Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-516

SSN 774 Virginia Class Submarine (SSN 774)

As of December 31, 2012

Defense Acquisition Management
Information Retrieval
(DAMIR)

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Program Information

Program Name

SSN 774 Virginia Class Submarine (SSN 774)

DoD Component

Navy

Responsible Office

Responsible Office

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Date Assigned June 28, 2012

References

SAR Baseline (Production Estimate)

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated September 3, 2010

Approved APB

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated September 3, 2010

Mission and Description

The VIRGINIA Class (SSN 774) Submarine Program is bringing forward a critical national security asset designed to flexibly address the unique multi-mission requirements of the post-Cold War era. Capable of performing traditional submarine missions, dominating the littoral battle space and adapting to future requirements, the VIRGINIA Class Submarine will satisfy any assigned role well into the Twenty-First Century. Intended to replace the fleet of SSN 688 Class submarines, the VIRGINIA Class Submarine is characterized by state-of-the-art stealth, enhanced features for special operations forces, and cost effective Command, Control, Communication and Intelligence capability. With an array of armament including the MK48 Advanced Capability (ADCAP) torpedo and cruise missile vertical launch capability, the VIRGINIA Class Submarine maintains total undersea superiority at an affordable cost.

Executive Summary

The first nine ships of the VIRGINIA Class have been delivered to the Navy with eight more under construction. The most recently delivered, USS MISSISSIPPI (SSN 782), was completed almost one year ahead of the contractual requirement. The program transitioned to the construction of two submarines per year in FY 2011. A Block IV Construction Contract proposal was received from the General Dynamics Electric Boat (EB) & Huntington Ingalls Industries-Newport News (HII-NNS) VIRGINIA Class Submarine team for Block IV (ten ships, FY 2014-2018). Award is projected for fall 2013. The President's Budget for FY 2014 supports a second ship in FY 2014.

Continuing the record of increased performance at reduced costs, each of the nine delivered submarines has demonstrated improved performance and an overall reduction in production schedule. The last Block II ship, MINNESOTA (SSN 783), is projected to deliver early as are the Block III ships, all currently under construction and ahead of schedule. Significant improvements in production processes continue to drive cost reduction progress and acceleration of delivery schedules. In addition to reducing production costs, the program is also taking action to reduce life cycle costs. With the successful conclusion of the Virginia Class cost reduction effort, the program focused attention to other ways to reduce not only acquisition cost but also class total ownership cost through Reduction in Total Ownership Costs (RTOC). Expanding upon the cost reduction effort, RTOC is focused on achieving an increase in deployments and the elimination of a planned maintenance depot availability over the life of each submarine. As part of the initiative to reduce cost, the VIRGINIA Program conducted a number of reviews of select systems, equipment, processes, and procedures that affect Total Ownership Costs (TOC). The reviews considered improvements in ship construction materials and construction processes and procedures that affect overall life cycle maintenance requirements. The technical baseline has been signed out for Block IV, implementing these changes.

The program is continuing planning actions for a VIRGINIA Payload Module (VPM) with Concept Design begining in FY 2013 and Detail Design expected to be completed to support construction in FY 2019. VPM will be flexibly designed to support a Tomahawk strike mission as well as other future payload concepts. VPM would provide future VIRGINIA Class SSNs an additional four large diameter payload tubes, each capable of carrying seven Tomahawk cruise missiles, increasing SSN Tomahawk cruise missile capacity from 12 to 40. Current OHIO Class SSGNs are reaching the end of their service life and VIRGINIA Class Submarines with VPM would eliminate the gap resulting from the retirement of the SSGNs. Key objectives for 2013 include completion of Requirements Definition, an approved Capability Development Document (CDD), Acquisition Strategy, an Integrated Master Schedule and the commencement of the detail design.

Notable production milestones occurring in 2012 included the delivery to the Navy of USS MISSISSIPPI (SSN 782) and the completion of MINNESOTA's (SSN 783) pressure hull in May. The former accomplishment represented a 3-month improvement on the previous shortest span from construction start to delivery. For 2013, MINNESOTA (SSN 783) is projected to deliver in May, 11 months ahead of contract delivery. This will be followed by commissioning on September 7, 2013. Other key events include NORTH DAKOTA (SSN 784) christening on September 21, 2013.

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

Threshold Breaches

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

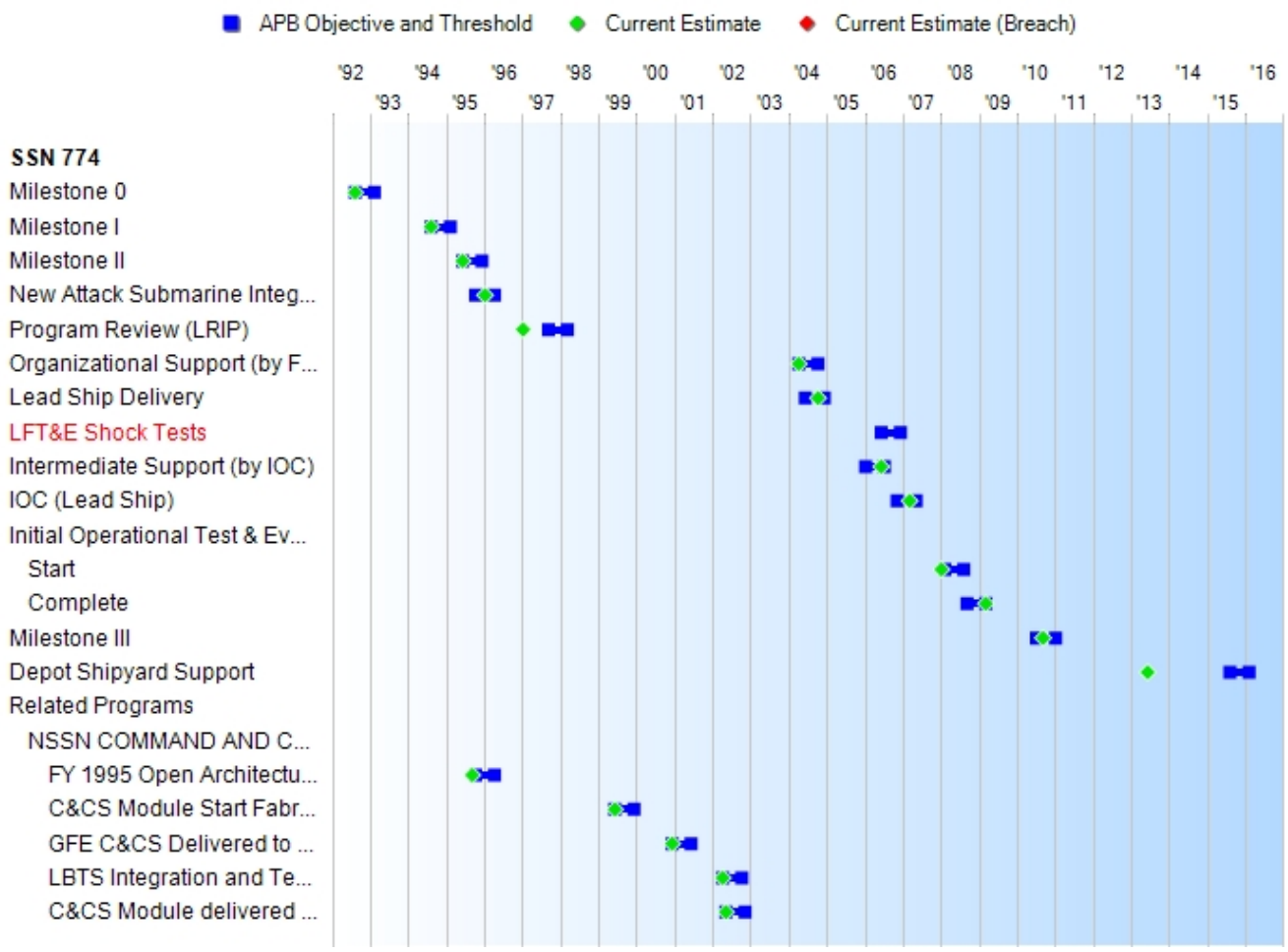
Nunn-McCurdy Breaches		
Current UCR Baseline		
	PAUC	None
	APUC	None
Original UCR Baseline		
	PAUC	Significant
	APUC	None

Explanation of Breach

Schedule -- This schedule breach was previously reported in the December 2006 SAR.

Nunn McCurdy Unit Cost -- This program reflects a significant Nunn-McCurdy breach to the original baseline that was first reported in the December 2005 SAR.

Schedule


APB Objective and Threshold
Current Estimate
Current Estimate (Breach)
'92
'93
'94
'95
'96
'97
'98
'99
'00
'01
'02
'03
'04
'05
'06
'07
'08
'09
'10
'11
'12
'13
'14
'15
'16
SSN 774
Milestone 0
Milestone I
Milestone II
New Attack Submarine Integ...
Program Review (LRIP)
Organizational Support (by F...
Lead Ship Delivery
LFT&E Shock Tests
Intermediate Support (by IOC)
IOC (Lead Ship)
Initial Operational Test & Ev...
Start
Complete
Milestone III
Depot Shipyard Support
Related Programs
NSSN COMMAND AND C...
FY 1995 Open Architectu...
C&CS Module Start Fabr...
GFE C&CS Delivered to ...
LBTS Integration and Te...
C&CS Module delivered ...

Milestones	SAR Baseline Prod Est	Current APB Production Objective/Threshold		Current Estimate
Milestone 0	AUG 1992	AUG 1992	FEB 1993	AUG 1992
Milestone I	AUG 1994	AUG 1994	FEB 1995	AUG 1994
Milestone II	JUN 1995	JUN 1995	DEC 1995	JUN 1995
New Attack Submarine Integrated Product and Process Development Contract Award	OCT 1995	OCT 1995	APR 1996	JAN 1996
Program Review (LRIP)	SEP 1997	SEP 1997	MAR 1998	JAN 1997
Organizational Support (by Fast Cruise)	APR 2004	APR 2004	OCT 2004	APR 2004
Lead Ship Delivery	JUN 2004	JUN 2004	DEC 2004	OCT 2004
LFT&E Shock Tests	JUN 2006	JUN 2006	DEC 2006	N/A [1]
Intermediate Support (by IOC)	JAN 2006	JAN 2006	JUL 2006	JUN 2006
IOC (Lead Ship)	NOV 2006	NOV 2006	MAY 2007	MAR 2007
Initial Operational Test & Evaluation				
Start	FEB 2008	FEB 2008	AUG 2008	JAN 2008
Complete	SEP 2008	SEP 2008	MAR 2009	MAR 2009
Milestone III	JUL 2010	JUL 2010	JAN 2011	SEP 2010
Depot Shipyard Support	AUG 2015	AUG 2015	FEB 2016	JUN 2013
Related Programs				
NSSN COMMAND AND CONTROL SYSTEM				
FY 1995 Open Architecture Demo Complete	OCT 1995	OCT 1995	APR 1996	SEP 1995
C&CS Module Start Fabrication	JUN 1999	JUN 1999	DEC 1999	JUN 1999
GFE C&CS Delivered to Shipyard	DEC 2000	DEC 2000	JUN 2001	DEC 2000
LBTS Integration and Test Complete	APR 2002	APR 2002	OCT 2002	APR 2002
C&CS Module delivered to ship	MAY 2002	MAY 2002	NOV 2002	MAY 2002

[1] *APB Breach*

Acronyms And Abbreviations

C&CS - Command and Control System
GFE - Government Furnished Equipment
IOC - Initial Operational Capability
LBTS - Land Based Test Site
LFT&E - Live Fire Test and Evaluation
LRIP - Low Rate Initial Production
NSSN - New Attack Submarine

Change Explanations

None

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

Memo

On December 4, 2006, the Undersecretary of Defense (Acquisition, Technology and Logistics) (USD (AT&L)) notified Congress of the decision to eliminate the VIRGINIA Class Ship Shock Test from the Live Fire Test and Evaluation portion of the VIRGINIA Class Test and Evaluation Master Plan (TEMP).

Performance

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

Track To Budget

RDT&E				
APPN 1319	BA 03	PE 0603561N	(Navy)	
	Project F2177	NEW DESIGN SSN HM&E (NSSN UNIQUE)		(Sunk)
APPN 1319	BA 03	PE 0603564N	(Navy)	
	Project F2200	Ship Preliminary Design		(Sunk)
APPN 1319	BA 03	PE 0603570N	(Navy)	
	Project S2158	NUCLEAR PROPULSION		(Sunk)
APPN 1319	BA 05	PE 0604558N	(Navy)	
	Project F1947	NEW DESIGN SSN HM&E and Combat Systems		
	Project F1950	NEW DESIGN SSN HM&E and Combat Systems		
	Project F2429	NEW DESIGN SSN HM&E and Combat Systems		(Sunk)
	Project F2430	NEW DESIGN SSN HM&E and Combat Systems		(Sunk)
	Project F2644	NEW DESIGN SSN HM&E and Combat Systems		(Sunk)
	Project F2645	NEW DESIGN SSN HM&E and Combat Systems		(Sunk)
	Project F2887	NEW DESIGN SSN HM&E and Combat Systems		(Sunk)
	Project F2888	NEW DESIGN SSN HM&E and Combat Systems		(Sunk)
	Project F3062	NEW DESIGN SSN HM&E and Combat Systems	(Shared)	(Sunk)
	Project F4500	VIRGINIA Payload Module		
	Project F9231	NEW DESIGN SSN HM&E and Combat Systems		(Sunk)
	Project F9232	NEW DESIGN SSN HM&E and Combat Systems		(Sunk)
	Project F9386	NEW DESIGN SSN HM&E and		(Sunk)

		Combat Systems		
	Project F9387	NEW DESIGN SSN HM&E and Combat Systems		(Sunk)
	Project F9999	NEW DESIGN SSN HM&E and Combat Systems		(Sunk)
APPN 1319	BA 04	PE 0604567N	(Navy)	
	Project F2199	Ship Contract Design		(Sunk)

Future Years Defense Program funding includes the following projects from BA 05 PE 0604558: Project F1947 New Design Hull Mechanical & Electrical (HM&E), Project F1950 New Design Combat Systems and Project F4500 VIRGINIA Payload Module. PE 0604558, Project 3062, Multi-mission Team Trainer, is not included as part of the VIRGINIA Class baseline acquisition cost for Research, Development Test & Evaluation (RDT&E).

Procurement

APPN 1611	BA 02	PE 0204281N	(Navy)	
	ICN 2013	New SSN (NSSN-1)		
APPN 1611	BA 05	PE 0204281N	(Navy)	
	ICN 5110	Outfitting and Post Delivery	(Shared)	
	ICN 5300	Completion of PY Shipbuilding Programs	(Shared)	(Sunk)
APPN 1810	BA 01	PE 0204281N	(Navy)	
	ICN 0920	Repair Parts	(Shared)	(Sunk)
	ICN 0942	VA Class Support Equipment	(Shared)	

VIRGINIA Class program acquisition costs include a portion of the Other Procurement, Navy (OPN) budget Item Control Number (ICN) 0942. Programs included in VIRGINIA Class acquisition costs are: VA Class Special Operations Forces Support, Test and Evaluation Measuring Equipment, Exterior Communication System (ECS) Trainer, Virginia Ship Control Operator Trainer (VSCOT) and Major Shore Spares. The balance of the OPN budget is captured in program Operating and Support Costs.

Cost and Funding

Cost Summary

Total Acquisition Cost and Quantity

	BY1995 $M			BY1995 $M	TY $M		
Appropriation	SAR Baseline Prod Est	Current APB Production Objective/Threshold		Current Estimate	SAR Baseline Prod Est	Current APB Production Objective	Current Estimate
RDT&E	5420.4	5420.4	5962.4	5681.8	6351.2	6351.2	6765.2
Procurement	58933.2	58933.2	64826.5	54856.5	86856.1	86856.1	85082.2
Flyaway	58279.0	--	--	54347.8	85890.1	--	84297.2
Recurring	56764.1	--	--	52832.9	84249.0	--	82656.1
Non Recurring	1514.9	--	--	1514.9	1641.1	--	1641.1
Support	654.2	--	--	508.7	966.0	--	785.0
Other Support	0.0	--	--	0.0	0.0	--	0.0
Initial Spares	654.2	--	--	508.7	966.0	--	785.0
MILCON	0.0	0.0	--	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	--	0.0	0.0	0.0	0.0
Total	64353.6	64353.6	N/A	60538.3	93207.3	93207.3	91847.4

Confidence Level for Current APB Cost 50% - The Independent Cost Estimate (ICE) to support the VIRGINIA Class Submarine Program Milestone III decision, like all life-cycle cost estimates previously performed by Cost Assessment and Program Evaluation (CAPE), 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 the Department has 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 equally likely that the estimate will prove too low or too high for execution of the program described.

Quantity	SAR Baseline Prod Est	Current APB Production	Current Estimate
RDT&E	0	0	0
Procurement	30	30	30
Total	30	30	30

The Navy is planning for a possible class extension and has added Advance Procurement (FY 2018) for an FY 2020 ship. An Acquisition Program Baseline to extend the class beyond the program of record 30-ship program and to include VIRGINIA Payload Module (VPM) will be developed when requirements are determined for VPM.

Cost and Funding

Funding Summary

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

Appropriation	Prior	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	To Complete	Total
RDT&E	4971.9	162.5	118.7	249.4	275.9	268.1	140.9	577.8	6765.2
Procurement	45138.2	4943.6	5400.4	7060.4	5650.1	5511.7	5815.9	5561.9	85082.2
MILCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2014 Total	50110.1	5106.1	5519.1	7309.8	5926.0	5779.8	5956.8	6139.7	91847.4
PB 2013 Total	50097.7	4328.9	4952.1	6695.9	6109.4	5853.8	5456.9	9781.5	93276.2
Delta	12.4	777.2	567.0	613.9	-183.4	-74.0	499.9	-3641.8	-1428.8

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	16	2	2	2	2	2	2	2	30
PB 2014 Total	0	16	2	2	2	2	2	2	2	30
PB 2013 Total	0	16	2	1	2	2	2	2	3	30
Delta	0	0	0	1	0	0	0	0	-1	0

Cost and Funding

Annual Funding By Appropriation

Annual Funding TY$
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
1992	--	--	--	--	--	--	22.7
1993	--	--	--	--	--	--	66.3
1994	--	--	--	--	--	--	363.7
1995	--	--	--	--	--	--	453.4
1996	--	--	--	--	--	--	429.0
1997	--	--	--	--	--	--	452.3
1998	--	--	--	--	--	--	382.4
1999	--	--	--	--	--	--	308.4
2000	--	--	--	--	--	--	275.4
2001	--	--	--	--	--	--	237.3
2002	--	--	--	--	--	--	218.8
2003	--	--	--	--	--	--	242.2
2004	--	--	--	--	--	--	155.4
2005	--	--	--	--	--	--	153.1
2006	--	--	--	--	--	--	166.3
2007	--	--	--	--	--	--	191.2
2008	--	--	--	--	--	--	233.5
2009	--	--	--	--	--	--	180.5
2010	--	--	--	--	--	--	172.8
2011	--	--	--	--	--	--	161.5
2012	--	--	--	--	--	--	105.7
2013	--	--	--	--	--	--	162.5
2014	--	--	--	--	--	--	118.7
2015	--	--	--	--	--	--	249.4
2016	--	--	--	--	--	--	275.9
2017	--	--	--	--	--	--	268.1

2018	--	--	--	--	--	--	140.9
2019	--	--	--	--	--	--	139.1
2020	--	--	--	--	--	--	143.5
2021	--	--	--	--	--	--	32.7
2022	--	--	--	--	--	--	41.5
2023	--	--	--	--	--	--	52.7
2024	--	--	--	--	--	--	57.9
2025	--	--	--	--	--	--	64.7
2026	--	--	--	--	--	--	22.8
2027	--	--	--	--	--	--	22.9
Subtotal	**--**	**--**	**--**	**--**	**--**	**--**	**6765.2**

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

Fiscal Year	Quantity	End Item Recurring Flyaway BY 1995 $M	Non End Item Recurring Flyaway BY 1995 $M	Non Recurring Flyaway BY 1995 $M	Total Flyaway BY 1995 $M	Total Support BY 1995 $M	Total Program BY 1995 $M
1992	--	--	--	--	--	--	23.8
1993	--	--	--	--	--	--	68.0
1994	--	--	--	--	--	--	365.9
1995	--	--	--	--	--	--	447.5
1996	--	--	--	--	--	--	416.4
1997	--	--	--	--	--	--	433.7
1998	--	--	--	--	--	--	363.7
1999	--	--	--	--	--	--	289.9
2000	--	--	--	--	--	--	255.1
2001	--	--	--	--	--	--	216.9
2002	--	--	--	--	--	--	198.0
2003	--	--	--	--	--	--	216.0
2004	--	--	--	--	--	--	134.8
2005	--	--	--	--	--	--	129.4
2006	--	--	--	--	--	--	136.3
2007	--	--	--	--	--	--	153.0
2008	--	--	--	--	--	--	183.5
2009	--	--	--	--	--	--	140.0
2010	--	--	--	--	--	--	132.1
2011	--	--	--	--	--	--	120.3
2012	--	--	--	--	--	--	77.2
2013	--	--	--	--	--	--	116.4
2014	--	--	--	--	--	--	83.4
2015	--	--	--	--	--	--	172.0
2016	--	--	--	--	--	--	186.8
2017	--	--	--	--	--	--	178.1
2018	--	--	--	--	--	--	91.9
2019	--	--	--	--	--	--	89.0
2020	--	--	--	--	--	--	90.1

2021	--	--	--	--	--	--	20.1
2022	--	--	--	--	--	--	25.1
2023	--	--	--	--	--	--	31.3
2024	--	--	--	--	--	--	33.7
2025	--	--	--	--	--	--	37.0
2026	--	--	--	--	--	--	12.8
2027	--	--	--	--	--	--	12.6
Subtotal	**--**	**--**	**--**	**--**	**--**	**--**	**5681.8**

Future Years Defense Program (FYDP) funding includes the following projects from BA 05 PE 0604558: Project F1947 New Design Hull Mechanical & Electrical (HM&E), Project F1950 New Design Combat Systems, and Project F4500 VIRGINIA Payload Module. PE 0604558, Project 3062, Multi-mission Team Trainer, is not included as part of the VIRGINIA Class baseline acquisition cost for Research, Development Test & Evaluation (RDT&E).

Annual Funding TY$
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
1996	--	571.0	--	219.3	790.3	--	790.3
1997	--	533.2	--	242.5	775.7	--	775.7
1998	1	1625.0	--	840.9	2465.9	--	2465.9
1999	1	1882.0	--	165.6	2047.6	--	2047.6
2000	--	744.6	--	--	744.6	--	744.6
2001	1	1597.9	--	90.8	1688.7	0.2	1688.9
2002	1	2423.2	--	60.8	2484.0	15.9	2499.9
2003	1	2402.0	--	14.3	2416.3	8.3	2424.6
2004	1	2715.5	--	6.9	2722.4	11.0	2733.4
2005	1	2601.5	--	--	2601.5	4.3	2605.8
2006	1	2584.6	--	--	2584.6	15.1	2599.7
2007	1	2627.9	--	--	2627.9	8.4	2636.3
2008	1	3228.2	--	--	3228.2	19.5	3247.7
2009	1	3652.5	--	--	3652.5	17.9	3670.4
2010	1	4034.7	--	--	4034.7	9.8	4044.5
2011	2	5164.0	--	--	5164.0	18.7	5182.7
2012	2	4735.8	--	--	4735.8	12.3	4748.1
2013	2	4919.9	--	--	4919.9	21.9	4941.8
2014	2	5360.8	--	--	5360.8	25.8	5386.6
2015	2	7023.2	--	--	7023.2	27.9	7051.1
2016	2	5606.1	--	--	5606.1	35.0	5641.1
2017	2	5449.2	--	--	5449.2	53.3	5502.5
2018	2	4484.7	1252.1	--	5736.8	53.4	5790.2
2019	2	4581.5	--	--	4581.5	13.9	4595.4
2020	--	132.0	--	--	132.0	29.3	161.3
2021	--	127.8	--	--	127.8	18.2	146.0
2022	--	128.3	--	--	128.3	28.7	157.0
2023	--	126.6	--	--	126.6	15.8	142.4
2024	--	108.5	--	--	108.5	11.2	119.7

2025	--	82.6	--	--	82.6	5.1	87.7
2026	--	105.8	--	--	105.8	0.4	106.2
2027	--	43.4	--	--	43.4	--	43.4
Subtotal	**30**	**81404.0**	**1252.1**	**1641.1**	**84297.2**	**481.3**	**84778.5**

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

Fiscal Year	Quantity	End Item Recurring Flyaway BY 1995 $M	Non End Item Recurring Flyaway BY 1995 $M	Non Recurring Flyaway BY 1995 $M	Total Flyaway BY 1995 $M	Total Support BY 1995 $M	Total Program BY 1995 $M
1996	--	548.1	--	210.6	758.7	--	758.7
1997	--	504.1	--	229.3	733.4	--	733.4
1998	1	1502.6	--	777.6	2280.2	--	2280.2
1999	1	1713.0	--	150.8	1863.8	--	1863.8
2000	--	661.0	--	--	661.0	--	661.0
2001	1	1371.2	--	77.9	1449.1	0.2	1449.3
2002	1	2067.7	--	51.8	2119.5	13.6	2133.1
2003	1	1937.5	--	11.5	1949.0	6.7	1955.7
2004	1	2113.7	--	5.4	2119.1	8.5	2127.6
2005	1	1939.0	--	--	1939.0	3.2	1942.2
2006	1	1860.8	--	--	1860.8	10.9	1871.7
2007	1	1809.2	--	--	1809.2	5.8	1815.0
2008	1	2150.6	--	--	2150.6	13.0	2163.6
2009	1	2363.5	--	--	2363.5	11.6	2375.1
2010	1	2526.3	--	--	2526.3	6.1	2532.4
2011	2	3137.4	--	--	3137.4	11.4	3148.8
2012	2	2820.2	--	--	2820.2	7.3	2827.5
2013	2	2874.8	--	--	2874.8	12.8	2887.6
2014	2	3074.1	--	--	3074.1	14.8	3088.9
2015	2	3952.3	--	--	3952.3	15.7	3968.0
2016	2	3096.0	--	--	3096.0	19.3	3115.3
2017	2	2953.2	--	--	2953.2	28.9	2982.1
2018	2	2385.2	665.9	--	3051.1	28.4	3079.5
2019	2	2391.2	--	--	2391.2	7.3	2398.5
2020	--	67.6	--	--	67.6	15.0	82.6
2021	--	64.2	--	--	64.2	9.2	73.4
2022	--	63.3	--	--	63.3	14.1	77.4
2023	--	61.3	--	--	61.3	7.6	68.9
2024	--	51.5	--	--	51.5	5.4	56.9

2025	--	38.5	--	--	38.5	2.4	40.9
2026	--	48.4	--	--	48.4	0.2	48.6
2027	--	19.5	--	--	19.5	--	19.5
Subtotal	**30**	**52167.0**	**665.9**	**1514.9**	**54347.8**	**279.4**	**54627.2**

The Navy is planning for a possible class extension and has added Advance Procurement (FY18) for an FY20 ship. An APB to extend the class and to include VIRGINIA Payload Module (VPM) will be developed when requirements are determined for VPM.

Cost Quantity Information
1611 | Procurement | Shipbuilding and Conversion, Navy

Fiscal Year	Quantity	End Item Recurring Flyaway (Aligned with Quantity) BY 1995 $M
1996	--	--
1997	--	--
1998	1	2141.8
1999	1	2357.1
2000	--	--
2001	1	1916.6
2002	1	2036.7
2003	1	1824.5
2004	1	1813.6
2005	1	1745.4
2006	1	1786.6
2007	1	1866.7
2008	1	1830.3
2009	1	1905.2
2010	1	1777.6
2011	2	3354.6
2012	2	3191.0
2013	2	3106.8
2014	2	3187.5
2015	2	3139.0
2016	2	3165.5
2017	2	3199.1
2018	2	3301.7
2019	2	3519.7
2020	--	--
2021	--	--
2022	--	--

2023	--	--
2024	--	--
2025	--	--
2026	--	--
2027	--	--
Subtotal	**30**	**52167.0**

Annual Funding TY$
1810 | Procurement | Other Procurement, 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
2005	--	--	--	--	--	12.5	12.5
2006	--	--	--	--	--	44.1	44.1
2007	--	--	--	--	--	47.0	47.0
2008	--	--	--	--	--	39.7	39.7
2009	--	--	--	--	--	48.0	48.0
2010	--	--	--	--	--	13.8	13.8
2011	--	--	--	--	--	21.7	21.7
2012	--	--	--	--	--	5.3	5.3
2013	--	--	--	--	--	1.8	1.8
2014	--	--	--	--	--	13.8	13.8
2015	--	--	--	--	--	9.3	9.3
2016	--	--	--	--	--	9.0	9.0
2017	--	--	--	--	--	9.2	9.2
2018	--	--	--	--	--	25.7	25.7
2019	--	--	--	--	--	2.8	2.8
Subtotal	**--**	**--**	**--**	**--**	**--**	**303.7**	**303.7**

Annual Funding BY$
1810 | Procurement | Other Procurement, Navy

Fiscal Year	Quantity	End Item Recurring Flyaway BY 1995 $M	Non End Item Recurring Flyaway BY 1995 $M	Non Recurring Flyaway BY 1995 $M	Total Flyaway BY 1995 $M	Total Support BY 1995 $M	Total Program BY 1995 $M
2005	--	--	--	--	--	10.4	10.4
2006	--	--	--	--	--	35.6	35.6
2007	--	--	--	--	--	37.2	37.2
2008	--	--	--	--	--	30.9	30.9
2009	--	--	--	--	--	36.9	36.9
2010	--	--	--	--	--	10.4	10.4
2011	--	--	--	--	--	16.1	16.1
2012	--	--	--	--	--	3.8	3.8
2013	--	--	--	--	--	1.3	1.3
2014	--	--	--	--	--	9.6	9.6
2015	--	--	--	--	--	6.4	6.4
2016	--	--	--	--	--	6.1	6.1
2017	--	--	--	--	--	6.1	6.1
2018	--	--	--	--	--	16.7	16.7
2019	--	--	--	--	--	1.8	1.8
Subtotal	**--**	**--**	**--**	**--**	**--**	**229.3**	**229.3**

VIRGINIA Class program acquisition costs include a portion of Other Procurement, Navy (OPN) budget Item Control Number (ICN) 0942. Programs included in VIRGINIA Class acquisition costs are: VA Class Special Operations Forces Support, Test and Evaluation Measuring Equipment, Exterior Communication System (ECS) Trainer, Virginia Ship Control Operator Trainer (VSCOT) and Major Shore Spares. The balance of the OPN budget is captured in program Operating and Support Costs.

Low Rate Initial Production

	Initial LRIP Decision	Current Total LRIP
Approval Date	6/30/1995	6/30/1995
Approved Quantity	14	14
Reference	MS II ADM	MS II ADM
Start Year	1998	1998
End Year	2007	2011

The Current Total LRIP Quantity is more than 10% of the total production quantity due to this being a shipbuilding program for which this is standard practice.

Foreign Military Sales

None

Nuclear Cost

$15,349.4M (TY$). These costs are for reactor propulsion plant equipment. These costs are included in the Shipbuilding and Conversion, Navy (SCN) costs in this report.

Unit Cost

Unit Cost Report

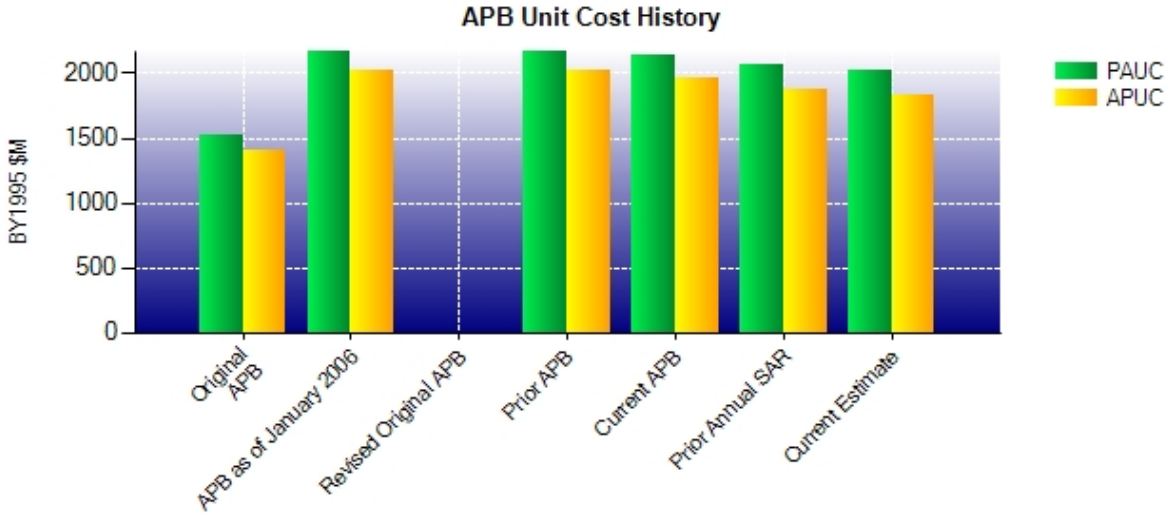
Unit Cost	BY1995 $M Current UCR Baseline (SEP 2010 APB)	BY1995 $M Current Estimate (DEC 2012 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	64353.6	60538.3	
Quantity	30	30	
Unit Cost	2145.120	2017.943	-5.93
Average Procurement Unit Cost (APUC)			
Cost	58933.2	54856.5	
Quantity	30	30	
Unit Cost	1964.440	1828.550	-6.92

Unit Cost	BY1995 $M Original UCR Baseline (JUN 1995 APB)	BY1995 $M Current Estimate (DEC 2012 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	45633.1	60538.3	
Quantity	30	30	
Unit Cost	1521.103	2017.943	**+32.66** [1]
Average Procurement Unit Cost (APUC)			
Cost	42228.1	54856.5	
Quantity	30	30	
Unit Cost	1407.603	1828.550	+29.91

[1] **Nunn-McCurdy Breach**

This program reflects a significant Nunn-McCurdy breach to the original baseline that was first reported in the December 2005 SAR. The supporting breach information and explanations can be found in the Unit Cost Report section of that SAR.

Unit Cost History



		BY1995 $M		TY $M	
	Date	PAUC	APUC	PAUC	APUC
Original APB	JUN 1995	1521.103	1407.603	2369.360	2242.227
APB as of January 2006	MAY 2005	2174.943	2021.430	2749.060	2578.850
Revised Original APB	N/A	N/A	N/A	N/A	N/A
Prior APB	MAY 2005	2174.943	2021.430	2749.060	2578.850
Current APB	SEP 2010	2145.120	1964.440	3106.910	2895.203
Prior Annual SAR	DEC 2011	2072.847	1877.320	3109.207	2876.090
Current Estimate	DEC 2012	2017.943	1828.550	3061.580	2836.073

SAR Unit Cost History

Initial SAR Baseline to Current SAR Baseline (TY $M)

Initial PAUC Dev Est	Changes								PAUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2369.360	-166.403	0.000	259.820	42.410	564.303	9.333	28.087	737.550	3106.910

Current SAR Baseline to Current Estimate (TY $M)

PAUC Prod Est	Changes								PAUC Current Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
3106.910	179.227	0.000	-48.420	26.600	-195.370	0.000	-7.367	-45.330	3061.580

Initial SAR Baseline to Current SAR Baseline (TY $M)

Initial APUC Dev Est	Changes								APUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2242.227	-160.064	0.000	259.820	36.360	479.440	9.333	28.087	652.976	2895.203

Current SAR Baseline to Current Estimate (TY $M)

APUC Prod Est	Changes								APUC Current Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2895.203	177.797	0.000	-48.420	0.000	-181.140	0.000	-7.367	-59.130	2836.073

SAR Baseline History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	AUG 1994	AUG 1994	AUG 1994
Milestone II	N/A	JUN 1995	JUN 1995	JUN 1995
Milestone III	N/A	OCT 2007	JUL 2010	SEP 2010
IOC	N/A	OCT 2005	NOV 2006	MAR 2007
Total Cost (TY $M)	N/A	71080.8	93207.3	91847.4
Total Quantity	N/A	30	30	30
Prog. Acq. Unit Cost (PAUC)	N/A	2369.360	3106.910	3061.580

Cost Variance

Summary Then Year $M				
	RDT&E	Proc	MILCON	Total
SAR Baseline (Prod Est)	6351.2	86856.1	--	93207.3
Previous Changes				
Economic	+6.9	+3575.1	--	+3582.0
Quantity	--	--	--	--
Schedule	--	+392.7	--	+392.7
Engineering	+798.0	--	--	+798.0
Estimating	-162.6	-4307.8	--	-4470.4
Other	--	--	--	--
Support	--	-233.4	--	-233.4
Subtotal	+642.3	-573.4	--	+68.9
Current Changes				
Economic	+36.0	+1758.8	--	+1794.8
Quantity	--	--	--	--
Schedule	--	-1845.3	--	-1845.3
Engineering	--	--	--	--
Estimating	-264.3	-1126.4	--	-1390.7
Other	--	--	--	--
Support	--	+12.4	--	+12.4
Subtotal	-228.3	-1200.5	--	-1428.8
Adjustments	--	--	--	--
Total Changes	+414.0	-1773.9	--	-1359.9
CE - Cost Variance	6765.2	85082.2	--	91847.4
CE - Cost & Funding	6765.2	85082.2	--	91847.4

Summary Base Year 1995 $M				
	RDT&E	Proc	MILCON	Total
SAR Baseline (Prod Est)	5420.4	58933.2	--	64353.6
Previous Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	+129.7	--	+129.7
Engineering	+556.6	--	--	+556.6
Estimating	-111.2	-2584.6	--	-2695.8
Other	--	--	--	--
Support	--	-158.7	--	-158.7
Subtotal	+445.4	-2613.6	--	-2168.2
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	-877.2	--	-877.2
Engineering	--	--	--	--
Estimating	-184.0	-599.1	--	-783.1
Other	--	--	--	--
Support	--	+13.2	--	+13.2
Subtotal	-184.0	-1463.1	--	-1647.1
Adjustments	--	--	--	--
Total Changes	+261.4	-4076.7	--	-3815.3
CE - Cost Variance	5681.8	54856.5	--	60538.3
CE - Cost & Funding	5681.8	54856.5	--	60538.3

Previous Estimate: December 2011

RDT&E	$M	
Current Change Explanations	**Base Year**	**Then Year**
Revised escalation indices. (Economic)	N/A	+36.0
Reduction to VIRGINIA Class Total Ownership Cost Reduction Program. (Estimating)	-91.3	-133.0
Reduction to VIRGINIA Payload Module (VPM) development program estimate. (Estimating)	-15.9	-15.2
Revised estimates due to refinement of development requirements for Hull, Mechanical and Electrical and Combat Systems. (Estimating)	-73.9	-112.0
Adjustment for current and prior escalation. (Estimating)	-2.9	-4.1
RDT&E Subtotal	-184.0	-228.3

Procurement	$M	
Current Change Explanations	**Base Year**	**Then Year**
Revised escalation indices. (Economic)	N/A	+1758.8
Acceleration of procurement buy profile (Navy) shifting the FY 2020 ship to FY 2014 which adds a 10th ship to Multi-Year Procurement Block buy. (Schedule)	-877.2	-1845.3
Revised estimate to reflect the application of new outyear escalation indices. (Estimating)	-638.5	-1274.0
Advance Procurement Funding added to FY 2018 to fund class extension. (Estimating)	+314.6	+591.8
Adjustment for current and prior escalation. (Estimating)	-291.5	-483.0
Revised estimates due to refinement of requirements. (Estimating)	+73.6	+134.6
Reduction to VIRGINIA Class Technology Insertion Program estimate. (Estimating)	-52.5	-95.9
Increased estimate for Other Procurement, Navy (OPN) Initial Spares. (Support)	+17.9	+25.7
Decreased estimate for Shipbuilding and Conversion, Navy (SCN) Outfitting Initial Spares. (Support)	-3.4	-11.5
Adjustment for current and prior escalation. (Support)	-1.3	-1.8
Revised estimate for Post Delivery SCN. (Estimating)	-4.8	+0.1
Procurement Subtotal	-1463.1	-1200.5

Contracts

Appropriation: Procurement

Contract Name	**SSN 783**
Contractor	Gen Dyn, EB Corp
Contractor Location	Groton, CT 06340
Contract Number, Type	N00024-03-C-2101/6, FPIF
Award Date	August 14, 2003
Definitization Date	August 14, 2003

Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
1349.9	1532.6	1	1491.0	1643.0	1	1506.2	1507.0

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/22/2012)	-22.1	-9.4
Previous Cumulative Variances	-45.7	-32.7
Net Change	+23.6	+23.3

Cost And Schedule Variance Explanations

The favorable net change in the cost variance is due to positive performance in the final assembly and testing before launch and final delivery.

The favorable net change in the schedule variance is due to efficient integration and testing activities.

General Contract Variance Explanation

This contract is subject to quarterly earned value reporting making December 2012 the latest data available for this report.

Contract Comments

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 authorized contract change orders.

Appropriation: Procurement

Contract Name	**SSN 784**
Contractor	Gen Dyn, EB Corp
Contractor Location	Groton, CT 06340
Contract Number, Type	N00024-09-C-2104/1, FPIF
Award Date	December 22, 2008
Definitization Date	December 22, 2008

Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
1717.1	1899.5	1	1880.3	2029.7	1	1858.7	1868.8

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date (2/23/2013)	-8.6	+0.4
Previous Cumulative Variances	-24.7	+30.7
Net Change	+16.1	-30.3

Cost And Schedule Variance Explanations

The favorable net change in the cost variance is due to positive modular fabrication, outfitting and delivery of modules.

The unfavorable net change in the schedule variance is due to maintaining an aggressive schedule for fabrication activities as module construction neared completion.

Contract Comments

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to authorized contract change orders.

Appropriation: Procurement

Contract Name	**SSN 785**
Contractor	Gen Dyn, EB Corp
Contractor Location	Groton, CT 06340
Contract Number, Type	N00024-09-C-2104/2, FPIF
Award Date	December 22, 2008
Definitization Date	December 22, 2008

Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
1646.7	1821.6	1	1770.3	1906.8	1	1750.8	1775.3

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date (2/23/2013)	+14.0	-38.9
Previous Cumulative Variances	-17.6	-27.7
Net Change	+31.6	-11.2

Cost And Schedule Variance Explanations

The favorable net change in the cost variance is due to positive modular fabrication and outfitting performance.

The unfavorable net change in the schedule variance is due to maintaining an aggressive schedule for fabrication and assembly.

Contract Comments

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to authorized contract change orders.

Appropriation: Procurement

Contract Name	**SSN 786**
Contractor	Gen Dyn, EB Corp
Contractor Location	Groton, CT 06340
Contract Number, Type	N00024-09-C-2104/3, FPIF
Award Date	December 22, 2008
Definitization Date	December 22, 2008

Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
1694.1	1825.9	N/A	1745.1	1884.6	N/A	1714.8	1716.7

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date (2/23/2013)	+11.8	-12.1
Previous Cumulative Variances	-48.1	+6.1
Net Change	+59.9	-18.2

Cost And Schedule Variance Explanations

The favorable net change in the cost variance is due to positive modular fabrication performance.

The unfavorable net change in the schedule variance is due to added resources in supporting an aggressive schedule. Schedule variance is not negatively impacting cost variance.

Contract Comments

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to authorized contract change orders.

Appropriation: Procurement

Contract Name	**SSN 787**
Contractor	Gen Dyn, EB Corp
Contractor Location	Groton, CT 06340
Contract Number, Type	N00024-09-C-2104/4, FPIF
Award Date	December 22, 2008
Definitization Date	December 22, 2008

Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
1773.6	1909.2	1	1802.2	1941.4	1	1756.2	1778.2

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date (2/23/2013)	+18.2	-4.5
Previous Cumulative Variances	--	--
Net Change	+18.2	-4.5

Cost And Schedule Variance Explanations

The favorable cumulative cost variance is due to favorable performance from early module fabrication and assembly. This hull is still at a relatively early stage of construction.

The unfavorable cumulative schedule variance is due to added resources supporting an aggressive schedule. Schedule variance is not negatively impacting cost variance.

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 authorized contract change orders.

Appropriation: RDT&E

Contract Name	**Lead Yard Services**
Contractor	Gen Dyn, EB Corp
Contractor Location	Groton, CT 06340
Contract Number, Type	N00024-10-C-2118, CPFF
Award Date	July 02, 2010
Definitization Date	July 02, 2010

Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
171.9	N/A	N/A	318.7	N/A	N/A	318.7	318.7

Cost And Schedule Variance Explanations

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

General Contract Variance Explanation

Cost reporting is being performed per the requirements of this contract. Earned Value Management, however, is not required on this level of effort contract.

Contract Comments

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to tasking added to this incrementally funded contract.

The Lead Yard Services contract provides design studies, engineering, material and logistics support and research and development activities on the baseline VIRGINIA design.

Deliveries and Expenditures

Deliveries To Date	Plan To Date	Actual To Date	Total Quantity	Percent Delivered
Development	0	0	0	--
Production	8	9	30	30.00%
Total Program Quantities Delivered	8	9	30	30.00%

Expenditures and Appropriations (TY $M)			
Total Acquisition Cost	91847.4	Years Appropriated	22
Expenditures To Date	39824.8	Percent Years Appropriated	61.11%
Percent Expended	43.36%	Appropriated to Date	55216.2
Total Funding Years	36	Percent Appropriated	60.12%

The above data is current as of 3/22/2013.

The ninth ship of the VIRGINIA Class, USS MISSISSIPPI (SSN 782), was delivered in May 2012, nearly 12 months early to the contract delivery date.

Operating and Support Cost

SSN 774

Assumptions and Ground Rules

Cost Estimate Reference:

The source of this data is the VIRGINIA Class MSIII Program Life Cycle Cost Estimate (PLCCE) dated June 2010, which uses the CAIG's six element cost classification system. The analysis includes description of input data and detailed Cost Element Structure reporting in the format recommended by the Office of the Secretary of Defense (OSD), Cost Analysis Improvement Group (CAIG).

Visibility and Management of Operation and Support Cost (VAMOSC) data for LOS ANGELES Class and VIRGINIA Class actuals were used to construct the estimate. The estimate includes costs for Unit Level Manpower, Unit Operations, Maintenance, Sustaining Support, Continuing System Improvements, and Indirect Support. Unit Level Manpower was estimated based on the crew description contained in the Manning Estimate Report (MER) (15 officers, 120 enlisted), and the direct personnel costs using VIRGINIA Class rates factored for VIRGINIA Class crew size. Unit Operations was based on historical LOS ANGELES Class data and factored by power, weight, and crew size. Maintenance was estimated based on historical LOS ANGELES Class maintenance costs factored for the VIRGINIA Class based on weight. Public and private shipyard data was used, as well as the maintenance schedule provided in the CARD to appropriately phase maintenance costs over the service life of the submarines. Sustaining Support was estimated based on historical LOS ANGELES Class data factored by weight or crew size, depending on the individual element. Continuing System Improvements were estimated based on historical LOS ANGELES Class data factored by weight. The Software Maintenance portion was based on the analysis of DDG 51 cost per line of code and factored by the total Source Lines of Code count contained in the CARD. Indirect Support was based on historical infrastructure costs from U.S. Naval Submarine Bases, as well as historical personnel costs from LOS ANGELES Class which were factored for the VIRGINIA Class crew size.

Sustainment Strategy:

The baseline sustainment strategy is structured to achieve 14 deployments during the 33 year design life for each of the total force of 30 VCS submarines. The first deployment occurs after a Post Shakedown Availability (PSA) conducted at the private industry construction yard. The deployment rate is achieved through maintaining material readiness using maintenance periods including three (3) Extended Drydocking Selected Restricted Availabilities (EDSRAs) and one (1) Depot Maintenance Period (DMP) scheduled and planned according to the required maintenance periods for major equipments and systems. The EDRSAs and DMP are expected to be performed at Navy depot maintenance facilities such as the Naval shipyards. Additional routine maintenance and repair are conducted throughout the submarine’s life cycle at the homeport Navy intermediate maintenance facility.

Changes to the equipment and system design are considered and implemented on a case by case basis which may increase maintenance periodicities and support an increase to 15 deployments during the life cycle for later submarines of the Class.

Antecedent Information:

O&S costs for the legacy system (SSN 688 Class) in TY$ and BY$ have not been previously compiled and tracked, nor has a comprehensive legacy Life Cycle Cost (LCC) estimate been prepared. Assembly of an accurate compilation O&S cost estimate for the SSN 688 Class using actual cost data going back to 1976 when USS LOS ANGELES was commissioned and then projecting those costs out to Calendar Year (CY) 2029 is also problematic based on the availability and detail of the historic data. VCS and legacy O&S comparisons are hampered by changes in required attack submarine force size where the SSN 688 Class at one time had 62 submarines

compared to the planned class size of 30 VCS submarines.

Unitized O&S Costs BY1995 $M		
Cost Element	**SSN 774 Average Annual Cost per Ship**	**LOS ANGELES CLASS (Antecedent) Average Annual Cost per Ship**
Unit-Level Manpower	8.98	5.45
Unit Operations	0.74	0.70
Maintenance	13.98	15.03
Sustaining Support	0.96	0.99
Continuing System Improvements	6.37	4.24
Indirect Support	4.37	4.11
Other	0.00	0.00
Total	35.40	30.52

Unitized Cost Comments:

The source of antecedent data is VAMOSC data for LOS ANGELES Class (SSN 688) submarines for the years 1984-2008, however, this data must be adjusted due to significant differences between the two classes, to achieve a comparable estimate. The 688 Class was comprised of 62 ships with major design changes in blocks of ships that had an original planned life of 30 years. Some of these 62 ships were retired at mid-life and, therefore, did not incur normal life of ship maintenance and operating costs.

There are several factors contributing to an apparent anomaly between the SSN 774 and SSN 688 per ship Unit Level Manpower costs. The costs for SSN 688 are lower than SSN 774 despite a larger crew size for SSN 688 due to the source and timing of the data. SSN 688 costs are extracted from VAMOSC using class average data 1984 - 2008. Manpower costs for the first several years of the data were approximately 65% of the most recent costs for the SSN 688 Class indicating real growth in pay and allowances (i.e., above inflation) over the period. The overall average, however, is significantly influenced by the lower initial costs. Further, 688 VAMOSC data reflect the average annual cost of ships in the fleet. VIRGINIA estimates were built using a ramp up/ramp down methodology and reflect the total annual manpower costs for the program from assignment of the first pre-commissioning crew of the lead ship through decommissioning of the last ship.

The total O&S Cost referenced below for the SSN 688 Class was derived using the average annual cost per ship, 62 ships in the class and an expected service life of 33 years. The 33-year service life is used for comparative purposes with the SSN 774 Class as SSN 688 ships were originally designed for 30 years and subsequently increased to 33 years.

	Total O&S Cost $M			
	Current Production APB Objective/Threshold		Current Estimate	
	SSN 774		SSN 774	LOS ANGELES CLASS (Antecedent)
Base Year	36216.6	39838.3	35038.7	62443.9
Then Year	98758.7	N/A	95627.9	N/A

Total O&S Costs Comments:
None

Disposal Costs

Disposal costs for the VIRGINIA Class are not included in Total Operating and Support (O&S) Costs. Total program disposal costs are estimated to be $1,177.9M Base Year (BY) 1995 (BY95); $3,130.8M Then Year (TY).