2014	2.5
Subtotal	27.3

Annual Funding - CVN 78 1804 Acq O&M Operation and Maintenance, Navy	
Fiscal Year	TY \$M
	Total Program
2015	4.9
2016	38.4
2017	35.6
2018	3.9
2019	3.9
2020	4.0
Subtotal	90.7

Annual Funding - CVN 78 1804 Acq O&M Operation and Maintenance, Navy	
Fiscal Year	BY 2000 \$M
	Total Program
2015	3.7
2016	28.5
2017	26.0
2018	2.8
2019	2.7
2020	2.8
Subtotal	66.5

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	--	--	--	--	--	--	41.7
2015	--	--	--	--	--	--	8.2
2016	--	--	--	--	--	--	12.5
2017	--	--	--	--	--	--	10.0
Subtotal	--	--	--	--	--	--	880.8

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	--	--	--	--	--	--	47.1
2012	--	--	--	--	--	--	24.3
2013	--	--	--	--	--	--	42.4
2014	--	--	--	--	--	--	31.9
2015	--	--	--	--	--	--	6.2
2016	--	--	--	--	--	--	9.3
2017	--	--	--	--	--	--	7.3
Subtotal	--	--	--	--	--	--	754.4

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	--	257.5	--	--	257.5	--	257.5	
2012	--	--	--	--	--	--	--	
2013	1	14.9	--	--	14.9	--	14.9	
2014	--	65.6	--	--	65.6	--	65.6	
2015	--	197.3	--	--	197.3	--	197.3	
2016	--	189.3	--	--	189.3	--	189.3	
2017	--	145.3	--	--	145.3	--	145.3	
2018	1	280.8	--	--	280.8	--	280.8	
2019	--	150.0	--	--	150.0	--	150.0	
2020	--	65.0	--	--	65.0	--	65.0	
2021	--	150.0	--	--	150.0	--	150.0	
2022	--	265.0	--	--	265.0	--	265.0	
2023	--	264.0	--	--	264.0	--	264.0	
Subtotal	3	2391.9	--	--	2391.9	--	2391.9	

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	--	164.6	--	--	164.6	--	164.6
2012	--	--	--	--	--	--	--
2013	1	9.1	--	--	9.1	--	9.1
2014	--	39.5	--	--	39.5	--	39.5
2015	--	116.8	--	--	116.8	--	116.8
2016	--	110.0	--	--	110.0	--	110.0
2017	--	82.8	--	--	82.8	--	82.8
2018	1	156.9	--	--	156.9	--	156.9
2019	--	82.2	--	--	82.2	--	82.2
2020	--	34.9	--	--	34.9	--	34.9
2021	--	79.0	--	--	79.0	--	79.0
2022	--	136.8	--	--	136.8	--	136.8
2023	--	133.6	--	--	133.6	--	133.6
Subtotal	3	1380.8	--	--	1380.8	--	1380.8

Cost Quantity Information

The Navy was successful in using Firm Fixed Price (FFP) Contracting for EMALS on the CVN 78 to control costs and intends to utilize the same contract approach in the upcoming CVN 79 negotiations.

A detailed estimate of CVN 80 EMALS costs has not yet been included in the CVN 80 cost estimates. The Navy is committed to driving down EMALS costs and fully expects future estimates and budgets for CVN 80 to reflect a continued downward trend.

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	438.5
2009	--	--
2010	--	--
2011	--	--
2012	--	--
2013	1	447.9
2014	--	--
2015	--	--
2016	--	--
2017	--	--
2018	1	494.4
2019	--	--
2020	--	--
2021	--	--
2022	--	--
2023	--	--
Subtotal	3	1380.8

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 3 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

None

EMALS

Notes

Currently, there is no FMS associated with EMALS. A contract under a FMS case UK-P-FAL was awarded to General Atomics (GA), however, the United Kingdom did not pursue the EMALS procurement. A stop work order on the contract to GA was issued May 17, 2012 which is still in effect. GA submitted a de-scope proposal on October 23, 2012. A final modification was awarded to GA on August 13, 2014 officially closing this FMS case.

Nuclear Costs

CVN 78

Nuclear Research and Development and Reactor Plant Government Furnished Equipment (GFE) 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 \$6,221.0M in TY dollars for the CVN 78 Class Aircraft Carriers (CVN 78-80).

EMALS

None

Unit Cost

CVN 78

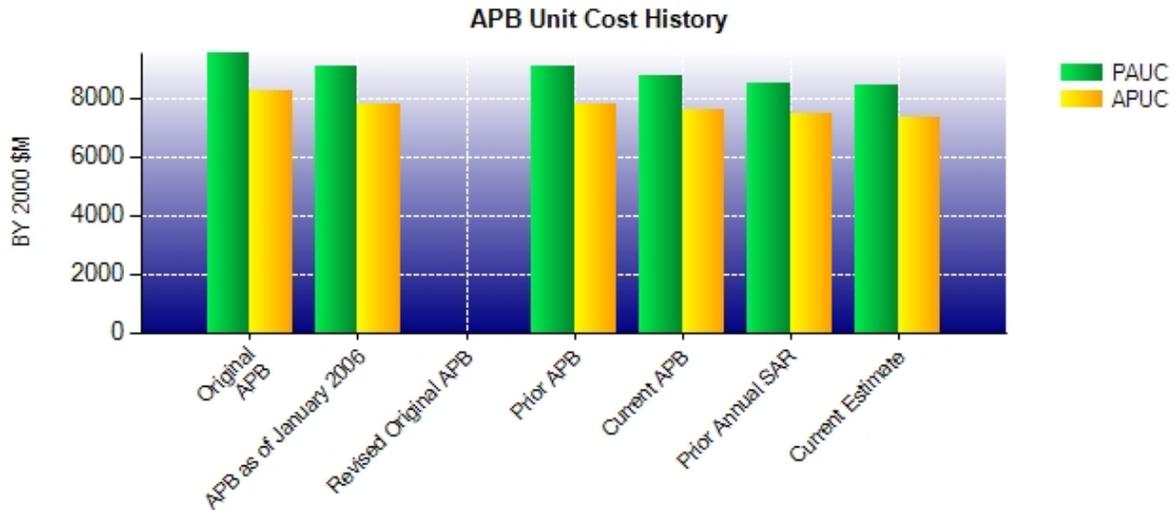
Unit Cost Report

Item	BY 2000 \$M	BY 2000 \$M	% Change
	Current UCR Baseline (Apr 2013 APB)	Current Estimate (Dec 2014 SAR)	
Program Acquisition Unit Cost			
Cost	26369.7	25243.7	
Quantity	3	3	
Item	8789.900	8414.567	-4.27
Average Procurement Unit Cost			
Cost	22764.3	22100.4	
Quantity	3	3	
Unit Cost	7588.100	7366.800	-2.92

Item	BY 2000 \$M	BY 2000 \$M	% Change
	Original UCR Baseline (Apr 2004 APB)	Current Estimate (Dec 2014 SAR)	
Program Acquisition Unit Cost			
Cost	28701.2	25243.7	
Quantity	3	3	
Unit Cost	9567.067	8414.567	-12.05
Average Procurement Unit Cost			
Cost	24825.9	22100.4	
Quantity	3	3	
Unit Cost	8275.300	7366.800	-10.98

CVN 78

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 2013	8482.267	7470.567	13332.333	12163.767
Current Estimate	Dec 2014	8414.567	7366.800	13222.600	12005.733

SAR Unit Cost History

Current SAR Baseline to Current Estimate (TY \$M)									
Initial PAUC Development Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
11633.467	2130.600	0.000	279.833	-27.067	-794.233	0.000	0.000	1589.133	13222.600

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	2097.000	0.000	222.467	132.967	-772.500	0.000	0.000	1679.934	12005.733

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	Apr 2015
IOC	N/A	Sep 2015	N/A	Mar 2017
Total Cost (TY \$M)	N/A	34900.4	N/A	39667.8
Total Quantity	N/A	3	N/A	3
PAUC	N/A	11633.467	N/A	13222.600

EMALS

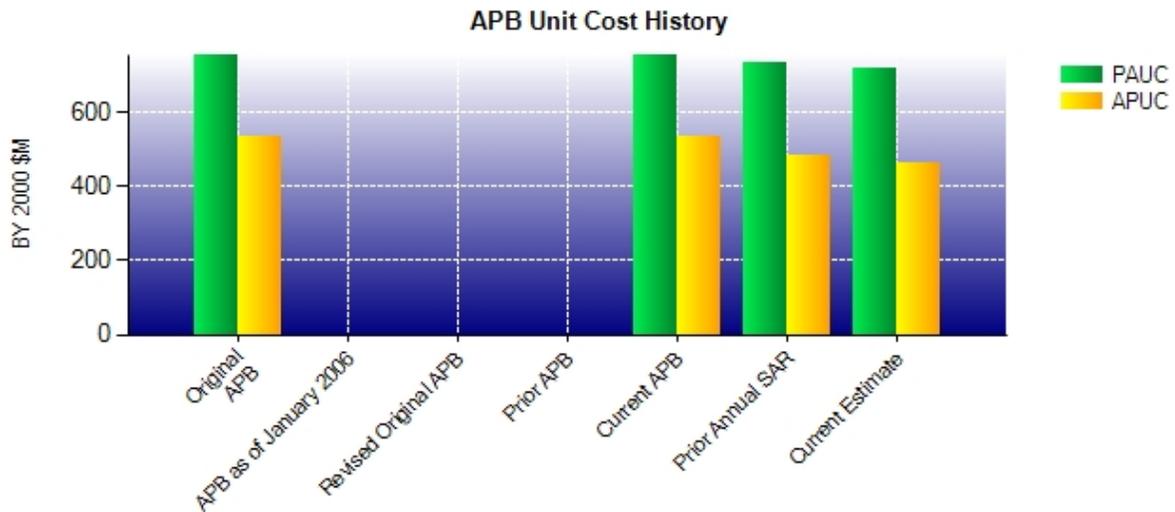
Unit Cost Report

Item	BY 2000 \$M	BY 2000 \$M	% Change
	Current UCR Baseline (Apr 2013 APB)	Current Estimate (Dec 2014 SAR)	
Program Acquisition Unit Cost			
Cost	2263.4	2154.0	
Quantity	3	3	
Item	754.467	718.000	-4.83
Average Procurement Unit Cost			
Cost	1593.4	1380.8	
Quantity	3	3	
Unit Cost	531.133	460.267	-13.34

Item	BY 2000 \$M	BY 2000 \$M	% Change
	Original UCR Baseline (Apr 2013 APB)	Current Estimate (Dec 2014 SAR)	
Program Acquisition Unit Cost			
Cost	2263.4	2154.0	
Quantity	3	3	
Unit Cost	754.467	718.000	-4.83
Average Procurement Unit Cost			
Cost	1593.4	1380.8	
Quantity	3	3	
Unit Cost	531.133	460.267	-13.34

EMALS

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 2013	733.267	480.233	1118.067	823.733
Current Estimate	Dec 2014	718.000	460.267	1097.800	797.300

SAR Unit Cost History

Current SAR Baseline to Current Estimate (TY \$M)									
Initial PAUC Development Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
393.900	163.967	0.000	0.000	0.000	539.933	0.000	0.000	703.900	1097.800

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	155.267	0.000	0.000	0.000	384.933	0.000	0.000	540.200	797.300

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			Sep 2016	N/A	Mar 2017
Total Cost (TY \$M)			1181.7	N/A	3293.4
Total Quantity			3	N/A	3
PAUC			393.900	N/A	1097.800

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	+107.4	+6214.9	+0.4	--	+6322.7
Quantity	--	--	--	--	--
Schedule	+172.1	+667.4	--	--	+839.5
Engineering	-480.1	+398.9	--	--	-81.2
Estimating	-271.2	-1767.3	+33.9	+20.2	-1984.4
Other	--	--	--	--	--
Support	--	--	--	--	--
Subtotal	-471.8	+5513.9	+34.3	+20.2	+5096.6
Current Changes					
Economic	-6.7	+76.1	-0.1	-0.2	+69.1
Quantity	--	--	--	--	--
Schedule	--	--	--	--	--
Engineering	--	--	--	--	--
Estimating	+79.2	-550.2	+2.0	+70.7	-398.3
Other	--	--	--	--	--
Support	--	--	--	--	--
Subtotal	+72.5	-474.1	+1.9	+70.5	-329.2
Total Changes	-399.3	+5039.8	+36.2	+90.7	+4767.4
CE - Cost Variance	3523.7	36017.2	36.2	90.7	39667.8
CE - Cost & Funding	3523.7	36017.2	36.2	90.7	39667.8

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	-264.0	-2011.0	+25.8	+14.9	-2234.3
Other	--	--	--	--	--
Support	--	--	--	--	--
Subtotal	-496.2	-1823.3	+25.8	+14.9	-2278.8
Current Changes					
Economic	--	--	--	--	--
Quantity	--	--	--	--	--
Schedule	--	--	--	--	--
Engineering	--	--	--	--	--
Estimating	+55.1	-311.3	+1.5	+51.6	-203.1
Other	--	--	--	--	--
Support	--	--	--	--	--
Subtotal	+55.1	-311.3	+1.5	+51.6	-203.1
Total Changes	-441.1	-2134.6	+27.3	+66.5	-2481.9
CE - Cost Variance	3049.5	22100.4	27.3	66.5	25243.7
CE - Cost & Funding	3049.5	22100.4	27.3	66.5	25243.7

Previous Estimate: December 2013

RDT&E	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-6.7
Adjustment for current and prior escalation. (Estimating)	+1.9	+2.4
Increase to CVN 78 Class due to special studies and analysis. (Estimating)	+1.1	+1.4
Decrease to CVN 78 Class due to Small Business Innovative Research (SBIR) and other miscellaneous adjustments. (Estimating)	-0.8	-0.8
Increase to CVN 78 Class due to Integration costs for replacing the Dual Band Radar (DBR) on CVN 79 and CVN 80. (Estimating)	+29.5	+41.3
Increase due to revised estimates in the outyears for Developmental Test & Evaluation, Operational Test & Evaluation, Live Fire Test & Evaluation and CVN 80 efforts. (Estimating)	+20.2	+30.4
Revised estimate due to application of new outyear escalation indices. (Estimating)	+3.2	+4.5
RDT&E Subtotal	+55.1	+72.5

Procurement	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+76.1
Adjustment for current and prior escalation. (Estimating)	-22.4	-35.6
Decrease to CVN 78 due to miscellaneous adjustments. (Estimating)	0.0	+0.2
Increase to CVN 78 due to revised cost estimates for Outfitting. (Estimating)	+3.6	+6.2
Re-allocation of funds between CVN 78 funding and EMALS funding. (Estimating)	+55.0	+79.3
Decrease to CVN 79 due to Congressional reduction on Consolidated Afloat Navy Enterprise System (CANES). (Estimating)	-2.1	-3.6
Decrease to CVN 79 due to Congressional reduction on Digital Modular Radio (DMR). (Estimating)	-0.7	-1.1
Decrease to CVN 79 due to Congressional reduction on Identification Friend or Foe (IFF). (Estimating)	-0.9	-1.6
Decrease to CVN 79 due to Congressional reduction on SPN-46. (Estimating)	-0.9	-1.5
Decrease to CVN 79 due to miscellaneous reductions. (Estimating)	-43.1	-72.7
Decrease to CVN 79 due to Non-Pay, Non-Fuel Purchases rate adjustment. (Estimating)	-39.7	-69.8
Re-Phasing of CVN 79 funding from FY 2016 and FY 2018 to FY 2017. (Estimating)	-5.3	0.0
Decrease to CVN 79 Post Delivery and Outfitting due to revised estimates. (Estimating)	-7.7	-7.3
Re-allocation of funds between CVN 79 funding and EMALS funding. (Estimating)	+1.2	-0.1
Decrease to CVN 80 due to Non-Pay, Non-Fuel Purchases rate adjustment. (Estimating)	-66.8	-121.1
Decrease to CVN 80 due to revised estimates and proper pricing. (Estimating)	-159.2	-280.9
Re-allocation of funds between CVN 80 funding and EMALS funding. (Estimating)	0.0	0.0
Revised estimate due to application of new outyear escalation indices. (Estimating)	-22.3	-40.6
Procurement Subtotal	-311.3	-474.1

MILCON	\$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
Increase to CVN 78 Class due to revised estimates for Drydock # 8 Electrical Distribution Upgrade. (Estimating)	+1.4	+1.9
MILCON Subtotal	+1.5	+1.9

Acq O&M	\$M	
	Base Year	Then Year
Current Change Explanations		
Revised escalation indices. (Economic)	N/A	-0.2
Increase to CVN 78 Class due to establishment of 1st of class sustainment support and procurement of first of class critical platform spares. (Estimating)	+53.1	+72.9
Decrease to CVN 78 Class due to miscellaneous adjustments. (Estimating)	-1.7	-2.4
Revised Estimate due to application of new outyear escalation indices. (Estimating)	+0.2	+0.2
Acq O&M Subtotal	+51.6	+70.5

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	+26.8	+459.2	--	+486.0
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+425.1	+1240.7	+20.7	+1686.5
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+451.9	+1699.9	+20.7	+2172.5
Current Changes				
Economic	-0.7	+6.6	--	+5.9
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+19.2	-85.9	--	-66.7
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+18.5	-79.3	--	-60.8
Total Changes	+470.4	+1620.6	+20.7	+2111.7
CE - Cost Variance	880.8	2391.9	20.7	3293.4
CE - Cost & Funding	880.8	2391.9	20.7	3293.4

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	+355.6	+849.8	+18.8	+1224.2
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+355.6	+849.8	+18.8	+1224.2
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+14.1	-59.9	--	-45.8
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+14.1	-59.9	--	-45.8
Total Changes	+369.7	+789.9	+18.8	+1178.4
CE - Cost Variance	754.4	1380.8	18.8	2154.0
CE - Cost & Funding	754.4	1380.8	18.8	2154.0

Previous Estimate: December 2013

RDT&E	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-0.7
Adjustment for current and prior escalation. (Estimating)	+0.5	+0.6
Decrease due to Small Business Innovative Research (SBIR) adjustment and other miscellaneous adjustments. (Estimating)	-1.2	-1.5
Increase to maintain EMALS shore based test site and conduct EMALS land-based testing. (Estimating)	+14.7	+20.0
Revised estimate due to application of new outyear escalation indices. (Estimating)	+0.1	+0.1
RDT&E Subtotal	+14.1	+18.5

Procurement	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+6.6
Adjustment for current and prior escalation. (Estimating)	-2.0	-3.3
Re-allocation of funds between CVN 78 funding and EMALS funding. (Estimating)	-54.8	-79.3
Re-allocation of funds between CVN 79 funding and EMALS funding. (Estimating)	-1.2	+0.1
Re-allocation of funds between CVN 80 funding and EMALS funding. (Estimating)	0.0	0.0
Revised estimate due to application of new outyear escalation indices. (Estimating)	-1.7	-3.2
Decrease to EMALS due to miscellaneous adjustments. (Estimating)	-0.2	-0.2
Procurement Subtotal	-59.9	-79.3

Contracts

Contract Identification

Appropriation: Procurement
Contract Name: CVN 78 DETAIL DESIGN & CONSTRUCTION
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	6014.2	N/A	1	6773.8	6728.5

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 (12/31/2014)	-876.7	-67.2
Previous Cumulative Variances	-721.5	-35.9
Net Change	-155.2	-31.3

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to material cost growth (30%), labor inefficiencies (37%), Overhead degradation (36%), and Facilities Capital Cost of Money (FCCM) improvement (-4%). The material variances are due to market forces, unanticipated impacts of a "first of class" specification on contractor furnished material costs (e.g. valves, electrical components, steel and other commodities), and refined understanding of material requirements as the ship design matured. Labor inefficiencies are the result of "first of class" challenges including producibility issues (e.g. thin plate steel, weld distortion, and the increased use of temporary structures and rigging). Material costs increased to fund Leased Labor additions to address "first of class" issues. Additionally, increased supervision has been required to manage the above challenges and a developing workforce. Contributing to the Cost Variance (CV) and Schedule (SV) are schedule impacts due to planning/budgeting integration efforts to accurately apply distributed budgets to both current and future work. Target price does not include the Estimated Authorized Cost of Unpriced Work.

The unfavorable net change in the schedule variance is due to the rescheduling of the CVN 78 delivery from September 2015 to March 2016. Although shipbuilder actions to resolve "first of class" issues have retired some technical and schedule risk, HII-NNS was unable to retire all schedule risk, resulting in a four month delay to the launch of CVN 78, with associated impact to delivery. The Navy agreed to delay the delivery date accordingly while HII-NNS has increased material funds to facilitate additional Leased Labor for system and compartment finalization.

Notes

The Program Manager's Estimated Price at Completion (PMEPAC) of \$6,728.5M exceeds the current contract Target Price of \$6,014.2M by \$714.3M. This \$714.3M price Variance at Completion (VAC) includes \$23.9M of authorized work that has not been adjudicated resulting in government liability of \$690.4M. The PMEAC Cost VAC remains at \$884.7M pending completion of the Navy's assessment of the launch delay impact to delivery. The Government liability, of the \$884.7M, cost variance is \$690.4M based on the contract shareline ratios which reduce the contractors target fee as cost growth increases.

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	3296.1	N/A	N/A	3347.7	3361.0

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 Construction Preparation (CP) contract extensions for FY 2011 through FY 2014 efforts as well as 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 (12/31/2014)	+12.2		+0.4
Previous Cumulative Variances	-2.1		+0.7
Net Change	+14.3		-0.3

Cost and Schedule Variance Explanations

The favorable net change in the cost variance is due to economic order quantity savings and reduced scope for material purchased for Non-Propulsion Plant Long Lead Time Material (LLTM). Readiness of material and planning products for work start as well as other process improvements contributed to positive performance in advance construction activities and resulting net change in Cost Variance (CV).

The unfavorable net change in the schedule variance is due to delayed receipts of LLTM, specifically air conditioning plants, weapons elevator machinery, and electrical controllers.

Notes

The FY 2014 extension to the CP contract was awarded March 4, 2014 in the amount of \$1.3B. As the Navy and HII-NNS continue to negotiate the award of the CVN 79 Detail Design and Construction (DD&C) Contract, the two parties have negotiated an agreement on an extension to the CP contract to allow continuation of ongoing planning, construction, and material procurement to maintain the current build plan. Continued negotiations for the DD&C contract affords an opportunity for the shipbuilder to incorporate further construction process improvements and Government Furnished Equipment (GFE) cost reductions into the construction plan. As of December 31, 2014, the CP contract is 56.0% complete based on dollars. The Advance Construction effort is 40.9% complete on a dollar basis and 53.7% complete on a man-hour basis.

Contract Identification

Appropriation: RDT&E
Contract Name: EMALS Basic Ordering Agreement Logistics Development Order
Contractor: General Atomics 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	44.7	63.3

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 (12/31/2014)	+0.6	-1.8
Previous Cumulative Variances	-0.7	-1.5
Net Change	+1.3	-0.3

Cost and Schedule Variance Explanations

The favorable net change in the cost variance is due to fewer than planned systems engineering resources required to support logistics product development.

The unfavorable net change in the schedule variance is due to Technical Manual Development which was slightly behind schedule. This is being mitigated by conducting six incremental subsystem data module In Process Reviews (IPRs) in place of one complete review. Five of six IPRs are complete and the final IPR is currently underway.

Notes

The Program Manager's Estimated Price at Completion (PMEPAC) currently exceeds the Current Contract Price by \$18.7M. An Integrated Baseline Review (IBR) was conducted in December 2013 that yielded 27 findings. The PMEAC was based on the cost and schedule risks associated with the IBR findings. General Atomics has taken corrective action to address all IBR findings and the IBR was closed in December 2014. An updated Program Manager's Estimate at Completion (EAC) is being developed and will be available in the third quarter of FY 2015. The PMEAC is expected to decrease based on the reduced risk associated with the IBR closeout and the General Atomics cost and schedule performance to date. This order is currently 58.7% complete.

Contract Identification

Appropriation: Procurement
Contract Name: EMALS CVN 78 Production
Contractor: General Atomics Electromagnetic Systems Group
Contractor Location: 3550 General Atomics Court
 San Diego, CA 92121-1122
Contract Number: N68335-09-C-0573
Contract Type: Firm Fixed Price (FFP)
Award Date: June 30, 2009
Definitization Date: June 30, 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
573.0	N/A	1	558.1	N/A	1	558.1	558.1

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to contract negotiations/definitization and subsequent contract modifications.

Cost and Schedule Variance Explanations

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

Notes

This was initially awarded as a not-to-exceed undefinitized contract action.

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	0	0	3	0.00%
Total Program Quantity Delivered	0	0	3	0.00%

Expended and Appropriated (TY \$M)			
Total Acquisition Cost	39667.8	Years Appropriated	19
Expended to Date	17335.3	Percent Years Appropriated	59.38%
Percent Expended	43.70%	Appropriated to Date	21107.3
Total Funding Years	32	Percent Appropriated	53.21%

The above data is current as of January 31, 2015.

EMALS

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	0	0	0	--
Production	0	0	3	0.00%
Total Program Quantity Delivered	0	0	3	0.00%

Expended and Appropriated (TY \$M)			
Total Acquisition Cost	3293.4	Years Appropriated	16
Expended to Date	1186.2	Percent Years Appropriated	66.67%
Percent Expended	36.02%	Appropriated to Date	1761.5
Total Funding Years	24	Percent Appropriated	53.49%

The above data is current as of January 31, 2015.

Operating and Support Cost

CVN 78

Cost Estimate Details

Date of Estimate:	January 30, 2015
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 OPNAV "Maintenance" Notices. Maintenance and Personnel costs are the major contributors to the total O&S Program.

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 O&S costs were derived from requirements, actual returns, and the Naval Visibility and Management of Operating and Support Costs (VAMOSOC) database, with the primary focus using requirements. Unit Level Manpower (1.0) 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 July 2011).

Unit Operations (2.0), Intermediate Maintenance (3.2), Sustaining Support (4.0), and Continuing System Improvements (5.0) were derived from VAMOSOC, with data pulled from FY 2000 through FY 2010; 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		CVN 68 Class (Antecedent)
	Average Annual Cost Per Ship		Average Annual Cost Per Ship
Unit-Level Manpower		132.494	167.460
Unit Operations		20.896	16.706
Maintenance		73.570	110.115
Sustaining Support		9.685	10.607
Continuing System Improvements		9.940	15.072
Indirect Support		73.480	93.315
Other		0.000	0.000
Total		320.065	413.275

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	48009.8	206638.0
Then Year	251600.0	N/A	136167.6	N/A

Total O&S cost for 11 ships would be \$176,030.0M BY dollars/\$753,789M in TY dollars.

Equation to Translate Annual Cost to Total Cost

Total Cost = Average Annual Cost Per Ship * Number of Ships * Service Life = \$320.065M * 3 * 50 = \$48,009.750M

O&S Cost Variance		
Category	BY 2000 \$M	Change Explanations
Prior SAR Total O&S Estimates - Dec 2013 SAR	48011.4	
Programmatic/Planning Factors	0.0	
Cost Estimating Methodology	0.0	
Cost Data Update	-1.6	Revised to use February 2014 Naval Center for Cost Analysis Joint Inflation Calculator (JIC).
Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	0.0	
Other	0.0	
Total Changes	-1.6	
Current Estimate	48009.8	

2014 SAR O&S data reflects the following change from previous SARs:

- The estimates use the January 2015 vice February 2014 Naval Center for Cost Analysis Joint Inflation Calculator (JIC).

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

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

EMALS

Cost Estimate Details

Date of Estimate:	January 21, 2015
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

EMALS is planned for 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 (third quarter FY 2023) will be under a blended support and sustainment scenario by the Original Equipment Manufacturer (OEM), General Atomics (GA), and Navy support from 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.

Specific requirements for these systems (sustainment roles and equipment required) are still being defined since the system design for both systems remains under development with exact maintenance requirements yet to be determined. The Maintenance planning requirements Estimated Completion Date (ECD) for EMALS is no later than the end of FY 2015.

Antecedent Information

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	4.453	0.000
Unit Operations	0.000	0.000
Maintenance	5.878	0.000
Sustaining Support	1.446	0.000
Continuing System Improvements	3.682	0.000
Indirect Support	1.703	0.000
Other	0.000	0.000
Total	17.162	--

Item	Total O&S Cost \$M			
	EMALS		No Antecedent (Antecedent)	
	Current Development APB Objective/Threshold	Current Estimate		
Base Year	2574.3	2831.7	2574.3	N/A
Then Year	6422.6	N/A	7190.3	N/A

Total O&S cost for 11 Shipsets would be \$9,430.0M in BY dollars/\$40,329.0M in TY dollars.

Equation to Translate Annual Cost to Total Cost

Total Cost = Average Annual Cost Per Shipset * number of Shipsets * Service Life = \$17.162M * 3 * 50 = \$2574.3M

O&S Cost Variance		
Category	BY 2000 \$M	Change Explanations
Prior SAR Total O&S Estimates - Dec 2013 SAR	2574.3	
Programmatic/Planning Factors	0.0	
Cost Estimating Methodology	0.0	
Cost Data Update	0.0	
Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	0.0	
Other	0.0	
Total Changes	0.0	
Current Estimate	2574.3	

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.