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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy										Date: February 2018		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy I BA 5: System Development & Demonstration (SDD)					R-1 Program Element (Number/Name) PE 0604580N I (U)Virginia Payload Module (VPM)							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	325.673	94.846	72.861	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	493.380
4500: VIRGINIA Payload Module	325.673	94.846	72.861	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	493.380
Program MDAP/MAIS Code: Project MDAP/MAIS Code(s): 516												
Note 1. Detailed design funding for this project transitions to SCN (BLI: 2013) beginning in FY17 to support VPM production beginning in FY20.												
A. Mission Description and Budget Item Justification The U.S. Navy must maintain a submarine fleet that is of sufficient capability and numbers to defend American interests. The VIRGINIA Class Submarine, formerly the New Attack Submarine (New SSN), is designed to fulfill this need. It will counter the potential threats of the next century in a multi- mission capable submarine that has the ability to provide covert, sustained combat presence in denied waters. The primary goal of the program is to develop an affordable yet capable submarine by evaluating a broad range of system and technology alternatives, and pursuing cost reduction, producibility improvement, and technical risk management. This Program Element (PE) provides the technology, prototype components, and systems engineering needed to design and construct the VIRGINIA Payload Module (VPM). VPM mitigates and will recapitalize the conventional TOMAHAWK Land Attack Missile (TLAM) gap created by the retirement of SSGNs in the late 2020s while maintaining current platform requirements. This PE directly supports the following VIRGINIA Class Submarine missions: (1) covert strike warfare; (2) anti-submarine warfare; (3) covert intelligence collection/surveillance, indication and warning, and electronic warfare; (4) anti-surface ship warfare; (5) special warfare; (6) mine warfare; and (7) battle group support.												
B. Program Change Summary (\$ in Millions)				FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total				
Previous President's Budget				97.920	72.861	0.000	-	0.000				
Current President's Budget				94.846	72.861	0.000	-	0.000				
Total Adjustments				-3.074	0.000	0.000	-	0.000				
• Congressional General Reductions				-	-							
• Congressional Directed Reductions				-	-							
• Congressional Rescissions				-	-							
• Congressional Adds				-	-							
• Congressional Directed Transfers				-	-							
• Reprogrammings				-	-							
• SBIR/STTR Transfer				-3.074	0.000							
• Rate/Misc Adjustments				0.000	0.000	0.000	-	0.000				

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PE 0604580N: (U)Virginia Payload Module (VPM)
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Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy										Date: February 2018		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604580N I (U)Virginia Payload Module (VPM)				Project (Number/Name) 4500 I VIRGINIA Payload Module			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
4500: VIRGINIA Payload Module	325.673	94.846	72.861	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	493.380
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 516												
A. Mission Description and Budget Item Justification												
This project encompasses Navy RDT&E efforts required to incorporate a modular design for future VIRGINIA Class Submarines (VCS) which integrates additional strike payload capacity for Tomahawk Land Attack and follow on missiles. The design is targeted for VCS Block V (FY19-23 ships).												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)												
							FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	
Title: Non-Propulsion Electronics System (NPES) Engineering							12.103	12.700	0.000	0.000	0.000	
Articles:							-	-	-	-	-	
FY 2018 Plans:												
Formal EQT of the new Common Weapons Launcher (CWL) electronics and support structure will take place, including full shock test. TOMAHAWK missile electrical characteristic and interface requirements verification testing will commence, necessary to validate accurate power and navigation data inputs. Combat system interface and fail-over modes will be tested to confirm proper SWFTS interoperability. And various fleet operator concept of operations demonstrations will take place to support development of operator training and maintenance procedures.												
FY 2019 Base Plans:												
N/A												
FY 2019 OCO Plans:												
N/A												
FY 2018 to FY 2019 Increase/Decrease Statement:												
Funding decreased from FY18 to FY19 as project shifts from RDT&E to SCN Detailed Design.												
Title: Hull, Mechanical, and Electrical (HM&E) Systems Engineering							82.743	60.161	0.000	0.000	0.000	
Articles:							-	-	-	-	-	
FY 2018 Plans:												
Continue design efforts for the VPM including integration to existing hull structure, hydrodynamic assessments, hydraulic system design, tube control interface, and internal arrangements to accommodate hardware,												

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>electronics and personnel. Continue executing IMS and Manufacturing Plans. Continue payload tube proto-tactical construction and receipt of ITHs and ITKs. Complete prototypical larger capacity Air Conditioning plant and qualify plant for capacity and noise; begin production of first prototype unit Air Conditioning plant. Complete payload tube prototype.</p> <p>FY 2019 Base Plans: N/A</p> <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased from FY18 to FY19 as project shifts from RDT&E to SCN Detailed Design.</p>					
Accomplishments/Planned Programs Subtotals	94.846	72.861	0.000	0.000	0.000

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• SCN/2013: VIRGINIA Class Submarine	5,040.219	5,225.911	7,169.783	-	7,169.783	7,150.388	6,475.968	6,004.291	6,126.497	40,799.161	150,316.746
• OPN/0942: Virginia Class Support Equipment	63.908	46.610	66.328	-	66.328	28.465	23.263	22.910	23.326	Continuing	Continuing
• OMN/1B2B: Ship Operational Support and Training	781.123	997.328	997.663	20.236	1,017.899	993.535	1,019.377	1,044.931	1,070.013	0.000	6,924.206
• RDT&E/0604558N/1947: New Design SSN HM&E	83.732	82.506	104.968	-	104.968	78.062	155.449	192.807	236.241	Continuing	Continuing
• RDT&E/0604558N/1950: New Design SSN Combat Sys Dev	25.285	34.913	40.604	-	40.604	37.757	36.568	37.327	38.097	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
The VIRGINIA Class Submarine Program has implemented Integrated Product and Process Development (IPPD). The traditional distinct phasing of the design process has been replaced with the continuous concurrent engineering IPPD process. The IPPD approach has facilitated a smoother transition from design to manufacturing and has reduced the number of changes typically encountered during construction of the lead and early follow-on ships. In September 1997, Congress passed a law											

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Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604580N I (U) <i>Virginia Payload Module (VPM)</i>	Project (Number/Name) 4500 I <i>VIRGINIA Payload Module</i>
<p>allowing Electric Boat (EB) and Northrop Grumman Newport News (NGNN), now Huntington Ingalls Industries (HII), to team for production of the first four VIRGINIA Class Submarines. Under the teaming agreement, EB remained the design yard for the VIRGINIA Class Submarine and HII became a part of the IPPD process. The Program Office is managing two Multi-Year Procurement (MYP) contracts. The first is for the Block III (FY09-13) ships. The second is for the Block IV (FY14-18) ships awarded April 2014. All Block I & II ships (SSNs 774-783) have been delivered. The first two Block III ships, SSN 784 and SSN 785, delivered in August 2014 and June 2015 respectively, with the remaining six ships awarded and under construction. The first six Block IV ships are awarded and under construction, with the remaining four to be authorized and appropriated in FY 2017 and FY 2018. Developmental efforts began in FY13 and will be executed via current Lead Design Yard Agent contract with Electric Boat. The program is currently planning for the fourth MYP (Block V) contract that will reflect 10 SSNs (FY19-23) and is anticipated to award in Early FY 2019.</p> <p><u>E. Performance Metrics</u></p> <p>Preliminary Design Review</p> <p>Critical Design Review</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy												Date: February 2018			
Appropriation/Budget Activity 1319 / 5						R-1 Program Element (Number/Name) PE 0604580N / (U)Virginia Payload Module (VPM)				Project (Number/Name) 4500 / VIRGINIA Payload Module					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Component Development	WR	NSWC : Carderock, MD	38.566	10.200	Nov 2016	2.246	Nov 2017	0.000		-		0.000	15.815	66.827	-
Component Development	WR	NUWC : Newport, RI	22.281	6.500	Nov 2016	1.853	Nov 2017	0.000		-		0.000	20.538	51.172	-
Component Development	C/CPFF	Electric Boat : Groton, CT	250.076	70.646	Nov 2016	63.094	Nov 2017	0.000		-		0.000	132.370	516.186	-
Component Development	C/CPFF	GD-AIS : Pittsfield, MA	14.000	4.600	Jan 2017	4.975	Jan 2018	0.000		-		0.000	0.000	23.575	-
Component Development	WR	PMA 280/281 : Pax River, MD	0.000	2.700	Jan 2017	0.000	Jan 2018	0.000		-		0.000	0.000	2.700	-
Component Development	SS/CPFF	ARL/PSU : UNIVERSITY PARK, PA	0.000	0.200	Jan 2017	0.000	Jan 2018	0.000		-		0.000	0.000	0.200	-
Component Development	WR	NSWC : Philadelphia, PA	0.000	0.000		0.287	Nov 2017	0.000		-		0.000	0.000	0.287	-
Component Development	C/CPFF	Raytheon : Tuscon, AZ	0.000	0.000		0.406	Jan 2018	0.000		-		0.000	0.000	0.406	-
Subtotal			324.923	94.846		72.861		0.000		-		0.000	168.723	661.353	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	C/CPAF	SEAPORT : Rockville, MD	0.750	0.000		0.000		0.000		-		0.000	0.500	1.250	-
Subtotal			0.750	0.000		0.000		0.000		-		0.000	0.500	1.250	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			325.673	94.846		72.861		0.000		-		0.000	169.223	662.603	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy

Date: February 2018

Appropriation/Budget Activity

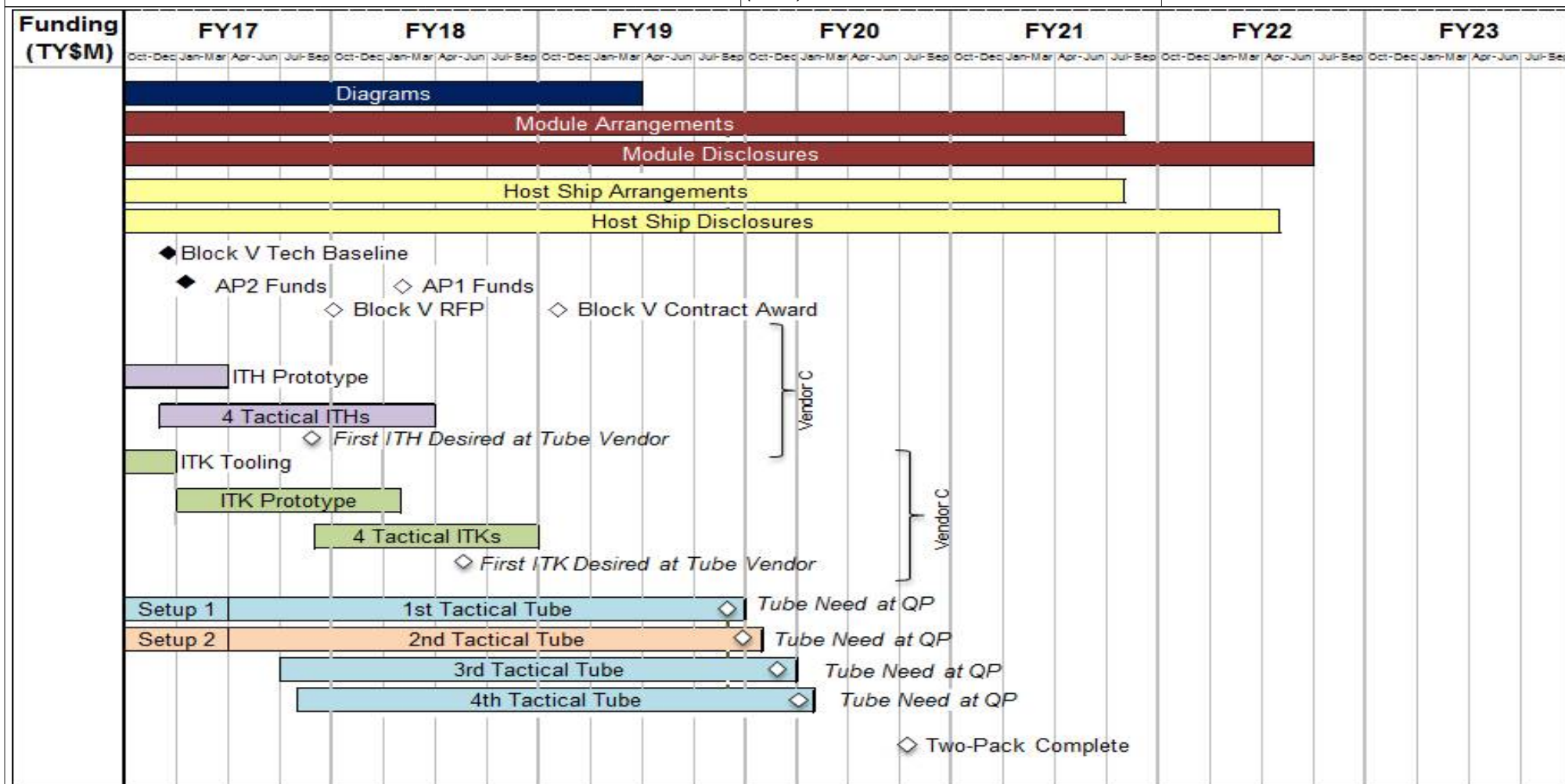
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R-1 Program Element (Number/Name)

PE 0604580N I (U)Virginia Payload Module (VPM)

Project (Number/Name)

4500 I VIRGINIA Payload Module



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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604580N / (U)Virginia Payload Module (VPM)	Project (Number/Name) 4500 / VIRGINIA Payload Module	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 4500				
Diagrams	1	2017	2	2019
Module Arrangements	1	2017	4	2021
Module Design Development	1	2017	3	2022
Host Ship Arrangements	1	2017	4	2021
Host Ship Design Development	1	2017	3	2022
Block V Tech Baseline	1	2017	1	2017
Block V RFP	4	2017	4	2017
Block V Contract Award	1	2019	1	2019
Vendor C ITH Prototype	1	2017	2	2017
Vendor C 4 Tactical ITHs	1	2017	2	2018
Vendor C ITK tooling	1	2017	1	2017
Vendor C ITK Prototype	2	2017	1	2018
Vendor C 4 Tactical ITKs	4	2017	1	2019
1st Tactical Tube	1	2017	4	2019
2nd Tactical Tube	1	2017	1	2020
3rd Tactical Tube	4	2017	1	2020
4th Tactical Tube	4	2017	2	2020
Two-Pack Complete	4	2020	4	2020