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RCS: DD-A&T(Q&A)823-178



Trident II (D-5) Sea-Launched Ballistic Missile UGM 133A (Trident II Missile)

As of FY 2021 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

UNCLASSIFIED

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Common Acronyms and Abbreviations for MDAP Programs

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

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

Program Information

Program Name

Trident II (D-5) Sea-Launched Ballistic Missile UGM 133A (Trident II Missile)

DoD Component

Navy

Responsible Office

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References

SAR Baseline (Production Estimate)

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated July 15, 1987

Approved APB

Navy Acquisition Executive (NAE) Approved Acquisition Program Baseline (APB) dated September 10, 2011

Mission and Description

The TRIDENT II (D5) Sea-Launched Ballistic Missile UGM 133A (TRIDENT II (D5) missile) developed an improved Submarine Launched Ballistic Missile with greater accuracy and payload capability at equivalent ranges as compared to the TRIDENT I (C4) system. TRIDENT II (D5) enhances United States (U.S.) strategic deterrence by providing a survivable sea-based system capable of engaging the full spectrum of potential targets. It enhances the U.S. position in strategic arms negotiation by providing a weapon system with performance and payload flexibility to accommodate various treaty initiatives. The TRIDENT II (D5) missile's increased payload allows the deterrent mission to be achieved with fewer submarines.

Executive Summary

Program Highlights Since Last Report

In September 2019, the program completed the second operational flight test (Commander Evaluation Test 2) of the TRIDENT II D5 Life Extended Missile.

In the area of rocket motors and post boost control system gas generators, the TRIDENT II (D5) missile program has maintained the solid rocket motor unit cost from FY 2014 PB as the Navy continues low-rate production of boost motors with Lockheed Martin and Northrop Grumman. There continues to be industrial base concerns regarding solid rocket motor manufacturers as well as their suppliers (such as Ammonium Perchlorate). The Navy is working closely with industrial partners and reaching out to other government programs to ensure Solid Rocket Motors industrial base stays viable and costs under control. The current budget maintains buying 12 rocket motor sets per year.

The PM continues to monitor the disparity between OSD approved and industry realized inflation indices to monitor its effects to the strategic weapon systems' operational engineering support. With cradle to grave responsibility, a broad range of engineering knowledge and unique skill sets must be maintained to support the Navy's and the Nation's primary strategic deterrent system.

While the TRIDENT II (D5) Missile program is over 90% delivered and expended, it has been decided by the Assistant Secretary of the Navy (Research, Development and Acquisition) the current APB is to remain open as the TRIDENT II (D5) missile will be sustained throughout the entire life of the OHIO Class submarine, and will also be the initial payload for the Ship, Submersible, Ballistic, Nuclear (SSBN) 826 COLUMBIA Class submarine.

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

History of Significant Developments Since Program Initiation

History of Significant Developments Since Program Initiation	
Date	Significant Development Description
March 1980	The Secretary of the Navy announces the intention to proceed with an Advanced Development Program for a Submarine Launched Ballistic Missile Modernization program.
October 1983	Milestone II - Inventory Objective: R&D Missiles - 30; Production Missiles - 715.
July 1987	Milestone III - Program based upon a missile procurement inventory objective of 815 missiles to support the outload and missile flight test program of 21 TRIDENT II submarines (13 new builds/8 backfit).
March 1990	TRIDENT II (D5) weapon system achieved IOC with the outload and deployment of USS TENNESSEE (Ship, Submersible, Ballistic, Navy (SSBN) 734).
January 1991	FY 1992 PB reduced the missile procurement inventory objective to 779 missiles to support the outload and the missile flight test program of 18 TRIDENT II submarines (10 new builds/8 backfits).
January 1993	FY 1994 PB reduced both the annual procurement rate of missiles and the missile inventory objective to 428 missiles to support the outload and a reduced missile flight test program of 10 TRIDENT II submarines (no backfits). Annual procurement quantities reduced from 66 to 24 in FY 1994 and 12 per year in FY 1998 and thereafter. Reduced flight tests led to the reduced inventory objective and reduced force structure. This force structure was based upon the outcome of the Defense Nuclear Posture Review (NPR) and was in accordance with Presidential Decision Directive/NSC-30 of September 21, 1994. The program decision was based upon the deferral of the decision on the D5 Backfit Program until POM 1996. Pending that decision, the backfit efforts were removed from the TRIDENT II (D5) Missile program.
January 1994	FY 1995 PB further reduced the missile procurement inventory objective to 389 missiles based on revision of several planning factors.
March 1995	The TRIDENT II (D5) Missile procurement program was revised to support a force level of 14 TRIDENT II submarines based on the conclusions of the NPR. Four Pacific TRIDENT submarines would be backfit to the TRIDENT II configuration beginning in FY 2000. New builds will complete with 10 TRIDENT II configured submarines. The new inventory objective of 434 missiles reflects the requirement to outload 14 submarines and a further reduction in the numbers of missiles to support the flight test program. New APB was approved.
3rd Quarter FY 1998	The TRIDENT II (D5) Missile inventory objective was reduced from 434 missiles to 425 by reducing the flight tests as a result of a new determination that flight test data from Demonstration and Shakedown Operations (DASOs) may be combined with Follow-On CINC Evaluation Test data to determine reliability and safety.
January 1999	FY 2000 PB contained funding in FY 2005 for the commencement of the TRIDENT II (D5) Missile Life Extension (LE) program.
December 1999	All TRIDENT II (D5) new build submarines had completed strategic loadout and had deployed.
December 2001	Program Decision Memorandum (PDM) II directed the TRIDENT II (D5) missile extend its service life from 30 to 44 years. Funding for this effort would support additional acquisition necessary to continue production of missile critical components, acquire additional missiles to support flight testing during the extended life and to replace missile electronics and guidance systems in all TRIDENT II (D5) missiles.
June 2002	Approval of APB reflecting service life extension of the TRIDENT II (D5) submarine from 30-

	44 years as directed by PDM II of 15 December 2001. Inventory Objective is now 540 missiles.
January 2011	TRIDENT II (D5) LE completed its system Critical Design Review.
September 2011	TRIDENT II (D5) missile submitted a revised acquisition program baseline approved by the Assistant Secretary of the Navy (Research, Development & Acquisition). The significant changes in this APB were a revised D5 LE funding profile, the addition of the Explosive Handling Wharf (EHW) #2 at the Strategic Weapons Facility, Pacific (SWFPAC), and Joint Fuze sustainment efforts.
June 2014	USS WEST VIRGINIA (SSBN 736) completed DASO with two successful D5 LE flight operations involving both the LE missile electronics packages and the Guidance LE subsystem.
November 2015	DASO flight operation with a fully configured D5 LE missile involving all four of the missile electronics packages and the Guidance LE subsystem.
February 2017	Initial Fleet Introduction of the fully configured D5 LE missile which involved all four missile electronics packages and the Guidance LE subsystem with the outload of the USS MARYLAND (SSBN 738).
April 2018	EHW#2 at SWFPAC received its Authority to Operate, as scheduled. This facility is critical to meeting workload demands of the Pacific fleet.
June 2018	Program completed the first operational flight test (Commander Evaluation Test 1) of the TRIDENT II (D5) LE missile, four months ahead of schedule.
September 2019	The program completed the second operational flight test (Commander Evaluation Test 2) of the TRIDENT II D5 Life Extended Missile.

Threshold Breaches

APB Breaches

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

Explanation of Breach

This schedule breach was previously reported in the December 2014 SAR.

Nunn-McCurdy Breaches

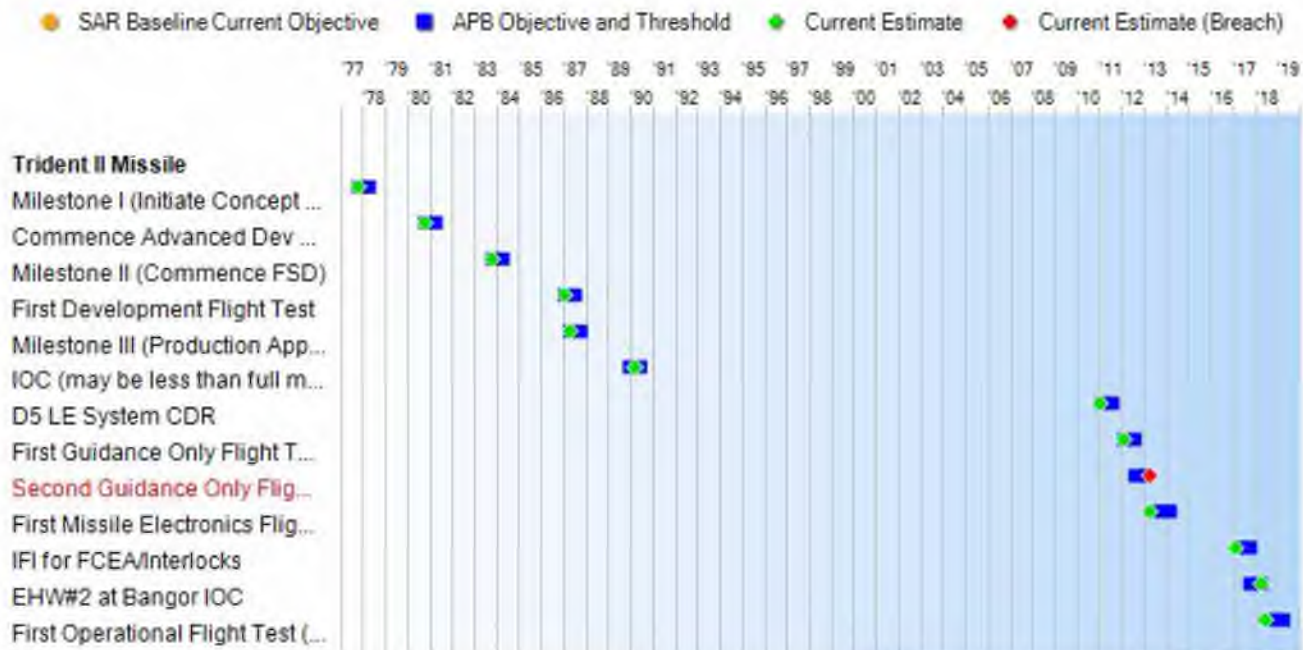
Current UCR Baseline

PAUC	None
APUC	None

Original UCR Baseline

PAUC	None
APUC	None

Schedule



Schedule Events				
Events	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate
Milestone I (Initiate Concept Definition)	Oct 1977	Oct 1977	Apr 1978	Oct 1977
Commence Advanced Dev Phase	Oct 1980	Oct 1980	Apr 1981	Oct 1980
Milestone II (Commence FSD)	Oct 1983	Oct 1983	Apr 1984	Oct 1983
First Development Flight Test	Jan 1987	Jan 1987	Jul 1987	Jan 1987
Milestone III (Production Approval)/ Award Initial Missile Production	Apr 1987	Apr 1987	Oct 1987	Apr 1987
IOC (may be less than full msl outload)	Dec 1989	Dec 1989	Jun 1990	Mar 1990
D5 LE System CDR	N/A	Feb 2011	Aug 2011	Jan 2011
First Guidance Only Flight Test (DASO-23)	N/A	Feb 2012	Aug 2012	Feb 2012
Second Guidance Only Flight Test (DASO-24)	N/A	Aug 2012	Feb 2013	Apr 2013'
First Missile Electronics Flight Test (PTM-1/DASO-25)	N/A	Sep 2013	Mar 2014	Apr 2013
IFI for FCEA/Interlocks	N/A	Apr 2017	Oct 2017	Feb 2017
EHW#2 at Bangor IOC	N/A	Oct 2017	Apr 2018	Apr 2018
First Operational Flight Test (CET)	N/A	Oct 2018	Apr 2019	Jun 2018

¹ APB Breach

Change Explanations

None

Acronyms and Abbreviations

CDR - Critical Design Review
CET - Commander Evaluation Test
D5 LE - D5 Life Extension
DASO - Demonstration and Shakedown Operation
Dev - Development
EHW - Explosive Handling Wharf
FCEA - Flight Control Electronics Assembly
FSD - Full Scale Development
IFI - Initial Fleet Introduction
MSL - missile
PTM - Proofing Test Missile

Performance

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

Track to Budget

RDT&E

Appn	BA	PE	
Navy	1319	07	0101221N
	Project	Name	
	0951	JOINT WARHEAD FUZE SUSTAINMENT PROGRAM	
Navy	1319	04	0603371N
	Project	Name	
	0951	TRIDENT II/TRIDENT II (Sunk)	
Navy	1319	04	0604327N
	Project	Name	
	9611	HARD AND DEEPLY BURIED TARGET DEFEAT SYSTEM/Advanced Conventional Strike Capability Demonstration (Sunk)	
Navy	1319	04	0604363N
	Project	Name	
	0951	TRIDENT II/TRIDENT II (Sunk)	

Procurement

Appn	BA	PE	
Navy	1507	01	0101228N
	Line Item	Name	
	1150	TRIDENT II (D-5) Missile (Sunk)	
	1250	TRIDENT II MODS (Shared)	

Notes

The funding profile for Proc (Weapons Proc, Navy (WPN)) does not match that found in the FY 2021 PB controls for WPN after FY 2011. Beginning in FY 2012, WPN funding is shared between Acquisition and O&S costs in the SAR and, hence, the O&S costs are not reflected in the TRIDENT II (D5) missile acquisition.

MILCON

Appn	BA	PE	
Navy	1205	01	0202576N
	Project	Name	
		Facilities Restoration and MOD- Grounds (Shared) (Sunk)	
Navy	1205	01	0203176N
	Project	Name	
		Facilities Restoration and MOD- Fleet (Shared) (Sunk)	

Ops			
Navy	1205	01	0212176N
	Project	Name	
	68436990	Fleet Ballistic Missile (Sunk)	
Navy	1205	01	0212576N
	Project	Name	
		Facilities New Footprint (Shared) (Sunk)	
Navy	1205	01	0703676N
	Project	Name	
		Facility Restoration and MOD - Maint and Prod (Shared) (Sunk)	
Navy	1205	01	0703967N
	Project	Name	
	60042117	Missile Motor Magazines	
Navy	1205	01	0712976N
	Project	Name	
	60495822	Facilities - D5 Missile Motor Receipt/Storage Facility	
Navy	1205	01	0805976N
	Project	Name	
		Facility Restoration and MOD - Training (Shared) (Sunk)	

Cost and Funding

Cost Summary

Total Acquisition Cost							
Appropriation	BY 1983 \$M			BY 1983 \$M	TY \$M		
	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate	SAR Baseline Production Estimate	Current APB Production Objective	Current Estimate
RDT&E	8434.9	8783.9	9662.3	8792.5	9453.2	10126.0	10155.2
Procurement	17588.5	18406.7	20247.4	18535.6	25396.9	30643.5	31281.8
Flyaway	--	--	--	14183.5	--	--	23970.4
Recurring	--	--	--	14183.5	--	--	23970.4
Non Recurring	--	--	--	0.0	--	--	0.0
Support	--	--	--	4352.1	--	--	7311.4
Other Support	--	--	--	4328.5	--	--	7276.0
Initial Spares	--	--	--	23.6	--	--	35.4
MILCON	532.9	757.6	833.4	656.6	668.4	1220.3	1041.7
Acq O&M	0.0	0.0	--	0.0	0.0	0.0	0.0
Total	26556.3	27948.2	N/A	27984.7	35518.5	41989.8	42478.7

Cost Notes

No cost estimate for the program has been completed in the previous year.

Total Quantity			
Quantity	SAR Baseline Production Estimate	Current APB Production	Current Estimate
RDT&E	30	28	28
Procurement	815	533	533
Total	845	561	561

Cost and Funding

Funding Summary

Appropriation Summary									
FY 2021 President's Budget / December 2019 SAR (TY\$ M)									
Appropriation	Prior	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	To Complete	Total
RDT&E	10104.7	23.2	17.3	6.9	3.1	0.0	0.0	0.0	10155.2
Procurement	28642.4	647.6	603.0	495.8	387.4	299.3	206.3	0.0	31281.8
MILCON	991.2	50.5	0.0	0.0	0.0	0.0	0.0	0.0	1041.7
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2021 Total	39738.3	721.3	620.3	502.7	390.5	299.3	206.3	0.0	42478.7
PB 2020 Total	39747.6	721.3	628.2	498.8	434.3	300.5	0.0	0.0	42330.7
Delta	-9.3	0.0	-7.9	3.9	-43.8	-1.2	206.3	0.0	148.0

Quantity Summary										
FY 2021 President's Budget / December 2019 SAR (TY\$ M)										
Quantity	Undistributed	Prior	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	To Complete	Total
Development	28	0	0	0	0	0	0	0	0	28
Production	0	533	0	0	0	0	0	0	0	533
PB 2021 Total	28	533	0	0	0	0	0	0	0	561
PB 2020 Total	28	533	0	0	0	0	0	0	0	561
Delta	0	0	0	0	0	0	0	0	0	0

Cost and Funding

Annual Funding By Appropriation

Annual Funding							
1319 RDT&E Research, Development, Test, and Evaluation, Navy							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
1978	--	--	--	--	--	--	5.0
1979	--	--	--	--	--	--	5.0
1980	--	--	--	--	--	--	25.6
1981	--	--	--	--	--	--	96.7
1982	--	--	--	--	--	--	198.4
1983	--	--	--	--	--	--	351.0
1984	--	--	--	--	--	--	1447.3
1985	--	--	--	--	--	--	1982.6
1986	--	--	--	--	--	--	1942.3
1987	--	--	--	--	--	--	1565.3
1988	--	--	--	--	--	--	1029.7
1989	--	--	--	--	--	--	546.5
1990	--	--	--	--	--	--	169.5
1991	--	--	--	--	--	--	43.0
1992	--	--	--	--	--	--	2.2
1993	--	--	--	--	--	--	0.4
1994	--	--	--	--	--	--	--
1995	--	--	--	--	--	--	0.5
1996	--	--	--	--	--	--	0.3
1997	--	--	--	--	--	--	--
1998	--	--	--	--	--	--	--
1999	--	--	--	--	--	--	--
2000	--	--	--	--	--	--	--
2001	--	--	--	--	--	--	--
2002	--	--	--	--	--	--	--
2003	--	--	--	--	--	--	--
2004	--	--	--	--	--	--	--
2005	--	--	--	--	--	--	--
2006	--	--	--	--	--	--	--
2007	--	--	--	--	--	--	19.4
2008	--	--	--	--	--	--	--
2009	--	--	--	--	--	--	--
2010	--	--	--	--	--	--	14.0
2011	--	--	--	--	--	--	21.7
2012	--	--	--	--	--	--	41.5

Trident II Missile

December 2019 SAR

2013	--	--	--	--	--	--	56.2
2014	--	--	--	--	--	--	83.8
2015	--	--	--	--	--	--	81.7
2016	--	--	--	--	--	--	93.4
2017	--	--	--	--	--	--	111.9
2018	--	--	--	--	--	--	108.2
2019	--	--	--	--	--	--	61.6
2020	--	--	--	--	--	--	23.2
2021	--	--	--	--	--	--	17.3
2022	--	--	--	--	--	--	6.9
2023	--	--	--	--	--	--	3.1
Subtotal	28	--	--	--	--	--	10155.2

Annual Funding 1319 RDT&E Research, Development, Test, and Evaluation, Navy							
Fiscal Year	Quantity	BY 1983 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
1978	--	--	--	--	--	--	7.2
1979	--	--	--	--	--	--	6.5
1980	--	--	--	--	--	--	30.1
1981	--	--	--	--	--	--	104.2
1982	--	--	--	--	--	--	203.1
1983	--	--	--	--	--	--	343.9
1984	--	--	--	--	--	--	1368.5
1985	--	--	--	--	--	--	1818.1
1986	--	--	--	--	--	--	1731.2
1987	--	--	--	--	--	--	1355.1
1988	--	--	--	--	--	--	862.6
1989	--	--	--	--	--	--	439.3
1990	--	--	--	--	--	--	130.9
1991	--	--	--	--	--	--	32.1
1992	--	--	--	--	--	--	1.6
1993	--	--	--	--	--	--	0.3
1994	--	--	--	--	--	--	--
1995	--	--	--	--	--	--	0.3
1996	--	--	--	--	--	--	0.2
1997	--	--	--	--	--	--	--
1998	--	--	--	--	--	--	--
1999	--	--	--	--	--	--	--
2000	--	--	--	--	--	--	--
2001	--	--	--	--	--	--	--
2002	--	--	--	--	--	--	--
2003	--	--	--	--	--	--	--
2004	--	--	--	--	--	--	--
2005	--	--	--	--	--	--	--
2006	--	--	--	--	--	--	--
2007	--	--	--	--	--	--	10.7
2008	--	--	--	--	--	--	--
2009	--	--	--	--	--	--	--
2010	--	--	--	--	--	--	7.4
2011	--	--	--	--	--	--	11.2
2012	--	--	--	--	--	--	21.1
2013	--	--	--	--	--	--	28.2
2014	--	--	--	--	--	--	41.5
2015	--	--	--	--	--	--	39.9
2016	--	--	--	--	--	--	44.9
2017	--	--	--	--	--	--	52.8

Trident II Missile

December 2019 SAR

2018	--	--	--	--	--	--	49.8
2019	--	--	--	--	--	--	27.8
2020	--	--	--	--	--	--	10.3
2021	--	--	--	--	--	--	7.5
2022	--	--	--	--	--	--	2.9
2023	--	--	--	--	--	--	1.3
Subtotal	28	--	--	--	--	--	8792.5

Annual Funding 1507 Procurement Weapons Procurement, Navy							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
1985	--	--	--	--	--	160.8	160.8
1986	--	--	--	--	--	508.4	508.4
1987	21	1051.6	--	--	1051.6	295.2	1346.8
1988	66	1710.0	--	--	1710.0	323.5	2033.5
1989	66	1586.8	--	--	1586.8	252.2	1839.0
1990	41	1114.2	--	--	1114.2	286.4	1400.6
1991	52	1242.9	--	--	1242.9	269.5	1512.4
1992	28	817.6	--	--	817.6	279.3	1096.9
1993	21	719.6	--	--	719.6	258.5	978.1
1994	24	989.2	--	--	989.2	111.5	1100.7
1995	18	606.5	--	--	606.5	58.9	665.4
1996	6	186.5	--	--	186.5	324.2	510.7
1997	7	209.1	--	--	209.1	108.1	317.2
1998	5	150.8	--	--	150.8	117.7	268.5
1999	5	189.3	--	--	189.3	126.4	315.7
2000	12	362.7	--	--	362.7	122.7	485.4
2001	12	355.2	--	--	355.2	81.9	437.1
2002	12	378.8	--	--	378.8	154.0	532.8
2003	12	553.5	--	--	553.5	19.5	573.0
2004	12	640.0	--	--	640.0	0.9	640.9
2005	5	612.9	--	--	612.9	102.4	715.3
2006	--	708.9	--	--	708.9	196.3	905.2
2007	--	766.7	--	--	766.7	147.4	914.1
2008	12	862.6	--	--	862.6	179.2	1041.8
2009	24	889.2	--	--	889.2	178.9	1068.1
2010	24	867.8	--	--	867.8	184.4	1052.2
2011	24	935.7	--	--	935.7	177.5	1113.2
2012	24	624.7	--	--	624.7	131.8	756.5
2013	--	420.5	--	--	420.5	180.8	601.3
2014	--	463.4	--	--	463.4	202.4	665.8
2015	--	454.0	--	--	454.0	203.0	657.0
2016	--	397.1	--	--	397.1	206.2	603.3
2017	--	403.9	--	--	403.9	210.2	614.1
2018	--	408.5	--	--	408.5	234.3	642.8
2019	--	427.9	--	--	427.9	139.9	567.8
2020	--	436.7	--	--	436.7	210.9	647.6
2021	--	444.2	--	--	444.2	158.8	603.0
2022	--	359.7	--	--	359.7	136.1	495.8
2023	--	298.7	--	--	298.7	88.7	387.4
2024	--	208.9	--	--	208.9	90.4	299.3

Trident II Missile

December 2019 SAR

2025	--	114.1	--	--	114.1	92.2	206.3
Subtotal	533	23970.4	--	--	23970.4	7311.4	31281.8

Annual Funding 1507 Procurement Weapons Procurement, Navy							
Fiscal Year	Quantity	BY 1983 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
1985	--	--	--	--	--	137.7	137.7
1986	--	--	--	--	--	420.7	420.7
1987	21	839.8	--	--	839.8	235.8	1075.6
1988	66	1314.1	--	--	1314.1	248.6	1562.7
1989	66	1173.3	--	--	1173.3	186.5	1359.8
1990	41	796.4	--	--	796.4	204.7	1001.1
1991	52	866.5	--	--	866.5	187.8	1054.3
1992	28	555.9	--	--	555.9	189.9	745.8
1993	21	480.5	--	--	480.5	172.6	653.1
1994	24	647.8	--	--	647.8	73.0	720.8
1995	18	390.9	--	--	390.9	38.0	428.9
1996	6	118.7	--	--	118.7	206.5	325.2
1997	7	131.8	--	--	131.8	68.2	200.0
1998	5	94.0	--	--	94.0	73.3	167.3
1999	5	116.5	--	--	116.5	77.8	194.3
2000	12	220.2	--	--	220.2	74.6	294.8
2001	12	213.0	--	--	213.0	49.1	262.1
2002	12	224.7	--	--	224.7	91.4	316.1
2003	12	321.8	--	--	321.8	11.3	333.1
2004	12	361.3	--	--	361.3	0.5	361.8
2005	5	336.7	--	--	336.7	56.3	393.0
2006	--	379.9	--	--	379.9	105.2	485.1
2007	--	402.2	--	--	402.2	77.3	479.5
2008	12	445.4	--	--	445.4	92.5	537.9
2009	24	452.6	--	--	452.6	91.1	543.7
2010	24	434.3	--	--	434.3	92.3	526.6
2011	24	459.5	--	--	459.5	87.2	546.7
2012	24	302.2	--	--	302.2	63.8	366.0
2013	--	200.6	--	--	200.6	86.2	286.8
2014	--	218.0	--	--	218.0	95.2	313.2
2015	--	210.2	--	--	210.2	94.0	304.2
2016	--	180.6	--	--	180.6	93.8	274.4
2017	--	180.1	--	--	180.1	93.8	273.9
2018	--	178.2	--	--	178.2	102.1	280.3
2019	--	183.0	--	--	183.0	59.8	242.8
2020	--	183.1	--	--	183.1	88.4	271.5
2021	--	182.6	--	--	182.6	65.2	247.8
2022	--	144.9	--	--	144.9	54.9	199.8
2023	--	118.0	--	--	118.0	35.0	153.0
2024	--	80.9	--	--	80.9	35.0	115.9

Trident II Missile

December 2019 SAR

2025	--	43.3	--	--	43.3	35.0	78.3
Subtotal	533	14183.5	--	--	14183.5	4352.1	18535.6

The funding profile for Proc (Weapons Proc, Navy (WPN)) does not match that found in the FY 2021 PB controls for WPN after FY 2011. Beginning in FY 2012, WPN funding is shared between Acquisition and O&S costs in the SAR and, hence, the O&S costs are not reflected in the TRIDENT II (D5) missile acquisition.

Cost Quantity Information		
1507 Procurement Weapons Procurement, Navy		
Fiscal Year	Quantity	End Item Recurring Flyaway (Aligned With Quantity) BY 1983 \$M
1985	--	--
1986	--	--
1987	21	737.2
1988	66	1068.2
1989	66	953.0
1990	41	796.4
1991	52	901.9
1992	28	541.8
1993	21	480.5
1994	24	647.8
1995	18	390.9
1996	6	118.7
1997	7	131.9
1998	5	94.0
1999	5	116.5
2000	12	220.4
2001	12	213.1
2002	12	224.7
2003	12	321.8
2004	12	779.6
2005	5	827.3
2006	--	--
2007	--	--
2008	12	628.9
2009	24	1015.2
2010	24	1163.8
2011	24	997.5
2012	24	814.2
2013	--	--
2014	--	--
2015	--	--
2016	--	--
2017	--	--

2018	--	--
2019	--	--
2020	--	--
2021	--	--
2022	--	--
2023	--	--
2024	--	--
2025	--	--
Subtotal	533	14185.3

Annual Funding 1205 MILCON Military Construction, Navy and Marine Corps	
Fiscal Year	TY \$M
	Total Program
1984	79.3
1985	82.4
1986	126.3
1987	21.0
1988	18.1
1989	15.4
1990	7.6
1991	70.5
1992	--
1993	--
1994	--
1995	--
1996	--
1997	--
1998	--
1999	--
2000	5.7
2001	1.1
2002	4.2
2003	7.2
2004	--
2005	--
2006	2.8
2007	--
2008	28.7
2009	--
2010	--
2011	--
2012	78.0
2013	264.4
2014	24.9
2015	83.8
2016	--
2017	--
2018	--
2019	69.8
2020	50.5
Subtotal	1041.7

Annual Funding 1205 MILCON Military Construction, Navy and Marine Corps	
Fiscal Year	BY 1983 \$M
	Total Program
1984	72.8
1985	73.4
1986	109.3
1987	17.6
1988	14.6
1989	12.0
1990	5.7
1991	51.3
1992	--
1993	--
1994	--
1995	--
1996	--
1997	--
1998	--
1999	--
2000	3.6
2001	0.7
2002	2.6
2003	4.3
2004	--
2005	--
2006	1.6
2007	--
2008	15.4
2009	--
2010	--
2011	--
2012	38.8
2013	129.7
2014	12.0
2015	39.5
2016	--
2017	--
2018	--
2019	30.2
2020	21.5
Subtotal	656.6

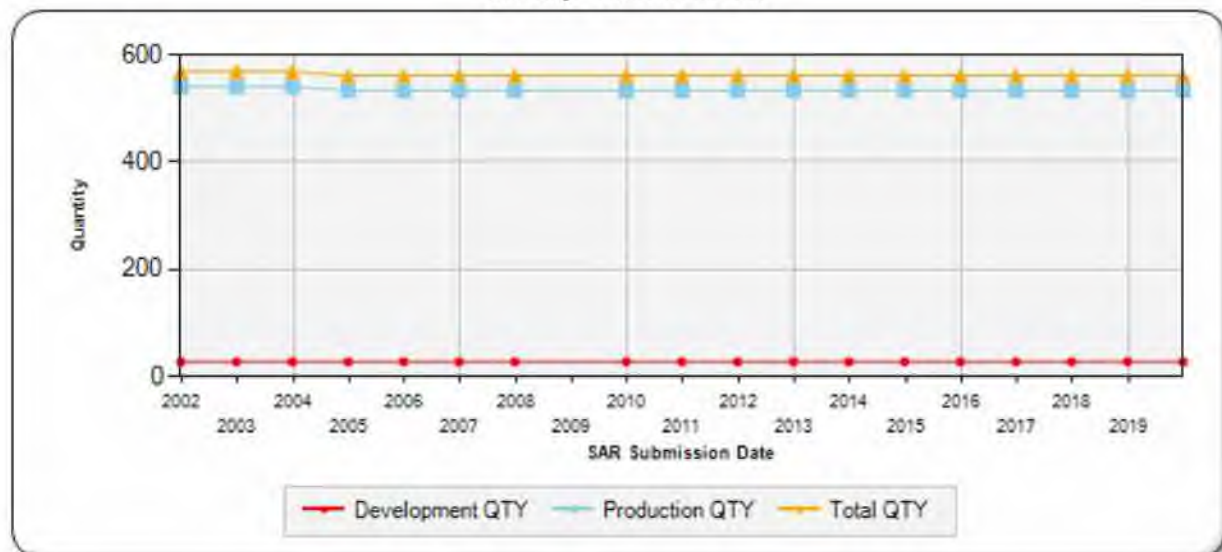
Charts

Trident II Missile first began SAR reporting in December 1997

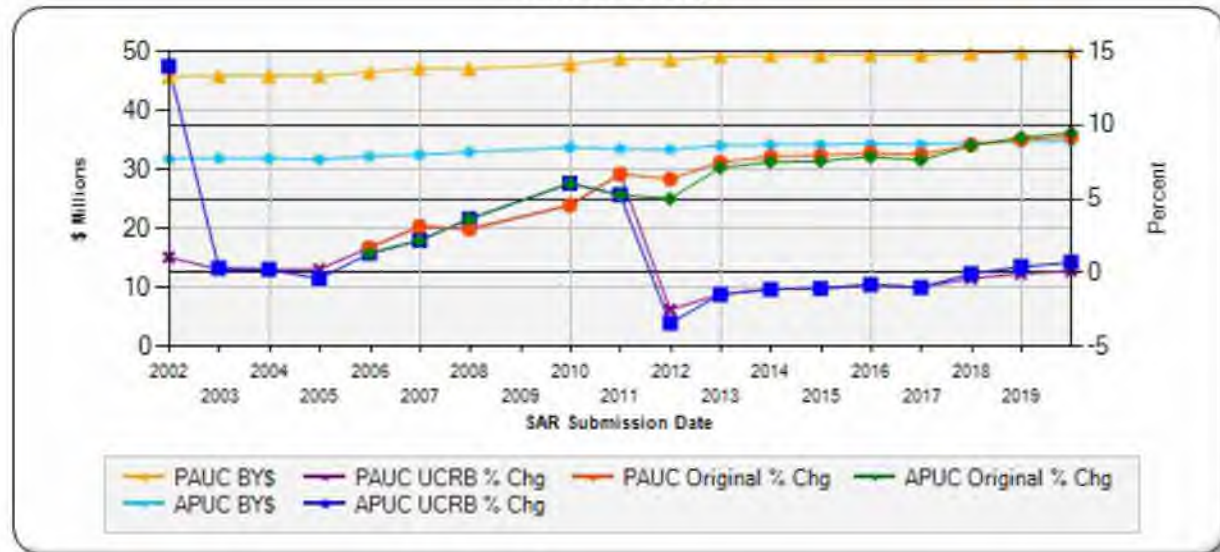
Program Acquisition Cost - Trident II Missile
Base Year 1983 \$M



Quantity - Trident II Missile



Unit Cost - Trident II Missile
Base Year 1983 \$M



Risks

Significant Schedule and Technical Risks

Significant Schedule and Technical Risks	
Current Estimate (December 2019)	
1.	Disparity between OSD approved and industry realized inflation indices has an effect on the strategic weapons systems' operational engineering support and the ability to maintain a broad range of engineering knowledge and skill sets required to support the strategic weapon system.
2.	Industrial base concerns in regards to solid rocket motor manufacturers and their suppliers. The industrial base has been reduced to one primary manufacturer/supplier which is Northrup Grumman. This manufacturing base has a secondary effect on the Navy as they are the sole consumer of solid rocket motor production and could impact future budgets as they will be the only government entity requiring this technology and manufacturing.

Risks

Risk and Sensitivity Analysis

Risks and Sensitivity Analysis	
Current Baseline Estimate (September 2011)	
1.	The TRIDENT II (D5) Missile has reached its original design life goal and, like any other aging weapon system, will require increased maintenance and repair to sustain a safe, reliable, and accurate SWS and an adequate industrial base and workforce expertise to ensure that this system will be available as the initial payload for the follow-on SSBN 826 COLUMBIA Class submarine.
Original Baseline Estimate (July 1987)	
1.	N/A
Revised Original Estimate (June 2002)	
1.	N/A
Current Procurement Cost (December 2019)	
1.	Current Procurement Cost matches the Current Baseline Estimate

Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	10/30/1983	10/30/1983
Approved Quantity	21	21
Reference	Milestone II ADM	Milestone II ADM
Start Year	1983	1983
End Year	1987	1987

Foreign Military Sales

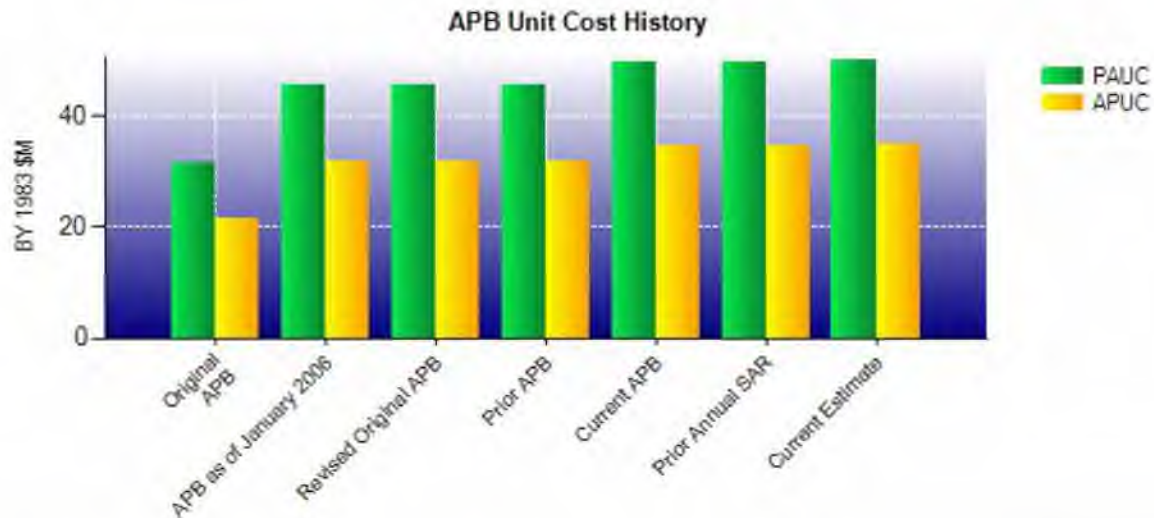
None

Nuclear Costs

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

Unit Cost

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 1983 \$M	BY 1983 \$M	% Change
	Current UCR Baseline (Sep 2011 APB)	Current Estimate (Dec 2019 SAR)	
Program Acquisition Unit Cost			
Cost	27948.2	27984.7	
Quantity	561	561	
Unit Cost	49.819	49.884	+0.13
Average Procurement Unit Cost			
Cost	18406.7	18535.6	
Quantity	533	533	
Unit Cost	34.534	34.776	+0.70
Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 1983 \$M	BY 1983 \$M	% Change
	Revised Original UCR Baseline (Jun 2002 APB)	Current Estimate (Dec 2019 SAR)	
Program Acquisition Unit Cost			
Cost	25943.7	27984.7	
Quantity	568	561	
Unit Cost	45.676	49.884	+9.21
Average Procurement Unit Cost			
Cost	17155.2	18535.6	
Quantity	540	533	
Unit Cost	31.769	34.776	+9.47



APB Unit Cost History					
Item	Date	BY 1983 \$M		TY \$M	
		PAUC	APUC	PAUC	APUC
Original APB	Jul 1987	31.428	21.581	42.034	31.162
APB as of January 2006	Jun 2002	45.676	31.769	66.098	51.266
Revised Original APB	Jun 2002	45.676	31.769	66.098	51.266
Prior APB	Jun 2002	45.676	31.769	66.098	51.266
Current APB	Sep 2011	49.819	34.534	74.848	57.492
Prior Annual SAR	Dec 2018	49.791	34.677	75.456	58.411
Current Estimate	Dec 2019	49.884	34.776	75.720	58.690

SAR Unit Cost History

Current SAR Baseline to Current Estimate (TY \$M)									
PAUC Production Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
42.034	-0.709	9.302	3.380	0.180	16.199	0.000	5.334	33.686	75.720

Current SAR Baseline to Current Estimate (TY \$M)									
Initial APUC Production Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
31.162	-0.685	3.970	3.215	0.175	15.239	0.000	5.614	27.528	58.690

SAR Baseline History				
Item	SAR Planning Estimate	SAR Development Estimate	SAR Production Estimate	Current Estimate
Milestone I	N/A	Oct 1977	Oct 1977	Oct 1977
Milestone II	N/A	Oct 1983	Oct 1983	Oct 1983
Milestone III	N/A	Mar 1987	Apr 1987	Apr 1987
IOC	N/A	Dec 1989	Dec 1989	Mar 1990
Total Cost (TY \$M)	N/A	37645.1	35518.5	42478.7
Total Quantity	N/A	740	845	561
PAUC	N/A	50.872	42.034	75.720

Cost Variance

Summary TY \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	9453.2	25396.9	668.4	35518.5
Previous Changes				
Economic	-37.5	-370.3	+3.9	-403.9
Quantity	-48.0	-6671.1	--	-6719.1
Schedule	+74.8	+1713.6	+108.0	+1896.4
Engineering	-0.8	+93.1	+8.5	+100.8
Estimating	+714.1	+8047.1	+252.9	+9014.1
Other	--	--	--	--
Support	--	+2923.9	--	+2923.9
Subtotal	+702.6	+5736.3	+373.3	+6812.2
Current Changes				
Economic	+0.6	+5.1	+0.5	+6.2
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-1.2	+75.2	-0.5	+73.5
Other	--	--	--	--
Support	--	+68.3	--	+68.3
Subtotal	-0.6	+148.6	--	+148.0
Total Changes	+702.0	+5884.9	+373.3	+6960.2
Current Estimate	10155.2	31281.8	1041.7	42478.7

Summary BY 1983 \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	8434.9	17588.5	532.9	26556.3
Previous Changes				
Economic	--	--	--	--
Quantity	-40.0	-3930.8	--	-3970.8
Schedule	+32.3	-32.2	+35.1	+35.2
Engineering	+1.3	+50.4	+4.2	+55.9
Estimating	+364.7	+3597.0	+84.6	+4046.3
Other	--	--	--	--
Support	--	+1209.7	--	+1209.7
Subtotal	+358.3	+894.1	+123.9	+1376.3
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	-0.1	--	--	-0.1
Engineering	--	--	--	--
Estimating	-0.6	+27.9	-0.2	+27.1
Other	--	--	--	--
Support	--	+25.1	--	+25.1
Subtotal	-0.7	+53.0	-0.2	+52.1
Total Changes	+357.6	+947.1	+123.7	+1428.4
Current Estimate	8792.5	18535.6	656.6	27984.7

Previous Estimate: December 2018

RDT&E	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+0.6
Re-phasing effort to properly align with the current Mk5A ALT 370 program schedule. (Schedule)	-0.1	0.0
Decrease to the Mk5 ALT 370 program due to Small Business Innovative Research taxes to meet statutory requirements. (Estimating)	-0.3	-0.6
Adjustment for current and prior escalation. (Estimating)	-0.3	-0.6
RDT&E Subtotal	-0.7	-0.6

Procurement	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+5.1
Increase to quantities of Flight Control Electronics Assemblies that are required for the D5 Life Extension. (Estimating)	+3.8	+9.6
Funding realignment to O&S for Operational Engineering Support in the areas of reliability maintenance, performance evaluation, and accuracy to sustain and address near and mid-term risks to the wholeness of the TRIDENT II D5 program. Required to sustain 533 TRIDENT II missiles and maintain today's demonstrated performance reliability, accuracy, and viability of the Navy's strategic deterrent. (Estimating)	-18.4	-46.7
Increase in order-to-sustain the strategic weapon system through the entire life of the OHIO Class and as the initial payload for Ship, Submersible, Ballistic, Navy (SSBN) 826 COLUMBIA Class submarines. (Estimating)	+43.3	+114.1
Adjustment for current and prior escalation. (Estimating)	-0.8	-1.8
Adjustment for current and prior escalation. (Support)	-0.2	-0.6
Increase in Other Support. [was: 1) Funding decrease, which resulted from the Integrated Flight Initialization System Refresh being procured in a prior year, which allowed funds to be available for higher Navy priority (FY 2019 -8.7M; 2) Funding realignment from Support to Flyaway for the increased quantities for the Flight Control Electronics Assemblies (FY 2021 -2.2M; FY 2022 -9.5M); 3) Adjustment for current and prior escalation (FY 2023 -1.1M; FY 2024 -1.2M); and 4) Increase in order-to-sustain the strategic weapon system through the entire life of the OHIO Class and as the initial payload for Ship, Submersible, Ballistic, Navy (SSBN) 826 COLUMBIA Class submarines (FY 2025 92.2M).] (Support)	+25.3	+68.9
Procurement Subtotal	+53.0	+148.6

MILCON	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+0.5
Adjustment for current and prior escalation. (Estimating)	-0.2	-0.5
MILCON Subtotal	-0.2	0.0

Contracts

Contract Identification	
Appropriation:	Procurement
Contract Name:	FY 15 Guidance Strategic Programs Alteration (SPALT)
Contractor:	Charles Stark Draper Laboratory
Contractor Location:	55 Technology Square Cambridge, MA 02139
Contract Number:	N00030-15-C-0003
Contract Type:	Fixed Price Incentive(Firm Target) (FPIF)
Award Date:	February 02, 2015
Definitization Date:	February 02, 2015

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
302.4	41.0	869	302.4	41.0	869	302.4	302.4

Contract Variance			
Item	Cost Variance		Schedule Variance
Cumulative Variances To Date (1/31/2020)	+4.3		-1.6
Previous Cumulative Variances	+2.6		-2.9
Net Change	+1.7		+1.3

Cost and Schedule Variance Explanations

The favorable net change in the cost variance is due to final cost invoice timing issue for the sensor repair and test capabilities effort. Effort has been completed, however the final cost invoice is still needed. Favorable cost variance will diminish once invoice is received.

The favorable net change in the schedule variance is due to the completion of some of the previously delayed work on electronic components and sensor instruments production. Delay was originally from late delivery on previous annual sensor procurements. Certain instruments previously experienced delays due to throughput issues and high amounts of rework, but finished delivery within the contract delivery date. Electronic components continue to be delayed due to availability of material. All schedule delays are expected to be managed within program resources.

Notes

The FY 2015 Guidance contract specifies a Ceiling Price that applies to the Fixed Price Incentive Production CLIN only (Item 0001). The remainder of the contract does not have a Ceiling Price.

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

Contract Identification

Appropriation: Procurement
Contract Name: FY 16 Guidance Strategic Programs Alteration (SPALT)
Contractor: Charles Stark Draper Lab
Contractor Location: 55 Technology Square
 Cambridge, MA 02139
Contract Number: N00030-16-C-0008
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: February 02, 2016
Definitization Date: February 02, 2016

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
163.6	41.1	869	163.6	41.1	869	163.6	163.6

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (1/31/2020)	-2.4	-2.5
Previous Cumulative Variances	-1.8	-4.1
Net Change	-0.6	+1.6

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to 1) additional personnel resources needed to deliver planned units after previous technical and efficiency issues led to delays in the delivery schedule; 2) unfavorable cost variance from reworked and scrapped circuit card modules from a wiring board contamination issue; and 3) subcontractor unfavorable rate change. All unfavorable cost variances are expected to be managed within program resources.

The favorable net change in the schedule variance is due to 1) delayed units have started to ship again after a stop-work order was issued to investigate a degradation problem; and 2) previously delayed units completed their FY 2016 contracted deliveries.

Notes

The FY 2016 Guidance SPALT contract specifies a Ceiling Price that applies to the Fixed Price Incentive Production CLIN (Item 0001). The remainder of the contract does not have a Ceiling Price.

Contract Identification

Appropriation: Procurement
Contract Name: FY 17 Guidance Strategic Programs Alteration (SPALT)
Contractor: Charles Stark Draper Laboratory
Contractor Location: 55 Technology Square
 Cambridge, MA 02139
Contract Number: N00030-17-C-0008
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: February 01, 2017
Definitization Date: January 26, 2017

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
53.5	61.7	905	304.6	212.2	905	304.6	304.6

Target Price Change Explanation

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

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (1/31/2020)	-0.9	-2.9
Previous Cumulative Variances	+3.7	-0.4
Net Change	-4.6	-2.5

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to 1) delays to deliveries on previous contracts have cascaded to the FY 2017 contract; 2) chip degradation issues have led to a need to qualify a new chip, which has primarily delayed the FY 2017 deliveries; and 3) delayed deliveries of units on previous contracts led to a late ramp up of deliveries on the FY 2017 delivery efforts. All schedule delays are expected to be managed within program resources.

The unfavorable net change in the schedule variance is due to 1) subassembly rework and total production labor; and 2) cost growth from technical issue investigations. All unfavorable costs are expected to be managed within program resources.

Notes

The FY 2017 Guidance contract specifies a Ceiling Price that applies to the Fixed Price Incentive Production CLINs only (Items 0001, 0002 and 0007). The remainder of the contract is comprised of option CLINs that do not have a Ceiling Price.

Contract Identification

Appropriation: Procurement
Contract Name: TRIDENT II FY 17 Production and Deployed Support
Contractor: Lockheed Martin Space Systems
Contractor Location: 1111 Lockheed Martin Way
Sunnyvale, CA 94089
Contract Number: N00030-16-C-0100
Contract Type: Fixed Price Incentive(Firm Target) (FPIF), Cost Plus Fixed Fee (CPFF)
Award Date: July 14, 2016
Definitization Date: September 30, 2016

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
106.2	654.7	N/A	789.2	654.7	N/A	789.2	789.2

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to contract definitization, contract options exercised, and contract modifications.

Contract Variance			
Item	Cost Variance		Schedule Variance
Cumulative Variances To Date (1/31/2020)	+10.8		-34.9
Previous Cumulative Variances	+12.5		-34.8
Net Change	-1.7		-0.1

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to the reduction of favorable cost variance associated with fewer than planned junior staff supporting Ordnance Structures and Controls and Systems Support/Support Equipment. The cumulative cost variance remains favorable and is expected to achieve schedule recovery.

The unfavorable net change in the schedule variance is due to 1) slower start up than planned for certain Test Missile Kit circuit cards and package builds resulting from focus on completing effort for prior contracts; 2) delays with encoders and certain radio frequency units; 3) delays associated with support of structures and controls; 4) delays associated with certain requalification efforts; and 5) delays with support systems and support equipment resulting from ongoing impacts from hurricanes. These schedule delays are expected to be managed within program resources.

Notes

The FY 2017 Production and Deployed Systems Support contract specifies a ceiling price that applies to the Fixed Price Incentive Production CLINs.

Contract Identification

Appropriation: Procurement
Contract Name: TRIDENT II FY 2018 Production and Deployed Support
Contractor: Lockheed Martin Space Systems
Contractor Location: 1111 Lockheed Martin Way
Sunnyvale, CA 94089
Contract Number: N00030-17-C-0100
Contract Type: Fixed Price Incentive(Firm Target) (FPIF), Cost Plus Fixed Fee (CPFF)
Award Date: July 31, 2017
Definitization Date: October 01, 2017

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
418.7	578.5	N/A	1525.7	578.5	N/A	1525.7	1525.7

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to contract definitization and the exercise of options and contract modifications.

Contract Variance			
Item	Cost Variance	Schedule Variance	
Cumulative Variances To Date (1/31/2020)	+12.3	-23.6	
Previous Cumulative Variances	+12.3	-3.6	
Net Change	+0.0	-20.0	

Cost and Schedule Variance Explanations

The unfavorable net change in the schedule variance is due to 1) delayed deliveries; 2) impacts from prior production years; and 3) delayed subcontract efforts. All delays are being actively managed and expected to be resolved within program resources.

Notes

The FY 2018 Production and Deployed Systems Support contract specifies a ceiling price that applies to the Fixed Price Incentive Production CLINs.

Contract Identification

Appropriation: Procurement
Contract Name: FY 2019 Production and Deployed Systems Support
Contractor: Lockheed Martin Space
Contractor Location: 1111 Lockheed Martin Way
Sunnyvale, CA 94089
Sunnyvale, CA 94089
Contract Number: N00030-18-C-0100
Contract Type: Fixed Price Incentive(Firm Target) (FPIF), Cost Plus Fixed Fee (CPFF)
Award Date: August 08, 2018
Definitization Date: September 28, 2018

Contract Price								
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)		
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager	
103.9	591.5	N/A	103.9	591.5	N/A	751.7	751.7	

Cost and Schedule Variance Explanations

Cost and Schedule Variance reporting is not required on this (FPIF/CPFF) contract.

Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	28	28	28	100.00%
Production	533	533	533	100.00%
Total Program Quantity Delivered	561	561	561	100.00%

Expended and Appropriated (TY \$M)			
Total Acquisition Cost	42478.7	Years Appropriated	43
Expended to Date	41171.3	Percent Years Appropriated	89.58%
Percent Expended	96.92%	Appropriated to Date	40459.6
Total Funding Years	48	Percent Appropriated	95.25%

The above data is current as of February 10, 2020.

Notes	
<p>The deliveries identified in this section are for the TRIDENT II (D5) missile equipment sections. While the TRIDENT II (D5) Missile program is over 90% delivered and expended, it has been decided by the Assistant Secretary of the Navy (Research, Development and Acquisition) the current APB is to remain open as the TRIDENT II (D5) missile will be sustained throughout the entire life of the OHIO Class submarine, and will also be the initial payload for the Ship, Submersible, Ballistic, Nuclear (SSBN) 826 COLUMBIA Class submarine.</p>	

Operating and Support Cost

Cost Estimate Details

Date of Estimate:	February 05, 2020
Source of Estimate:	POE
Quantity to Sustain:	533
Unit of Measure:	Missile
Service Life per Unit:	43.00 Years
Fiscal Years in Service:	FY 2000 - FY 2042

Total missiles procured for the TRIDENT II (D5) missile program is 561. Of that number, 28 of those missiles were RDT&E missiles, with the remainder of 533 to be procured using Weapons Procurement, Navy (WPN) funding. Strategic Systems Programs (SSP) uses the number of 533 as O&S costs began in FY 2000 and ends in FY 2042. The 28 developmental missiles will not be sustained.

The costs reflected in this section are for FY 2000 - FY 2042. This is due to the fact that TRIDENT II (D5) missile did not have to establish an O&S APB or report O&S costs prior to FY 2000. FY 2000 was the first year that SSP was required to begin showing O&S costs for TRIDENT II (D5) missile in its SAR.

Sustainment Strategy

With the collaboration of SSP and its industry partners, life cycle sustainment is the basic premise of the TRIDENT II (D5) missile program and its life extension. The strategy is to reduce O&S costs, provide a full range of logistics support, maintain critical reliability and accuracy requirements and implement the Shipboard Systems Integration (SSI) refresh schedule. A total of 533 TRIDENT II (D5) missiles will be procured for this program that will support the OHIO-Class submarine through FY 2042. The TRIDENT II (D5) missile will be the initial strategic weapon system (SWS) for the Ship, Submersible, Ballistic, Nuclear (SSBN) 826 COLUMBIA Class submarine.

The TRIDENT II (D5) missile SWS is completing its 30th year of deployment and has reached its original design life goal. Like any other aging weapon system, increased maintenance and repair will be required to sustain a safe, reliable, and accurate SWS. SSP's "Cradle to Grave" responsibility requires a broad range of engineering knowledge and unique skill sets to support the Navy's primary nuclear deterrent system. As such, engineering support spanning all phases of the weapon system life cycle is provided by one organization (SSP). Operational Engineering Support is required for the establishment of a "closed loop" system which includes the following: 1) collecting data from the Fleet; 2) measuring weapons system performance; 3) analyzing the data collected to identify performance deficiencies; 4) investigating problems identified; 5) developing solutions to resolve the deficiencies and problems; and 6) implementing corrective actions to the Fleet. The SSP life cycle budget maintains the industrial base and expertise in the workforce and ensures those skill sets will be available for the follow-on SSBN 826 COLUMBIA Class submarine.

The TRIDENT II (D5) missile SWS achieved Milestone I in October 1977; Milestone II in October 1983; and Milestone III in April 1987. At that time, program life cycle cost estimates and SCPs were not required. At the request of the Assistant Secretary of the Navy (Research, Development & Acquisition) (ASN RD&A), SSP submitted an Internal ICE for only the acquisition portion of the TRIDENT II (D5) Life Extension Program, therefore no O&S cost estimate is available. ASN (RD&A) has determined the current APB is to remain open to support the SSBN 826 COLUMBIA Class submarine.

Antecedent Information

The TRIDENT II (D5) weapon system replaced the TRIDENT I (C4) weapon system. O&S costs and assumptions for the TRIDENT I (C4) system are not available.

Annual O&S Costs BY1983 \$M		
Cost Element	Trident II Missile Average Annual Cost Per Missile	TRIDENT I (C-4) (Antecedent) N/A
Unit-Level Manpower	--	--
Unit Operations	--	--
Maintenance	0.228	0.000
Sustaining Support	1.007	0.000
Continuing System Improvements	--	--
Indirect Support	0.003	0.000
Other	--	--
Total	1.238	--

While the TRIDENT II (D5) Missile program will procure 533 WPN missiles there will never be a time when SSP will support a total of 533 missiles in a given year. This is due to the flight test program as every year a certain number of missiles are tested for reliability and accuracy.

Annual O&S Costs are broken down into these categories:

Maintenance: Provides for the repair, overhaul, and missile processing of the TRIDENT II (D5) Missile's SWS at the Strategic Weapons Facilities (SWFs).

Sustaining Support: Provides for the sustainment of the TRIDENT II (D5) Missile's SWS to include SSI efforts, replacement of aging rocket motors, tooling and test equipment, modifications required for treaty obligations, SWS training at the SWFs, and salaries and benefits for the SSP employees.

Indirect Support: Provides for real property maintenance including funding for recurring maintenance, major repair projects, and minor construction in support of the Fleet Ballistic Missiles and TRIDENT II (D5) facilities. The last year of funding for these efforts was FY 2003.

Item	Total O&S Cost \$M			
	Trident II Missile			TRIDENT I (C-4) (Antecedent)
	Current Production APB Objective/Threshold		Current Estimate	
Base Year	N/A	N/A	28365.0	N/A
Then Year	N/A	N/A	70069.0	N/A

Equation to Translate Annual Cost to Total Cost

Exact calculation may differ slightly due to rounding:

\$1.2376M is the average O&S cost per missile per year (in BY\$)

\$1.2376M x 533 missiles = \$659.641M is the average O&S cost for all missiles per year (in BY\$)

\$659.641M x 43 years = \$28,365M is the total O&S cost for all missiles from FY 2000 - 2042 (in BY\$)

O&S Cost Variance		
Category	BY 1983 \$M	Change Explanations
Prior SAR Total O&S Estimates - Dec 2018 SAR	27757.9	
Programmatic/Planning Factors	607.1	Increases due to the following : 1) sustainment of the SWS through the entire life of the OHIO Class and as the initial payload for the SSBN 826 COLUMBIA Class; and 2) civilian personnel costs attributable to Workforce Reshaping. The PM will continue to update O&S costs as necessary as the budget years roll into the FYDP. An APB update is planned in FY 2025.
Cost Estimating Methodology	0.0	
Cost Data Update	0.0	
Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	0.0	
Other	0.0	
Total Changes	607.1	
Current Estimate	28365.0	

Disposal Estimate Details

Date of Estimate: February 05, 2020
Source of Estimate: POE
Disposal/Demilitarization Total Cost (BY 1983 \$M): 171.0

O&S Costs for TRIDENT II (D5) missile include 1st, 2nd, and 3rd stage rocket motor disposal. At this time, these are the only disposal/demilitarization costs anticipated for the TRIDENT II (D5) missile. Any further disposal/demilitarization costs will be determined once final decisions have been made in regards to the SSBN 826 COLUMBIA Class program. The costs displayed in this section reflect infrastructure costs required for maintaining a disposal program.