



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 2015 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

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Common Acronyms and Abbreviations

Acq O&M - Acquisition-Related Operations and Maintenance
APB - Acquisition Program Baseline
APPN - Appropriation
APUC - Average Procurement Unit Cost
BA - Budget Authority/Budget Activity
BY - Base Year
DAMIR - Defense Acquisition Management Information Retrieval
Dev Est - Development Estimate
DoD - Department of Defense
DSN - Defense Switched Network
Econ - Economic
Eng - Engineering
Est - Estimating
FMS - Foreign Military Sales
FY - Fiscal Year
IOC - Initial Operational Capability
\$K - Thousands of Dollars
LRIP - Low Rate Initial Production
\$M - Millions of Dollars
MILCON - Military Construction
N/A - Not Applicable
O&S - Operating and Support
Oth - Other
PAUC - Program Acquisition Unit Cost
PB - President's Budget
PE - Program Element
Proc - Procurement
Prod Est - Production Estimate
QR - Quantity Related
Qty - Quantity
RDT&E - Research, Development, Test, and Evaluation
SAR - Selected Acquisition Report
Sch - Schedule
Spt - Support
TBD - To Be Determined
TY - Then Year
UCR - Unit Cost Reporting

Program Information

Program Name

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

DoD Component

Navy

Responsible Office

Responsible Office

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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, Electro-Magnetic 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 was launched on November 17, 2013. CVN 78 weighed 77,000 tons at launch and was 70% complete – the highest levels attained in aircraft carrier new construction. In addition, all tanks and voids were final coated, all Dual Band Radar (DBR) arrays were installed and 6.1 million of 9.5 million feet of electrical cable were pulled by launch. This unprecedented level of completeness has best prepared the ship for the post-launch test program. Material variance factors such as a shrinking supplier base, cost increases for developmental components, and CVN 78 unique items have been contained. As of December 2013, material availability on the waterfront improved and 95% of all material was procured. Further changes to material variance are not anticipated. Previously reported labor factors associated with use of thinner steels, blast and coat, and unit erection are no longer having a negative effect on labor variance.

Shipbuilder ability to maintain work package completion rates and to attain aggressive yet achievable goals for compartment outfitting, system turn-over and compartment turn-over will be a significant contributor to remaining cost and schedule performance. However, the principal risk remaining on the CVN 78 is the Shipboard test program and risks associated with first time shipboard operation of new systems and components. To mitigate this risk, the program is executing multiple land based test programs to reduce technical risk prior to shipboard testing.

Government Furnished Equipment (GFE) systems such as EMALS, Advanced Arresting Gear (AAG), and DBR are all executing robust, multi-year land based tests. New contractor developed systems such as Machinery Control and Monitoring System (MCMS), JP-5, and Aqueous Film-Forming Foam (AFFF) are also subjects of early land based testing.

At the direction of the Assistant Secretary of the Navy for Research, Development and Acquisition (ASN (RD&A)), an independent team conducted an end-to-end assessment of CVN 78 cost variance that included opportunities to prevent further increases. Recommendations from the report were briefed to ASN (RD&A) in December 2011, and continue to be implemented. 24 of 38 recommendations have been implemented with the remaining in progress.

Huntington Ingalls Industries – Newport News Shipbuilding (HII-NNS) is under contract for CVN 79 construction preparation (CP), which includes advance construction, material procurement, and research, design and engineering efforts. In the CVN 79 Detailed Design & Construction (DD&C) Request for Proposals (RFP) provided to HII-NNS on October 2, 2012, the Navy solicited a Fixed Price Incentive (FPI) contract with a simplified structure. As the Navy and HII-NNS continue to negotiate the award of the CVN 79 DD&C contract, the two parties have negotiated 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 will afford an opportunity for the shipbuilder to incorporate further construction process improvements into the construction plan. The CVN 79 DD&C contract is expected to be awarded in early FY 2015.

In light of this extended negotiation timeline, the Program Manager's current estimates for the CVN 79 Defense Acquisition Board Program Review (DAB PR) and CVN 79 Start Construction milestones exceed the corresponding APB threshold dates by approximately one year. The program is developing a Program Deviation Report (PDR).

Adjustment of the ship's full funding profile within the Navy's overall shipbuilding budget have caused a change in the PM's estimated delivery of the ship, from September 2022 to no later than March 2023. This adjustment maintains ship delivery within its APB threshold. Further refinement of the CVN 79 build and delivery schedule will occur as part of DD&C negotiations.

The FY 2014 National Defense Authorization Act (NDAA), which was signed into law on December 26, 2013, increased the cost cap for CVN 78, and added a provision allowing adjustment to the cost cap under Secretary of the Navy authority for discoveries made during the Shipboard Testing Program. The FY 2014 NDAA also updated

the CVN 79 cost cap to reflect adjustments made to date under Navy authority and added a requirement for quarterly cost estimates for CVN 79.

Development and ship integration efforts for EMALS continue. The EMALS subprogram continues to be managed within the parameters established in the APB signed by the Under Secretary for Defense (Acquisition, Technology and Logistics) (USD (AT&L)) on April 2, 2013.

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

Threshold Breaches

CVN 78

APB Breaches	
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Schedule		<input checked="" type="checkbox"/>
Performance		<input type="checkbox"/>
Cost	RDT&E	<input type="checkbox"/>
	Procurement	<input type="checkbox"/>
	MILCON	<input type="checkbox"/>
	Acq O&M	<input type="checkbox"/>
O&S Cost		<input type="checkbox"/>
Unit Cost	PAUC	<input type="checkbox"/>
	APUC	<input type="checkbox"/>

Explanation of Breach

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 Defense Acquisition Board (DAB) Program Review (PR) and DD&C contract award dates.

The Program Office is developing a Program Deviation Report and is staffing the PDR to the Assistant Secretary of the Navy (Research Development and Acquisition (ASN (RDA))) submitting notification of the DAB PR contract award changes.

Nunn-McCurdy Breaches	
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Current UCR Baseline

PAUC	None
APUC	None

Original UCR Baseline

PAUC	None
APUC	None

EMALS

APB Breaches	
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Schedule		<input type="checkbox"/>
Performance		<input type="checkbox"/>
Cost	RDT&E	<input type="checkbox"/>
	Procurement	<input type="checkbox"/>
	MILCON	<input type="checkbox"/>
	Acq O&M	<input type="checkbox"/>
O&S Cost		<input type="checkbox"/>
Unit Cost	PAUC	<input type="checkbox"/>
	APUC	<input type="checkbox"/>

Nunn-McCurdy Breaches	
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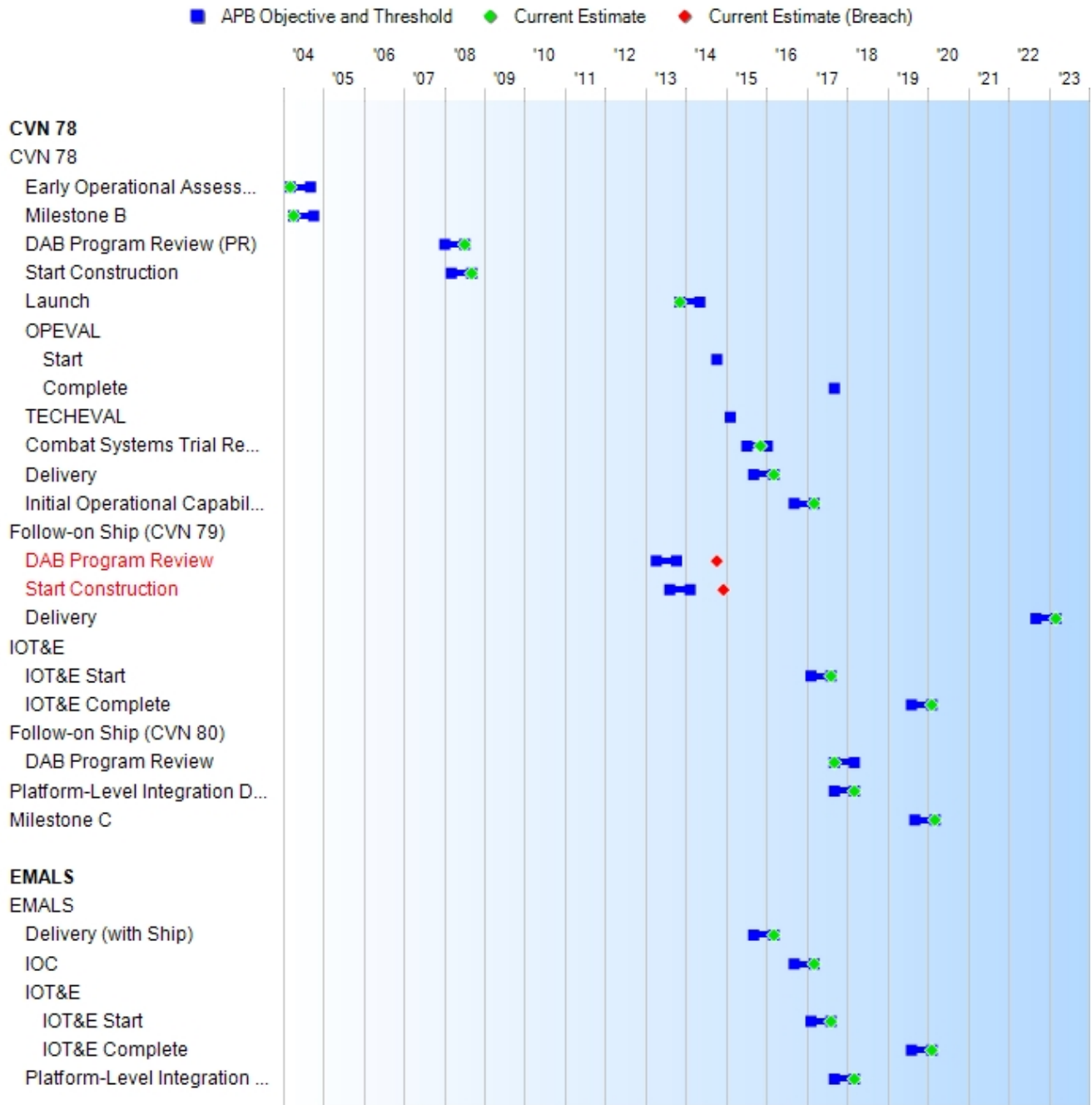
Current UCR Baseline

PAUC	None
APUC	None

Original UCR Baseline

PAUC	None
APUC	None

Schedule



CVN 78				
Milestones	SAR Baseline Dev Est	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	FEB 2015	N/A	N/A	N/A
Combat Systems Trial Rehearsal (CSTR)	JUL 2014	JUL 2015	JAN 2016	NOV 2015
Delivery	SEP 2014	SEP 2015	MAR 2016	MAR 2016 (Ch-1)
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	OCT 2014 ¹ (Ch-2)
Start Construction	JAN 2011	AUG 2013	FEB 2014	DEC 2014 ¹ (Ch-3)
Delivery	SEP 2018	SEP 2022	MAR 2023	MAR 2023 (Ch-4)
IOT&E				
IOT&E Start	N/A	FEB 2017	AUG 2017	AUG 2017
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	SEP 2017
Platform-Level Integration DT Period Complete	N/A	SEP 2017	MAR 2018	MAR 2018
Milestone C	MAR 2017	SEP 2019	MAR 2020	MAR 2020

¹APB Breach

Change Explanations

(Ch-1) Completion of schedule analysis resulted in revision of CVN 78 delivery from February 2016 to March 2016.

(Ch-2) DAB Program Review rescheduled from August 2013 to October 2014 to reflect revised contract award schedule for CVN 79.

(Ch-3) Start Construction rescheduled from September 2013 to December 2014 to reflect revised contract award schedule for CVN 79.

(Ch-4) CVN 79 delivery revised from September 2022 to March 2023 as a result of funding profile re-phasing.

Memo

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

DAB - Defense Acquisition Board
 DT - Developmental Testing
 IOT&E - Initial Operational Test and Evaluation
 OPEVAL - Operational Evaluation
 TECHEVAL - Technical Evaluation

EMALS

Milestones	SAR Baseline Dev Est	Current APB Development Objective/Threshold		Current Estimate
EMALS				
Delivery (with Ship)	SEP 2015	SEP 2015	MAR 2016	MAR 2016 (Ch-1)
IOC	SEP 2016	SEP 2016	MAR 2017	MAR 2017
IOT&E				
IOT&E Start	FEB 2017	FEB 2017	AUG 2017	AUG 2017
IOT&E Complete	AUG 2019	AUG 2019	FEB 2020	FEB 2020
Platform-Level Integration DT Period Complete	SEP 2017	SEP 2017	MAR 2018	MAR 2018

Change Explanations

(Ch-1) Completion of schedule analysis resulted in revision of CVN 78 delivery from February 2016 to March 2016.

Acronyms and Abbreviations

DT - Developmental Test
 IOT&E - Initial Operational Test & Evaluation

Performance

CVN 78					
Characteristics	SAR Baseline Dev Est	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	Level II as defined by OPNAV Instruction	TBD	Level II as defined by OPNAV Instruction

		9070.1	9070.1 with the exception of Collective Protection System		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 Source

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

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

Requirements Source

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

Change Explanations

None

Memo

The Joint Requirements Oversight Council 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.

Acronyms and Abbreviations

JROC - Joint Requirements Oversight Council

KPP - Key Performance Parameter

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)
	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
	22300		CV Feasibility Studies (Sunk)
	42300		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)
	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 and Post Delivery	(Shared)
	5300	Completion of Prior Year Shipbuilding	(Shared)

MILCON

Appn	BA	PE
Navy	1205 01	0203176N
Project		Name
	62688500	Pier 11 CVN-78 Power Booms
Navy	1205 01	0702776N
Project		Name
	32443998	Drydock 8 Electrical Distribution Upgrade

Acq O&M

Appn	BA	PE
Navy	1804 01	0702827N
Project		Name
	12BJ	CVN 78 Ford Class Training

EMALS

RDT&E

Appn	BA	PE
Navy	1319 04	0603512N
Project		Name
	2208	CVN 21 (Shared)
	4004	EMALS
	9B48A	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	
Navy	1205	01	0212176N	
	Project		Name	
	N0400024		EMALS Facility	(Sunk)

Cost and Funding

Cost Summary - Total Program

Total Acquisition Cost and Quantity - Total Program

Appropriation	BY2000 \$M			BY2000 \$M	TY \$M		
	SAR Baseline Dev Est	Current APB Development Objective/Threshold		Current Estimate	SAR Baseline Dev Est	Current APB Development Objective	Current Estimate
RDT&E	3875.3	4123.4	--	3734.7	4333.4	4744.6	4313.5
Procurement	24825.9	24357.7	--	23852.4	31748.7	33258.8	38962.5
Flyaway	--	--	--	23852.4	--	--	38962.5
Recurring	--	--	--	20649.1	--	--	34246.8
Non Recurring	--	--	--	3203.3	--	--	4715.7
Support	--	--	--	0.0	--	--	0.0
Other Support	--	--	--	0.0	--	--	0.0
Initial Spares	--	--	--	0.0	--	--	0.0
MILCON	0.0	152.0	--	44.6	0.0	208.5	55.0
Acq O&M	0.0	0.0	--	14.9	0.0	0.0	20.2
Total	28701.2	28633.1	N/A	27646.6	36082.1	38211.9	43351.2

Cost and Funding

Cost Summary - CVN 78

Total Acquisition Cost and Quantity - CVN 78

Appropriation	BY2000 \$M			BY2000 \$M	TY \$M		
	SAR Baseline Dev Est	Current APB Development Objective/Threshold		Current Estimate	SAR Baseline Dev Est	Current APB Development Objective	Current Estimate
RDT&E	3490.6	3472.2	3819.4	2994.4	3923.0	3999.8	3451.2
Procurement	24235.0	22764.3	25040.7	22411.7	30977.4	30808.7	36491.3
Flyaway	--	--	--	22411.7	--	--	36491.3
Recurring	--	--	--	19208.4	--	--	31775.6
Non Recurring	--	--	--	3203.3	--	--	4715.7
Support	--	--	--	0.0	--	--	0.0
Other Support	--	--	--	0.0	--	--	0.0
Initial Spares	--	--	--	0.0	--	--	0.0
MILCON	0.0	133.2	146.5	25.8	0.0	187.8	34.3
Acq O&M	0.0	0.0	--	14.9	0.0	0.0	20.2
Total	27725.6	26369.7	N/A	25446.8	34900.4	34996.3	39997.0

Confidence Level for Current APB Cost 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.

Quantity	SAR Baseline Dev Est	Current APB Development	Current Estimate
RDT&E	0	0	0
Procurement	3	3	3
Total	3	3	3

Cost Summary - EMALS

Total Acquisition Cost and Quantity - EMALS

Appropriation	BY2000 \$M			BY2000 \$M	TY \$M		
	SAR Baseline Dev Est	Current APB Development Objective/Threshold		Current Estimate	SAR Baseline Dev Est	Current APB Development Objective	Current Estimate
RDT&E	384.7	651.2	748.9	740.3	410.4	744.8	862.3
Procurement	590.9	1593.4	1752.7	1440.7	771.3	2450.1	2471.2
Flyaway	--	--	--	1440.7	--	--	2471.2
Recurring	--	--	--	1440.7	--	--	2471.2
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	2199.8	1181.7	3215.6	3354.2

Confidence Level for Current APB Cost 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.

Quantity	SAR Baseline Dev Est	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 and Quantity Summary - Total Program FY2015 President's Budget / December 2013 SAR (TY\$ M)

Appropriation	Prior	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	To Complete	Total
RDT&E	3731.3	147.7	122.9	58.2	57.1	52.8	44.8	98.7	4313.5
Procurement	15331.3	1546.7	2008.9	3093.1	2293.2	2849.3	1864.5	9975.5	38962.5
MILCON	51.6	3.4	0.0	0.0	0.0	0.0	0.0	0.0	55.0
Acq O&M	0.0	0.0	4.9	12.9	2.4	0.0	0.0	0.0	20.2
PB 2015 Total	19114.2	1697.8	2136.7	3164.2	2352.7	2902.1	1909.3	10074.2	43351.2
PB 2014 Total	19248.5	1738.1	2776.7	2023.7	2605.9	3013.8	3479.7	8242.8	43129.2
Delta	-134.3	-40.3	-640.0	1140.5	-253.2	-111.7	-1570.4	1831.4	222.0

Cost and Funding

Funding Summary - CVN 78

Appropriation and Quantity Summary - CVN 78 FY2015 President's Budget / December 2013 SAR (TY\$ M)

Appropriation	Prior	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	To Complete	Total
RDT&E	2922.7	104.7	114.7	55.7	57.1	52.8	44.8	98.7	3451.2
Procurement	14564.9	1520.7	1811.6	2903.8	2147.9	2646.3	1864.5	9031.6	36491.3
MILCON	30.9	3.4	0.0	0.0	0.0	0.0	0.0	0.0	34.3
Acq O&M	0.0	0.0	4.9	12.9	2.4	0.0	0.0	0.0	20.2
PB 2015 Total	17518.5	1628.8	1931.2	2972.4	2207.4	2699.1	1909.3	9130.3	39997.0
PB 2014 Total	17659.1	1466.9	2604.6	1682.8	2560.9	2977.9	3230.5	7592.4	39775.1
Delta	-140.6	161.9	-673.4	1289.6	-353.5	-278.8	-1321.2	1537.9	221.9

Quantity	Undistributed	Prior	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	To Complete	Total
Development	0	0	0	0	0	0	0	0	0	0
Production	0	2	0	0	0	0	1	0	0	3
PB 2015 Total	0	2	0	0	0	0	1	0	0	3
PB 2014 Total	0	2	0	0	0	0	1	0	0	3
Delta	0	0	0	0	0	0	0	0	0	0

Funding Summary - EMALS

Appropriation and Quantity Summary - EMALS FY2015 President's Budget / December 2013 SAR (TY\$ M)

Appropriation	Prior	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	To Complete	Total
RDT&E	808.6	43.0	8.2	2.5	0.0	0.0	0.0	0.0	862.3
Procurement	766.4	26.0	197.3	189.3	145.3	203.0	0.0	943.9	2471.2
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 2015 Total	1595.7	69.0	205.5	191.8	145.3	203.0	0.0	943.9	3354.2
PB 2014 Total	1589.4	271.2	172.1	340.9	45.0	35.9	249.2	650.4	3354.1
Delta	6.3	-202.2	33.4	-149.1	100.3	167.1	-249.2	293.5	0.1

Quantity	Undistributed	Prior	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	To Complete	Total
Development	0	0	0	0	0	0	0	0	0	0
Production	0	2	0	0	0	0	1	0	0	3
PB 2015 Total	0	2	0	0	0	0	1	0	0	3
PB 2014 Total	0	2	0	0	0	0	1	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 TY\$ - CVN 78

1319 | RDT&E | Research, Development, Test, and Evaluation, Navy

Fiscal Year	Quantity	End Item Recurring Flyaway TY \$M	Non End Item Recurring Flyaway TY \$M	Non Recurring Flyaway TY \$M	Total Flyaway TY \$M	Total Support TY \$M	Total Program TY \$M
1997	--	--	--	--	--	--	0.9
1998	--	--	--	--	--	--	46.1
1999	--	--	--	--	--	--	83.3
2000	--	--	--	--	--	--	136.8
2001	--	--	--	--	--	--	189.6
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	--	--	--	--	--	--	102.9
2014	--	--	--	--	--	--	104.7
2015	--	--	--	--	--	--	114.7
2016	--	--	--	--	--	--	55.7
2017	--	--	--	--	--	--	57.1
2018	--	--	--	--	--	--	52.8
2019	--	--	--	--	--	--	44.8
2020	--	--	--	--	--	--	32.6
2021	--	--	--	--	--	--	32.9
2022	--	--	--	--	--	--	33.2

Subtotal	--	--	--	--	--	--	3451.2
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Annual Funding BY\$ - CVN 78

1319 | RDT&E | Research, Development, Test, and Evaluation, Navy

Fiscal Year	Quantity	End Item Recurring Flyaway BY 2000 \$M	Non End Item Recurring Flyaway BY 2000 \$M	Non Recurring Flyaway BY 2000 \$M	Total Flyaway BY 2000 \$M	Total Support BY 2000 \$M	Total Program BY 2000 \$M
1997	--	--	--	--	--	--	0.9
1998	--	--	--	--	--	--	46.9
1999	--	--	--	--	--	--	83.7
2000	--	--	--	--	--	--	135.5
2001	--	--	--	--	--	--	185.2
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	--	--	--	--	--	--	88.8
2013	--	--	--	--	--	--	79.4
2014	--	--	--	--	--	--	79.4
2015	--	--	--	--	--	--	85.4
2016	--	--	--	--	--	--	40.7
2017	--	--	--	--	--	--	40.9
2018	--	--	--	--	--	--	37.1
2019	--	--	--	--	--	--	30.8
2020	--	--	--	--	--	--	22.0
2021	--	--	--	--	--	--	21.8
2022	--	--	--	--	--	--	21.5
Subtotal	--	--	--	--	--	--	2994.4

Annual Funding TY\$ - CVN 78
1611 | Procurement | Shipbuilding and Conversion, Navy

Fiscal Year	Quantity	End Item Recurring Flyaway TY \$M	Non End Item Recurring Flyaway TY \$M	Non Recurring Flyaway TY \$M	Total Flyaway TY \$M	Total Support TY \$M	Total Program TY \$M
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	--	358.2	--	424.5	782.7	--	782.7
2008	1	1770.1	--	1010.7	2780.8	--	2780.8
2009	--	3628.6	--	54.9	3683.5	--	3683.5
2010	--	825.0	--	251.0	1076.0	--	1076.0
2011	--	1715.6	--	539.1	2254.7	--	2254.7
2012	--	453.6	--	101.2	554.8	--	554.8
2013	1	392.3	--	82.7	475.0	--	475.0
2014	--	1307.8	--	212.9	1520.7	--	1520.7
2015	--	1673.5	--	138.1	1811.6	--	1811.6
2016	--	2711.5	--	192.3	2903.8	--	2903.8
2017	--	2042.7	--	105.2	2147.9	--	2147.9
2018	1	2628.0	--	18.3	2646.3	--	2646.3
2019	--	1785.3	--	79.2	1864.5	--	1864.5
2020	--	2903.5	--	134.2	3037.7	--	3037.7
2021	--	3006.9	--	114.5	3121.4	--	3121.4
2022	--	1768.6	--	60.4	1829.0	--	1829.0
2023	--	651.0	--	111.0	762.0	--	762.0
2024	--	1.0	--	--	1.0	--	1.0
2025	--	44.9	--	--	44.9	--	44.9
2026	--	77.7	--	--	77.7	--	77.7
2027	--	140.2	--	--	140.2	--	140.2
2028	--	17.7	--	--	17.7	--	17.7
Subtotal	3	31775.6	--	4715.7	36491.3	--	36491.3

Annual Funding BY\$ - CVN 78
1611 | Procurement | Shipbuilding and Conversion, Navy

Fiscal Year	Quantity	End Item Recurring Flyaway BY 2000 \$M	Non End Item Recurring Flyaway BY 2000 \$M	Non Recurring Flyaway BY 2000 \$M	Total Flyaway BY 2000 \$M	Total Support BY 2000 \$M	Total Program BY 2000 \$M
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	1245.7	--	711.2	1956.9	--	1956.9
2009	--	2479.9	--	37.5	2517.4	--	2517.4
2010	--	545.5	--	166.0	711.5	--	711.5
2011	--	1100.3	--	345.8	1446.1	--	1446.1
2012	--	285.1	--	63.6	348.7	--	348.7
2013	1	242.1	--	51.1	293.2	--	293.2
2014	--	792.4	--	129.0	921.4	--	921.4
2015	--	994.5	--	82.1	1076.6	--	1076.6
2016	--	1579.9	--	112.1	1692.0	--	1692.0
2017	--	1166.9	--	60.1	1227.0	--	1227.0
2018	1	1471.8	--	10.3	1482.1	--	1482.1
2019	--	980.2	--	43.5	1023.7	--	1023.7
2020	--	1563.0	--	72.2	1635.2	--	1635.2
2021	--	1586.9	--	60.4	1647.3	--	1647.3
2022	--	915.1	--	31.2	946.3	--	946.3
2023	--	330.2	--	56.3	386.5	--	386.5
2024	--	0.5	--	--	0.5	--	0.5
2025	--	21.9	--	--	21.9	--	21.9
2026	--	37.1	--	--	37.1	--	37.1
2027	--	65.7	--	--	65.7	--	65.7
2028	--	8.1	--	--	8.1	--	8.1
Subtotal	3	19208.4	--	3203.3	22411.7	--	22411.7

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 but have not yet been incorporated into the CVN 80 cost estimates. The Navy is committed to driving down aircraft carrier construction costs, and fully expects future estimates 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	6276.6
2009	--	--
2010	--	--
2011	--	--
2012	--	--
2013	1	6090.9
2014	--	--
2015	--	--
2016	--	--
2017	--	--
2018	1	6840.9
2019	--	--
2020	--	--
2021	--	--
2022	--	--
2023	--	--
2024	--	--
2025	--	--
2026	--	--
2027	--	--

2028	--	--
Subtotal	3	19208.4

Annual Funding TY\$ - CVN 78
1205 | MILCON | Military Construction,
Navy and Marine Corps

Fiscal Year	Total Program TY \$M
2013	30.9
2014	3.4
Subtotal	34.3

Annual Funding BY\$ - CVN 78
1205 | MILCON | Military Construction,
Navy and Marine Corps

Fiscal Year	Total Program BY 2000 \$M
2013	23.3
2014	2.5
Subtotal	25.8

Annual Funding TY\$ - CVN 78
1804 | Acq O&M | Operation and
Maintenance, Navy

Fiscal Year	Total Program TY \$M
2015	4.9
2016	12.9
2017	2.4
Subtotal	20.2

Annual Funding BY\$ - CVN 78
1804 | Acq O&M | Operation and
Maintenance, Navy

Fiscal Year	Total Program BY 2000 \$M
2015	3.7
2016	9.5
2017	1.7
Subtotal	14.9

Annual Funding By Appropriation - EMALS

Annual Funding TY\$ - EMALS

1319 | RDT&E | Research, Development, Test, and Evaluation, Navy

Fiscal Year	Quantity	End Item Recurring Flyaway TY \$M	Non End Item Recurring Flyaway TY \$M	Non Recurring Flyaway TY \$M	Total Flyaway TY \$M	Total Support TY \$M	Total Program TY \$M
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	--	--	--	--	--	--	55.1
2014	--	--	--	--	--	--	43.0
2015	--	--	--	--	--	--	8.2
2016	--	--	--	--	--	--	2.5
Subtotal	--	--	--	--	--	--	862.3

Annual Funding BY\$ - EMALS**1319 | RDT&E | Research, Development, Test, and Evaluation, Navy**

Fiscal Year	Quantity	End Item Recurring Flyaway BY 2000 \$M	Non End Item Recurring Flyaway BY 2000 \$M	Non Recurring Flyaway BY 2000 \$M	Total Flyaway BY 2000 \$M	Total Support BY 2000 \$M	Total Program BY 2000 \$M
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	--	--	--	--	--	--	42.5
2014	--	--	--	--	--	--	32.6
2015	--	--	--	--	--	--	6.1
2016	--	--	--	--	--	--	1.8
Subtotal	--	--	--	--	--	--	740.3

Annual Funding TY\$ - EMALS
1611 | Procurement | Shipbuilding and Conversion, Navy

Fiscal Year	Quantity	End Item Recurring Flyaway TY \$M	Non End Item Recurring Flyaway TY \$M	Non Recurring Flyaway TY \$M	Total Flyaway TY \$M	Total Support TY \$M	Total Program TY \$M
2007	--	5.8	--	--	5.8	--	5.8
2008	1	27.8	--	--	27.8	--	27.8
2009	--	211.6	--	--	211.6	--	211.6
2010	--	143.9	--	--	143.9	--	143.9
2011	--	360.3	--	--	360.3	--	360.3
2012	--	--	--	--	--	--	--
2013	1	17.0	--	--	17.0	--	17.0
2014	--	26.0	--	--	26.0	--	26.0
2015	--	197.3	--	--	197.3	--	197.3
2016	--	189.3	--	--	189.3	--	189.3
2017	--	145.3	--	--	145.3	--	145.3
2018	1	203.0	--	--	203.0	--	203.0
2019	--	--	--	--	--	--	--
2020	--	310.1	--	--	310.1	--	310.1
2021	--	250.6	--	--	250.6	--	250.6
2022	--	185.8	--	--	185.8	--	185.8
2023	--	197.4	--	--	197.4	--	197.4
Subtotal	3	2471.2	--	--	2471.2	--	2471.2

Annual Funding BY\$ - EMALS
1611 | Procurement | Shipbuilding and Conversion, Navy

Fiscal Year	Quantity	End Item Recurring Flyaway BY 2000 \$M	Non End Item Recurring Flyaway BY 2000 \$M	Non Recurring Flyaway BY 2000 \$M	Total Flyaway BY 2000 \$M	Total Support BY 2000 \$M	Total Program BY 2000 \$M
2007	--	4.2	--	--	4.2	--	4.2
2008	1	19.6	--	--	19.6	--	19.6
2009	--	144.6	--	--	144.6	--	144.6
2010	--	95.2	--	--	95.2	--	95.2
2011	--	231.1	--	--	231.1	--	231.1
2012	--	--	--	--	--	--	--
2013	1	10.5	--	--	10.5	--	10.5
2014	--	15.8	--	--	15.8	--	15.8
2015	--	117.3	--	--	117.3	--	117.3
2016	--	110.3	--	--	110.3	--	110.3
2017	--	83.0	--	--	83.0	--	83.0
2018	1	113.7	--	--	113.7	--	113.7
2019	--	--	--	--	--	--	--
2020	--	166.9	--	--	166.9	--	166.9
2021	--	132.3	--	--	132.3	--	132.3
2022	--	96.1	--	--	96.1	--	96.1
2023	--	100.1	--	--	100.1	--	100.1
Subtotal	3	1440.7	--	--	1440.7	--	1440.7

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 have not yet been included in the CVN 80 cost estimates. The Navy is committed to driving down EMALS costs and fully expects future estimates 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	494.7
2009	--	--
2010	--	--
2011	--	--
2012	--	--
2013	1	450.6
2014	--	--
2015	--	--
2016	--	--
2017	--	--
2018	1	495.4
2019	--	--
2020	--	--
2021	--	--
2022	--	--
2023	--	--
Subtotal	3	1440.7

**Annual Funding TY\$ - EMALS
1205 | MILCON | Military Construction,
Navy and Marine Corps**

Fiscal Year	Total Program TY \$M
2004	20.7
Subtotal	20.7

**Annual Funding BY\$ - EMALS
1205 | MILCON | Military Construction,
Navy and Marine Corps**

Fiscal Year	Total Program BY 2000 \$M
2004	18.8
Subtotal	18.8

Low Rate Initial Production

CVN 78

	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 Acquisition Decision Memorandum (ADM) dated April 26, 2004 approving 3 ships.

EMALS

There are no LRIP quantities planned for EMALS.

Foreign Military Sales

CVN 78

None

EMALS

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 EMALS procurement. This FMS case is technically still open and 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. NAVAIR is negotiating with GA on the de-scope proposal.

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 \$6,464.4M in TY dollars for the CVN 78 Class Aircraft Carriers (CVN 78-80).

EMALS

None

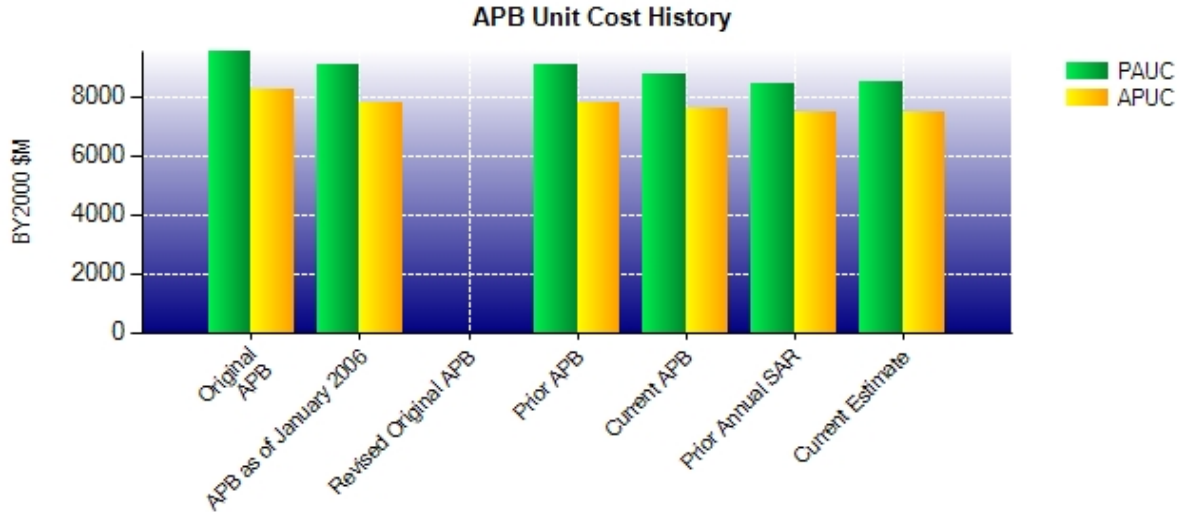
Unit Cost**CVN 78****Unit Cost Report**

	BY2000 \$M	BY2000 \$M	
Unit Cost	Current UCR Baseline (APR 2013 APB)	Current Estimate (DEC 2013 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	26369.7	25446.8	
Quantity	3	3	
Unit Cost	8789.900	8482.267	-3.50
Average Procurement Unit Cost (APUC)			
Cost	22764.3	22411.7	
Quantity	3	3	
Unit Cost	7588.100	7470.567	-1.55

	BY2000 \$M	BY2000 \$M	
Unit Cost	Original UCR Baseline (APR 2004 APB)	Current Estimate (DEC 2013 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	28701.2	25446.8	
Quantity	3	3	
Unit Cost	9567.067	8482.267	-11.34
Average Procurement Unit Cost (APUC)			
Cost	24825.9	22411.7	
Quantity	3	3	
Unit Cost	8275.300	7470.567	-9.72

CVN 78

Unit Cost History



	Date	BY2000 \$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 2012	8466.333	7459.267	13258.367	12094.867
Current Estimate	DEC 2013	8482.267	7470.567	13332.333	12163.767

SAR Unit Cost History

Current SAR Baseline to Current Estimate (TY \$M)

Initial PAUC Dev Est	Changes								PAUC Current Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
11633.467	2107.567	0.000	279.833	-27.067	-661.467	0.000	0.000	1698.866	13332.333

Current SAR Baseline to Current Estimate (TY \$M)

Initial APUC Dev Est	Changes								APUC Current Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
10325.800	2071.633	0.000	222.467	132.967	-589.100	0.000	0.000	1837.967	12163.767

SAR Baseline History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	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	MAR 2017
Total Cost (TY \$M)	N/A	34900.4	N/A	39997.0
Total Quantity	N/A	3	N/A	3
Prog. Acq. Unit Cost (PAUC)	N/A	11633.467	N/A	13332.333

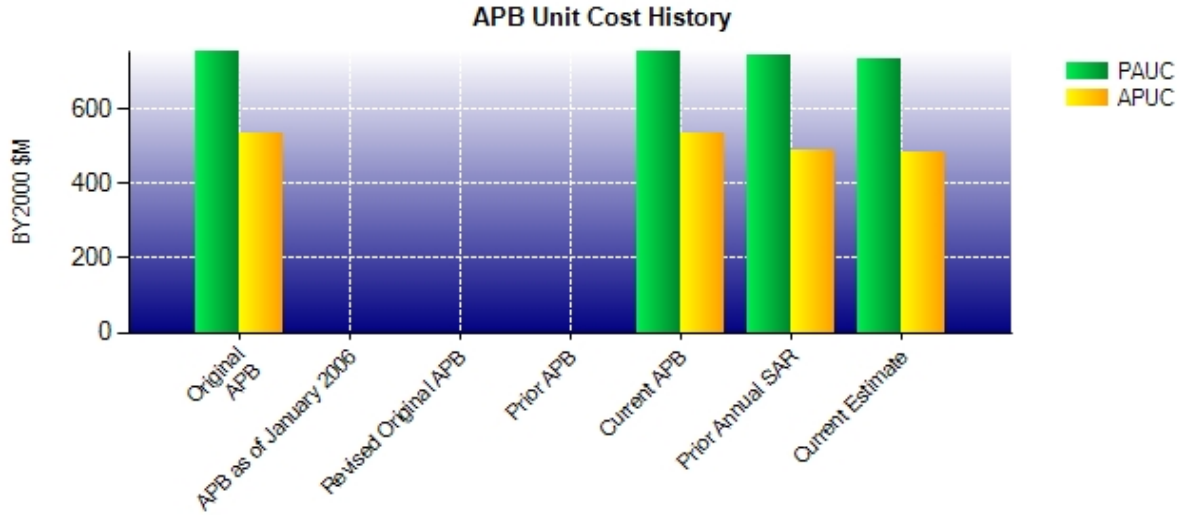
EMALS**Unit Cost Report**

	BY2000 \$M	BY2000 \$M	
Unit Cost	Current UCR Baseline (APR 2013 APB)	Current Estimate (DEC 2013 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	2263.4	2199.8	
Quantity	3	3	
Unit Cost	754.467	733.267	-2.81
Average Procurement Unit Cost (APUC)			
Cost	1593.4	1440.7	
Quantity	3	3	
Unit Cost	531.133	480.233	-9.58

	BY2000 \$M	BY2000 \$M	
Unit Cost	Original UCR Baseline (APR 2013 APB)	Current Estimate (DEC 2013 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	2263.4	2199.8	
Quantity	3	3	
Unit Cost	754.467	733.267	-2.81
Average Procurement Unit Cost (APUC)			
Cost	1593.4	1440.7	
Quantity	3	3	
Unit Cost	531.133	480.233	-9.58

EMALS

Unit Cost History



	Date	BY2000 \$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 2012	740.933	488.167	1118.033	823.700
Current Estimate	DEC 2013	733.267	480.233	1118.067	823.733

SAR Unit Cost History

Current SAR Baseline to Current Estimate (TY \$M)

Initial PAUC Dev Est	Changes								PAUC Current Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
393.900	162.000	0.000	0.000	0.000	562.167	0.000	0.000	724.167	1118.067

Current SAR Baseline to Current Estimate (TY \$M)

Initial APUC Dev Est	Changes								APUC Current Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
257.100	153.067	0.000	0.000	0.000	413.567	0.000	0.000	566.634	823.733

SAR Baseline History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	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	MAR 2017
Total Cost (TY \$M)	N/A	1181.7	N/A	3354.2
Total Quantity	N/A	3	N/A	3
Prog. Acq. Unit Cost (PAUC)	N/A	393.900	N/A	1118.067

Cost Variance**CVN 78**

Summary Then Year \$M					
	RDT&E	Proc	MILCON	Acq O&M	Total
SAR Baseline (Dev Est)	3923.0	30977.4	--	--	34900.4
Previous Changes					
Economic	+113.3	+6119.8	+0.7	--	+6233.8
Quantity	--	--	--	--	--
Schedule	+172.1	+667.4	--	--	+839.5
Engineering	-480.1	+398.9	--	--	-81.2
Estimating	-273.9	-1878.9	+35.4	--	-2117.4
Other	--	--	--	--	--
Support	--	--	--	--	--
Subtotal	-468.6	+5307.2	+36.1	--	+4874.7
Current Changes					
Economic	-5.9	+95.1	-0.3	--	+88.9
Quantity	--	--	--	--	--
Schedule	--	--	--	--	--
Engineering	--	--	--	--	--
Estimating	+2.7	+1111.6	-1.5	+20.2	+133.0
Other	--	--	--	--	--
Support	--	--	--	--	--
Subtotal	-3.2	+206.7	-1.8	+20.2	+221.9
Total Changes	-471.8	+5513.9	+34.3	+20.2	+5096.6
CE - Cost Variance	3451.2	36491.3	34.3	20.2	39997.0
CE - Cost & Funding	3451.2	36491.3	34.3	20.2	39997.0

Summary Base Year 2000 \$M					
	RDT&E	Proc	MILCON	Acq O&M	Total
SAR Baseline (Dev Est)	3490.6	24235.0	--	--	27725.6
Previous Changes					
Economic	--	--	--	--	--
Quantity	--	--	--	--	--
Schedule	+120.2	--	--	--	+120.2
Engineering	-352.4	+187.7	--	--	-164.7
Estimating	-264.1	-2044.9	+26.9	--	-2282.1
Other	--	--	--	--	--
Support	--	--	--	--	--
Subtotal	-496.3	-1857.2	+26.9	--	-2326.6
Current Changes					
Economic	--	--	--	--	--
Quantity	--	--	--	--	--
Schedule	--	--	--	--	--
Engineering	--	--	--	--	--
Estimating	+0.1	+33.9	-1.1	+14.9	+47.8
Other	--	--	--	--	--
Support	--	--	--	--	--
Subtotal	+0.1	+33.9	-1.1	+14.9	+47.8
Total Changes	-496.2	-1823.3	+25.8	+14.9	-2278.8
CE - Cost Variance	2994.4	22411.7	25.8	14.9	25446.8
CE - Cost & Funding	2994.4	22411.7	25.8	14.9	25446.8

Previous Estimate: December 2012

RDT&E	\$M	
	Base Year	Then Year
Current Change Explanations		
Revised escalation indices. (Economic)	N/A	-5.9
Adjustment for current and prior escalation. (Estimating)	+2.0	+2.6
Revised estimate due to application of new outyear escalation indices. (Estimating)	+2.4	+3.3
Decrease to CVN 78 Class due to Public Law 113-6 Division G, Section 3001 and 3004 Discretionary Rescission. (Estimating)	-0.2	-0.2
Decrease to CVN 78 Class due to Small Business Innovative Research (SBIR), Working Capital Fund (WCF) adjustments and other miscellaneous adjustments. (Estimating)	-3.3	-4.7
Decrease to CVN 78 Class due to Contracted Services reduction. (Estimating)	-20.8	-29.1
Decrease to CVN 78 Class due to FY 2013 Sequester Order. (Estimating)	-1.1	-1.1
Revised estimate to support CVN 78 Class requirements for 1st of Class testing. (Estimating)	+21.1	+31.9
RDT&E Subtotal	+0.1	-3.2

Procurement	\$M	
	Base Year	Then Year
Current Change Explanations		
Revised escalation indices. (Economic)	N/A	+95.1
Decrease to CVN 79 due to FY 2013 Sequester Order. (Estimating)	0.0	0.0
Revised estimate fo fully fund CVN 78 End Cost. (Estimating)	+33.1	+58.0
Reduced cost estimate for CVN 78 Post Delivery and Outfitting (PD/OF). (Estimating)	-7.1	-10.8
Re-allocation of funds between CVN 78 funding and EMALS funding. (Estimating)	-1.2	-0.1
Re-allocation of funds between CVN 79 funding and EMALS funding. (Estimating)	+10.2	-0.1
Re-allocation of funds between CVN 80 funding and EMALS funding. (Estimating)	+11.1	0.0
Adjustment for current and prior escalation. (Estimating)	-5.3	-7.9
Decrease to CVN 79 due to FY 2013 Sequester Order. (Estimating)	-46.0	-74.5
Decrease to CVN 79 due to Congressional reductions to Government Furnished Equipment (GFE). (Estimating)	-33.1	-53.9
Decrease to CVN 79 due to Public Law 113-6 Division G, Section 3001 and 3004 Discretionary Rescission. (Estimating)	-0.4	-0.7
Decrease to CVN 79 due to Congressional reduction for Change Orders. (Estimating)	-9.8	-16.2
Increase to CVN 79 due to revised estimates for Basic Construction, Non-Recurring Engineering, and to properly align phasing with requirements. (Estimating)	+199.5	+348.3
Decrease to CVN 79 due to Better Buying Power Initiatives, Contracted Services reductions, WCF adjustments and other miscellaneous adjustments. (Estimating)	-77.5	-134.5
Increase to CVN 79 due to Non-Pay, Non-Fuel Purchases rate adjustment. (Estimating)	+2.1	+3.8
Re-phasing of CVN 80. (Estimating)	-41.6	0.0
Increase to CVN 80 due to Non-Pay, Non-Fuel Purchases rate adjustment and other miscellaneous adjustments. (Estimating)	+13.3	+24.2
Decrease to CVN 80 due to Better Buying Power Initiatives, Contracted Services reductions, WCF adjustments and other miscellaneous adjustments. (Estimating)	-24.4	-44.0
Increase to CVN 80 to add Air Traffic Controller Radar (SPN-46). (Estimating)	+11.0	+20.0

Procurement Subtotal +33.9 +206.7

MILCON	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-0.3
Adjustment for current and prior escalation. (Estimating)	+0.2	+0.3
Decrease due to FY 2013 Sequester Order. (Estimating)	-1.3	-1.8
MILCON Subtotal	-1.1	-1.8

Acq O&M	\$M	
Current Change Explanations	Base Year	Then Year
Funding provided to support training requirements for the CVN 78 Class. (Estimating)	+14.9	+20.2
Acq O&M Subtotal	+14.9	+20.2

Cost Variance**EMALS**

Summary Then Year \$M				
	RDT&E	Proc	MILCON	Total
SAR Baseline (Dev Est)	410.4	771.3	--	1181.7
Previous Changes				
Economic	+28.0	+452.6	--	+480.6
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+423.9	+1247.2	+20.7	+1691.8
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+451.9	+1699.8	+20.7	+2172.4
Current Changes				
Economic	-1.2	+6.6	--	+5.4
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+1.2	-6.5	--	-5.3
Other	--	--	--	--
Support	--	--	--	--
Subtotal	--	+0.1	--	+0.1
Total Changes	+451.9	+1699.9	+20.7	+2172.5
CE - Cost Variance	862.3	2471.2	20.7	3354.2
CE - Cost & Funding	862.3	2471.2	20.7	3354.2

Summary Base Year 2000 \$M				
	RDT&E	Proc	MILCON	Total
SAR Baseline (Dev Est)	384.7	590.9	--	975.6
Previous Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+354.8	+873.6	+18.8	+1247.2
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+354.8	+873.6	+18.8	+1247.2
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+0.8	-23.8	--	-23.0
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+0.8	-23.8	--	-23.0
Total Changes	+355.6	+849.8	+18.8	+1224.2
CE - Cost Variance	740.3	1440.7	18.8	2199.8
CE - Cost & Funding	740.3	1440.7	18.8	2199.8

Previous Estimate: December 2012

RDT&E	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-1.2
Reduced funding due to internal Navy realignments. (Estimating)	-0.6	-0.8
Reduced funding due to FY 2013 Sequestration Order. (Estimating)	-3.9	-5.0
Increased funding due to Carrier Systems Development Sequestration Restoral. (Estimating)	+4.3	+5.8
Adjustment for current and prior escalation. (Estimating)	+1.0	+1.2
RDT&E Subtotal	+0.8	0.0

Procurement	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+6.6
Re-allocation of funds between CVN 78 - CVN 80 funding and EMALS funding. (Estimating)	-20.2	+0.1
Adjustment for current and prior escalation. (Estimating)	-0.3	-0.4
Revised estimate to reflect application of new outyear escalation indices. (Estimating)	-3.3	-6.2
Procurement Subtotal	-23.8	+0.1

Contracts

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, Type	N00024-08-C-2110, CPAF/CPIF/CPFF
Award Date	September 10, 2008
Definitization Date	September 10, 2008

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	5950.3	N/A	1	6643.7	6705.8

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.

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date (1/19/2014)	-721.5	-35.9
Previous Cumulative Variances	-551.6	-209.2
Net Change	-169.9	+173.3

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to material cost growth (58%), labor inefficiencies (32%), Overhead degradation (15%), and Facilities Capital Cost of Money (FCCM) improvement (-5%). 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). Additionally, increased supervision has been required to manage the above challenges and a developing workforce.

The favorable net change in the schedule variance is due to the rescheduling of the CVN 78 launch from July 2013 to November 2013. 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 with the delay to launch and has revised the delivery date accordingly. On February 22, 2013 the Navy approved the shipbuilder's request to reschedule its baseline in order to develop a realistic and more efficient plan to accomplish the remaining work on the ship; however, the contract delivery date remains September 2015.

Contract Comments

The Program Manager's Estimated Price at Completion (PMEAC) of \$6,705.8M exceeds the current contract Target Price of \$5,950.3M by \$755.6M. This \$755.6M price Variance at Completion (VAC) includes \$65.2M 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.

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, Type N00024-09-C-2116, CPFF/CPIF
 Award Date January 15, 2009
 Definitization Date December 08, 2010

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	1999.2	N/A	N/A	2024.0	2018.7

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 2013 efforts as well as multiple modifications for procurement of additional material to support the CVN 79 procurement strategy.

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date (1/19/2014)	-2.1	+0.7
Previous Cumulative Variances	+4.9	+27.0
Net Change	-7.0	-26.3

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to higher than expected costs for material on non-propulsion plant Long Lead Time Material (LLTM) on Contract Line Item Numbers (CLINs) 0404 and 1505, specifically actuators and some Heating, Ventilation and Air Conditioning (HVAC) ducting.

The unfavorable net change in the schedule variance is due to normalization of schedule variance after contractor purchase of some material ahead of original schedule for economic order quantity savings. This effect will self-correct as the schedule catches up.

Contract Comments

The CVN 79 CP extension contract for FY 2011 efforts and FY 2012 options were awarded on December 8, 2010. The FY 2012 Options were awarded December 21, 2011 in the amount of \$103.5M for CVN 79 platform and propulsion engineering services, and CVN 78 Class Lead Yard Services (LYS) and Integrated Logistics Support. Several modifications to the contract were made between July 18, 2012 and March 07, 2013, totaling \$465.28M for procurement of additional material to support the CVN 79 procurement strategy. The FY 2013 extension to the CP contract was awarded March 22, 2013 in the amount of \$407.4M. 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 will afford an opportunity for the shipbuilder to incorporate further construction process improvements and Government Furnished Equipment (GFE) cost reductions into the construction plan. As of January 2014, the CP contract is 64.3% complete based on dollars. The Advance Construction effort is 47.7% complete on a dollar basis and 47.7% complete on a man-hour basis.

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, Type N68335-11-G-0003, CPFF
 Award Date August 12, 2012
 Definitization Date August 12, 2012

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	44.5	N/A	1	45.5	44.5

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date (1/31/2014)	-0.7	-1.5
Previous Cumulative Variances	+1.2	-1.4
Net Change	-1.9	-0.1

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to less than planned resources necessary to conduct Maintenance Task Analysis and Technical Manual Development. Resource hiring was slowed as a result of the FY 2013 Continuing Resolution Authority/Sequestration. As a result, available resources from other groups without all necessary skill sets were utilized, slowing progress and requiring additional effort to complete tasks.

The unfavorable net change in the schedule variance is due to subcontract award to QinetiQ North America (QNA) to provide engineering support for Launch Control Subsystem logistics development. This Subcontract effort was previously behind schedule.

Contract Comments

The Program Manager's Estimated Price at Completion (PMEPAC) is currently equivalent to the Current Contract Price Target. An Integrated Baseline Review (IBR) was conducted in December 2013. A Program Manager's Estimate at Completion (PMEAC) will be developed in third quarter FY 2014 upon adjudication of all IBR findings.

Appropriation: Procurement

Contract Name **EMALS Rotor Forgings and Machining**
 Contractor General Atomics Electromagnetic Systems Group
 Contractor Location 3550 General Atomics Court
 San Diego, CA 92121-1122
 Contract Number, Type N68335-08-C-0044, FFP
 Award Date November 06, 2007
 Definitization Date October 30, 2009

Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price at Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
21.4	N/A	1	19.7	N/A	1	19.7	19.7

Target Price Change Explanation

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

Cost and Schedule Variance Explanations

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

Contract Comments

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

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

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, Type N68335-09-C-0573, FFP
Award Date June 30, 2009
Definitization Date June 30, 2010

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.

Contract Comments

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

Deliveries and Expenditures

CVN 78

Delivered to Date	Plan 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	39997.0	Years Appropriated	18
Expended to Date	15949.3	Percent Years Appropriated	56.25%
Percent Expended	39.88%	Appropriated to Date	19147.3
Total Funding Years	32	Percent Appropriated	47.87%

The above data is current as of 3/20/2014.

EMALS

Delivered to Date	Plan 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	3354.2	Years Appropriated	15
Expended to Date	1153.3	Percent Years Appropriated	62.50%
Percent Expended	34.38%	Appropriated to Date	1664.7
Total Funding Years	24	Percent Appropriated	49.63%

The above data is current as of 3/20/2014.

Decrease in expenditures from 2012 SAR are due to corrections to the 2012 expenditure data.

Operating and Support Cost

CVN 78

Assumptions and Ground Rules

Cost Estimate Reference:

Estimate is based on Program Office/Naval Sea Systems Command (NAVSEA) 05C Cost Engineering and Industrial Analysis Division Cost Estimate Division dated March 2013.

Sustainment Strategy:

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.

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 both requirements and actual returns, Visibility and Management of Operating and Support Costs (VAMOSOC); with the primary focus using requirements. Unit Level Manpower (1.0) was based on authorized billets (3,291) as detailed in the CVN 68 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 NCCA 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 FY00 through FY10; using full year data and excluding CVN 73 which was a forward deployed ship starting in 2008.

Unitized 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	132.494	167.460
Unit Operations	16.706	16.706
Maintenance	77.772	110.115
Sustaining Support	9.691	10.607
Continuing System Improvements	9.933	15.072
Indirect Support	73.480	93.315
Other	0.000	0.000
Total	320.076	413.275

Unitized Cost Comments:

Total Cost = 320.076 * 3 * 50 = 48011.4

	Total O&S Cost \$M			
	Current Development APB Objective/Threshold		Current Estimate	
	CVN 78		CVN 78	CVN 68 Class (Antecedent)
Base Year	55600.0	61160.0	48011.4	206638.0
Then Year	251600.0	N/A	136342.8	321225.0

Total O&S Costs Comments:

2013 SAR O&S data reflects the following changes from previous SARs:

- The estimates use the February 2014 vice February 2013 Naval Center for Cost Analysis Joint Inflation Calculator (JIC).
- The Shipbuilding Construction, Navy (SCN) Historical Index vice the SCN 1611 Index is used to Inflate Refueling Complex Overhaul (RCOH) Cost.

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 Cost Assessment and Program Evaluation (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.

Total O&S cost for 11 ships would be \$176,041.8M in base-year dollars/\$754,817M in then-year dollars.

O&S Cost Variance		
Category	Base Year 2000 \$M	Change Explanation
Prior SAR Total O&S Estimate December 2012	49,107.00	
Cost Estimating Methodology	-1,095.60	Deflated RCOH Cost to BY using SCN Historic Index vice SCN 1611 Index
Cost Data Update	0.0	

Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	0.0	
Programmatic/Planning Factors	0.0	
Other	0.0	
Total Changes	-1,095.6	
Current Estimate	48,011.4	

Disposal Costs:

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 the Electromagnetic Aircraft Launch System (EMALS).

Disposal cost for three hulls is \$1,612.2M in Base Year 2000 dollars.

EMALS**Assumptions and Ground Rules**Cost Estimate Reference:

Estimate is based on Program Office/Naval Sea Systems Command (NAVSEA) 05C Cost Engineering and Industrial Analysis Division Cost Estimate dated March 2013.

Sustainment Strategy:

EMALS is planned for 11 shipsets over a 50 year service life.

EMALS (3Q 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.

Unitized 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	--

Unitized Cost Comments:

Total O&S Cost = 17.162 * 3 * 50 = 2574.3

	Total O&S Cost \$M			
	Current Development APB Objective/Threshold		Current Estimate	
	EMALS		EMALS	No Antecedent (Antecedent)
Base Year	2574.3	2831.7	2574.3	N/A
Then Year	6422.6	N/A	6981.1	N/A

Total O&S Costs Comments:

2013 SAR O&S data reflects the following changes from previous SARs:

- The attached estimates use the February 2014 vice February 2013 Naval Center for Cost Analysis Joint Inflation Calculator (JIC). This change only impacts the TY\$ estimate.

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 Cost Assessment and Program Evaluation (CAPE), October 2007, Operating and Support Cost Estimating Guide using historical data from operating carrier classes and the Office of the Chief of Naval Operations (OPNAV) "Maintenance" Notices. Maintenance and Personnel costs are the major contributors to the total O&S Program.

Total O&S cost for 11 Shipsets would be \$9,439.0M in base-year dollars/\$39,189.0M in then-year dollars.

Disposal Costs:

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