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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0101221N / Strategic Sub & Wpns Sys Supt							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	1,192.668	130.652	148.379	157.676	-	157.676	152.942	139.404	163.953	167.228	Continuing	Continuing
0951: Joint Warhead Fuze Sustainment Program	504.114	108.199	62.203	23.226	-	23.226	25.100	2.227	0.000	0.000	0.000	725.069
2021: Mk4A Shape Stable Nose Tip	0.000	5.771	27.169	22.820	-	22.820	13.990	7.408	5.892	6.007	Continuing	Continuing
2228: Technical Applications Programs	659.458	6.977	14.509	82.783	-	82.783	110.933	126.787	155.020	158.119	Continuing	Continuing
3097: W78/88-1 Life Extension Program	0.000	0.000	24.000	26.000	-	26.000	0.000	0.000	0.000	0.000	0.000	50.000
3158: Integrated Nuclear Weapons Security Sys Dev	29.096	2.726	2.798	2.847	-	2.847	2.919	2.982	3.041	3.102	Continuing	Continuing
9999: Congressional Adds	0.000	6.979	17.700	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	24.679
Program MDAP/MAIS Code: Project MDAP/MAIS Code(s): 178												
A. Mission Description and Budget Item Justification												
The Joint Warhead Fuze Sustainment Program (0951) is an effort to develop advanced components to improve the reliability, safety, and security of Arming, Fuzing and Firing (AF&F) systems for nuclear reentry systems. The current effort is focused on supporting the alteration of the AF&F system for the MK5/W88 system which will be five years beyond its design life at the scheduled deployment of the AF&F alteration. This effort also supports future utilization of the developed components by the US Air Force and United Kingdom.												
The Mk4A Shape Stable Nose Tip (SSNT) (2021) effort will convert reentry body (RB) forward shell assemblies (FSA's) from legacy carbon composite nose tips to SSNT's. This will require ground and flight testing of SSNT RBA's, updates and modifications to RB documentation (Weapon Specifications, Interface Control Drawings, product drawings etc), updated Fire Control software for fleet implementation, conversion of war reserve RB's to FSA's with SSNT, procurement/conversion of surveillance and flight test units, Strategic Weapons Facility (SWF) logistics implementation planning and execution, review and update Mk4A surveillance planning and the DoD share of National Nuclear Security Administration (NNSA) Office of Secure Transportation (OST) for shipping.												
The Technology Applications Program (2228) supports the TRIDENT II (D5) Submarine Launched Ballistic Missile (SLBM) that provides the U.S. a weapon system with greater accuracy and payload capability as compared to the TRIDENT I (C4) system. TRIDENT II enhances U.S. strategic deterrence providing a survivable, sea-based system capable of engaging the full spectrum of potential targets with fewer submarines. The Multi Star Enhanced Prelaunch (MEP) project leverages the capability of the D5 Life Extension Guidance (Mk6 Mod1) to sight two stars vice one combined with the interface updates to the Fire Control and Navigation subsystem,												

UNCLASSIFIED

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<p>allowing for in-flight correction, the potential to operate in environments where GPS is denied, and may provide future relief to the strict tolerance requirements of the strategic navigator on the current OHIO class submarines and the COLUMBIA program. The Systems Engineering Modeling and Simulation capability will consist of three elements: Model Based Design, Strategic Weapon System (SWS) Integrated Modeling and Simulation/Common Architecture & Framework, and SWS Enhancement Ground Test. This effort will provide the capability to comprehensively evaluate and test the integrated SWS within representative operational environments, providing unprecedented visibility across the SWS and system performance characterization equivalent to flight testing. This capability will enable trade space analysis to identify technical margin, subsystem interactions, and lifecycle affordability opportunities to include other services and be able to identify the benefits and risks of commonality to the individual programs, requirements and CONOPs modifications that could facilitate commonality, potential common acquisition strategies between the services, and total life cycle cost implications. Starting in FY 2020 this project will begin development for D5 Life Extension D5LE2. The D5LE2 will include System Level Architecture Trades and Design Processes in which initial planning and system technology trade studies are necessary to begin preparing for D5LE2. Investments are required starting in FY20 to begin trading system architecture concepts and implementing modern model based design and system engineering practices. D5LE2 Avionics Architecture & Technology Development will include legacy D5 and D5LE electronic technologies now obsolete and manufacturing lines shutdown. Avionics architectures, sensor, bus and component designs are inherently complex with design and manufacturing technologies continuously evolving. Technology advancements and improved system architecture concepts have the potential to improve system capability, modularity, manufacturability, SWS operations and sustainability.</p> <p>The 3097 RDTEN project will evaluate and down-select of a range of options to meet USSTRATCOM requirements for a future Navy warhead variant. In FY20, the study will enter Phase 6.2 to further refine the down-selected concepts, screening criteria and programmatic tradeoffs (e.g., cost, schedule, technical maturity) for the concepts being considered.</p> <p>The Integrated Nuclear Weapons Security System (INWSS) (3158) efforts support the Nuclear Weapons Security program and SSBN Escort mission. The policies and requirements regarding the safeguard of nuclear weapons within the Department of Defense is established by DoD S5210.41M. Within the Department of the Navy, nuclear weapons are limited to TRIDENT Fleet Ballistic Missiles (FBM), either deployed aboard TRIDENT submarines or located landside at Naval Submarine Base, Kings Bay, or Naval Submarine Base, Bangor where missiles are first assembled as well as repaired. The Chief of Naval Operations (CNO) has assigned the Strategic Systems Programs (SSP), the FBM program manager, with mission responsibility for the safeguard of FBM nuclear technologies. This budget supports efforts directed at improving the current technological baseline through a series of studies. These efforts will improve countermeasure technologies to address detection, delay and denial.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy	Date: March 2019
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Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101221N / <i>Strategic Sub & Wpns Sys Supt</i>
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B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	135.219	157.679	141.154	-	141.154
Current President's Budget	130.652	148.379	157.676	-	157.676
Total Adjustments	-4.567	-9.300	16.522	-	16.522
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-27.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	17.700			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.869	0.000			
• Program Adjustments	0.000	0.000	16.722	-	16.722
• Rate/Misc Adjustments	-0.001	0.000	-0.200	-	-0.200
• Congressional Directed Reductions	-9.697	-	-	-	-
Adjustments					
• Congressional Add Adjustments	7.000	-	-	-	-

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 9999: Congressional Adds

Congressional Add: *Program Increase*

Congressional Add: *Model Based Systems Engineering*

Congressional Add: *Autonomous Strategic Force Protection Sensor Network*

Congressional Add Subtotals for Project: 9999

Congressional Add Totals for all Projects

FY 2018	FY 2019
6.979	0.000
0.000	15.000
0.000	2.700
6.979	17.700
6.979	17.700

Change Summary Explanation

The FY2020 funding request was reduced by \$9.278M to account for the availability of prior year execution balances.

Interoperable Warhead (W78/88-1 Life Extension Program) was reduced in FY19 due to executability and was rephrased into FY20.

FY20 begins D5 Life Extension (D5LE2). The D5LE2 will include System Level Architecture Trades and Design Processes in which initial planning and system technology trade studies are necessary to begin preparing for D5LE2.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0101221N / Strategic Sub & Wpns Sys Supt				Project (Number/Name) 0951 / Joint Warhead Fuze Sustainment Program			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
0951: Joint Warhead Fuze Sustainment Program	504.114	108.199	62.203	23.226	-	23.226	25.100	2.227	0.000	0.000	0.000	725.069
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 178												
A. Mission Description and Budget Item Justification												
The Joint Warhead Fuze Sustainment Program is an effort to develop advanced components to improve the reliability, safety, and security of AF&F systems for nuclear reentry systems. The current effort is focused on supporting the alteration of the AF&F system for the MK5/W88 system which will be five years beyond its design life at the scheduled deployment of the AF&F alteration. This effort also supports future utilization of the developed components by the US Air Force and United Kingdom.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: TRIDENT II								108.199	62.203	23.226	0.000	23.226
Articles:								-	-	-	-	-
Description: Identify, prioritize, develop, proof, and demonstrate advanced technologies that will be leveraged and incorporated into future AF&Fs.												
FY 2019 Plans:												
Continue development, proofing, demonstration of identified advanced technologies for future AF&Fs												
Continue Support engineer working groups and program reviews.												
Continue AF&F sub-assembly design demonstrations												
Continue development of advanced safety and surety architecture solutions.												
Continue to develop and implement software changes due to AF&F												
Conduct performance assessment of tested designs												
Conduct production engineering												
Continue missile integration of the Mk5A Alt 370 fuze development, and perform pre-flight test and analysis												
Continue design, develop and qualify production tools and processes, testers, gauges, AF&F simulators and trainers												
Continue flight test and integration												
Continue Production Proof In (PPI) builds												
Conduct system vulnerability analysis												
Continue engineering support for Electromagnetic Environment testing and data analysis												

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Appropriation/Budget Activity 1319 / 7				R-1 Program Element (Number/Name) PE 0101221N / Strategic Sub & Wpns Sys Supt				Project (Number/Name) 0951 / Joint Warhead Fuze Sustainment Program				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Continue thermal Battery Evaluations and Certifications Continue procurement of developmental hardware Continue qualification of developmental hardware FY 2020 Base Plans: Continue Support engineer working groups and program reviews Conduct production engineering Conduct performance assessment of tested designs Continue missile integration of the Mk5A Alt 370 fuze development, and perform pre-flight test and analysis Continue design, develop and qualify production tools and processes, testers, gauges, AF&F simulators and trainers Conduct system vulnerability analysis FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: Program has completed software development required for Mk5 ALT 370 AF&F and began transitioning to production and engineering support. The program is starting to scale down and will be completed in FY22 (-38.977)												
Accomplishments/Planned Programs Subtotals								108.199	62.203	23.226	0.000	23.226
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost	
• RDTEN/3219: SBSD Nuclear Technology Development	265.462	190.100	114.006	-	114.006	80.085	60.142	56.841	54.400	Continuing	Continuing	
• RDTEN/3220: Advanced Submarine System Development	751.497	514.846	419.051	-	419.051	313.582	196.261	171.766	187.173	Continuing	Continuing	
• OPN/5358: SWS Modernization Funds	238.675	256.817	280.510	-	280.510	241.396	254.053	259.020	264.201	0.000	3,189.691	
• WPN/1250: TRIDENT II Mods	1,131.910	1,056.750	1,177.251	-	1,177.251	1,215.624	1,204.762	1,288.753	1,318.818	3,215.106	26,124.279	
• SCN/1045: OHIO Replacement Submarine	861.853	3,173.400	1,698.907	-	1,698.907	3,921.212	4,196.024	3,871.536	4,789.491	85,685.907	108,971.468	

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / <i>Strategic Sub & Wpns Sys Supt</i>	Project (Number/Name) 0951 / <i>Joint Warhead Fuze Sustainment Program</i>	

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u> <u>Base</u>	<u>FY 2020</u> <u>OCO</u>	<u>FY 2020</u> <u>Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OMN/1D2D: <i>Fleet Ballistic Missile</i>	1,070.308	1,140.910	1,187.770	-	1,187.770	1,182.056	1,225.804	1,238.604	1,273.316	Continuing	Continuing

Remarks

D. Acquisition Strategy

Contracts will continue to be awarded to those sources who were engaged in the Mk4LE Reentry Body development program and are currently engaged in the production and/or operational support of the deployed Mk4LE Reentry Body on the basis of Other Than Full and Open Competition pursuant to the authority of 10 U.S.C. 2304 (c) (1) and (3) implemented by FAR 6.302.-1, 3, 4

E. Performance Metrics

Not applicable

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0101221N / Strategic Sub & Wpns Sys Supt				Project (Number/Name) 0951 / Joint Warhead Fuze Sustainment Program					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Joint Warhead Fuze Sustainment DOE	MIPR	DOE : NM	415.585	90.935	Feb 2018	48.855	Nov 2018	13.993	Nov 2019	-		13.993	0.000	569.368	-
Joint Warhead Fuze Sustainment ITT	SS/CPFF	ITT : VA	18.907	4.265	Feb 2018	3.851	Feb 2019	2.105	Nov 2019	-		2.105	0.000	29.128	-
Joint Warhead Fuze Sustainment LMMS	SS/CPFF	LMMS : CA	46.817	11.793	Feb 2018	7.931	Dec 2018	5.317	Nov 2019	-		5.317	0.000	71.858	-
Joint Warhead Fuze Sustainment	WR	NSWC Dahlgren : VA	18.606	0.318	Feb 2018	0.551	Nov 2018	1.044	Nov 2019	-		1.044	0.000	20.519	-
Joint Warhead Fuze Sustainment	SS/CPFF	BAE : MD	1.234	0.505	Mar 2018	0.150	Feb 2019	0.000		-		0.000	0.000	1.889	-
Joint Warhead Fuze Sustainment	SS/CPIF	APL : MD	0.785	0.144	Aug 2018	0.073	Feb 2019	0.000		-		0.000	0.000	1.002	-
Joint Warhead Fuze Sustainment	C/BA	GDAIS : MA	1.680	0.000		0.000		0.000		-		0.000	0.000	1.680	-
Joint Warhead Fuze Sustainment	WR	CNSW : ID	0.400	0.239	Feb 2018	0.000		0.243	Oct 2019	-		0.243	0.000	0.882	-
Joint Warhead Fuze Sustainment	WR	NCCC : Not Specified	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	-
Joint Warhead Fuze Sustainment	C/BA	TOYON : VA	0.000	0.000		0.792	Feb 2019	0.524	Nov 2019	-		0.524	0.000	1.316	-
Subtotal			504.114	108.199		62.203		23.226		-		23.226	0.000	697.742	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			504.114	108.199		62.203		23.226		-		23.226	0.000	697.742	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy												Date: March 2019																	
Appropriation/Budget Activity 1319 / 7												R-1 Program Element (Number/Name) PE 0101221N / Strategic Sub & Wpns Sys Supt								Project (Number/Name) 0951 / Joint Warhead Fuze Sustainment Program									
Proj 0951		FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
		1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Joint Warhead Fuze Sustainment Program																													
Assembly Level Testing																													
Performance Assessment of Tested Designs																													
Development Tests																													
Production Engineering																													
General JCIDS Support																													
General Acquisition Planning Support																													
2020PB - 0101221N - 0951																													

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / <i>Strategic Sub & Wpns Sys Supt</i>	Project (Number/Name) 0951 / <i>Joint Warhead Fuze Sustainment Program</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Proj 0951</i>				
Joint Warhead Fuze Sustainment Program: Assembly Level Testing:	1	2018	4	2022
Joint Warhead Fuze Sustainment Program: Performance Assessment of Tested Designs:	1	2018	4	2022
Joint Warhead Fuze Sustainment Program: Development Tests:	1	2018	4	2022
Joint Warhead Fuze Sustainment Program: Production Engineering:	1	2018	4	2022
Joint Warhead Fuze Sustainment Program: General JCIDS Support:	1	2018	4	2022
Joint Warhead Fuze Sustainment Program: General Acquisition Planning Support:	1	2018	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0101221N / Strategic Sub & Wpns Sys Supt				Project (Number/Name) 2021 / Mk4A Shape Stable Nose Tip			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
2021: Mk4A Shape Stable Nose Tip	0.000	5.771	27.169	22.820	-	22.820	13.990	7.408	5.892	6.007	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 178												
A. Mission Description and Budget Item Justification												
The Mk4A Shape Stable Nose Tip (SSNT) effort will convert reentry body (RB) forward shell assemblies (FSA's) from legacy carbon composite nose tips to SSNT's. This will require ground and flight testing of SSNT RBA's, updates and modifications to RB documentation (Weapon Specifications, Interface Control Drawings, product drawings etc), updated Fire Control software for fleet implementation, conversion of war reserve RB's to FSA's with SSNT, procurement/conversion of surveillance and flight test units, Strategic Weapons Facility (SWF) logistics implementation planning and execution, review and update Mk4A surveillance planning and the DoD share of National Nuclear Security Administration (NNSA) Office of Secure Transportation (OST) for shipping.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Mk4A Shape Stable Nose Tip Articles: FY 2019 Plans: Mk4A SSNT system requirements review SPALT/NWRO documentation Development of the reentry body aerodynamics model and associated fire control flight parameters Nosetip development hardware to support nosetip development testing Qualification and buildup for forward shell development testing. FY 2020 Base Plans: Continue Mk4A SSNT system requirements review Continue Development of the reentry body aerodynamics model and associated fire control flight parameters Continue Nosetip development hardware to support nosetip development testing Continue Qualification and buildup for forward shell development testing. Program and engineering support during material characterization of nosetip billet materials Engineering support for both development and qualification testing (ground and flight) FY 2020 OCO Plans:								5.771	27.169	22.820	0.000	22.820
								-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019		
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / <i>Strategic Sub & Wpns Sys Supt</i>	Project (Number/Name) 2021 / <i>Mk4A Shape Stable Nose Tip</i>			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
N/A					
<i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> Funding decrease due to the completion of documentation & updating requirements specifications for the impacts to Trident II(D5) and W76/Mk4A. This incorporates SSNT & updates in the Mk4A reentry body aerodynamics model systems requirements review. (-4.349)					
Accomplishments/Planned Programs Subtotals	5.771	27.169	22.820	0.000	22.820
C. Other Program Funding Summary (\$ in Millions) N/A					
Remarks					
D. Acquisition Strategy Contracts will continue to be awarded to those sources who were engaged in the Mk4LE Reentry Body development program and are currently engaged in the production and/or operational support of the deployed Mk4LE Reentry Body on the basis of Other Than Full and Open Competition pursuant to the authority of 10 U.S.C. 2304 (c) (1) and (3) implemented by FAR 6.302.-1, 3, 4					
E. Performance Metrics N/A					

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0101221N / Strategic Sub & Wpns Sys Supt				Project (Number/Name) 2021 / Mk4A Shape Stable Nose Tip					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
SSNT LMSS	SS/CPIF	LMSSC : CA	0.000	5.000	May 2018	19.930	Nov 2018	21.060	Dec 2019	-		21.060	Continuing	Continuing	Continuing
SSNT DOE/SNL	MIPR	DOE/SNL : NM	0.000	0.000		5.209	Feb 2019	0.700	Oct 2019	-		0.700	Continuing	Continuing	Continuing
SSNT JH-APL	SS/CPFF	APL : MD	0.000	0.000		1.000	Feb 2019	0.000		-		0.000	0.000	1.000	-
SSNT PERATON	SS/CPIF	PERATON : VA	0.000	0.000		0.515	Feb 2019	0.530	Oct 2019	-		0.530	Continuing	Continuing	Continuing
SSNT NSWC	WR	NSWC : VA	0.000	0.771	Jul 2018	0.515	Jan 2019	0.530	Dec 2019	-		0.530	Continuing	Continuing	Continuing
Subtotal			0.000	5.771		27.169		22.820		-		22.820	Continuing	Continuing	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	5.771		27.169		22.820		-		22.820	Continuing	Continuing	N/A
Remarks															

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PE 0101221N: *Strategic Sub & Wpns Sys Supt*
Navy

R-1 Line #207

Appropriation/Budget Activity
1319 / 7

R-1 Program Element (Number/Name)
PE 0101221N / Strategic Sub & Wpns Sys
Supt

Project (Number/Name)	Start Date	End Date	Project Manager	Project Status	Project Description
2021 / Mk4A Shape Stable Nose Tip					

Proj 2021	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024					
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q		
Mk4A Shape Stabe Nose Tip: General Acquisition Planning Support																														
Mk4A Shape Stable Nose Tip: Production Engineering																														

2020DON - 0101221N - 2021

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / <i>Strategic Sub & Wpns Sys Supt</i>	Project (Number/Name) 2021 / <i>Mk4A Shape Stable Nose Tip</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Proj 2021</i>				
Mk4A Shape Stabe Nose Tip: General Acquisition Planning Support: Schedule Detail	3	2018	4	2024
Mk4A Shape Stable Nose Tip: Production Engineering: Schedule Detail	3	2018	4	2024

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0101221N / Strategic Sub & Wpns Sys Supt				Project (Number/Name) 2228 / Technical Applications Programs			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
2228: Technical Applications Programs	659.458	6.977	14.509	82.783	-	82.783	110.933	126.787	155.020	158.119	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Multi Star Enhanced Prelaunch (MEP) project leverages the capability of the D5 Life Extension Guidance (Mk6 Mod1) to sight two stars vice one combined with the interface updates to the Fire Control and Navigation subsystem, allowing for in-flight correction, the potential to operate in environments where Global Positioning System (GPS) is denied, and potential future relief to the strict tolerance requirements of the strategic navigator on the current OHIO class submarines and the COLUMBIA Class program. The Systems Engineering Modeling and Simulation capability will consist of three elements: Model Based Design, Strategic Weapon System (SWS) Integrated Modeling and Simulation/Common Architecture & Framework, and SWS Enhancement Ground Test. This effort will provide the capability to comprehensively evaluate and test the integrated SWS within representative operational environments, providing unprecedented visibility across the SWS and system performance characterization equivalent to flight testing. This capability will enable trade space analysis to identify technical margin, subsystem interactions, and lifecycle affordability opportunities to include other services and be able to identify the benefits and risks of commonality to the individual programs, requirements and CONOPs modifications that could facilitate commonality, potential common acquisition strategies between the services, and total life cycle cost implications.

Starting in FY 2020 this project will begin development for D5 Life Extension D5LE2. The D5LE2 will include System Level Architecture Trades and Design Processes in which initial planning and system technology trade studies are necessary to begin preparing for D5LE2. Investments are required starting in FY20 to begin trading system architecture concepts and implementing modern model based design and system engineering practices. D5LE2 Avionics Architecture & Technology Development will include legacy D5 and D5LE electronic technologies now obsolete and manufacturing lines shutdown. Avionics architectures, sensor, bus and component designs are inherently complex with design and manufacturing technologies continuously evolving. Technology advancements and improved system architecture concepts have the potential to improve system capability, modularity, manufacturability, SWS operations and sustainability.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Multi-Star Enhanced Prelaunch (MEP)	5.756	9.973	10.709	0.000	10.709
Articles:	-	-	-	-	-
FY 2019 Plans: Continue DASO 30 Hardware in the Loop Testing Navigation DASO 30 Software Integration Development Continue DASO 30 SWS Subsystem Integrated Testing and Analysis DASO 30 Interface Coordination Documentation complete Software design readiness review					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0101221N / Strategic Sub & Wpns Sys Supt		Project (Number/Name) 2228 / Technical Applications Programs		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
DASO Shipment FY 2020 Base Plans: Continue DASO 30 Hardware in the Loop Testing Continue Navigation DASO 30 Software Integration Development Continue DASO 30 SWS Subsystem Integrated Testing and Analysis Continue DASO 30 Interface Coordination Documentation complete Continue Software design readiness review FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: Increase due to minor rate and inflation adjustments.						
Title: D5LE2		0.000	0.000	68.184	0.000	68.184
Articles:		-	-	-	-	-
FY 2019 Plans: N/A FY 2020 Base Plans: System Effectiveness Trade Studies: - Evaluate architectures/concepts for various system level requirements - Requirements definition and proofing Radiation Hardened Architecture: - Evaluate current allocation of requirements -Evaluate enabling architectures or CONOPs to meet requirements SWS Functional and Behavior Modeling Development and identify feasible solutions sets Testability CONOPs Study: - Ability to determine missile health and status without pulling missiles FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement:						

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0101221N / Strategic Sub & Wpns Sys Supt		Project (Number/Name) 2228 / Technical Applications Programs		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
D5LE2 is a new effort. The Navy will begin studies to define a cost-effective, credible, and effective D5 SLBM replacement that can deploy throughout the service life of the COLUMBIA SSBN.						
Title: System Engineering Modeling and Simulation		1.221	4.536	3.890	0.000	3.890
Articles:		-	-	-	-	-
FY 2019 Plans: Continue develop model based design integration plan. Continue modeling and simulation gap analysis. Continue assessment on RadHard avionics and electronics technology and affordability. Continue assessment on propellant technologies. Continue assessment on new Post Boost Control and Electro-Mechanical Thrust Vector Control (TVC) systems for improved Mission flexibility and affordability. Begin Functional Simulation Development. Begin system Behavioral Model Development.						
FY 2020 Base Plans: Continue develop model based design integration plan. Continue modeling and simulation gap analysis. Continue assessment on RadHard avionics and electronics technology and affordability. Continue assessment on propellant technologies. Continue assessment on new Post Boost Control and Electro-Mechanical Thrust Vector Control (TVC) systems for improved Continue Mission flexibility and affordability. Continue Functional Simulation Development. Continue System Behavioral Model Development.						
FY 2020 OCO Plans: N/A						
FY 2019 to FY 2020 Increase/Decrease Statement: Decrease due to minor rate and inflation adjustments.						
Accomplishments/Planned Programs Subtotals		6.977	14.509	82.783	0.000	82.783
C. Other Program Funding Summary (\$ in Millions)						
N/A						

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / Strategic Sub & Wpns Sys Supt	Project (Number/Name) 2228 / Technical Applications Programs
C. Other Program Funding Summary (\$ in Millions)		
Remarks		
D. Acquisition Strategy Contracts will continue to be awarded to those sources who were engaged in program and are currently engaged in the production and/or operational support on the basis of Other Than Full and Open Competition pursuant to the authority of 10 U.S.C. 2304 (c) (1) and (3) implemented by FAR 6.302.-1, 3, 4		
E. Performance Metrics Not applicable		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0101221N / Strategic Sub & Wpns Sys Supt				Project (Number/Name) 2228 / Technical Applications Programs					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Technical Applications CSDL	SS/CPFF	CSDL : MA	333.572	4.032	Oct 2018	11.757	Jan 2019	23.306	Nov 2019	-		23.306	Continuing	Continuing	Continuing
Technical Applications NSWC	WR	NSWC : VA	94.318	0.300	Jul 2018	0.352	Jan 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Technical Applications DOE	MIPR	DOE : NM	33.717	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Technical Applications ITT	SS/CPFF	ITT : CO	12.194	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Technical Applications LMSS	SS/CPFF	LMSS : CA	164.272	1.000	May 2018	1.800	Jan 2019	37.676	Dec 2019	-		37.676	Continuing	Continuing	Continuing
Technical Applications AERO	SS/CPFF	AERO : CA	3.068	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Technical Applications VAR	Various	Various : Various	18.317	1.345	Jun 2018	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Technical Applications GD-AIS	SS/CPFF	GDMS : MA	0.000	0.300	Oct 2017	0.600	Jan 2019	1.500	Nov 2019	-		1.500	Continuing	Continuing	Continuing
Technical Applications ARL	SS/CPFF	ARL : TX	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Technical Applications APL	SS/CPFF	APL : MD	0.000	0.000		0.000		12.003	Dec 2019	-		12.003	Continuing	Continuing	Continuing
Technical Applications BAE	SS/CPFF	BAE : MD	0.000	0.000		0.000		0.306	Nov 2019	-		0.306	0.000	0.306	-
Technical Applications NGMS	SS/CPFF	NGMS : CA	0.000	0.000		0.000		1.032	Nov 2019	-		1.032	0.000	1.032	-
Technical Applications NIR	SS/CPFF	NIR : Not Specified	0.000	0.000		0.000		6.960	Nov 2019	-		6.960	0.000	6.960	-
Subtotal			659.458	6.977		14.509		82.783		-		82.783	Continuing	Continuing	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			659.458	6.977		14.509		82.783		-		82.783	Continuing	Continuing	N/A
Remarks															

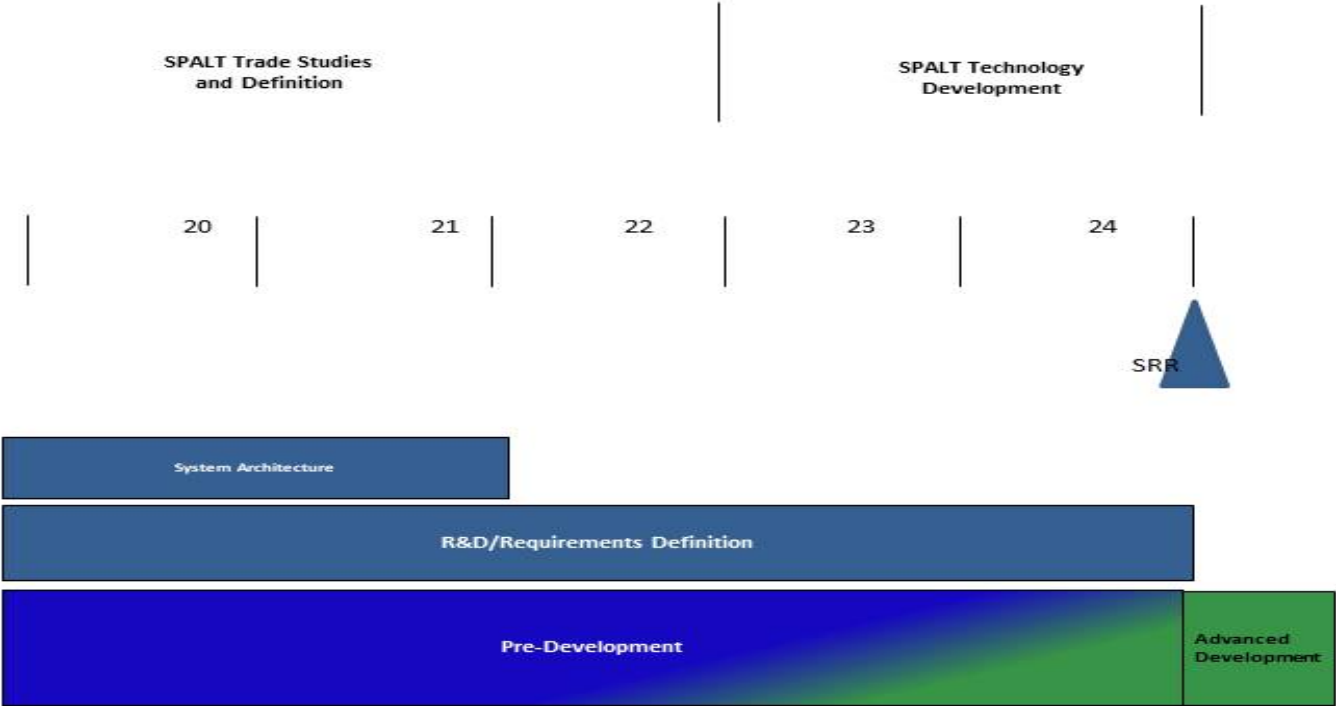
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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy																							Date: March 2019							
Appropriation/Budget Activity 1319 / 7												R-1 Program Element (Number/Name) PE 0101221N / Strategic Sub & Wpns Sys Supt											Project (Number/Name) 2228 / Technical Applications Programs							
Proj 2228	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024					
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q						
Multi-Star Enhanced Prelaunch (MEP)	MEP Subsystem Interface Specifications Developed																													
System Engineering Modeling and Simulation	SWS Integrated Modeling & Simulation/ Common Framework																													
System Engineering Modeling and Simulation	SWS Enhancement Group Test																													
System Engineering Modeling and Simulation	Model-Based Design																													

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / Strategic Sub & Wpns Sys Supt	Project (Number/Name) 2228 / Technical Applications Programs

D5LE2 Schedule



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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / Strategic Sub & Wpns Sys Supt	Project (Number/Name) 2228 / Technical Applications Programs	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2228				
Multi-Star Enhanced Prelaunch (MEP): MEP Subsystem Interface Specifications Developed:	1	2018	4	2023
Multi-Star Enhanced Prelaunch (MEP): MEP Early Engineering Software Development:	1	2018	4	2023
Multi-Star Enhanced Prelaunch (MEP): MEP Engineering Software Development:	1	2018	4	2023
Multi-Star Enhanced Prelaunch (MEP): MEP Subsystem Testing:	1	2018	4	2023
Multi-Star Enhanced Prelaunch (MEP): MEP Preliminary System Integration & Test:	1	2018	4	2023
Multi-Star Enhanced Prelaunch (MEP): MEP Final Engineering Software Development:	1	2018	4	2023
Multi-Star Enhanced Prelaunch (MEP): MEP Final System Integration Test:	1	2018	4	2023
Multi-Star Enhanced Prelaunch (MEP): MEP DASO Flight Test Demonstration:	1	2018	4	2023
Multi-Star Enhanced Prelaunch (MEP): MEP Post Flight Test Data Analysis:	1	2018	4	2023
System Engineering Modeling and Simulation: SWS Integrated Modeling & Simulation/ Common Framework:	1	2018	4	2023
System Engineering Modeling and Simulation: SWS Enhancement Group Test:	1	2018	4	2023
System Engineering Modeling and Simulation: Model-Based Design:	1	2018	4	2023
D5LE2:	1	2020	4	2024
D5LE2: System Effectiveness Trade Studies: Schedule Detail	1	2020	4	2024
D5LE2: Radiation Hardened Architecture: Schedule Detail	1	2020	4	2024
D5LE2: SWS Functional & Behavior Modeling Development: Schedule Detail	1	2020	4	2024
D5LE2: Testability CONOPs Study: Schedule Detail	1	2020	4	2024
D5LE2: Evaluate Performance Architecture: Schedule Detail	1	2022	4	2024
D5LE2: Nuclear Weapons Surety: Schedule Detail	1	2023	4	2024
D5LE2: Functional Simulation Development: Schedule Detail	1	2024	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0101221N / Strategic Sub & Wpns Sys Supt				Project (Number/Name) 3097 / W78/88-1 Life Extension Program			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
3097: W78/88-1 Life Extension Program	0.000	0.000	24.000	26.000	-	26.000	0.000	0.000	0.000	0.000	0.000	50.000
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The 3097 RD TEN project will evaluate and down-select of a range of options to meet USSTRATCOM requirements for a future Navy warhead variant. In FY20, the study will enter Phase 6.2 to further refine the down-selected concepts, screening criteria and programmatic tradeoffs (e.g., cost, schedule, technical maturity) for the concepts being considered.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: IW								0.000	24.000	26.000	0.000	26.000
Articles:								-	-	-	-	-
FY 2019 Plans:												
System requirements definition. System Requirements Review (SRR)												
DoD/DoE and Missile/Reentry/Fire Control interface definition												
Subsystem design integration and assessments												
Thermal Protection System/ Release Assembly (TPS/RA) conceptual design												
Nuclear Explosive Package (NEP) design integration												
Radar Module, pathlength Module,and missile Interface and Controller Module												
Fire Control requirements definition & software development												
FY 2020 Base Plans:												
Phase 6.2 study plan												
Systems Engineering Program Plan (SEMP)												
System Qualification and SPALT planning												
Ground and flight test program planning												
System assessment tools and models development System Safety Program Plan												
Technology Readiness Level/ Manufacturing Readiness Level (TRL/MRL) assessment												
AF&F component conceptual design (Radar Module, Pathlength Module, Missile Interface and Controller Module, Thermal Battery Assemblies)												
Preliminary reliability and safety impact assessment												
Modeling and analysis, flight sciences support												

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019			
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0101221N / <i>Strategic Sub & Wpns Sys Supt</i>		Project (Number/Name) 3097 / <i>W78/88-1 Life Extension Program</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Deployment planning FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: Funding in FY19/20 supports the DOE Phase 6.2/6.2A study for the Interoperable Warhead Program and begins system requirements definition and design activities. Increased funding in FY20 provides for additional program planning and systems engineering activities including flight and ground test planning and AF&F conceptual design activities.						
Accomplishments/Planned Programs Subtotals		0.000	24.000	26.000	0.000	26.000
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks						
D. Acquisition Strategy Contracts will be awarded to those sources who were engaged in the W78/88-1 Life Extension Program and are currently engaged in the production and/or operational support of the deployed W78/88-1 Systems on the basis of Other Than Full and Open Competition pursuant to the authority of 10 U.S.C. 2304 (c) (1) and (3) implemented by FAR 6.302.-1, 3, 4						
E. Performance Metrics N/A						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0101221N / Strategic Sub & Wpns Sys Supt						Project (Number/Name) 3097 / W78/88-1 Life Extension Program			

Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	
W78/88-1 Life Ext Program	SS/CPFF	LMSSC : CA	0.000	0.000		17.000	Dec 2018	22.300	Jan 2020	-		22.300	0.000	39.300	-	
W78/88-1 Life Ext Program	MIPR	DOE : NM	0.000	0.000		4.000	Feb 2019	3.700	Jan 2020	-		3.700	0.000	7.700	-	
W78/88-1 Life Ext Program	SS/CPFF	PERATON : VA	0.000	0.000		3.000	Dec 2018	0.000		-		0.000	0.000	3.000	-	
Subtotal			0.000	0.000		24.000		26.000		-		26.000	0.000	50.000	N/A	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total		Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		24.000		26.000		-		26.000	0.000	50.000	N/A	

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy																						Date: March 2019							
Appropriation/Budget Activity 1319 / 7												R-1 Program Element (Number/Name) PE 0101221N / Strategic Sub & Wpns Sys Supt								Project (Number/Name) 3097 / W78/88-1 Life Extension Program									
Proj 3097		FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
		1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / <i>Strategic Sub & Wpns Sys Supt</i>	Project (Number/Name) 3097 / <i>W78/88-1 Life Extension Program</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3097				
6.2/6.2A Study:	1	2019	4	2020

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0101221N / Strategic Sub & Wpns Sys Supt				Project (Number/Name) 3158 / Integrated Nuclear Weapons Security Sys Dev			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
3158: Integrated Nuclear Weapons Security Sys Dev	29.096	2.726	2.798	2.847	-	2.847	2.919	2.982	3.041	3.102	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Enhanced Special Weapons effort supports the Nuclear Weapons Security (NWS) program and SSBN Escort mission. The policies and requirements regarding the safeguard of nuclear weapons within the Department of Defense is established by DoD S5210.41M. Within the Department of the Navy, nuclear weapons are limited to TRIDENT Fleet Ballistic Missiles (FBM), either deployed aboard TRIDENT submarines or located landside at Naval Submarine Base, Kings Bay or Naval Submarine Base, Bangor where missiles are first assembled as well as repaired. The CNO has assigned SSP, the FBM program manager, with mission responsibility for the safeguard of FBM nuclear assets. More specifically, the mission includes landside and pier operations as well as transits to and from the dive point, each of which present challenges to personnel as well as existing technologies. This budget supports efforts directed at improving the current technological baseline through a series of studies focusing on land and in transit requirements. Collectively, these efforts will improve countermeasure technologies addressing detection, delay and denial.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Integrated Nuclear Weapons Security Sys Dev	2.726	2.798	2.847	0.000	2.847
Articles:	-	-	-	-	-
FY 2019 Plans: Continue Wide Area/Extended Detection: Development of technologies to increase detection, localization, classification, and tracking capabilities beyond the perimeter of the limited area, waterfront restricted area, along the convoy route and transit route. This effort includes technologies to detect intruders in difficult environments such as dense foliage, marsh, fog and heavy rain. Continue research and development efforts towards the improvement of countermeasures technologies addressing detection, delay and denial. Continue Analysis of Alternatives on WQX-2 follow on Sensor Selection & Transition					
FY 2020 Base Plans: Continue Wide Area/Extended Detection: Development of technologies to increase detection, localization, classification, and tracking capabilities beyond the perimeter of the limited area, waterfront restricted area, along the convoy route and transit route. This effort includes technologies to detect intruders in difficult environments such as dense foliage, marsh, fog and heavy rain. Continue research and development efforts towards the improvement of countermeasures technologies addressing detection, delay and denial.					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019							
Appropriation/Budget Activity 1319 / 7			R-1 Program Element (Number/Name) PE 0101221N / <i>Strategic Sub & Wpns Sys Supt</i>			Project (Number/Name) 3158 / <i>Integrated Nuclear Weapons Security Sys Dev</i>					
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)											
			FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total				
Continue Analysis of Alternatives on WQX-2 follow on Sensor Selection & Transition											
FY 2020 OCO Plans: N/A											
FY 2019 to FY 2020 Increase/Decrease Statement: Increase due to minor rate and inflation adjustments.											
Accomplishments/Planned Programs Subtotals			2.726	2.798	2.847	0.000	2.847				
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPN/Various-2: <i>OPN (Nuclear Weapons Security)</i>	28.559	29.852	41.991	-	41.991	34.427	35.098	35.791	36.506	Continuing	Continuing
• OMN/11D2D-3: <i>Fleet Ballistic Missile (Nuclear Weapons Security)</i>	86.489	81.424	82.569	-	82.569	84.073	85.708	87.466	89.213	Continuing	Continuing
• OMN/11D2D-5: <i>Fleet Ballistic Missile (Transit/Escort)</i>	90.816	110.861	124.191	-	124.191	108.328	109.703	111.526	113.665	Continuing	Continuing
• MCN/Various-1: <i>MILCON (CNI) (Nuclear Weapons Security)</i>	0.000	88.960	0.000	-	0.000	0.000	155.440	0.000	0.000	0.000	386.589
Remarks											
D. Acquisition Strategy Procurements are being executed through a combination of private contractors (large and small business), government Centers of Excellence (COEs), other government agencies and the Naval Submarine Bases, Kitsap and Kings Bay. Contract awards are based upon "best value" determinations, and where practical will be performance based or include incentive provisions.											
E. Performance Metrics Not applicable											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0101221N / <i>Strategic Sub & Wpns Sys Supt</i>						Project (Number/Name) 3158 / <i>Integrated Nuclear Weapons Security Sys Dev</i>			
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Integrated Nuclear Weapons Security Sys Dev	SS/CPFF	APL : MD	3.895	0.275	Aug 2018	0.199	Feb 2019	2.647	Nov 2019	-		2.647	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	WR	NSWC : VA	4.297	0.252	Oct 2017	0.201	Feb 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	SS/CPFF	JRC : VA	3.020	0.276	Feb 2018	0.233	Feb 2019	0.200	Oct 2019	-		0.200	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	C/BA	DRAPER : MA	0.355	0.000		0.201	Feb 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	WR	CNS : ID	0.000	0.652	Oct 2018	1.300	Feb 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys	C/CPFF	GDMS : MA	0.000	0.442	Feb 2018	0.456	Feb 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys	C/BA	ONR : DC	0.000	0.000		0.208	Feb 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	WR	NFESC : CA	2.700	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	WR	CNWS : CA	0.404	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	WR	SNWS : CA	4.558	0.222	Feb 2018	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	MIPR	DOE : NM	0.425	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	SS/CPFF	ARL : TX	1.880	0.225	Feb 2018	0.000		0.000		-		0.000	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0101221N / Strategic Sub & Wpns Sys Supt				Project (Number/Name) 3158 / Integrated Nuclear Weapons Security Sys Dev					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Integrated Nuclear Weapons Security Sys Dev	WR	NUWD : WA	0.881	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	C/BA	NRL : DC	1.188	0.262	Oct 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	WR	NUWC : RI	1.578	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	C/BA	SPAWAR : CA	0.390	0.120	Feb 2018	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	C/BA	SPA : VA	0.475	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	MIPR	ATC : TX	0.461	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	WR	NEDU : FL	0.383	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	SS/CPFF	LMSS : CA	2.026	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	MIPR	DOEI : ID	0.180	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			29.096	2.726		2.798		2.847		-		2.847	Continuing	Continuing	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			29.096	2.726		2.798		2.847		-		2.847	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy							Date: March 2019			
Appropriation/Budget Activity 1319 / 7				R-1 Program Element (Number/Name) PE 0101221N / Strategic Sub & Wpns Sys Supt			Project (Number/Name) 3158 / Integrated Nuclear Weapons Security Sys Dev			
	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract	
Remarks										

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PE 0101221N: *Strategic Sub & Wpns Sys Supt*
Navy

R-1 Line #207

Appropriation/Budget Activity

R-1 Program Element (Number/Name)
PE 0101221N / Strategic Sub & Wpns Sys
Supt

Project (Number/Name)
3158 / *Integrated Nuclear Weapons Security*
Sys Dev

Proj 3158	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
RDTE required to study NWS risks																												
NWS Wide Area/Extended Detection																												
AoA WQX-2 Sensor Selection & Transition																												

2020DON - 0101221N - 3158

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / Strategic Sub & Wpns Sys Supt	Project (Number/Name) 3158 / Integrated Nuclear Weapons Security Sys Dev

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3158				
RDTE required to study NWS risks: NWS Wide Area/Extended Detection:	1	2018	4	2024
RDTE required to study NWS risks: AoA WQX-2 Sensor Selection & Transition: Schedule Detail	1	2018	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0101221N / Strategic Sub & Wpns Sys Supt				Project (Number/Name) 9999 / Congressional Adds			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
9999: Congressional Adds	0.000	6.979	17.700	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	24.679
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
This funding is a congressional add to support Modeling and Simulation efforts for the Strategic Weapon System. The Systems Engineering Modeling and Simulation capability will consist of three elements: Model Based Design, Strategic Weapon System (SWS) Integrated Modeling and Simulation/Common Architecture & Framework, and SWS Enhancement Ground Test. This effort will provide the capability to comprehensively evaluate and test the integrated SWS within representative operational environments, providing unprecedented visibility across the SWS and system performance characterization equivalent to flight testing. This capability will enable trade space analysis to identify technical margin, subsystem interactions, and lifecycle affordability opportunities to include other services and be able to identify the benefits and risks of commonality to the individual programs, requirements and CONOPs modifications that could facilitate commonality, potential common acquisition strategies between the services, and total life cycle cost implications.												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2018	FY 2019			
Congressional Add: Program Increase								6.979	0.000			
FY 2018 Accomplishments: NSS Error Model Fire Control Interface Model Updated Missile Eclectic Guidance Algorithm Model Models have been integrated into deterministic simulations (VSSIM), covariance simulations, and HWIL and used to validate SWS interfaces and algorithms Fire Control data used to drive VSSIM Fire Control/Guidance Integration testing with GHWIL at Eastern Range Missile/Guidance Integration testing with the GHWIL at LM Missile Simulation Center												
FY 2019 Plans: N/A												
Congressional Add: Model Based Systems Engineering								0.000	15.000			
FY 2018 Accomplishments: N/A FY 2019 Plans: - Update Standards and Methods based upon FY18 Accomplishments - Improve Model Based Engineering (MBE) Infrastructure for data and model exchange in secure environment - Update Process with lessons learned from FY18 Accomplishments												

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019	
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / <i>Strategic Sub & Wpns Sys Supt</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>	

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019
- Implement command MBE training for civilian and military staff		
Congressional Add: Autonomous Strategic Force Protection Sensor Network	0.000	2.700
FY 2018 Accomplishments: N/A		
FY 2019 Plans: Develop advanced sensor systems for counterterrorism and antiterrorism operations to meet rigorous performance metrics necessary for nuclear facility, material, and weapons protection.		
Congressional Adds Subtotals	6.979	17.700

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
Contracts will be awarded to those sources who were engaged in program and are currently engaged in the production and/or operational support on the basis of Other Than Full and Open Competition pursuant to the authority of 10 U.S.C. 2304 (c) (1) and (3) implemented by FAR 6.302.-1, 3, 4

E. Performance Metrics
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0101221N / Strategic Sub & Wpns Sys Supt				Project (Number/Name) 9999 / Congressional Adds					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Technical Applications CSDL	SS/CPFF	CSDL : MA	0.000	5.300	Jul 2018	0.000		0.000		-		0.000	0.000	5.300	-
Technical Applications VAR	Various	Various : Various	0.000	0.300	Jul 2018	0.000		0.000		-		0.000	0.000	0.300	-
Technical Applications GD-AIS	SS/CPFF	GDMS : MA	0.000	1.379	Aug 2018	0.000		0.000		-		0.000	0.000	1.379	-
Model Based System Engineering	Various	various : various	0.000	0.000		15.000	Jun 2019	0.000		-		0.000	0.000	15.000	-
Autonomous Strategic Force Protection Sensor Network	Various	various : various	0.000	0.000		2.700	Jul 2019	0.000		-		0.000	0.000	2.700	-
Subtotal			0.000	6.979		17.700		0.000		-		0.000	0.000	24.679	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	6.979		17.700		0.000		-		0.000	0.000	24.679	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy																							Date: March 2019																	
Appropriation/Budget Activity 1319 / 7													R-1 Program Element (Number/Name) PE 0101221N / Strategic Sub & Wpns Sys Supt										Project (Number/Name) 9999 / Congressional Adds																	
Proj 9999													FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
													1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Congressional Add																																								
Model Based Systems Engineering																																								
Congressional Add																																								
Autonomous Strategic Force Protection Sensor Network																																								
																																</								

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / <i>Strategic Sub & Wpns Sys Supt</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9999				
Congressional Add: Model Based Systems Engineering: Congressional Model Based Systems Engineering	1	2019	4	2020
Congressional Add: Autonomous Strategic Force Protection Sensor Network: Congressional Autonomous Strategic Force Protection Sensor Network	1	2019	4	2020