Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603595N *I (U)Ohio Replacement*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	833.274	971.393	700.811	-	700.811	757.737	476.140	198.968	330.466	Continuing	Continuing
3220: *SBSD Advanced Submarine System Development*	0.000	796.804	971.393	700.811	-	700.811	757.737	476.140	198.968	330.466	Continuing	Continuing
3237: *Launch Test Facility*	0.000	36.470	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	36.470
Program MDAP/MAIS Code: P444												

A. Mission Description and Budget Item Justification

This program element supports innovative research and development in submarine Hull, Mechanical and Electrical (HM&E) and combat systems technologies and the subsequent evaluation, demonstration, and validation for submarine platforms. It will increase the submarine technology base and provide subsystem design options not currently feasible. The program element also supports programs transitioning from Science and Technology (S&T), Defense Advanced Research Projects Agency (DARPA), Independent Research and Development, and Small Business Innovation Research (SBIR) projects.

Project Unit 3220:

The objective of the Sea Based Strategic Deterrent (SBSD) Advanced Submarine System Development project is to design and prepare for construction of the replacement of the OHIO Class SSBN.

Project Unit 3237:

The Launch Test Facility project constructs the Launch Test Facility at Naval Air Warfare Center, China Lake, CA to enable Full Scale Surface Launch Testing and evaluation / qualification of the TRIDENT II D5LE SWS missile launcher subsystem for the OHIO Replacement Submarine. The project construction will be authorized by 10 U.S.C. Section 2353, funded from Research, Development, Test, and Evaluation (RDT&E) appropriations, and will have no general utility and will be utilized solely to meet RDT&E contractual requirements.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy					Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*		R-1 Program Element (Number/Name) PE 0603595N *I (U)Ohio Replacement*			
B. Program Change Summary ($ in Millions)	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**
Previous President's Budget	853.277	971.393	712.354	-	712.354
Current President's Budget	833.274	971.393	700.811	-	700.811
Total Adjustments	-20.003	0.000	-11.543	-	-11.543
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-20.003	0.000			
• Rate/Misc Adjustments	0.000	0.000	-11.543	-	-11.543

Change Summary Explanation

Note: Beginning in 2015, there is an administrative change that shifts efforts funded from PE 0603561N (Advanced Submarine System Development) / Project 3220 to PE 0603595N (Ohio Replacement) / Project 3220. This shift is consistent with Congressional intent identified in the FY13 Appropriation Act.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603595N / *(U)Ohio Replacement*	Project (Number/Name) 3220 / *SBSD Advanced Submarine System Development*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3220: *SBSD Advanced Submarine System Development*	0.000	796.804	971.393	700.811	-	700.811	757.737	476.140	198.968	330.466	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Note: Beginning in 2015, there is an administrative change that will shift efforts funded from PE 0603561N (Advanced Submarine System Development) / Project 3220 to PE 0603595N (OHIO Replacement) / Project 3220. This shift is consistent with Congressional intent identified in the FY13 Appropriation Act.

A. Mission Description and Budget Item Justification

The Sea Based Strategic Deterrent (SBSD) Advanced Submarine System Development project supports the OHIO Replacement (OR) program. The funding applies to the design, systems engineering, prototyping, and vendor qualification activities needed to execute the schedule for Common Missile Compartment (CMC) design, whole ship design, and component technologies development for the next generation U.S. ballistic missile submarine. This RDT&E program supports cooperation with the United Kingdom (UK) to maintain strategic deterrence, based on a single effort to develop a CMC as agreed by the UK Secretary of State for Defense and the U.S. Secretary of Defense in 2009.

The OHIO Replacement program strategy is to maximize the re-use of existing OHIO systems and new designs from the SEAWOLF and VIRGINIA Classes (as applicable), focus on Life Cycle Total Ownership Cost (TOC) affordability, and meet the military requirements established for this SSBN to achieve mission success in a challenging environment. The requested funding levels provide for the Technology Development, Design, and Engineering Integration efforts necessary to support the OHIO Replacement SSBN lead ship construction start in FY 2021.

The following key activities support a ship acquisition program to replace the OHIO Class SSBNs:

1. Design and development of a missile compartment, launch system, and strategic weapons support systems to meet U.S. strategic requirements while cooperating with the UK on modernizing its strategic deterrent in accordance with Presidential direction (December 2006).
2. Concept, System Definition, and Detailed Design for remaining portions of the ship will be accomplished through a Design/Build/Sustain approach modeled after the approach used by the VIRGINIA Class program.
3. Engineering and integration of existing technologies and development of new technologies required to provide the capabilities necessary to ensure platform operational effectiveness and minimize life cycle cost.

OR Concept and System Definition Prototyping, and Technology Development Efforts
The OR program supports design, systems engineering, prototyping and vendor qualification activities needed to develop CMC design, the OHIO Replacement whole ship design, and component development. The OR design timelines are based on the design approach proven on the VIRGINIA Class Program, adjusted for the additional complexity of a missile compartment and Strategic Weapons Systems (SWS). Planned technical studies and prototyping are necessary to reduce risks

associated with updating SSBN system designs for current technical standards and demonstrating design feasibility of developmental technology to meet the ship design and construction schedule.

The Navy continues investing in program funded affordability initiatives similar to those employed successfully for VIRGINIA Class, but tailored to the unique SSBN mission and operational tempo of OHIO Replacement to drive down overall program costs. Efforts will focus on reducing ship construction costs through implementing more effective design features and production methods to produce a more affordable/producible submarine. As part of this effort, alternative contracting strategies are also being examined to include multi-class multiyear procurement (MYP) and economic order quantity (EOQ).

Activities for FY 2015 were executed to ensure the first article quad pack prototype of the CMC remains on schedule to support the UK SUCCESSOR Program. The CMC program will mature required technologies and re-host the TRIDENT II D5 SWS (Launcher, Fire Control and Navigation) while ensuring no degradation to D5 security, safety and performance. In addition, whole ship design efforts are focused on technologies requiring significant engineering, integration and development time as well as those technologies that are required to support ship design and construction schedules such as the propulsor and maneuvering/ship control. These technologies are critical for stealth capability for a ship class that will be in service until the 2080s. Ship detailed design efforts include important pre-construction activities such as finalizing ship requirements, risk characterization and mitigation, improvement and validation of performance prediction tools and improvement of design tools. Technology development will address engineering and integration of existing technologies as well as maturation of developmental technologies.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Lead Design Yard (CMC / Ship Study and Design)	425.044	517.316	335.809	0.000	335.809
Articles:	-	-	-	-	-
FY 2015 Accomplishments: The combination of Common Missile Compartment (CMC) Design and Prototyping and Ship Study and Design represents the required Lead Design Yard (LDY) Shipbuilder effort for the OHIO Replacement (OR) Program. CMC: This funding applies to the design, systems engineering, prototyping, and vendor qualification activities needed to execute the schedule for Common Missile Compartment (CMC) design and component / technology development for the OHIO Replacement submarine. Included in this effort are prototyping of the Missile Tubes (MTs), Quad Packs (QPs) and ultimately the Missile Tube Module (MTM). Specific efforts in FY2015 included commencing efforts supporting prototyping of the Missile Tubes (MTs), Quad Packs (QPs) and ultimately the Missile Tube Module (MTM). First Article QP Arrangements Completed. Missile Tube Design Disclosures 97 percent Completed. CMC System Descriptions Completed. Commenced manufacture of first article QP missile tubes. Also included are continuing efforts for the design and development of the MTs, MTM and entire CMC to include: completion of approximately 79 percent of Diagrams, 6 percent of Design Disclosures (including 80 percent of First Article QP Design Disclosures), and 60 percent of CMC Arrangements (approximately 650 products). Completed all CMC Preliminary Hazard Analyses and Safety Requirements Hazard Analyses.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3220 / *SBSD Advanced Submarine System Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Additionally this effort continued validation of missile tube to missile tube quad pack production techniques development, testing, and integration of missile tube to keel robotic welding techniques that support process certification; generated digital manufacturing data for the prototype FAQP; began manufacturing of First Article MTs and placed contract actions for long lead material to support development of FAQP pressure hull. Ship Study and Design: This funding applies to the design, systems engineering, prototyping, and vendor qualification activities needed to execute the schedule for whole ship design, shipbuilder component / technology development for the OHIO Replacement submarine. Specific efforts in FY2015 included design of the forward and aft ends of OHIO Replacement including Rest of Ship (RoS) system integration including the neared completion of System Descriptions. Additionally this effort includes the completion of approximately 70 percent of engineered component procurement specifications, 90 percent of System Diagrams, 12 percent of Arrangements (approximately 200 products). This effort also commenced RoS Design Disclosures and completed approximately 70 percent of Preliminary Hazard Analyses. This funding also continues maintaining configuration control for all CMC interfaces with Rest of Ship, began ship integration of the Generation 1 Propulsor design and continued development of a Non-Shipboard Prototype to validate the next generation design tool at the shipbuilder.					
FY 2016 Plans: The combination of Common Missile Compartment (CMC) Design and Prototyping and Ship Study and Design represents the required Lead Design Yard (LDY) Shipbuilder effort for the OHIO Replacement (OR) Program. CMC: This funding applies to the design, systems engineering, prototyping, and vendor qualification activities needed to execute the schedule for Common Missile Compartment (CMC) design and component / technology development for the OHIO Replacement submarine. Included in this effort are continued prototyping of the Missile Tubes (MTs), Quad Packs (QPs) and ultimately the Missile Tube Module (MTM). Specific planned efforts in FY 2016 include continued fabrication of First Article prototype MTs, completion of First Article QP Design Disclosures, and Diagrams. Additionally, this effort includes the completion of approximately 20 percent of Design Disclosures (approximately 200 products) and 94 percent of CMC Arrangements (approximately 965 products). This effort also includes receiving approvals for CMC System Hazard Analyses (SHAs); performing assembly, installation and test of manufacturing fixtures required to prove Integrated Tube and Hull (ITH) manufacturing; commencing manufacturing of the FAQP pressure hull; support of development of Strategic Weapons Support Systems (SWSS) for the land based test facility; and placement of contract actions for material to support the Prototype MTM.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3220 / *SBSD Advanced Submarine System Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Ship Study and Design: Lead Design Yard (LDY) efforts increase by approximately 20 percent in FY 2016, driven by a 50 percent increase in labor hours and time related material associated with design disclosure and arrangement development as well as the accompanying engineering analysis. The increase in funding requirements from FY 2015 to FY 2016 supports the 83 percent design completion goal for an FY 2021 Lead Ship construction start and the aggressive 84 month build schedule necessary to support the first strategic deterrent patrol in FY 2031. This funding applies to the shipbuilder design, systems engineering, prototyping, and vendor qualification activities needed to execute the schedule for whole ship design, component / technology development for the OHIO Replacement submarine. Specific efforts in FY 2016 include the completion of approximately 93 percent of engineered component procurement specifications, RoS Systems Diagrams, 3 percent of Design Disclosures (approximately 75 products), 45 percent of Arrangements (approximately 800 products), and completion of Preliminary Hazard Analyses, and completed development of a Non-Shipboard Prototype to validate the next generation design tool at the shipbuilder. Efforts will also continue towards Safety Requirements Hazard Analyses and maintaining configuration control for all CMC interfaces with Rest of Ship and progressing ship integration of the Propulsor design.					
FY 2017 Base Plans: The combination of Common Missile Compartment (CMC) Design and Prototyping and Ship Study and Design represents the required Lead Design Yard (LDY) Shipbuilder effort for the OHIO Replacement (OR) Program. CMC: This funding applies to the design, systems engineering, prototyping, and vendor qualification activities needed to execute the schedule for Common Missile Compartment (CMC) design and component / technology development for the OHIO Replacement submarine. Included in this effort are continued prototyping of the Missile Tubes (MTs), Quad Packs (QPs) for quad packs and ultimately the Missile Tube Module (MTM). Specific planned efforts in FY 2017 include continued fabrication and outfitting of First Article QP prototype MTs; completion of approximately 30 percent of Design Disclosures (approximately 300 products), and 98 percent of CMC Arrangements (approximately 995 products) in support of the MTs, First Article QP (FAQP), and MTM build. This effort also includes completion of installation and test of manufacturing fixtures required to prove Integrated Tube and Hull (ITH) manufacturing, continued manufacture of the FAQP and continued support of development of Strategic Weapons Support Systems (SWSS) for the land based test facility. Ship Study and Design: This funding applies to the shipbuilder design, systems engineering, prototyping, and vendor qualification activities needed to execute the schedule for whole ship design, component / technology					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3220 / *SBSD Advanced Submarine System Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
development for the OHIO Replacement submarine. Specific efforts in FY 2017 include the completion of engineered component procurement specifications, 6 percent of Design Disclosures (approximately 150 products), 79 percent of Arrangements (approximately 1,400 products), as well as completing CMC Subsystem, System Hazard Analyses, and Safety Requirements Hazard Analyses. Efforts will also continue towards maintaining configuration control for all CMC interfaces with Rest of Ship and progressing ship integration of the Propulsor design. ***FY 2017 OCO Plans:*** N/A					
Title: NAVSEA R&D and Prototyping	152.606	184.978	142.608	0.000	142.608
Articles:	-	-	-	-	-
FY 2015 Accomplishments: This funding applies to the Government combat systems, component and technology development for the OHIO Replacement (OR) submarine essential to achieving required signatures, maneuverability, combat and communications capabilities. Specific efforts in FY 2015 included hardware manufacturing of the Generation 1 Propulsor models for testing on the large scale vehicle, and commencement of the Generation 2 Propulsor design based on lessons learned from Generation 1 testing; Commenced manufacturing of the full scale prototype propulsor quick disconnect duct hardware; and established the full scale bearing test rig for future evaluations of candidate prototype OR propulsor bearing materials. Additional efforts included beginning Phase II of the Concept of Operations Exercise (COOPEX) to support Hovering and Missile Compensation Control System (HMCCS) and Ship Control System designs; conducting a full scale at-sea characterization test on a surrogate platform to inform stern design; transition of out-of-autoclave bow dome manufacturing process to the shipbuilder; continuing Government Furnished Equipment (GFE) development studies to enable delivery of preliminary Government Furnished Information (GFI) for Non-Propulsion Electronics Systems (NPES); continued OR specific systems engineering efforts and arrangements trade studies to support AN/BRR-6 reliability updates; and conducting water tunnel and model testing to support control surface design. This effort also continues Government support and oversight of development of approximately 50 engineered components. ***FY 2016 Plans:*** This funding applies to the Government combat systems, component and technology development for the OHIO Replacement (OR) submarine essential to achieving required signatures, maneuverability, combat and communications capabilities. Efforts in FY 2016 include Generation 1 Propulsor testing on the Large Scale Vehicle and continued Generation 2 Propulsor design (including small and intermediate scale testing).					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3220 / *SBSD Advanced Submarine System Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Other efforts include machining and finishing of the quick disconnect duct prototype and preparations for the associated handling and assembly demonstrations for testing of candidate propulsor bearing materials at the full scale bearing test rig; and completing Concept of Operations Exercise (COOPEX) Phase II & III to support Hovering and Missile Compensation and Missile Compensation Control System (HMCCS) and Ship Control System designs. Specific efforts also include continued development, refinement, and delivery of GFI for NPES; continued assessment of AN/BRR-6 reliability based updates (including delivery of updated GFI); continued initial systems architecture assessment and development in conjunction with existing submarine classes to deliver increased GFI fidelity; and completion of testing and analysis to support the finalization of control surface design. This effort also continues Government support and oversight of development of approximately 50 engineered components. ***FY 2017 Base Plans:*** This funding applies to the Government combat systems, component and technology development for the OHIO Replacement (OR) submarine essential to achieving required signatures, maneuverability, combat and communications capabilities. Efforts in FY 2017 include Generation 2 propulsor design, intermediate scale testing, and hardware manufacturing for Large Scale Vehicle testing; begin installation of an array upgrade at the Acoustic Research Detachment (ARD) to support Generation 2 propulsor large scale vehicle testing; and completion of the quick disconnect duct demonstration. Other efforts include beginning testing of the OR prototype bearing at the full scale bearing test rig, start preliminary hydrodynamic characterization and submerged operating envelope development; development of drawings and procurement specifications for the OR bow dome. Specific efforts also include continued development, refinement, and delivery of GFI for NPES; continued assessment of AN/BRR-6 reliability based updates (including delivery of updated GFI); continued initial systems architecture assessment and development in conjunction with existing submarine classes to deliver increased GFI fidelity. This effort also continues Government support and oversight of development of approximately 50 engineered components. ***FY 2017 OCO Plans:*** N/A					
Title: Systems Engineering/Program Management	70.391	71.896	11.226	0.000	11.226
Articles:	-	-	-	-	-
FY 2015 Accomplishments: This funding applies to the Government technical and programmatic oversight including Program Office management and technical support from government laboratories for review, analysis and approval of lead					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3220 / *SBSD Advanced Submarine System Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
design yard and various government performers' design deliverables. Specific efforts in FY 2015 include continued review and approval of Arrangements, System Descriptions/Diagrams, and Design Disclosures in accordance with the Integrated Master Schedule (IMS) via technical oversight, review and Government approval of all Lead Design Yard (LDY) developed design products. Continued maintenance planning and design for sustainment activities to ensure SBSD availability requirements can be met. In August 2015, the updated OHIO Replacement Capabilities Development Document (CDD) was submitted to the Joint Requirements Oversight Council (JROC) for validation. Final JROC validation received on 25 August 2015. Continued functional allocation of CDD requirements to platform design and system attributes and performance standards. Continued to identify and assess platform, shore facilities, and infrastructure characteristics to identify opportunities to positively impact program costs. Continued program affordability initiatives in order reduce overall out-year program costs. Specific initiatives include Integrated Product Development Environment (IPDE) process development and identification of candidates for material reuse. Continued program affordability efforts targeted to achieving potential savings associated with multi-year and/or Economic Order Quantity (EOQ) procurements across submarine classes, investigating the government vs. contractor furnished equipment mix for potential efficiencies, and potential savings associated with continuous missile tube and/or launch tube production runs. Continued efforts for Milestone B document preparation to fulfill OSD oversight requirements. ***FY 2016 Plans:*** This funding applies to the Government technical and programmatic oversight including Program Office management and technical support from government laboratories for review, analysis and approval of lead design yard and various government performers' design deliverables. Specific efforts in FY 2016 include continued review and approval of Arrangements, System Descriptions/Diagrams, and Design Disclosures in accordance with the Integrated Master Schedule (IMS) via technical oversight, review and Government approval of all Lead Design Yard (LDY) developed design products. Complete development and gain approval of TEMP and LFT&E Master Plan. Obtain waiver for Full-Up-System Level (FUSL) testing. Continue program affordability efforts targeted to quantifying potential savings associated with multi-year and/or Economic Order Quantity (EOQ) procurements across submarine classes, investigating the government vs. contractor furnished equipment mix for potential efficiencies, identifying and quantifying manufacturing/producibility improvements, and potential savings associated with continuous MT and/or launch tube production runs. ***FY 2017 Base Plans:*** This funding applies to the Government technical and programmatic oversight including Program Office management and technical support from government laboratories for review, analysis and approval of lead design yard and various government performers' design deliverables. Specific efforts in FY 2017 include higher					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
fidelity functional mapping of JROC-validated CDD requirements to key subordinate design documents such as the NPES Functional Requirements Document (FRD) and Ship Building Specifications in support of the planned System Engineering Technical Review (SETR) events and in support of platform arrangements reviews and staffing of other design deliverables from the Lead Design Yard and PARMs. Requirements Development activities will migrate from the definition stage to the implementation and verification stage. ***FY 2017 OCO Plans:*** N/A					
Title: Strategic Weapons Systems Integration ***Articles:*** ***FY 2015 Accomplishments:*** Continued system engineering efforts required for the re-hosting and integration of the TRIDENT II (D5) SWS on the OHIO Replacement submarine including review and modification of SWS Coordination, Interface and Arrangement Drawings for SWS equipment within the CMC and Missile Control Center Module (MCCM), SWS system and subsystem detailed preliminary design, and Hardware and Software requirements development. Continued SWS Test Systems material procurement and builds, test berth /facility modifications and development of special test vehicles. Continued SWS Ashore test capability development. Continued SWS training capability/requirements development. Completed build and deliver Fire Control Engineering Test Systems. Continued design efforts for the development of a missile launch tube test capability and test stand including refurbishment of a test vehicle to support launch system prototype efforts and evaluation / qualification program. Continue design and development efforts for shipboard SWS Navigation. Continued systems engineering design efforts related to the OHIO Replacement guidance handling carts and procurement of a prototype guidance handling cart. ***FY 2016 Plans:*** Continue system engineering efforts required for the re-hosting and integration of the TRIDENT II (D5) SWS on the OHIO Replacement submarine including review and modification of SWS Coordination, Interface and Arrangement Drawings for SWS equipment within the CMC and Missile Control Center Module (MCCM) as the SWS system and its subsystems transition into detailed design. Continue SWS Test Systems material procurement and builds, test berth / facility modifications and development of special test vehicles. Continue SWS Ashore test capability development. Continue SWS training capability/requirements development. Complete final design efforts for the China Lake Launch Test Facility (LTF) . Conduct a launcher evaluation test readiness review. Conduct integration and test of multiple components at the LTF. Continue preliminary	148.763 -	197.203 -	211.168 -	0.000 -	211.168 -

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3220 / *SBSD Advanced Submarine System Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Fire Control hardware and software subsystem integration testing. Continue design and development efforts for shipboard SWS Navigation. Complete build and test of phase 1 of the Inertial Navigation Simulator which involves the simulation of subsystem interfaces. Continue systems engineering design efforts related to the OHIO Replacement guidance handling carts. Conduct mechanical and electrical surface support equipment critical design reviews. Commence Reentry Body Simulator development. ***FY 2017 Base Plans:*** Continue system engineering efforts required for the re-hosting and integration of the TRIDENT II (D5) SWS on the OHIO Replacement submarine including review and modification of SWS Coordination, Interface and Arrangement Drawings for SWS equipment within the CMC and Missile Control Center Module (MCCM) and SWS system and subsystem detailed design. Complete land-based test berth / facility modifications. Continue SWS Test Systems material procurement and builds, and development of special test vehicles. Continue SWS Ashore test capability development. Continue SWS training capability/requirements development. Initiate the launcher evaluation testing at the China Lake Launch Test Facility (LTF). Conduct SWS Launcher and Fire Control subsystem Critical Design Reviews. Continue design and development efforts for shipboard SWS Navigation in preparation for the Critical Design Review. Continued systems engineering design efforts related to the OHIO Replacement guidance handling carts and procurement of a prototype guidance handling cart. Complete Reentry Body Simulator development. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	796.804	971.393	700.811	0.000	700.811

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• RDTEN/3219: *SBSD Nuclear Technology Development*	369.964	419.273	390.326	-	390.326	389.279	281.218	270.091	149.700	Continuing	Continuing
• RDTEN/3237: *ORP Launch Test Facility*	36.470	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	36.470
• MILCON/0805376N: *Ohio Replacement Power and Propulsion Facility*	23.985	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	23.985

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3220 / *SBSD Advanced Submarine System Development*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• MILCON/0901211N: *MCON Design Funds*	0.364	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.364
• RDTEN/0951: *Joint Warhead Fuse Sustainment Program*	81.696	84.765	111.857	-	111.857	108.787	63.568	65.185	20.826	Continuing	Continuing
• OPN/5358: *SWS Modernization Fund*	209.583	240.694	215.138	-	215.138	245.396	238.665	254.815	243.736	Continuing	Continuing
• WPN/1250: *TRIDENT II Mods*	1,161.342	1,089.064	1,103.086	-	1,103.086	1,140.542	1,182.066	1,235.327	1,259.934	Continuing	Continuing
• OMN/1D2D: *Fleet Ballistic Missile*	994.191	1,034.668	1,030.267	-	1,030.267	1,046.348	1,066.921	1,127.576	1,151.370	Continuing	Continuing
• SCN/1045: *OHIO Replacement Submarine*	0.000	0.000	773.138	-	773.138	787.130	2,766.991	1,311.541	3,611.187	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Common Missile Compartment (CMC)will be designed and developed to support the U.S. and UK in development of the OHIO Replacement and SUCCESSOR SSBN programs enabling a common U.S.-UK CMC and maximizing the benefit of the ongoing U.S.-UK partnership in strategic deterrence. The OHIO Replacement R&D efforts will incentivize cost reduction initiatives in the design, construction and operations & support portions of the program. R&D efforts will be performed by Navy laboratories, shipyards, private industry, and University Affiliated Research Centers.

E. Performance Metrics

Updated Integrated Master Schedule and CMC build strategy down-select. Development of signature management efforts to address knowledge gap, concepts for propulsor and shafting, and design guidance and interface control requirements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3220 / *SBSD Advanced Submarine System Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	SS/CPFF	Ship Design Contractor-EB : Groton, CT	0.000	425.044	Oct 2014	517.316	Oct 2015	335.809	Oct 2016	-		335.809	Continuing	Continuing	Continuing
Product Development	WR	NSWC : Carderock, MD	0.000	145.437	Oct 2014	171.125	Oct 2015	121.628	Oct 2016	-		121.628	Continuing	Continuing	Continuing
Product Development	WR	NUWC : Newport, RI	0.000	14.808	Oct 2014	21.045	Oct 2015	10.045	Oct 2016	-		10.045	Continuing	Continuing	Continuing
Product Development	Various	NAVSEA : Various	0.000	23.921	Oct 2014	23.297	Oct 2015	10.935	Oct 2016	-		10.935	Continuing	Continuing	Continuing
Product Development	SS/CPFF	ARL Penn State University : State College, PA	0.000	0.492	Oct 2014	0.377	Oct 2015	0.377	Oct 2016	-		0.377	Continuing	Continuing	Continuing
Product Development	SS/CPFF	NGMS : Sunnyvale, CA	0.000	35.904	Oct 2014	51.886	Oct 2015	61.541	Oct 2016	-		61.541	Continuing	Continuing	Continuing
Product Development	SS/CPFF	JHU/APL : Laurel, MD	0.000	4.896	Oct 2014	7.317	Oct 2015	7.027	Oct 2016	-		7.027	Continuing	Continuing	Continuing
Product Development	WR	NUWC : Keyport, WA	0.000	0.000		0.000		0.332	Oct 2016	-		0.332	Continuing	Continuing	Continuing
Product Development	SS/CPFF	CSDL : Cambridge, MA	0.000	3.330	Oct 2014	3.393	Oct 2015	1.966	Oct 2016	-		1.966	Continuing	Continuing	Continuing
Product Development	WR	NSWC : Corona, CA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Product Development	SS/CPFF	LMFS : Mitchel Field, NY	0.000	7.935	Oct 2014	26.107	Oct 2015	20.209	Oct 2016	-		20.209	Continuing	Continuing	Continuing
Product Development	C/CPFF	EMCUBE : Alexandria, VA	0.000	0.951	Oct 2014	0.715	Oct 2015	0.649	Oct 2016	-		0.649	Continuing	Continuing	Continuing
Product Development	SS/CPFF	LMMSC : Sunnyvale, CA	0.000	26.472	Dec 2014	23.693	Dec 2015	18.313	Oct 2016	-		18.313	Continuing	Continuing	Continuing
Product Development	SS/CPFF	JRC : Washington, DC	0.000	0.867	Oct 2014	2.112	Dec 2015	1.863	Oct 2016	-		1.863	Continuing	Continuing	Continuing
Product Development	C/CPFF	GDAIS : Pittsfield, MA	0.000	25.291	Nov 2014	22.642	Nov 2015	41.039	Oct 2016	-		41.039	Continuing	Continuing	Continuing
Product Development	WR	CNSW : China Lake, CA	0.000	9.401	Nov 2014	13.175	Nov 2015	8.762	Oct 2016	-		8.762	Continuing	Continuing	Continuing
Product Development	SS/CPFF	IEC : Anaheim, CA	0.000	1.136	Oct 2014	1.023	Oct 2015	0.660	Oct 2016	-		0.660	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3220 / *SBSD Advanced Submarine System Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	WR	NSWC : Dahlgren, VA	0.000	3.432	Oct 2014	3.732	Oct 2015	6.032	Oct 2016	-		6.032	Continuing	Continuing	Continuing
Product Development	SS/CPFF	BAE : Rockville, MD	0.000	7.624	Oct 2014	8.106	Oct 2015	7.484	Oct 2016	-		7.484	Continuing	Continuing	Continuing
Product Development	SS/CPFF	BNA : Huntington Beach, CA	0.000	0.894	Dec 2014	1.213	Dec 2015	1.081	Oct 2016	-		1.081	Continuing	Continuing	Continuing
Product Development	WR	NSWC Crane : Crane, IN	0.000	12.205	Nov 2014	19.786	Nov 2015	23.027	Oct 2016	-		23.027	Continuing	Continuing	Continuing
Product Development	SS/CPFF	SPA : Alexandria, VA	0.000	2.711	Oct 2014	2.950	Oct 2015	2.705	Oct 2016	-		2.705	Continuing	Continuing	Continuing
Product Development	Various	SSP : Various	0.000	5.222	Oct 2014	8.976	Oct 2015	8.101	Oct 2016	-		8.101	Continuing	Continuing	Continuing
		Subtotal	0.000	757.973		929.986		689.585		-		689.585	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Management Support	C/CPFF	Various : Multiple Awards	0.000	19.938	Jan 2015	21.925	Oct 2015	0.000	Oct 2016	-		0.000	Continuing	Continuing	Continuing
Government Management Support	WR	Various: NSWC : Carderock, MD	0.000	18.477	Oct 2014	19.032	Oct 2015	10.786	Oct 2016	-		10.786	Continuing	Continuing	Continuing
Travel	WR	NAVSEA HQ : Washington, D.C.	0.000	0.416	Oct 2014	0.450	Oct 2015	0.440	Oct 2016	-		0.440	Continuing	Continuing	Continuing
		Subtotal	0.000	38.831		41.407		11.226		-		11.226	-	-	-

	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	796.804		971.393		700.811		-		700.811	-	-	-

Remarks

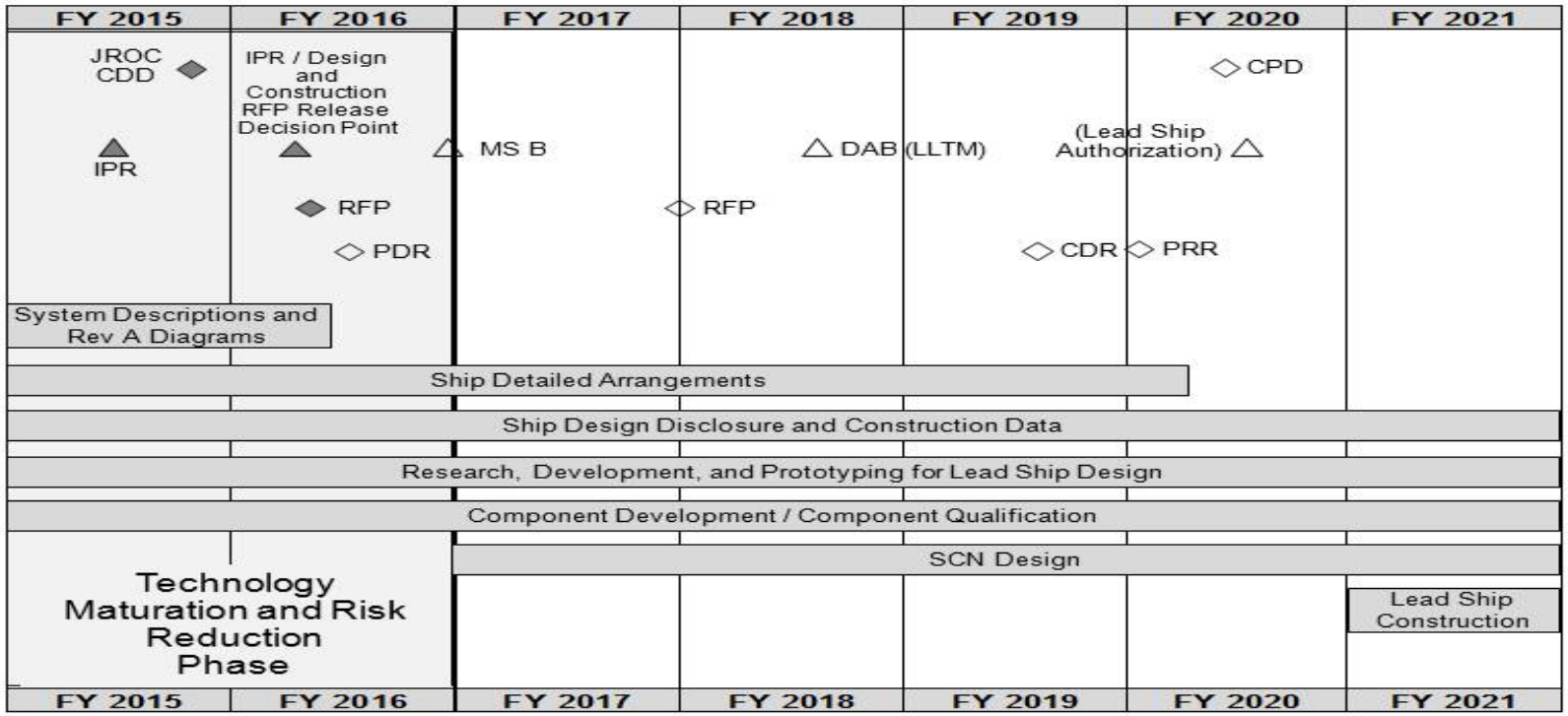
The listed Award Dates represent the date on which initial obligations occur for the effort.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603595N / *(U)Ohio Replacement*	Project (Number/Name) 3220 / *SBSD Advanced Submarine System Development*	

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract

Note: Beginning in 2015, there is an administrative change that shifts efforts funded from PE 0603561N (Advanced Submarine System Development) / Project 3220 to PE 0603595N (Ohio Replacement) / Project 3220. This shift is consistent with Congressional intent identified in the FY13 Appropriation Act.

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3220 / *SBSD Advanced Submarine System Development*



CDD - Capabilities Development Document
CDR - Critical Design Review
CPD - Capability Production Document
DAB - Defense Acquisition Board
IPR - In Progress Review
JROC - Joint Requirements Oversight Council
LLTM - Long Lead Time Material
MS - Milestone
PDR - Preliminary Design Review
PRR – Production Readiness Review
RDT&E - Research, Development, Test, & Evaluation
RFP - Request for Proposal
SCN - Shipbuilding and Conversion, Navy
SRR - System Requirements Review

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3220 / *SBSD Advanced Submarine System Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Notes: * Effort began prior to 1st Quarter FY 2015. ** Effort continues past 4th Quarter FY 2021				
System Descriptions and Rev A Diagrams*	1	2015	2	2016
Ship Detailed Arrangements*	1	2015	1	2020
Ship Design Disclosure and Construction Data*, **	1	2015	4	2021
Research, Development, and Prototyping for Lead Ship*, **	1	2015	4	2021
Component Development/Component Qualification* , **	1	2015	4	2021
SCN Design**	1	2017	4	2021
Lead Ship Construction**	1	2021	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603595N / *(U)Ohio Replacement*	Project (Number/Name) 3237 / *Launch Test Facility*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3237: *Launch Test Facility*	0.000	36.470	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	36.470
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project Unit 3237: Project constructs a new Launch Test Facility to support surface launch testing and evaluation of full-scale launch technologies. The project construction is authorized by 10 U.S.C. Section 2353, funded from Research, Development, Test, and Evaluation (RDT&E) appropriations, and will have no general utility and utilized solely to meet RDT&E contractual requirements. This project enables full-scale testing of a Trident II D5LE SWS missile launcher subsystem to collect launch event information for verification and validation of modeling and simulation software, to evaluate and demonstrate launcher subsystem performance, and to qualify the launcher subsystem hardware. This project provides a test facility to conduct qualification testing of full-scale launcher hardware. The project will provide performance and safety data to mitigate the risk of a tactical failure in the fleet.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: OR Launch Test Facility	36.470	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Construct the Launch Test Facility at Naval Air Warfare Center, China Lake, CA to enable Full Scale Launch Testing and evaluation / qualification of the TRIDENT II D5LE missile launcher subsystem for the OHIO Replacement Submarine. Additional details are contained in the form DD1391 provided as a supplement to the budget materials.					
FY 2016 Plans: N/A					
FY 2017 Base Plans: N/A					
FY 2017 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	36.470	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3237 / *Launch Test Facility*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• RDTEN/3219: *SBSD Nuclear Technology Development*	369.964	419.273	408.116	-	408.116	398.693	289.034	276.625	155.700	Continuing	Continuing

Remarks

D. Acquisition Strategy

FFP Contract executed through NAVFAC Multiple Award Construction Contract.

NAVFAC has the contractual warrant to buy design services. NAVFAC/Southwest executes the technical administration, planning, and scheduling for the overall design of the Launch Test Facility (LTF) based on the Facility Design Criteria executed by NAVFAC/SW. NAVFAC/SW Construction effort is led by NAVFAC/SW and executed by NAVFAC/SW Facilities Engineering and Acquisition Division (FEAD) for construction, certification and validation of the facility.

The facility will provide the necessary foundations, buildings, cranes, infrastructure, ordnance storage, test vehicle arrestment and other services & amenities needed to conduct full-scale surface launch test, integration testing, arrestment, and recovery/reuse of D5LE SWS test vehicles. Operation of the LTF requires interactions with NAWS & NAWCWD at China Lake, CA and its existing infrastructure, the environment, and operators & maintenance personnel. The facility is being developed to support the Surface Launch Test system capabilities which will provide a full scale, reusable launch test capability to support Launcher Subsystem development, evaluation and qualification, and Trident II D5LE SWS Missile Subsystem risk reduction.

E. Performance Metrics

Authority to Construct (ATC)
Authority to Operate (ATO)

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603595N / *(U)Ohio Replacement*	Project (Number/Name) 3237 / *Launch Test Facility*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	WR	NAWC CL : China Lake, CA	0.000	36.470	Oct 2014	0.000		0.000		-		0.000	0.000	36.470	-
		Subtotal	0.000	36.470		0.000		0.000		-		0.000	0.000	36.470	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	36.470		0.000		0.000		-		0.000	0.000	36.470	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3237 / *Launch Test Facility*

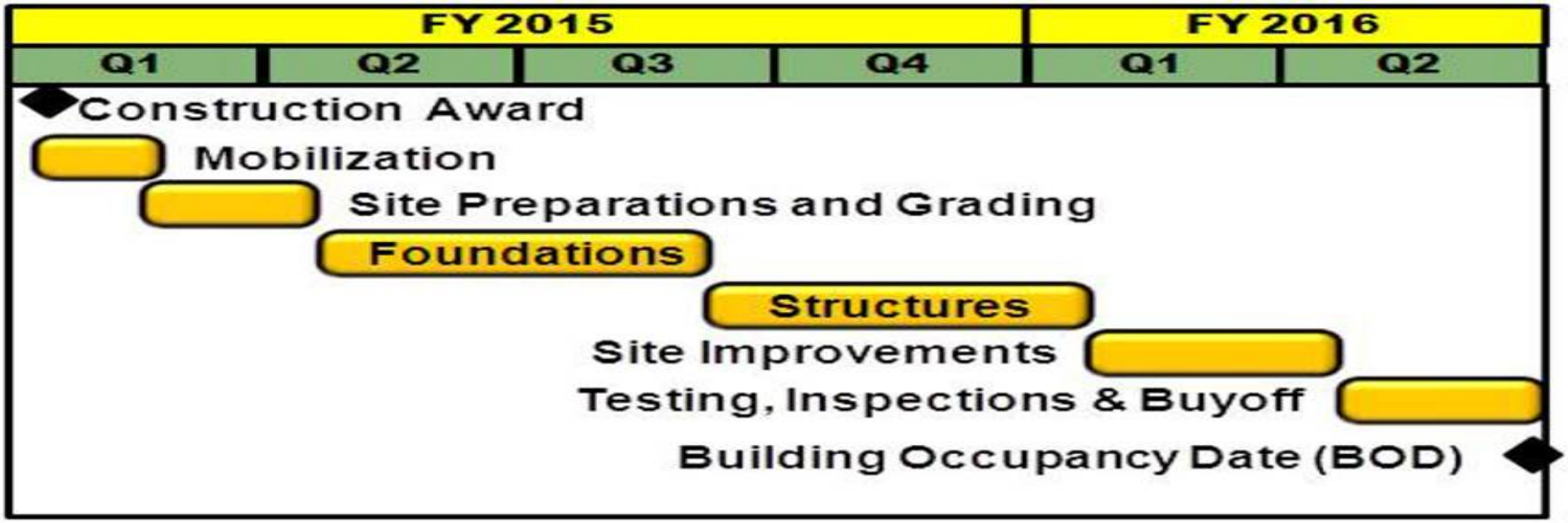


Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3237 / *Launch Test Facility*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3237				
Construction Contract Request for Proposal Issued (Estimated)	1	2015	1	2015
Construction Contract Awarded	1	2015	1	2015
Launch Test Facility Construction	1	2015	2	2016
Mobilization	1	2015	1	2015
Site Preparations and Grading	1	2015	2	2015
Foundations	2	2015	3	2015
Structures	3	2015	1	2016
Site Improvements	1	2016	2	2016
Testings, Inspections and Buyoff	2	2016	2	2016
Beneficial Occupancy Date (estimated 18 months after contract award)	2	2016	2	2016