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 December 31, 2012

Defense Acquisition Management
Information Retrieval
(DAMIR)

Table of Contents

Program Information

Program Name

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

DoD Component

Navy

Responsible Office

Responsible Office

CAPT Chris Meyer
Program Executive Office (PEO) Aircraft Carriers
PMS 378
614 Sicard Street SE Stop 7007
Washington, DC 20376-7007
chris.meyer@navy.mil

Phone 202-781-3969
Fax 202-781-4684
DSN Phone 326-3969
DSN Fax 326-4684

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 Future Aircraft Carrier GERALD R. FORD Class (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 Launch 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 FY 2007 National Defense Authorization Act (NDAA) provided authority for the construction and incremental funding across four years of the CVN 78 Class aircraft carriers designated CVN 78, CVN 79 and CVN 80. The FY 2010 President's Budget (PB) placed the CVN 78 program on 5-year intervals for construction contract awards shifting JOHN F. KENNEDY (CVN 79) Detail Design and Construction (DD&C) contract award from FY 2012 to FY 2013 and the CVN 80 DD&C contract award from FY 2016 to FY 2018. The FY 2012 NDAA extended the full funding period for CVN 79 and CVN 80 from four to five years and directed Electro-Magnetic Aircraft Launch System (EMALS) be designated as a major subprogram. The FY 2013 NDAA extended the full funding period for CVN 79 and CVN 80 from five to six years and required a Report to Congress from the Secretary of Navy detailing program management and cost control measures that will be employed in constructing the second Ford Class aircraft carrier before more than 50% of FY 2013 Shipbuilding and Conversion, Navy (SCN) funds may be obligated or expended. FY 2014 funding for CVN 78, programmed as part of PB 2013, exceeds the Congressional cost cap. As the Navy has previously announced, both a legislative proposal to seek Congressional approval to adjust the CVN 78 cost cap and a Report to Congress to adjust the CVN 79 cost cap within the Secretary's authority have been submitted with the FY 2014 PB.

Huntington Ingalls Industries-Newport News Shipbuilding (HII-NNS) is constructing CVN 78 and is under contract for CVN 79 advance construction, material procurement, research, design and engineering.

The CVN 78 is experiencing cost growth due to "first of class" material availability (i.e., valves, actuators), construction labor inefficiencies, and challenges associated with concurrent development and integration of new Government Furnished Equipment (GFE) and Contractor Furnished Equipment (CFE) systems during lead ship design and construction. For material costs, the variance reflects challenges associated with a shrinking supplier base, procurement of developmental contractor furnished components, and vendor qualification on CVN 78 unique items. Labor inefficiencies are the result of "first of class" challenges. The effect of new and thinner steels on structural erection was greater than expected, slowing production and requiring more hours than planned for straightening, temporary structure and rigging. HII-NNS also experienced "first of class" learning associated with the new CVN 78 Class modular build strategy, including movement, blast and coat, and assembly area footprint difficulties for larger, reconfigured CVN 78 structural units. Delays in the delivery of new developmental components as well as engineering products required to develop construction work package also inhibited labor performance.

During 2012, HII-NNS continued its design and production efforts on CVN 78. Quarterly Progress Reviews were held to manage and assess the status of design and production on CVN 78. As of February 17, 2013, the construction effort was 67.3% complete based on contract dollars. The landing of the island occurred on January 26, 2013. The shipbuilder has proposed a revised Estimate at Completion (EAC) increasing Direct Labor from 43.9 to 47.3 million man hours that incorporates their assessment of performance trends and associated recovery efforts for both construction and support areas. The Navy is evaluating this proposed increase with emphasis on mitigating key cost and schedule drivers. The Navy continues to work with the Participating Acquisition Resource Managers (PARMs) to identify and remove barriers to improve cost and schedule performance for the new developmental GFE systems. HII-NNS has rescheduled 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 has been 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 agrees with the delay to launch. Delivery is expected to be delayed until approximately 2nd Quarter FY 2016.

The Navy is submitting reports to the four defense committees addressing cost performance of the CVN 78 detail design and construction in response to Senator John McCain's letter of August 11, 2011. 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, briefed to ASN(RD&A) on December 21, 2011, are being implemented. Recommendations from the CVN 78 end to end reviews have been consolidated into 38 actionable items that are been tracked to completion. As of March 18, 2013, 17 recommendations have been implemented with 21 recommendations in progress. All recommendations are expected to be implemented by September 2014. The review team reconvened in 2012 and concluded the program offices action plan adequately addresses their recommendations.

The high level of design maturity and material certification for the CVN 79 provides a stable technical baseline for material procurement cost and schedule performance, which supports the development and execution of an improved and reliable build plan. The Construction Preparation (CP) Contract for CVN 79 advance procurement research, design, and engineering was awarded on January 15, 2009. An extension to CP efforts through FY 2013 was awarded in March 2013.

To enable full ship-set material buys for cost reduction benefits and to ensure material availability, two material procurement contract modifications were awarded to HII-NNS during FY 2012. A third material procurement award was executed in March 2013. CVN 79 affordability is being driven through several areas. The CVN 79 is a design roll-over from CVN 78, with changes for improved producibility, reduced cost, and limited fact-of-life obsolescence issues. Lessons learned during the construction of CVN 78 are resulting in changes to the CVN 79 build plan to improve production efficiency. In addition, production improvements are being achieved through implementation of several initiatives aimed at driving work to be executed at the most efficient time (typically in the shop or on the platen rather than in the dry-dock or after launch), as well as driving learning curve performance into subsets of the ship construction (creation of “families of units” and work cells). In the aggregate, the plan for CVN 79 construction will substantially drive down costs.

The CVN 79 DD&C Request for Proposal (RFP) was provided to HII-NNS on October 2, 2012. The CVN 79 DD&C contract is planned for award in September 2013. Unlike the CVN 78 DD&C which is a Cost Plus Incentive Fee (CPIF) contract, the Navy plans to negotiate a Fixed Price Incentive (FPI) contract with a simplified structure for CVN 79.

The Secretary of Navy announced at the December 1, 2012 de-activation ceremony of the ENTERPRISE (CVN 65) that the CVN 80 would be named ENTERPRISE.

This SAR reflects Electro-Magnetic Aircraft Launch System (EMALS) designation as a subprogram as specified in the Acquisition Program Baseline (APB) signed by the Under Secretary of Defense (Acquisition, Technology and Logistics) (USD(AT&L)) on April 2, 2013. EMALS is an advanced technology electrically generated aircraft launching system that uses a moving electromagnetic field to propel aircraft to launch speed. Benefits over the current C13 steam catapults include reduced weight and volume, greater launch flexibility for future aircraft, improved control, and reduced manning workload. EMALS System Development and Demonstration (SDD) program is greater than 91% complete. In November 2011, an F-35C was successfully launched.

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

Threshold Breaches

CVN 78

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

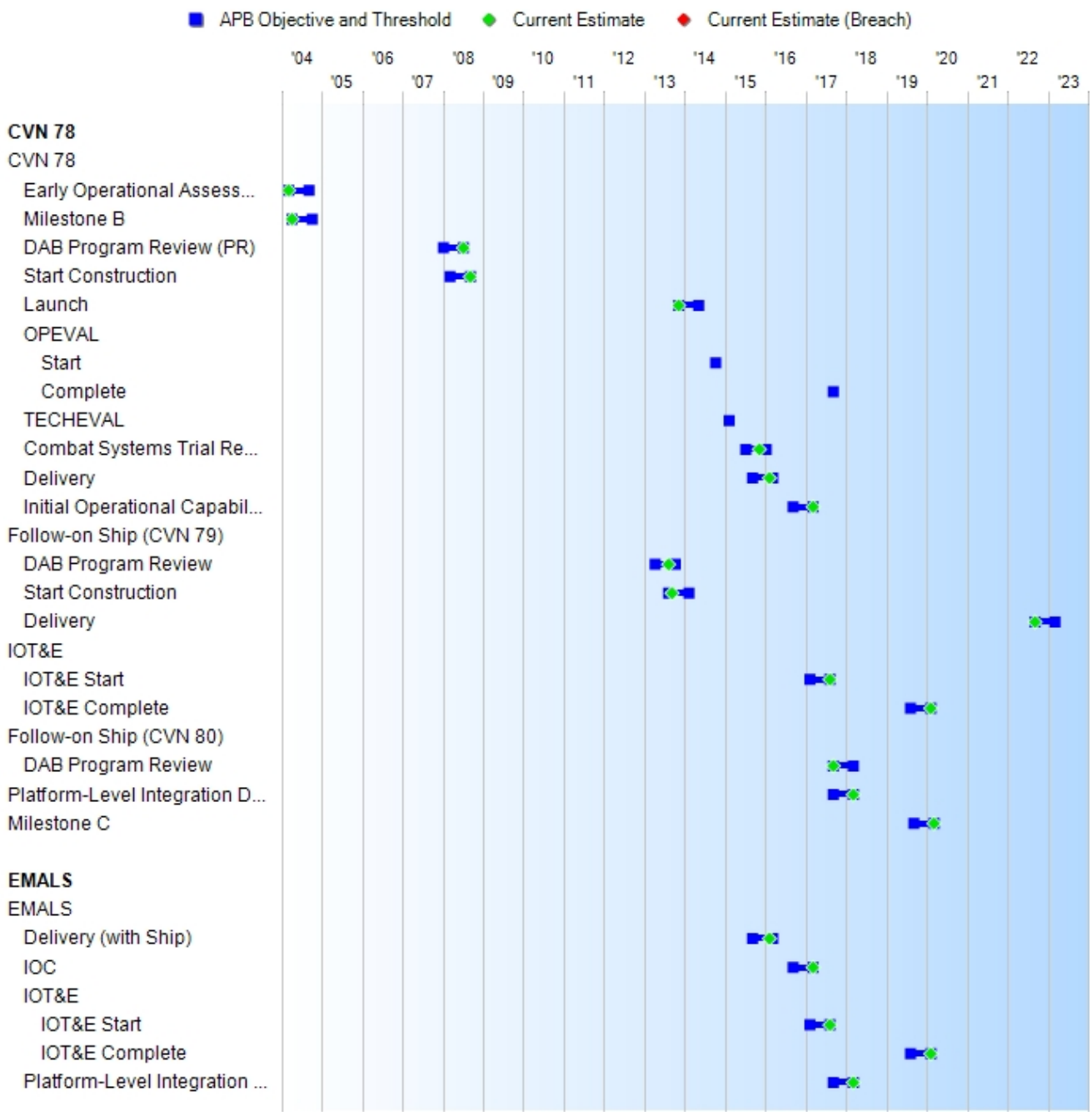
Nunn-McCurdy Breaches		
Current UCR Baseline		
	PAUC	None
	APUC	None
Original UCR Baseline		
	PAUC	None
	APUC	None

EMALS

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

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

Schedule


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

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	(Ch-1)
OPEVAL					
Start	OCT 2014	N/A	N/A	N/A	(Ch-2)
Complete	SEP 2017	N/A	N/A	N/A	(Ch-2)
TECHEVAL	FEB 2015	N/A	N/A	N/A	(Ch-2)
Combat Systems Trial Rehearsal (CSTR)	JUL 2014	JUL 2015	JAN 2016	NOV 2015	(Ch-3)
Delivery	SEP 2014	SEP 2015	MAR 2016	FEB 2016	(Ch-4)
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	AUG 2013	(Ch-5)
Start Construction	JAN 2011	AUG 2013	FEB 2014	SEP 2013	(Ch-6)
Delivery	SEP 2018	SEP 2022	MAR 2023	SEP 2022	
IOT&E					
IOT&E Start	N/A	FEB 2017	AUG 2017	AUG 2017	(Ch-7)
IOT&E Complete	N/A	AUG 2019	FEB 2020	FEB 2020	(Ch-7)
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	(Ch-8)
Milestone C	MAR 2017	SEP 2019	MAR 2020	MAR 2020	(Ch-9)

Acronyms And Abbreviations

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

Change Explanations

(Ch-1) Shipbuilder has rescheduled launch from July 2013 to November 2013 due to first of class production issues resulting in a four month delay to the launch of CVN 78.

(Ch-2) TECHEVAL and OPEVAL have been replaced by Platform-Level Integration DT Period Complete in the previously signed APB and are not applicable.

(Ch-3) CSTR has been rescheduled from July 2015 to November 2015 as a result of the Shipbuilder rescheduling launch from July 2013 to November 2013.

(Ch-4) Delivery of CVN 78 is rescheduled from September 2015 to February 2016 due to the Shipbuilder's delay of launch.

(Ch-5) Notional date changed from April 2013 to August 2013 to more properly align with contract award schedule for CVN 79.

(Ch-6) Notional date changed from July 2013 to September 2013 to more properly align with contract award schedule for CVN 79.

(Ch-7) IOT&E Start rescheduled from February 2017 to August 2017 as a result of delays to Launch and Delivery of the CVN 78 and IOT&E Complete rescheduled from August 2019 to Februrary 2020.

(Ch-8) Platform-Level Integration DT Period Completion rescheduled from September 2017 to March 2018 due to CVN 78 Launch and Delivery delays.

(Ch-9) Notional date changed from Sepember 2018 to March 2020 to more properly align with program schedule.

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

EMALS

Milestones	SAR Baseline Dev Est	Current APB Development Objective/Threshold		Current Estimate	
EMALS					
Delivery (with Ship)	SEP 2015	SEP 2015	MAR 2016	FEB 2016	(Ch-1)
IOC	SEP 2016	SEP 2016	MAR 2017	MAR 2017	(Ch-2)
IOT&E					
IOT&E Start	FEB 2017	FEB 2017	AUG 2017	AUG 2017	(Ch-3)
IOT&E Complete	AUG 2019	AUG 2019	FEB 2020	FEB 2020	(Ch-3)
Platform-Level Integration DT Period Complete	SEP 2017	SEP 2017	MAR 2018	MAR 2018	(Ch-4)

Acronyms And Abbreviations

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

Change Explanations

(Ch-1) Delivery rescheduled from September 2015 to February 2016 as a result of four month delay to launch.

(Ch-2) IOC delayed from September 2016 to March 2017 due to delivery delay of four months.

(Ch-3) IOT&E Start delayed from February 2017 to August 2017 and Completion delayed from August 2019 to Februray 2020 due to launch delay of four months.

(Ch-4) Platform-Level Integration DT Period Completion delayed from September 2017 to March 2018 due to launch delay of four months.

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	(Ch-1)
Stability Service Life Allowance (feet)	2.5	2.5	1.5	TBD	1.5	(Ch-1)
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	(Ch-2)
Surge Sortie Rate	310	N/A	N/A	TBD	N/A	(Ch-2)
Service Electrical Generating Capacity (times NIMITZ Class capacity in MW)	3.0	N/A	N/A	TBD	N/A	(Ch-2)
Weight Service Life Allowance (% of full load displacement in long tons)	7.5	N/A	N/A	TBD	N/A	(Ch-2)
Stability Service Life Allowance (feet)	2.5	N/A	N/A	TBD	N/A	(Ch-2)
Ship's Force Manpower (billets)	2391	N/A	N/A	TBD	N/A	(Ch-2)
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 Chief of Naval	(Ch-3)

		9070.1	9070.1 with the exception of Collective Protection System		Operations (OPNAV) Instruction 9070.1 with the exception of Collective Protection System
Survivability (low/slow flyer)	N/A	X1 probability of mission kill per low/slow flyer (>1 square meter target raid of Y1 low/slow flyer threats by Z1 yards from the ship.	X probability of mission kill per low/slow flyer (>1 square meter target raid of Y1 low/slow flyer threats by Z1 yards from the ship.	TBD	X probability of mission kill per low/slow flyer (>1 square meter target raid of Y1 low/slow flyer threats by Z1 yards from the ship.
Survivability (Small boat defense)	N/A	X1 probability of mission kill per boat (>20 square meter target), against a target raid of Y1 small boat threats by Z1 yards from ship.	X probability of mission kill per boat (>20 square meter target), against a target raid of Y1 small boat threats by Z1 yards from ship.	TBD	X probability of mission kill per boat (>20 square meter target), against a target raid of Y1 small boat threats by Z1 yards from ship.
Force Protection (CBR)	N/A	Provide individual protection (suits and masks from CBR agents for 100% of shipboard personnel and provide a toxic free	Provide individual protection (suits and masks from CBR agents for 100% of shipboard personnel.	TBD	Provide individual protection (suits and masks from CBR agents for 100% of shipboard personnel.

		environment for XX% of shipboard personnel where it is not necessary to wear protective clothing and masks.			
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

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

Acronyms And Abbreviations

CBR - Chemical, Biologoical and Radiological
IER - Interoperability Exchange Requirement
MW - Megawatt

Change Explanations

(Ch-1) The following performance characteristics current estimates for the lead ship were updated based on current engineering analysis: Weight Service Life Allowance updated from 5.6 to 5.9, Stability Service Life Allowance (feet) updated from 1.52 to 1.5.

(Ch-2) The latest Acquisition Program Baseline (APB) revision combined performance criteria for all three ships (CVN 78, CVN 79, and CVN 80) under one heading to eliminate duplication.

(Ch-3) Revised current estimate to spell out Chief of Naval Operation (OPNAV).

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 (JROC) has not established Key Performance Parameters (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 1319	BA 04	PE 0603512N	(Navy)	
	Project 10C098	Composite Mast for CVN's		(Sunk)
	Project 2208	CVN 21	(Shared)	
	Project 2678	Tech Insertion		(Sunk)
	Project 2693	Ship System Definition		(Sunk)
	Project 4006	CVN 79		(Sunk)
	Project 9181	Adv Battlestations/DSS		(Sunk)
	Project 9349	Aviation Ship Integration Center		(Sunk)
	Project 9516	Surface Ship Composite Moisture Seperators		(Sunk)
	Project 9B57A	Carrier Plant Automation and Manning Reduction		(Sunk)
APPN 1319	BA 04	PE 0603564N	(Navy)	
	Project 22300	CV Feasibility Studies		(Sunk)
	Project 42300	CVNX 1		(Sunk)
APPN 1319	BA 04	PE 0603570N	(Navy)	
	Project 2692	Advance Nuclear Power System/CVN 21 Propulsion Plant Development		
APPN 1319	BA 05	PE 0604567N	(Navy)	
	Project 2301	Contract Design		(Sunk)
	Project 3179	CVN 79 Total Ship Integration		
	Project 4007	CVN 21 LFT&E		
	Project 4008	CVN 21 Total Ship Integration		(Sunk)
	Project 9C20A	Automated Fiber Optic Manufacturing Initiative		(Sunk)

Procurement

APPN 1611	BA 02	PE 0204112N	(Navy)	

	ICN 2001	Carrier Replacement Program	(Shared)	
APPN 1611	BA 05	PE 0204112N	(Navy)	
	ICN 5110	Outfitting and Post Delivery	(Shared)	
	ICN 5300	Completion of Prior Year Shipbuilding		

MILCON

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

EMALS

RDT&E

APPN 1319	BA 04	PE 0603512N	(Navy)	
	Project 2208	CVN 21	(Shared)	
	Project 4004	EMALS		
	Project 9B48A	Improved Corrosion Protection for EMALS		(Sunk)
	Project 9D24A	EMALS Congressional Add		(Sunk)

Procurement

APPN 1611	BA 02	PE 0204112N	(Navy)	
	ICN 2001	Carrier Replacement Program	(Shared)	

MILCON

APPN 1205	BA 01	PE 0212176N	(Navy)	
	Project N0400024	Electromagnetic Aircraft Launch System (EMALS) Facility		(Sunk)

Cost and Funding

Cost Summary - Total Program

Total Acquisition Cost and Quantity - Total Program

	BY2000 $M			BY2000 $M	TY $M		
Appropriation	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	--	3733.8	4333.4	4744.6	4316.7
Procurement	24825.9	24357.7	--	23842.3	31748.7	33258.8	38755.7
Flyaway	24825.9	--	--	23842.3	31748.7	--	38755.7
Recurring	24825.9	--	--	20705.0	31748.7	--	34175.6
Non Recurring	0.0	--	--	3137.3	0.0	--	4580.1
Support	0.0	--	--	0.0	0.0	--	0.0
Other Support	0.0	--	--	0.0	0.0	--	0.0
Initial Spares	0.0	--	--	0.0	0.0	--	0.0
MILCON	0.0	152.0	--	45.7	0.0	208.5	56.8
Acq O&M	0.0	0.0	--	0.0	0.0	0.0	0.0
Total	28701.2	28633.1	N/A	27621.8	36082.1	38211.9	43129.2

Cost and Funding

Cost Summary - CVN 78

Total Acquisition Cost and Quantity - CVN 78

	BY2000 $M			BY2000 $M	TY $M		
Appropriation	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	2994.3	3923.0	3999.8	3454.4
Procurement	24235.0	22764.3	25040.7	22377.8	30977.4	30808.7	36284.6
Flyaway	24235.0	--	--	22377.8	30977.4	--	36284.6
Recurring	24235.0	--	--	19240.5	30977.4	--	31704.5
Non Recurring	0.0	--	--	3137.3	0.0	--	4580.1
Support	0.0	--	--	0.0	0.0	--	0.0
Other Support	0.0	--	--	0.0	0.0	--	0.0
Initial Spares	0.0	--	--	0.0	0.0	--	0.0
MILCON	0.0	133.2	146.5	26.9	0.0	187.8	36.1
Acq O&M	0.0	0.0	--	0.0	0.0	0.0	0.0
Total	27725.6	26369.7	N/A	25399.0	34900.4	34996.3	39775.1

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

	BY2000 $M			BY2000 $M	TY $M		
Appropriation	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	739.5	410.4	744.8	862.3
Procurement	590.9	1593.4	1752.7	1464.5	771.3	2450.1	2471.1
Flyaway	590.9	--	--	1464.5	771.3	--	2471.1
Recurring	590.9	--	--	1464.5	771.3	--	2471.1
Non Recurring	0.0	--	--	0.0	0.0	--	0.0
Support	0.0	--	--	0.0	0.0	--	0.0
Other Support	0.0	--	--	0.0	0.0	--	0.0
Initial Spares	0.0	--	--	0.0	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	2222.8	1181.7	3215.6	3354.1

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
FY2014 President's Budget / December 2012 SAR (TY$ M)

Appropriation	Prior	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	To Complete	Total
RDT&E	3573.2	173.5	147.7	116.8	64.7	63.5	59.4	117.9	4316.7
Procurement	14840.2	608.2	1587.0	2659.9	1959.0	2542.4	2954.4	11604.6	38755.7
MILCON	20.7	32.7	3.4	0.0	0.0	0.0	0.0	0.0	56.8
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2014 Total	18434.1	814.4	1738.1	2776.7	2023.7	2605.9	3013.8	11722.5	43129.2
PB 2013 Total	18406.1	814.3	1287.3	3581.3	1756.7	2961.0	3410.5	10311.3	42528.5
Delta	28.0	0.1	450.8	-804.6	267.0	-355.1	-396.7	1411.2	600.7

Cost and Funding

Funding Summary - CVN 78

Appropriation and Quantity Summary - CVN 78
FY2014 President's Budget / December 2012 SAR (TY$ M)

Appropriation	Prior	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	To Complete	Total
RDT&E	2819.7	112.6	104.7	114.4	62.2	63.5	59.4	117.9	3454.4
Procurement	14115.5	578.6	1358.8	2490.2	1620.6	2497.4	2918.5	10705.0	36284.6
MILCON	0.0	32.7	3.4	0.0	0.0	0.0	0.0	0.0	36.1
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2014 Total	16935.2	723.9	1466.9	2604.6	1682.8	2560.9	2977.9	10822.9	39775.1
PB 2013 Total	18406.1	814.3	1287.3	3581.3	1756.7	2961.0	3410.5	10311.3	42528.5
Delta	-1470.9	-90.4	179.6	-976.7	-73.9	-400.1	-432.6	511.6	-2753.4

Program funding and production quantities listed in this SAR are consistent with the FY 2014 President's Budget (PB). The FY 2014 PB did not reflect the enacted DoD appropriation for FY 2013, nor sequestration; it reflected the President's requested amounts for FY 2013.

Quantity	Undistributed	Prior	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	To Complete	Total
Development	0	0	0	0	0	0	0	0	0	0
Production	0	1	1	0	0	0	0	1	0	3
PB 2014 Total	0	1	1	0	0	0	0	1	0	3
PB 2013 Total	0	1	1	0	0	0	0	1	0	3
Delta	0	0	0	0	0	0	0	0	0	0

Funding Summary - EMALS

Appropriation and Quantity Summary - EMALS
FY2014 President's Budget / December 2012 SAR (TY$ M)

Appropriation	Prior	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	To Complete	Total
RDT&E	753.5	60.9	43.0	2.4	2.5	0.0	0.0	0.0	862.3
Procurement	724.7	29.6	228.2	169.7	338.4	45.0	35.9	899.6	2471.1
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 2014 Total	1498.9	90.5	271.2	172.1	340.9	45.0	35.9	899.6	3354.1
PB 2013 Total	--	--	--	--	--	--	--	--	0.0
Delta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3354.1

Program funding and production quantities listed in this SAR are consistent with the FY 2014 President's Budget (PB). The FY 2014 PB did not reflect the enacted DoD appropriation for FY 2013, nor sequestration; it reflected the President's requested amounts for FY 2013.

Quantity	Undistributed	Prior	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	To Complete	Total
Development	0	0	0	0	0	0	0	0	0	0
Production	0	1	1	0	0	0	0	1	0	3
PB 2014 Total	0	1	1	0	0	0	0	1	0	3
PB 2013 Total	0	0	0	0	0	0	0	0	0	0
Delta	0	1	1	0	0	0	0	1	0	3

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	--	--	--	--	--	--	189.5
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	--	--	--	--	--	--	112.6
2014	--	--	--	--	--	--	104.7
2015	--	--	--	--	--	--	114.4
2016	--	--	--	--	--	--	62.2
2017	--	--	--	--	--	--	63.5
2018	--	--	--	--	--	--	59.4
2019	--	--	--	--	--	--	37.0
2020	--	--	--	--	--	--	36.3
2021	--	--	--	--	--	--	27.6
2022	--	--	--	--	--	--	17.0

Subtotal	**--**	**--**	**--**	**--**	**--**	**--**	**3454.4**

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	--	--	--	--	--	--	185.1
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	--	--	--	--	--	--	95.4
2012	--	--	--	--	--	--	88.4
2013	--	--	--	--	--	--	86.2
2014	--	--	--	--	--	--	78.7
2015	--	--	--	--	--	--	84.3
2016	--	--	--	--	--	--	45.0
2017	--	--	--	--	--	--	45.1
2018	--	--	--	--	--	--	41.4
2019	--	--	--	--	--	--	25.3
2020	--	--	--	--	--	--	24.4
2021	--	--	--	--	--	--	18.2
2022	--	--	--	--	--	--	11.0
Subtotal	**--**	**--**	**--**	**--**	**--**	**--**	**2994.3**

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	--	358.3	--	424.5	782.8	--	782.8
2008	1	1770.0	--	1010.7	2780.7	--	2780.7
2009	--	3628.8	--	54.9	3683.7	--	3683.7
2010	--	824.9	--	251.1	1076.0	--	1076.0
2011	--	1747.3	--	539.8	2287.1	--	2287.1
2012	--	449.5	--	98.3	547.8	--	547.8
2013	1	455.4	--	123.2	578.6	--	578.6
2014	--	1097.4	--	261.4	1358.8	--	1358.8
2015	--	2354.6	--	135.6	2490.2	--	2490.2
2016	--	1560.3	--	60.3	1620.6	--	1620.6
2017	--	2479.7	--	17.7	2497.4	--	2497.4
2018	1	2847.4	--	71.1	2918.5	--	2918.5
2019	--	2876.9	--	316.6	3193.5	--	3193.5
2020	--	2499.4	--	18.3	2517.7	--	2517.7
2021	--	2308.1	--	18.6	2326.7	--	2326.7
2022	--	1559.4	--	48.2	1607.6	--	1607.6
2023	--	733.7	--	44.3	778.0	--	778.0
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**	**31704.5**	**--**	**4580.1**	**36284.6**	**--**	**36284.6**

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	--	260.7	--	308.8	569.5	--	569.5
2008	1	1246.1	--	711.6	1957.7	--	1957.7
2009	--	2481.5	--	37.6	2519.1	--	2519.1
2010	--	545.8	--	166.2	712.0	--	712.0
2011	--	1121.9	--	346.6	1468.5	--	1468.5
2012	--	282.9	--	61.8	344.7	--	344.7
2013	1	281.2	--	76.1	357.3	--	357.3
2014	--	665.0	--	158.4	823.4	--	823.4
2015	--	1400.3	--	80.6	1480.9	--	1480.9
2016	--	910.6	--	35.2	945.8	--	945.8
2017	--	1420.2	--	10.1	1430.3	--	1430.3
2018	1	1600.4	--	40.0	1640.4	--	1640.4
2019	--	1586.8	--	174.7	1761.5	--	1761.5
2020	--	1352.9	--	9.9	1362.8	--	1362.8
2021	--	1226.1	--	9.8	1235.9	--	1235.9
2022	--	812.9	--	25.1	838.0	--	838.0
2023	--	375.3	--	22.7	398.0	--	398.0
2024	--	0.5	--	--	0.5	--	0.5
2025	--	22.1	--	--	22.1	--	22.1
2026	--	37.6	--	--	37.6	--	37.6
2027	--	66.5	--	--	66.5	--	66.5
2028	--	8.2	--	--	8.2	--	8.2
Subtotal	**3**	**19240.5**	**--**	**3137.3**	**22377.8**	**--**	**22377.8**

Current estimate reflects the first 3 ships in the program through 2075. Navy plans to build at least 11 CVN 78 Class ships to replace CVN 68 Class ships.

Cost Quantity Information

The CVN 79 is budgeted at an aggressive but achievable target.

The Navy and shipbuilder have made fundamental change 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. The approach to carrier construction has undergone an extensive affordability review, the results of which are reflected in the CVN 79 budget. 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	6288.5
2009	--	--
2010	--	--
2011	--	--
2012	--	--
2013	1	6050.4
2014	--	--
2015	--	--
2016	--	--
2017	--	--
2018	1	6901.6
2019	--	--
2020	--	--
2021	--	--
2022	--	--
2023	--	--
2024	--	--
2025	--	--
2026	--	--
2027	--	--

2028	--	--
Subtotal	**3**	**19240.5**

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

Fiscal Year	Total Program TY $M
2013	32.7
2014	3.4
Subtotal	**36.1**

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

Fiscal Year	Total Program BY 2000 $M
2013	24.4
2014	2.5
Subtotal	**26.9**

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	--	--	--	--	--	--	60.9
2014	--	--	--	--	--	--	43.0
2015	--	--	--	--	--	--	2.4
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	--	--	--	--	--	--	74.2
2011	--	--	--	--	--	--	47.0
2012	--	--	--	--	--	--	24.2
2013	--	--	--	--	--	--	46.6
2014	--	--	--	--	--	--	32.3
2015	--	--	--	--	--	--	1.8
2016	--	--	--	--	--	--	1.8
Subtotal	**--**	**--**	**--**	**--**	**--**	**--**	**739.5**

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	--	211.5	--	--	211.5	--	211.5
2010	--	143.9	--	--	143.9	--	143.9
2011	--	328.7	--	--	328.7	--	328.7
2012	--	7.0	--	--	7.0	--	7.0
2013	1	29.6	--	--	29.6	--	29.6
2014	--	228.2	--	--	228.2	--	228.2
2015	--	169.7	--	--	169.7	--	169.7
2016	--	338.4	--	--	338.4	--	338.4
2017	--	45.0	--	--	45.0	--	45.0
2018	1	35.9	--	--	35.9	--	35.9
2019	--	249.2	--	--	249.2	--	249.2
2020	--	195.4	--	--	195.4	--	195.4
2021	--	410.6	--	--	410.6	--	410.6
2022	--	44.4	--	--	44.4	--	44.4
Subtotal	**3**	**2471.1**	**--**	**--**	**2471.1**	**--**	**2471.1**

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	--	211.0	--	--	211.0	--	211.0
2012	--	4.4	--	--	4.4	--	4.4
2013	1	18.3	--	--	18.3	--	18.3
2014	--	138.3	--	--	138.3	--	138.3
2015	--	100.9	--	--	100.9	--	100.9
2016	--	197.5	--	--	197.5	--	197.5
2017	--	25.8	--	--	25.8	--	25.8
2018	1	20.2	--	--	20.2	--	20.2
2019	--	137.5	--	--	137.5	--	137.5
2020	--	105.8	--	--	105.8	--	105.8
2021	--	218.1	--	--	218.1	--	218.1
2022	--	23.1	--	--	23.1	--	23.1
Subtotal	**3**	**1464.5**	**--**	**--**	**1464.5**	**--**	**1464.5**

Cost Quantity Information

The CVN 79 is budgeted at an aggressive but achievable target. 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	493.7
2009	--	--
2010	--	--
2011	--	--
2012	--	--
2013	1	461.2
2014	--	--
2015	--	--
2016	--	--
2017	--	--
2018	1	509.6
2019	--	--
2020	--	--
2021	--	--
2022	--	--
Subtotal	**3**	**1464.5**

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**

The Presidents Budget (PB) FY 2013 SAR did not reflect $20.7M in FY 2004 EMALS MILCON funding that was discovered during development of the EMALS Acquisition Program Baseline (APB). The PB 2014 SAR adds these funds to the program funding summary.

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 which is standard for shipbuilding programs.

EMALS

There are no LRIP quantities planned for EMALS.

Foreign Military Sales

CVN 78
None

EMALS
None

Nuclear Cost

CVN 78
Nuclear Research and Development (R&D) and Reactor Plant Government Furnished Equipment (GFE) costs are included within the program costs in this report; however, Department of Energy (DoE) nuclear costs are not included in this report.

Shipbuilding and Conversion, Navy (SCN) Nuclear Propulsion Equipment Cost is $6,464.4M in then-year dollars for the CVN 78 Class Aircraft Carriers (CVN 78-80).

EMALS
None

Unit Cost

CVN 78

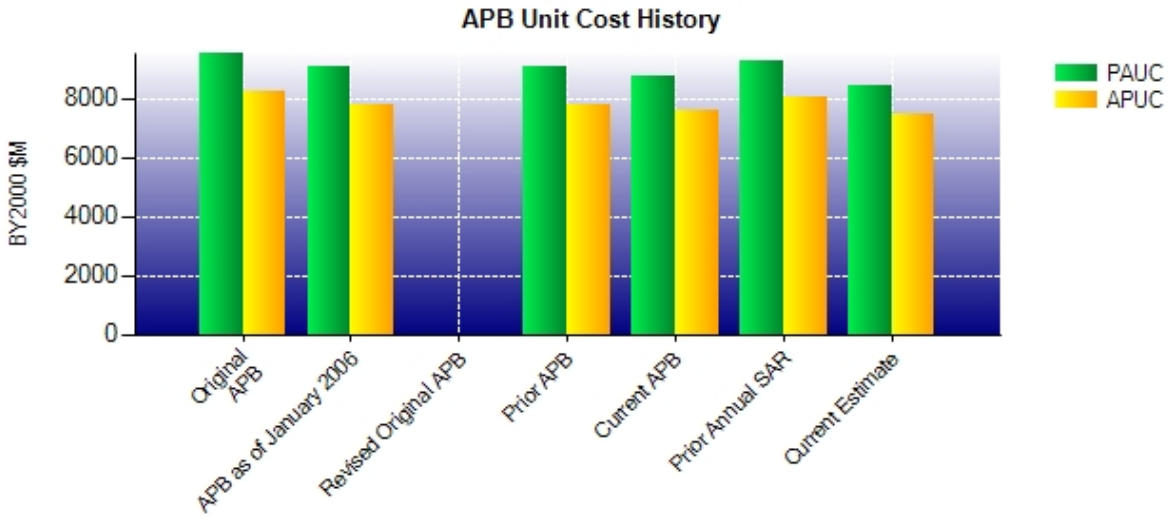
Unit Cost Report

Unit Cost	BY2000 $M Current UCR Baseline	BY2000 $M Current Estimate (DEC 2012 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	26369.7	25399.0	
Quantity	3	3	
Unit Cost	8789.900	8466.333	-3.68
Average Procurement Unit Cost (APUC)			
Cost	22764.3	22377.8	
Quantity	3	3	
Unit Cost	7588.100	7459.267	-1.70

Unit Cost	BY2000 $M Original UCR Baseline (APR 2004 APB)	BY2000 $M Current Estimate (DEC 2012 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	28701.2	25399.0	
Quantity	3	3	
Unit Cost	9567.067	8466.333	-11.51
Average Procurement Unit Cost (APUC)			
Cost	24825.9	22377.8	
Quantity	3	3	
Unit Cost	8275.300	7459.267	-9.86

CVN 78

Unit Cost History



		BY2000 $M		TY $M	
	Date	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 2011	9281.333	8052.733	14176.167	12765.733
Current Estimate	DEC 2012	8466.333	7459.267	13258.367	12094.867

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	2077.934	0.000	279.833	-27.067	-705.800	0.000	0.000	1624.900	13258.367

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	2039.933	0.000	222.467	132.967	-626.300	0.000	0.000	1769.067	12094.867

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	35330.9	N/A	39775.1
Total Quantity	N/A	3	N/A	3
Prog. Acq. Unit Cost (PAUC)	N/A	11776.967	N/A	13258.367

EMALS

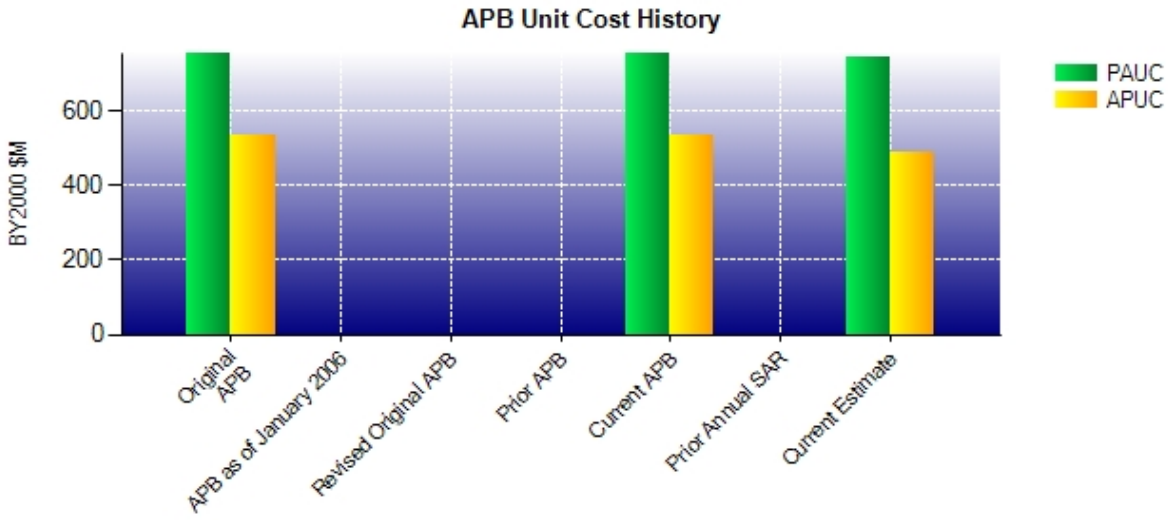
Unit Cost Report

Unit Cost	BY2000 $M Current UCR Baseline	BY2000 $M Current Estimate (DEC 2012 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	2263.4	2222.8	
Quantity	3	3	
Unit Cost	754.467	740.933	-1.79
Average Procurement Unit Cost (APUC)			
Cost	1593.4	1464.5	
Quantity	3	3	
Unit Cost	531.133	488.167	-8.09

Unit Cost	BY2000 $M Original UCR Baseline	BY2000 $M Current Estimate (DEC 2012 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	2263.4	2222.8	
Quantity	3	3	
Unit Cost	754.467	740.933	-1.79
Average Procurement Unit Cost (APUC)			
Cost	1593.4	1464.5	
Quantity	3	3	
Unit Cost	531.133	488.167	-8.09

EMALS

Unit Cost History



		BY2000 $M		TY $M	
	Date	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 2011	N/A	N/A	N/A	N/A
Current Estimate	DEC 2012	740.933	488.167	1118.033	823.700

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	160.200	0.000	0.000	0.000	563.933	0.000	0.000	724.133	1118.033

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	150.867	0.000	0.000	0.000	415.733	0.000	0.000	566.600	823.700

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	751.2	N/A	3354.1
Total Quantity	N/A	1	N/A	3
Prog. Acq. Unit Cost (PAUC)	N/A	751.200	N/A	1118.033

Cost Variance

CVN 78

Summary Then Year $M				
	RDT&E	Proc	MILCON	Total
SAR Baseline (Dev Est)	3923.0	30977.4	--	34900.4
Previous Changes				
Economic	+103.4	+5228.4	--	+5331.8
Quantity	--	--	--	--
Schedule	+172.1	+667.4	--	+839.5
Engineering	-480.1	+327.5	--	-152.6
Estimating	-362.7	-1480.0	+38.7	-1804.0
Other	--	--	--	--
Support	--	--	--	--
Subtotal	-567.3	+4743.3	+38.7	+4214.7
Current Changes				
Economic	+9.9	+891.4	+0.7	+902.0
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	+71.4	--	+71.4
Estimating	+88.8	-398.9	-3.3	-313.4
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+98.7	+563.9	-2.6	+660.0
Total Changes	-468.6	+5307.2	+36.1	+4874.7
CE - Cost Variance	3454.4	36284.6	36.1	39775.1
CE - Cost & Funding	3454.4	36284.6	36.1	39775.1

Summary Base Year 2000 $M				
	RDT&E	Proc	MILCON	Total
SAR Baseline (Dev Est)	3490.6	24235.0	--	27725.6
Previous Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	+120.2	--	--	+120.2
Engineering	-352.4	+166.5	--	-185.9
Estimating	-323.4	-1813.3	+29.3	-2107.4
Other	--	--	--	--
Support	--	--	--	--
Subtotal	-555.6	-1646.8	+29.3	-2173.1
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	+21.2	--	+21.2
Estimating	+59.3	-231.6	-2.4	-174.7
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+59.3	-210.4	-2.4	-153.5
Total Changes	-496.3	-1857.2	+26.9	-2326.6
CE - Cost Variance	2994.3	22377.8	26.9	25399.0
CE - Cost & Funding	2994.3	22377.8	26.9	25399.0

Previous Estimate: September 2012

RDT&E	$M	
Current Change Explanations	**Base Year**	**Then Year**
Revised escalation indices. (Economic)	N/A	+9.9
Adjustment for current and prior escalation. (Estimating)	-2.7	-3.4
Revised estimate to support CVN 79 Research and Development (R&D) requirements through to delivery. (Estimating)	+70.5	+103.9
Decrease to CVN 78 Class due to Small Business Innovative Research (SBIR) assessment, Working Capital Fund (WCF) and miscellaneous adjustments. (Estimating)	-2.6	-3.3
Revised estimate to reflect application of new outyear escalation indices. (Estimating)	-5.9	-8.4
RDT&E Subtotal	+59.3	+98.7

Procurement	$M	
Current Change Explanations	**Base Year**	**Then Year**
Revised escalation indices. (Economic)	N/A	+891.4
Additional funding for the balance of CVN 78 Detail Design and Construction (DD&C) contract variance at completion. (Estimating)	+248.0	+417.0
Additional funding for CVN 78 Jigs and Fixtures. (Engineering)	+54.0	+89.1
Decreased funding due to removal of SPN-46 requirement from CVN 79. (Engineering)	-32.8	-17.7
Adjustment for current and prior escalation. (Estimating)	-88.7	-136.3
Realignment of CVN 78 funding between FY 2014 and FY 2015. (Estimating)	+0.6	0.0
Revised estimate for CVN 78 Class Post Delivery and Outfitting. (Estimating)	+13.6	+25.0
Realignment of CVN 80 funding between FY 2018 and FY 2019 (Estimating)	-13.7	0.0
Revised estimate for CVN 79 Change Orders. (Estimating)	-29.9	-51.6
Revised estimate to reflect application of new outyear escalation indices. (Estimating)	-361.5	-653.0
Procurement Subtotal	-210.4	+563.9

MILCON	$M	
Current Change Explanations	**Base Year**	**Then Year**
Revised escalation indices. (Economic)	N/A	+0.7
Revised estimate to reflect application of new outyear esacalation indices. (Estimating)	-2.0	-2.8
Adjustment for current and prior escalation. (Estimating)	-0.4	-0.5
MILCON Subtotal	-2.4	-2.6

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	+25.9	+375.5	--	+401.4
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+400.6	+1429.7	--	+1830.3
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+426.5	+1805.2	--	+2231.7
Current Changes				
Economic	+2.1	+77.1	--	+79.2
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+23.3	-182.5	+20.7	-138.5
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+25.4	-105.4	+20.7	-59.3
Total Changes	+451.9	+1699.8	+20.7	+2172.4
CE - Cost Variance	862.3	2471.1	20.7	3354.1
CE - Cost & Funding	862.3	2471.1	20.7	3354.1

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	+336.8	+979.1	--	+1315.9
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+336.8	+979.1	--	+1315.9
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+18.0	-105.5	+18.8	-68.7
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+18.0	-105.5	+18.8	-68.7
Total Changes	+354.8	+873.6	+18.8	+1247.2
CE - Cost Variance	739.5	1464.5	18.8	2222.8
CE - Cost & Funding	739.5	1464.5	18.8	2222.8

Previous Estimate: September 2012

RDT&E	$M	
Current Change Explanations	**Base Year**	**Then Year**
Revised escalation indices. (Economic)	N/A	+2.1
Adjustment for current and prior escalation. (Estimating)	-1.2	-1.5
Revised estimate for EMALS System Development and Demonstration (SDD) phase. (Estimating)	+20.2	+26.1
Decrease to CVN 78 Class due to Small Business Innovative Research (SBIR) assessment and Working Capital Fund (WCF) adjustments . (Estimating)	-1.0	-1.3
RDT&E Subtotal	+18.0	+25.4

Procurement	$M	
Current Change Explanations	**Base Year**	**Then Year**
Revised escalation indices. (Economic)	N/A	+77.1
Adjustment for current and prior escalation. (Estimating)	-8.3	-12.9
Revised estimate to reflect application of new outyear escalation indices. (Estimating)	-56.4	-100.8
Revised estimate for CVN 79 shipset. (Estimating)	-40.8	-68.8
Procurement Subtotal	-105.5	-105.4

MILCON	$M	
Current Change Explanations	**Base Year**	**Then Year**
Inclusion of FY 2004 funding not previously reported. (Estimating)	+18.8	+20.7
MILCON Subtotal	+18.8	+20.7

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	5885.6	N/A	1	6665.6	6638.7

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date (2/17/2013)	-551.6	-209.2
Previous Cumulative Variances	-436.2	-221.5
Net Change	-115.4	+12.3

Cost And Schedule Variance Explanations

The unfavorable net change in the cost variance is due to material cost growth (86%), labor inefficiencies (25%), Overhead improvement (-3%), and Facilities Capital Cost of Money (FCCM) improvement (-8%). 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 improvement in material availability and the overall decrease in design hold ups, which have resulted in a significant increase in workable work packages available to the assembly trades. This increase in available work, coupled with the significant increase in manning and improved performance of the assembly trades, has resulted in an overall improvement in schedule performance.

Contract Comments

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.

The Program Manager’s Estimated Price at Completion (PMEAC) of $6638.7M exceeds the current contract Target Price of $5,885.6M by $753.1M. This $753.1M price Variance at Completion (VAC) includes $62.7M 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	1462.2	N/A	N/A	1437.5	1462.2

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date (2/17/2013)	+4.9	+27.0
Previous Cumulative Variances	+0.3	-2.4
Net Change	+4.6	+29.4

Cost And Schedule Variance Explanations

The favorable net change in the cost variance is due to lower than expected costs for valves and less than expected cost for complex machining on the Non-Propulsion Plant Long Lead Time Material (LLTM) CLINs 0404 and 1505.

The favorable net change in the schedule variance is due to early receipts of material procurements on the Non-Propulsion Plant LLTM CLINs 0404 and 1505.

Contract Comments

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to award of multiple CVN 79 Construction Preparation contract extensions for FY 2011 effort, FY 2012 options, and Mods A & B (awarded in July 2012 and September 2012 respectfully).

The CVN 79 Construction Preparation (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 (L YS) and Integrated Logistics Support. Mod A was awarded on July 18, 2012 and increased the ceiling value of CLIN 0404 to $74.6M. Mod B was awarded on September 27, 2012 and increased the ceiling value of CLIN 0404 to $191.9M, CLIN 1303 to $280.4M, and CLIN 1505 to $388.7M. As of February 17, 2013, the CP contract is 54.1% complete based on dollars. The Advanced Construction effort is 55.6% complete on a dollar basis and 45.4% complete on a man-hour basis.The PM Estimated Price at Completion is the Current Contract Price Target.

Appropriation: RDT&E

Contract Name	**EMALS System Development and Demonstration (SDD)**
Contractor	General Atomics Electromagnetic Systems Group
Contractor Location	San Diego, CA 92121-1122
Contract Number, Type	N68335-04-C-0167, CPAF
Award Date	April 02, 2004
Definitization Date	April 02, 2004

Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
145.6	N/A	1	431.8	N/A	1	540.2	548.5

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date (2/17/2013)	-7.9	-6.4
Previous Cumulative Variances	--	--
Net Change	-7.9	-6.4

Cost And Schedule Variance Explanations

The unfavorable cumulative cost variance is due to increased resources required to build and test software releases necessary to resolove issues uncovered during SDD testing, higher than planned resources required to conduct requirements analysis and verification, test spares replenishment for higher than anticipated line replaceable unit failures during developmental testing the cause of which have since been resolved, and rework of the Operator Interactive Technical Manual Development required for the 60% and 90% In Process Reviews.

The unfavorable cumulative schedule variance is due to higher than anticipated issues uncovered during the System Functional Demonstration and Environmental Qualification Tests, and the resulting time necessary to identify engineering solutions for these issues, incorporate changes to the units under test and repeat tests to ensure resolution.

Contract Comments

This is the first time this contract is being reported.

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

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to three Over Target Baselines over the course of the System Development and Demonstration Contract, the third of which was due to a major SDD Program Test and Evaluation restructure in 2009 resulting from a 2008 Program Assessment Review.

The Program Manager's Estimate at Completion (PMEAC) of $548.5M exceeds the Current Contract Target of $431.8M by $116.7M. In May 2011, General Atomics submitted a fourth Over Target Baseline/Over Target Schedule with adjusted contract ceiling which is under consideration by the Navy.

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	43.4	44.5

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date (2/17/2013)	+1.2	-1.4
Previous Cumulative Variances	--	--
Net Change	+1.2	-1.4

Cost And Schedule Variance Explanations

The favorable cumulative cost variance is due to less than planned resources necessary to conduct Reliability Centered Maintenance, Maintenance Task and Failure Mode Effects and Criticality Analyses (FMECA).

The unfavorable cumulative schedule variance is due to delays in Task Narrative and Technical Manual Development caused by longer than anticipated time for General Atomics to obtain resources to staff these efforts, and a delay in a sub-contract award to QinetiQ North America.

Contract Comments

This is the first time this contract is being reported.

The Program Manager's Estimated Price at Completion (PMEPAC) is currently equivalent to the Current Contract Price Target.

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

Cost And Schedule Variance Explanations

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

Contract Comments

This is the first time this contract is being reported.

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

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	558.2	N/A	1	558.2	558.2

Cost And Schedule Variance Explanations

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

Contract Comments

This is the first time this contract is being reported.

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

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

Deliveries and Expenditures

CVN 78

Deliveries To Date	Plan To Date	Actual To Date	Total Quantity	Percent Delivered
Development	0	0	0	--
Production	0	0	3	0.00%
Total Program Quantities Delivered	0	0	3	0.00%

Expenditures and Appropriations (TY $M)			
Total Acquisition Cost	39775.1	Years Appropriated	17
Expenditures To Date	13884.3	Percent Years Appropriated	53.13%
Percent Expended	34.91%	Appropriated to Date	17659.1
Total Funding Years	32	Percent Appropriated	44.40%

The above data is current as of 4/10/2013.

EMALS

Deliveries To Date	Plan To Date	Actual To Date	Total Quantity	Percent Delivered
Development	0	0	0	--
Production	0	0	3	0.00%
Total Program Quantities Delivered	0	0	3	0.00%

Expenditures and Appropriations (TY $M)			
Total Acquisition Cost	3354.1	Years Appropriated	14
Expenditures To Date	1252.5	Percent Years Appropriated	60.87%
Percent Expended	37.34%	Appropriated to Date	1589.4
Total Funding Years	23	Percent Appropriated	47.39%

The above data is current as of 4/10/2013.

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 Acquisition Program Basline (APB) Objective/Threshold values and current estimate reflects Total Operating and Support (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 source of antecedent data is the Naval Visibility and Management of Operating and Support Cost (VAMOSC) database for NIMITZ Class (CVN 68) aircraft carriers. Antecedent Total O&S costs are based on a 10 ship quantity for the NIMITZ Class.

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	132.5	167.5
Unit Operations	16.1	16.7
Maintenance	85.1	117.8
Sustaining Support	10.3	10.6
Continuing System Improvements	9.9	15.1
Indirect Support	73.5	93.3
Other	0.0	0.0
Total	327.4	421.0

Unitized Cost Comments:

None

	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	49107.0	210492.0
Then Year	251600.0	N/A	172369.0	322320.0

Total O&S Costs Comments:
2012 SAR Cost data has decreased from the 2011 SAR because:

- Direct Personnel: changed from Cost of Manpower Estimating Tool (COMET) to Office of the Secretary of Defense (OSD) Composite rates
- Indirect Personnel: changed from COMET to Manpower Cost Estimating Tool for Enhanced Online Reporting (METEOR) rates (COMET superseded by METEOR)
- Depot Maintenance: changed Operating (OP) Cycle from 24/6 to 32/8 in CVN 68 Class Baseline from which CVN 78 derives
- Depot Maintenance: changed from Actuals to OPNAV Note (to facilitate comparison between the ship classes since no actuals yet for CVN 78 Class)
- Removal of EMALS O&S costs from CVN 78 Class O&S Costs.
- Reduced quantity from 11 ships to 3 ships to reflect Program of Record.

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 Operating and Support Cost Estimating Guide using historical data from operating carrier classes and 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 ships would be $180,059.7M in base-year dollars/$1,136,023M in then-year dollars.

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 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.

The sustainment strategy for EMALS is currently under development.

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	4.5	0.0
Unit Operations	0.0	0.0
Maintenance	5.9	0.0
Sustaining Support	1.5	0.0
Continuing System Improvements	3.7	0.0
Indirect Support	1.7	0.0
Other	0.0	0.0
Total	17.3	--

Unitized Cost Comments:

None

	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	8311.1	N/A

Total O&S Costs Comments:
2012 SAR Cost data reflects the following:

- Direct Personnel: changed from Cost of Manpower Estimating Tool (COMET) to Office of the Secretary of Defense (OSD) Composite rates
- Indirect Personnel: changed from COMET to Manpower Cost Estimating Tool for Enhanced Online Reporting (METEOR) rates (COMET superseded by METEOR)
- Depot Maintenance: changed Operating (OP) Cycle from 24/6 to 32/8 in CVN 68 Class Baseline Depot Maintenance: changed from Actuals to OPNAV Note (to facilitate comparison between the ship classes since no actuals yet for EMALS)

Operating and Support (O&S) costs are developed at the EMALS shipset 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 Operations and Support Cost Estimating Guide using current technical and cost data from the EMALS development and production programs. 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/$51,548.0M in then-year dollars.

Disposal Costs

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