Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604755N *I Ship Self Def (Detect & Cntrl)*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	1,104.294	133.452	161.713	180.391	1.100	181.491	199.685	146.910	153.714	152.312	Continuing	Continuing
2178: *QRCC*	1,054.889	126.468	148.982	169.668	-	169.668	188.110	133.905	140.913	140.000	Continuing	Continuing
3172: *Joint Non-Lethal Weapons*	40.427	4.177	5.177	2.892	1.100	3.992	3.018	3.085	3.142	3.213	Continuing	Continuing
3358: *SSDS Training Improvement Program*	8.978	2.807	7.554	7.831	-	7.831	8.557	9.920	9.659	9.099	Continuing	Continuing

A. Mission Description and Budget Item Justification

The FY 2019 funding request was reduced by $.997 million to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

This program element consolidates efforts related to the integrated control of Ship Self Defense (SSD) and multi-warfare Combat Direction for Aircraft Carriers and Amphibious Class ships. Analysis and demonstration have established that surface SSD based on single-sensor detection point-to-point control architecture is inadequate against current and projected Anti-Ship Cruise Missile (ASCM) threats. The supersonic sea-skimming ASCM reduces the effective battle space to the horizon and the available reaction time-line to less than 30 seconds from first opportunity to detect until the ASCM impacts its target ship. Against such a threat, multi-sensor integration is required for effective detection, and parallel processing is essential to reduce reaction time to acceptable levels and to provide vital coordination/ integration of hard-kill and soft-kill assets. The program element also includes integrated Combat System embedded shipboard training, and Non-Lethal weapons in support of anti-terrorism/force protection missions.

Quick Reaction Combat Capability (QRCC, PU2178): This project provides for the evolutionary acquisition of the Ship Self Defense System (SSDS), the core combat system control element for the Quick Reaction Combat Capability (QRCC) in aircraft carriers and amphibious class ships. In addition, the project provides for Combat System Integration (CSI) with the central system engineering and software for the integration of advanced sensor, weapon and C4I upgrades, and for the test and evaluation and certification of the Integrated Combat System (ICS).

SSDS MK 2 integrates a diverse set of fire control loop sensors and weapons, and C4I systems for each ship class (CVN68/78, LHA6, LHD1, LPD17, and LSD41/49). SSDS MK2 provides the capabilities for integrated air and missile defense, multi-warfare situational awareness and combat direction, and joint interoperability via the Cooperative Engagement Capability (CEC) and Tactical Digital Information Link (TADL)-J. SSDS MK2 is being fielded with the new construction carriers (CVN78 class) and amphibious ships (LHA6, LPD17 classes). SSDS MK2 is replacing the Advanced Combat Direction System (ACDS) in the LHD1 class and SSDS MK1 in the LSD 41/49 class as fleet modernization initiatives. In addition, with the decision to replace the Dual Band Radar (DBR) for CVN 79/80 and Amphibious Class Ships (LHA 8) with an Enterprise Radar Suite (ERS), consisting of a new radar (Enterprise Air Search Radar)(EASR), and an X-Band Illuminator, SSDS will require development of system and software changes for ERS CSI.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604755N *I Ship Self Def (Detect & Cntrl)*

In order to meet the Navy's war fighting capabilities and modernization concepts described in SEA POWER 21, Navy Open Architecture (OA) is being introduced in conjunction with SSDS Commercial off the Shelf (COTS) Technology Refresh initiatives. This is the first step in unifying a set of war fighting functions into a common architecture shared among many ship classes. This principle of commonality is a major mechanism for cost control and avoidances in the Navy's future war fighting systems. Starting in 2008, SSDS MK 2 re-hosted existing tactical computer program applications into the Open Architecture Computing Environment (OACE) specifications with equipment suites concurrent with COTS Technology Insertion (TI) cycles, prior to migration and integration with other Navy OA applications for implementation on future new construction ships or during future ship modernization.

SSDS MK2 implements new combat system war-fighting capabilities and improvements on phased basis via Advanced Capability Builds (ACB) and Technology Insertion (TI). PU 2178 efforts are divided into three major functional areas: SSDS Product Development, Combat Systems Integration, and Test and Evaluation/ Certification.

The SSDS Product Development under PU 2178 encompasses systems engineering efforts, technology insertion and cyber-security, including the development and integration of ACB-12 with an Open Architecture Computing Environment (OACE), product line System Track Manager, and phased technology insertion configurations. CVN78 is the lead ship for ACB-12. For the CVN 78, FY 18-FY19 requires collaborative Combat System efforts to support CSSQT and DT/OT/OPEVAL and achieve requisite deployment capabilities for Ship Self Defense and Strike Group interoperability through extensive, Integrated Combat System (ICS) testing and software updates.

For Cyber-Security, the Boundary Defense Capability (BDC) initiative under PU 2178, will provide SSDS MK2 and Combat Systems-level cyber-security protection based on system of systems risk assessment. Cyber Security BDC is a phased multi-year development to define, develop, and integrate enterprise Combat System cyber-security solutions. These solutions will provide a set of boundary defense capabilities for the SSDS MK2 ICS, a set of centralized Combat Systems-level cyber-security capabilities, and a set of element-level cyber-security protections.

Combat System Integration under PU 2178 encompasses CS modeling and simulation, system analysis/engineering, and system/software development for integration of sensors, weapons and C4I systems with SSDS MK2 in the CVN and Amphibious Class Ships for integrated air and missile defense, ship self-defense, multi-warfare combat direction and strike group interoperability. Combat System Integration includes Fire Control Loop Improvement Project (FCLIP), Far-Term Interoperability Improvement Project (FTIIP), and ACB-20 war-fighting improvements, including the integration of EASR/ERS and integration of the Joint Strike Fighter (JFS) F35 variance B&C (Link 16 integration.
PU 2178 also includes the SSDS MK 2 Developmental Test/Operational Test (DT/OT) efforts and Combat System certification efforts.

Non-Lethal Weapons (PU 3172) - This project provides a long range laser warning and dazzle system, maritime vessel stopper system, and combined effects (light, laser, and sound) system for use in the maritime environment. Optical warning and distraction has been identified by the services as a possible technology solution to mitigate and/or address several known joint non-lethal capability gaps.

SSDS Training Improvement Program (PU 3358) - 3358 - SSDS Training Improvement Program provides enhancements and upgrades to the SSDS Total Ship Training Capability (TSTC) components within the combat system, combat system elements, Battle-Force Tactical Training (BFTT), and Advanced Training Domain (ATD) to

address needs for increased training capability and functionality in conjunction with SSDS MK2 Advanced Capability Builds (ACB)/Fire Control Loop Improvement Project (FCLIP), Far-Term Interoperability Improvement Project (FTIIP), Task Force Cyber Awakening (TFCA) Boundary Defense Capability (BDC), and Technical Insertion efforts under PU 2178 (QRCC). These enhancements will address current and future training requirements by implementing new functionality to enable the individual warfighter through distributed battle group events to engage in more complex training requirements to support fleet required training certification events. Capability Development and integration are related to Self Defense, Underwater, Surface, and other warfare areas. Capability enhancements and upgrades include development of re-useable common components that can be leveraged by SSDS MK2 combat systems, and/or integration of re-usable common components developed by the TSTC/BFTT Program and AEGIS Advanced Training Domain (ATD)/TSTC Total Ship Training Capability (TSTC) projects to meet AEGIS combat system training requirements. TSTC continues to integrate and update, as new tactical capabilities are being introduced, to enable crew operator proficiency training for basic and sustainment level training events, through distributed strike group certification fleet synthetic training (FST) events and including COMPTUEX FST at Sea integration into Live, Virtual and Constructive (LVC) environment. Continued Development is required to integrate new capabilities and interfaces to provide training for AEGIS and SSDS combat system capability upgrades, and to address the Fleet's Live, Virtual and Constructive (LVC) Fleet Training Wholeness initiative. Additionally, modernization is needed to support the DoD Training Transformation Plan, the Chief of Naval Operations Fleet Response Plan and Commander United States Fleet Forces Command Fleet Readiness Training Plan.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	134.619	161.713	135.374	-	135.374
Current President's Budget	133.452	161.713	180.391	1.100	181.491
Total Adjustments	-1.167	0.000	45.017	1.100	46.117
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	2.026	0.000			
• SBIR/STTR Transfer	-3.193	0.000			
• Program Adjustments	0.000	0.000	47.844	1.100	48.944
• Rate/Misc Adjustments	0.000	0.000	-2.827	-	-2.827

Change Summary Explanation

The FY 2019 budget request increased due to the initiation of the system engineering analysis for Joint Strike Fighter (JSF) F35B integration onboard LHA and LHD Class Ships, the F35B/C ICS Link 16 Integration, Cybersecurity Resiliency and Boundary Defense Capability (BDC) initiative to provide SSDS MK2 and Combat Systems-level cybersecurity protection based on system of systems risk assessment, and support to the CVN78 Wholeness - SSDS/Combat System Integration.

Added FY 2017 funding to support SSDS development, integration, test and certification in support of accelerated fielding of Identification Friend or Foe (IFF) Mode 5 on Carriers and L-Class ships. The SSDS effort required for IFF Mode 5 acceleration varies by platform so requires accelerated funding.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604755N / *Ship Self Def (Detect & Cntrl)*	Project (Number/Name) 2178 / *QRCC*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2178: *QRCC*	1,054.889	126.468	148.982	169.668	-	169.668	188.110	133.905	140.913	140.000	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The QRCC project (PU 2178) implements an evolutionary acquisition of improved ship self-defense capabilities against Anti-Ship Cruise Missiles (ASCMs), and improved multi-warfare capabilities, for Aircraft carriers and Amphibious Class ships. The SSDS is the integrating element of QRCC. The design integrates CS elements that do not individually provide the complete detection, control, and engagement capabilities needed against low flying, high speed ASCMs with low radar cross sections. The SSDS integration concept fulfills the need for an automated detection, quick reaction and multi-target engagement capability, emphasizing performance in the littoral environment. System design emphasizes use of non-developmental items, commercial standards, commercial processors, computer program reuse and open system architecture. SSDS is a physically distributed, open system architecture computer network consisting of commercially available or previously developed hardware. It includes the Navy's standard computers (Common Processor System) and displays (AN/UYQ-70 and Common Display System) and command table for human system interface, commercially based network switching and interface units, and commercially available fiber optic cabling.

SSDS MK1, the first generation of SSDS, integrates the SPS-49A(V)1 radar, SPS-67(V)1 radar, AN/SLQ-32A/B electronic warfare system, Combat Identification Friend or Foe-Self Defense (CIFF-SD), Rolling Airframe Missile (RAM) and Phalanx Close-In Weapon System (CIWS) and is installed on LSD41/49 class ships. SSDS MK1 successfully completed Operational Evaluation in June 1997. SSDS received Milestone III Approval for Full Rate Production (Mar 98) and authority to integrate with ACDS and Cooperative Engagement Capability (CEC) on CVN, LPD-17, LHD and LHA ship classes (as SSDS MK 2).
SSDS MK2 integrates other CS elements, such as AN/SPQ-9B radar, NATO Sea-sparrow system, CEC and TADIL-J for joint interoperability. SSDS MK2 provides enhanced capabilities for Self-Defense against air and surface threats using both own-ship and remote data to address AAW Capstone requirements. SSDS MK2 is the integrated, coherent real time Command and Control System for Aircraft Carriers and Amphibious Class ships.

SSDS MK 2 integrates a diverse set of fire control loop sensors and weapons, and C4I systems for each ship class (CVN68/78, LHA6, LHD1, LPD17, and LSD41/49). SSDS MK2 provides the capabilities for integrated air and missile defense, multi-warfare situational awareness and combat direction, and joint interoperability via the Cooperative Engagement Capability (CEC) and TADIL-J. SSDS MK2 is being fielded with the new construction carriers (CVN78 class) and amphibious ships (LHA6, LPD17 classes). SSDS MK2 is replacing the Advanced Combat Direction System (ACDS) in the LHD1 class and SSDS MK1 in the LSD 41/49 class as fleet modernization initiatives. In addition, with the decision to replace the Dual Band Radar (DBR) for CVN 79/80 and L-Class Ships (LHA 8) with an Enterprise Radar Suite (ERS), consisting of a new radar (Enterprise Air Search Radar (EASR), and an X-Band Illuminator, SSDS will require development of system and software changes for ERS Combat System Integration. The overall scope of the multi-year development for EASR/ERS integration will include systems engineering/analysis, M&S, hardware and software development, cyber-security implementation, Factory System Integration Test (FSIT) and Wrap Around Simulation, and Wallops Island integration and engineering Test for Fire Control Loop Elements.

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Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

SSDS MK2 implements new combat system war-fighting capabilities and improvements on phased basis via Advanced Capability Builds (ACB) and Technology Insertion (TI). PU 2178 efforts are divided into three major functional areas: SSDS Product Development, Combat Systems Integration, and Test and Evaluation/ Certification.

The SSDS Product Development encompasses systems engineering efforts, technology insertion and cyber-security, including the development and integration of ACB -12 with an Open Architecture Computing Environment (OACE), product line System Track Manager, and multiple technology insertion configurations. CVN78 is the lead ship for ACB-12. SSDS Product Improvement includes system engineering, critical experiments, software development, hardware development, operating environment, cyber-security software, hardware/software integration, factory qualification testing, land-based engineering testing, system/software Test Analyze and Fix (TAAF) effort in support of CS testing (CS integration, engineering, certification and at-sea testing), logistics products and ashore training course development.

Obsolescence of SSDS hardware impacts system production, maintainability and limits the ability of incorporating new capabilities. To combat obsolescence, new hardware TI baselines must be developed every four years, while each ship is planned for hardware modernization every eight to ten years. Due to prior year budget shortfalls, development of the TI-16 baseline was delayed. Obsolescence required a new hardware baseline be developed prior to the completion of TI-16 development. To address the obsolescence, the TI-12 hardware baseline was modernized with updated equipment. This new configuration was designated as TI-12 Hybrid (TI-12H). The TI-12H hardware also supports the Dual Band Radar (DBR) on CVN 78. The FY17 and beyond plans were adjusted to support the ACB-12 migration to the TI-12H configuration, to be completed in FY18, in addition to the migration to the TI-16 configuration, which will be completed in FY19. FY18-FY19 includes the system engineering analysis and hardware engineering for the next TI configurations, TI-16 Tech Refresh and TI-22, to define the architecture for the SSDS MK2 CS ship class variants, initial development of ACB 20, and the hardware requirements for common infrastructure for computing, display, network and cyber-security. FY19 includes initiation of the system engineering analysis for Joint Strike Fighter (JSF) F35B integration onboard LHA and LHD Class ships. FY19 will initiate the systems engineering and analysis for the integration of JSF F35B&C with Link 16.

For Cyber-Security, the Boundary Defense Capability (BDC) initiative under PU 2178, will provide SSDS MK2 and Combat Systems-level cyber-security protection based on system of systems risk assessment. Cyber Security BDC is a phased multi-year development to define, develop, and integrate enterprise Combat System cyber-security solutions. These solutions will provide a set of boundary defense capabilities for the SSDS MK2 ICS, a set of centralized Combat Systems-level cyber-security capabilities, and a set of element-level cyber-security protections. The boundary defense capabilities will protect and detect threats entering and leaving the Combat System. The centralized Combat System-level cyber-security capabilities will provide cyber situational awareness and management of various (e.g. malware detection, file integrity verification, etc.) cyber-security protection and detection capabilities. Element-level cyber-security protections will provide additional measures to ensure system integrity. Development of enterprise Combat System risk management processes will occur, to include a system of systems risk assessment methodology to support Combat System execution of the Risk Management Framework.

Combat System Integration under PU 2178 encompasses CS modeling and simulation, system analysis/engineering, and system/software development for integration of sensors, weapons and C4I systems with SSDS MK2 in CVN and Amphibious Class Ships for integrated air and missile defense, ship self-defense, multi-warfare combat direction and strike group interoperability. Combat System Integration includes Fire Control Loop Improvement Project (FCLIP), Far-Term Interoperability Improvement Project (FTIIP), and ACB-20 war-fighting improvements, including the integration of EASR/ERS.

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FCLIP is planned as a phased corrective action plan for system-of-systems deficiencies in SSDS MK2 ships, identified during live-fire testing with stressing anti-ship missile targets.

FCLIP Phase 2 is a phased multi-year development effort (FY16-FY19) that includes: CIWS integration with CEC/SSDS MK2, ESSM 2T Uplink, RAM Block2 Multi-Target processing in the missile, SoS integration of RAM Block 2 Multi-Target Processing, NSSMS MK9 Multi-Target Discrimination & Reporting, and modeling and analysis to ensure optimization and alignment of capabilities into the CS end-to-end fire control loop. CEC/SSDS MK2 Engage on Remote capability will be analyzed to determine performance improvements for potential implementation as part of FCLIP Phase 2. The overall scope of the multi-year development effort will include systems engineering/analysis, M&S, hardware and software development, cyber-security implementation, Factory Systems Integration Test (FSIT) with Wrap Around Simulation, and Wallops Island System integration and engineering testing for Fire Control Loop Elements.

FTIIP is the second phase of the corrective action plan for the resolution of the strike group interoperability issues. FTIIP includes implementation of Tactical Data Link (TDL) IFF Mode 5 identification capabilities, F/A-18 Digital Air Control (Phase 1) in support of F/A-18 and F-35 Joint Strike Fighter initial deployment, integration of the Shipboard Gridlock System/Automatic Correlation (SGS/AC) system into the SSDS MK2 TI-16 configuration, and implementation of other high priority software.

In FY09, system development was initiated for SSDS MK1 technology refresh for the LSD 41/49 class ships. The effort will transition these ships to an SSDS MK OACE and SSDS MK 2 single source library. The new system designation is SSDS MK2 Mod 5C. The system development effort encompasses TI of new OA computing and display equipment (Common Processor System (CPS) and Common Display System (CDS)), modifications and additions to the SSDS MK 2 software for an upgraded interface with the Phalanx Closed-In-Weapon System (CIWS) Block 1B Baseline 2 and Battle Force Tactical Trainer (BFTT), and other unique LSD SSDS interfaces and functionality. The first LSD SSDS MK 2 Mod 5C was installed in LSD-50 in FY14 after land-based Combat System Integration and Certification Testing with an IOC in FY16.

In FY10, SSDS MK 2 system development commenced for the first phase of migration to the Navy OA objective functional architecture designated as SSDS MK 2 ACB-12/TI-12. For the CVN78, the lead ship for ACB-12/TI-12, the baseline encompasses: implementation of common product line software components for System Track Management; integration of the product line System Track Management components and associated data model with other SSDS software components; integration of CPS and CDS; and expansion of SSDS MK 2 Local Area Network (LAN) to Combat System LAN; integration of new CS Combat System/C4I elements (Dual Band Radar(DBR), ESSM Block 1 with JUWL, SLQ-(V)6 SEWIP Block 2, MH-60R and CANES); implementation of cyber-security boundary defense capabilities and Total Ship Training Capability (TSTC). ACB-12/TI-12 has been fielded on the CVN 78, CVN 72 and LHD 2 in FY17. For the CVN 78, FY18-FY19 requires collaborative Combat System efforts to support DT/OT/OPEVAL and achieve requisite deployment capabilities for Ship Self Defense and Strike Group interoperability through extensive, Integrated Combat System (ICS) testing and software updates. For the CVN 78, FY19 will require collaborative Combat System efforts for support of Combat System Qualification Test (CSSQT) initiatives.

Funds were added in FY13 for the integration and test of SSDS MK2 Tactical Data Link (TDL) 16 interoperability improvements to address critical Strike Group interoperability issues under the AEGIS Wholeness Initiative, designated AMIIP. In FY13, software defect corrections were implemented as Phase 1 of the Fire Control Loop Improvement Project (FCLIP) to correct specific anti-ship missile defense deficiencies identified during live-fire testing. In FY16, FCLIP Phase 2 and FTIIP were initiated as follow on efforts for fire control loop and strike group interoperability improvements.

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In PB15, SSDS MK 2 Advance Capability Build (ACB)-16 was delayed 2 years due to the need to prioritize critical SSDS system improvements. ACB-16 was the designation for the next major SSDS baseline for the integration of new sensor, weapon, and C4I capabilities for anti-ship missile defense and strike group interoperability. As a result of the delay, ACB-16 has been re-designated to ACB-20. The SSDS MK 2 ACB-12 capability baseline development, test, and fielding will continue as planned. However, with the delay in development and fielding of ACB-16, an increased number of SSDS MK2 ships will receive the ACB-12 capability baseline and specific fire control loop, interoperability and cyber-security improvements, in lieu of ACB-16.

Funds were requested in PB18 for integration of the Enterprise Radar Suite (EASR and X-Band TI), SSDS MK2/CS cyber-security enhancements, and integration of TSTC enhancements for ACB-20, ACB-20 SSDS MK 2 Combat System Integration development includes fire control loop improvements beyond FCLIP Phase 2 for tracking, weapon scheduling and engagement control with ESSM Block 2 missile; SEWIP Block 2 soft kill coordinator, SEWIP Block 3 Electronic Attack, and SEWIP Block 2/3 integration with SSDS MK2 TI-16 configuration.

SSDS MK2 Development Test and Evaluation (DT&E) provides for comprehensive testing of the integrated CS for the CVN 68, CVN 78, LPD 17, LHD1, LHA 6 and LSD41/49 ship classes. This includes Land-Based testing at Wallops Island and At-Sea testing for the lead ships for the new CS configurations, and Live Fire testing on the SDTS. The DT&E encompasses test planning, preparation, test conduct, data collection and analysis, and resolution and verification of deficiency corrections. The SSDS MK 2 T&E/Certification supports Integrated Combat System certification, the SSDS Test and Evaluation Master Plan (TEMP) and the Air Warfare Ship Self Defense CAPSTONE Enterprise TEMP.
The initial DT&E and Follow on Operational Test and Evaluation (FOT&E) for SSDS MK 2 was conducted with the CVN 76 SSDS MK 2 Mod 1 configuration in FY05. In FY07, the SSDS MK 2 FOT&E requirements were linked with the Air Warfare Ship Self Defense Enterprise T&E initiative to combine At-Sea Combat System element DT&E and OT&E requirements to synergize the resources required for testing in the SSDS MK 2 ships and the SDTS. The LPD-17 class SSDS MK 2 Mod 2 FOT&E was conducted in FY07/FY08 as part of the Enterprise T&E initiative. Live fire, Combat System end-to-end testing was conducted against Anti-Ship Cruise Missile (ASCM) targets on the SDTS in FY07/08/09 with the CVN/LHD/LPD configurations. FOT&E of ESSM integration with SSDS MK 2 was initiated on the CVN 68 class in FY08 and extended through FY16. FOT&E for the CVN class SSDS MK 2 Mod 1B OACE COTS TI was conducted in FY09. FY16/FY17 FOT&E includes the LHA 6 SSDS MK 2 Mod 4B configuration with the RAM Block 2 missile, ESSM, AMIIP and FCLIP. FY16-FY18 FOT&E includes the LSD SSDS MK 2 Mod 5C configuration with the Phalanx CIWS 1B Baseline 2 system and RAM Block2. FY16-FY19 DT/ FOT&E includes CVN 78 SSDS MK 2 Mod 6C configuration with the DBR, SEWIP Block 2 ES, ESSM Block 1 with JUWL up-link, and RAM Block 2.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: SSDS MK2 Product Development/Combat Systems Integration	99.528	121.503	139.654	0.000	139.654
Articles:	-	-	-	-	-
FY 2018 Plans: For LSD SSDS MK 2 Mod 5C - Complete the development of software Build 10 for the TI-12H configuration. Conduct FSIT/FQT for this baseline.					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
For CVN78 SSDS MK2 MOD 6C - For the CVN 78, FY 18-FY19 requires collaborative CS efforts to support CSSQT and DT/OT/OPEVAL and achieve requisite deployment capabilities for Ship Self Defense and Strike Group interoperability through extensive integrated testing and software updates. - Provide TAAF support for LBET at Wallops Island, shipboard post delivery test and trials, and implement software changes/correction for CST for CSSQT. For LHD6/CVN73 SSDS MK2 MOD 3C/1E ACB-12/TI-12H/TI-16 - Complete the ACB-12 software migration to TI-16 and TI-12H and conduct FSIT/FQT for these ship baselines - Provide support for integrated CS land-based integration and engineering test at WI. This includes test data analysis and system / software trouble report resolution. For FCLIP Phase 2 / FTIIP / TFCA BDC baselines - Continued the software development for CIWS integration with CEC/SSDS MK2, ESSM 2T Up-Link, and NSSMS MK9 Multi-Target Discrimination & Reporting. - Initiate engineering and certification testing of FCLIP Phase 2 improved fire control loop improvements. For SSDS MK2 ACB-20/EASR/ERS/TI-16 -Continue systems engineering / analysis to establish the Concept of Integration and initiate the definition and functional allocation of the Combat System requirements to support the full scale development of system and software changes to the Ship Self Defense System (SSDS) ICS for CVN 79/80 and L-Class ships ICS variants in order to integrate the SEWIP Block 2/Block 3 Softkill Coordinator, Airborne Off-board Electronic Warfare (AOEW), SEWIP Blk 3EA, ESSM BLK 2, Cyber-security improvements and interoperability standard enhancements, to close critical fire control loop and interoperability gaps. The overall scope of the multi-year development will include Systems Engineering/Analysis, M&S, Hardware and Software development, Cyber-Security Capabilities, Factory System Integration Test (FSIT) and Wrap Around Simulation, and Wallops Island System Integration Test for Fire Control Loop elements. - Conduct source selection for planned FY19 Q2 award of the competitive CSEA/SDA contract for the SSDS MK2 ICS development including the SSDS MK2 ACB-20 baseline development with the integration of EASR/ ERS/TI-16. ***FY 2019 Base Plans:***					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
For FCLIP Phase 2/FTIIP/TFCA BDC baselines - Complete Mode 5 IFF development for Baseline 9. - Complete the software development for CIWS integration with CEC/SSDS MK2, ESSM 2T Up-Link, and NSSMS MK9 Multi-Target Discrimination and Reporting. - Continue engineering and certification testing of FCLIP Phase 2 improved fire control loop improvements. - Complete software development for IFF Mode 5 integration with SSDS MK2 Builds 9, 10 & 11. - Initiate Test, Analyze and Fix period for FCLIP Ph 2 and FTIIP capabilities. - Continue designing and developing TFCA Cyber-Security improvements to secure the combat system enclave. For Build 10 (ACB-12/TI-12 and ACB-12/TI-12H) - Provide TAAF and complete certifications to support ship installations and deployments. For Build 11 (ACB-12/TI-16) - Complete testing and certification (integration and combat system level), providing required TAAF, to support ship installations and deployments. For SSDS MK2 ACB-20/EASR/ERS/TI-16 - Award new CSEA/SDA contract for the SSDS MK2 ICS development - Transition from government engineering to design and development. For Joint Strike Fighter F35B - Initiate systems engineering analysis for LHA and LHD Class ships - Initiate systems engineering analysis for the integration of JSF F35BG&C with Link 16. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The $18.151M increase from FY 2018 to FY 2019 is due to CVN78 Wholeness SSDS/Combat System Integration (OSD IRT).					
Title: SSDS MK2 Development Test & Evaluation	26.940	27.479	30.014	0.000	30.014
Articles:	-	-	-	-	-
FY 2018 Plans:					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
For LSD SSDS MK 2 Mod 5C - Complete CSSQT on LSD49 - Conduct DTIII Phase 1 at ICSTF - Conduct OTIII Phase 2 ET12 SDTS - Conduct OTIII Phase 3 ET14 Lead Ship Event For CVN78 SSDS MK2 Mod6C - Continue Land-Based integration and engineering testing at WI and aboard ship for ICS software changes/ corrections for CVN78 DT/OT/ OPEVAL and deployment software deliveries. For the CVN 78, FY 17-FY19 requires collaborative Combat System efforts to support CSSQT and DT/OT/OPEVAL and achieve requisite deployment capabilities for Ship Self Defense and Strike Group interoperability through extensive, Integrated Combat System (ICS) testing and software updates. - Conduct Fire Control Loop risk reduction TRKEX/MSLEX on SDTS with DBR (MFR), CEC, SSDS MK2, SEWIP Block 2, ESSM and RAM Block2. - Initiate DT/OT-III J Phase 3/ET-09 MSLEX on SDTS. - Conduct CST at WI for authorization OQE for ICS software package for CSSQT Phase 2. For LHD6/CVN73 SSDS MK2 MOD 3C/1E ACB-12/TI-12H/TI-16 - Conduct CST at WI for authorization OQE for ICS software package for LHD6 SSDS Mod 3C ACB-12/TI-12H for CSLO. For FCLIP Phase 2/FTIIP/TFCA BDC - Initiate land-based integration and engineering testing at WI.					
FY 2019 Base Plans: For LSD SSDS MK2 Mod 5C - OTIII Phase 2 ET12 SDTS For CVN 78 SSDS MK2 Mod 6C - Conduct CST at WI for authorization OQE for ICS software package for CSSQT Phase 2. - Conduct CSSQT for CVN 78. - Complete DT/OT-III J Phase 3/ET-09 MSLEX on SDTS - Commence DTIII-J-Phase 3 on CVN 78					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
For FCLIP Phase 2/FTIIP/TFCA BDC - Initiate Sea-Based DT on SDTS - Conduct CST at WI for authorization OQE for ICS software package for Baseline 9. For LHD6/CVN73 SSDS MK2 Mod 3C/1E ACB-12/TI-12H/TI-16 - Conduct CST at WI for authorization OQE for ICS software package for LHD6 SSDS Mod 3C ACB-12/TI-12H for CSLO. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The $2.535M increase from FY 2018 to FY 2019 is due to CVN78 Wholeness SSDS/Combat System Integration (OSD IRT).					
Accomplishments/Planned Programs Subtotals	126.468	148.982	169.668	0.000	169.668

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/ BLI 5231 (SSDS): *SSDS*	54.919	73.086	90.336	-	90.336	91.336	97.030	93.470	98.257	Continuing	Continuing
• RDTEN/0607658N: *Cooperative Engagement Capability*	75.099	92.571	130.515	-	130.515	141.373	147.710	125.458	121.220	Continuing	Continuing

Remarks

D. Acquisition Strategy

D. Acquisition Strategy

The first SSDS MK 2 system procurements took place under a Cost Plus Award Fee (CPAF) contract in FY99 for the CVN 76, LPD 17, LPD 18 and CVN 69. Follow-on equipment procurements for additional ships of the CVN, LPD and LHD classes were awarded on Firm Fixed Price (FFP) contracts. For those ships that will be receive P3I OACE COTS tech Refresh hardware suites, the initial system Tech Refresh Development occurred under a CPAF type contract, with ship COTS conversion equipment/kits procured on FFP contracts.

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A system engineering/design agent and Life Cycle Maintenance Cost Plus Fixed Fee (CPFF) contract was awarded in FY05 and a follow-on CPFF/CPAF contract, N00024-08-C-5122, was awarded on 30 Sept 2008, to support SSDS MK 2 system/software maintenance and system upgrades through FY13 including the TI-12 COTS Tech Insertion.

A sole source follow-on Cost Plus Incentive Fee (CPIF) Level of Effort (LOE) contract, N00024-14-C-5128, was awarded 18 December 2013 with a Period of Performance (PoP) from FY14-FY17 for the development, test, certification of SSDS MK2 (ACB 12/TI-12) for CVN78, CVN72, LHD2, and the software migration of ACB 12 to TI-12H/TI-16 for CVN 68, LHD 1, LPD 17 ship classes. This contract was extended to December 2018 and an additional extension through FY20 is planned to provide continued support of the SSDS MK 2 to execute and complete development of the existing contract scope requirements for CVN and Amphibious Modernization ACB 12 on TI-12 and TI-12 Hybrid (TI-12H) (SSDS Software Build 10), and TI-16 (SSDS Software Build 11).

For SSDS MK2 TI-12H/TI-16 equipment, the SSDS program will use competitive build to specification production contracts, and leverage common enterprise COTS Open Architecture Computing Environment (OACE) products for computing, storage, display, network, conversion, and cyber security.

A new competitive contract for a SSDS Combat System Engineering Agent (CSEA)/Software Design Agent (SDA) is planned to be awarded in FY19 with a ten (10)-year PoP from FY19-FY29. This contract will provide support for the CVN and Amphibious Ship Class SSDS Combat System (CS) element and any future surface combatant based on evolution of the SSDS MK 2 Combat Systems Post-Advanced Capability Build (ACB) 12/TI-12/TI-12H/TI-16/TI-16 Tech Refresh and for ACB 20 and follow-on SW and HW technology upgrades. The current anticipated requirements to be provided include systems and software engineering support, development of engineering products to support combat system integration, configuration control, developmental test/operational test (DT/OT) support, training and logistics support, and field technical support for the SSDS ICS.

A CPAF/CPIF delivery order, N00178-04-D-4112-EH04, was awarded in FY05 to acquire a Systems Engineering & Integration (SE&I) agent to support SSDS MK2 (ACB 12) development, integration and testing for the CVN 78 Class Warfare System. A five (5)-year competitive CPIF contract with a PoP from FY17-FY22, was awarded on 02 March 2017 to provide ICS Systems Engineering, Integration and Test (SEI&T) support for the development, and/or alignment of existing and future emerging technical plans and engineering products across ship classes to provide support and resources for the integration, installation, checkout, and performance acceptance of the SSDS ICS on large deck class ships.

E. Performance Metrics

Requirement Documents
- Capability Development Document (CDD) for Ship Self Defense System (SSDS) MK2 approved 19 December 2013.
- Test and Evaluation Master Plan (TEMP No. 1400) For Ship Self Defense System (SSDS) Revision B, 5 Mar 2008. Revision C is in routing for approval and is anticipated to be signed out in FY18. During the approval cycle, DOT&E requested a major update to Rev. C to include cyber security T&E requirements.

Background
- SSDS MK1 OPEVAL was successfully completed June 1997 with a Milestone III approval in March 1998
- SSDS MK2 MOD 1 FOT&E was conducted on CVN 76 in 2005. All KPP thresholds were met. However, the system was assessed as not suitable and not effective by COMOPTEVFOR based on the identification of SSDS MK2 and Combat Systems deficiencies (24major, 37 minor deficiencies).

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
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- SSDS MK 2 Mod 2 FOT&E was conducted in LPD 17-19 in 2007/2008. All KPPs thresholds were met and the system was assessed OPERATIONALLY EFFECTIVE and OPERATIONALLY SUITABLE by COMOPTEVFOR in the 12 Feb 2010 report. 10 major and minor deficiencies were identified against SSDS MK 2. (Also, major Warfare effects deficiencies were identified against the LPD 17 class Combat System).
- SSDS MK 2 Mod 3A FOT&E was conducted in LHD 8 in Feb 2010. All KPPs thresholds were met and the system was assessed OPERATIONALLY EFFECTIVE and OPERATIONALLY SUITABLE by COMOPTEVFOR in the 13 Dec 2010 report. 10 major deficiencies were identified against SSDS MK 2. (Also, major Warfare effects deficiencies were identified against the LHD 8 Combat System).
- SSDS MK2 FOT&E with ESSM and RAM Block 1 was conducted in the SDTS Oct-Dec 2011 as part of Enterprise Test - 03. Combat System (system-of-system) deficiencies identified during MSLEX with stressing targets has resulted in a phased corrective action plan, designated as Fire Control Loop Improvement Project (FCLIP).
- SSDS MK2 FOT&E with RAM Block 2 DT&E was conducted in the SDTS Dec 2014 as part of Enterprise Test - O5 Phase 2. Low altitude, supersonic, maneuvering targets were successfully engaged with RAM Block 2 missiles.
- Conducted Enterprise Test (ET) Event 5 and Event 6 against a wide array of subsonic and supersonic targets during live fire testing conducted against the Self Defense Test Ship (SDTS) and the USS America (LHA 6) to assess performance of the Integrated Combat System (ICS).
- April 2016, at the Navy's test facility at Point Mugu, CA, the SDTS LHA6-configured SSDS MK 2 integrated CS utilizing the Rolling Airframe Missile (RAM) Guided Missile Weapons System (comprised of the MK 49 Launcher and the Block 2 missile) successfully completed a live fire test by engaging and killing a pair of supersonic, maneuvering, sea-skimming targets designed to represent current anti-ship missile threats. The test event validated that significant progress has been made FCLIP program which was designed to improve coordination across all elements of the overall SSDS integrated CS. This test was the second successful integrated combat systems firing event against this surrogate threat accomplished by the shipboard air search radars and surface to air missiles found on U.S. Navy Amphibious Class ships. The integrated CS is comprised of the SSDS Mk 2 Mod 4B, SPS-48, SPS-49, SPQ-9B, SLQ-32, Evolved Sea Sparrow Missile and RAM Block 2 missile.

Status

- The Director, Operational Test and Evaluation (DOT&E) Annual Reports have identified ship self-defense mission deficiencies based on operational testing. The report is a compilation of multiple reports from Commander,

Operational Test Force (COTF) including shipboard testing on the CVN 76, CVN 70, LPD 17, LPD 18, LPD 19, LHD 8; and enterprise testing on the SDTS and in the Probability of Raid Annihilation (PRA) test-bed.

- SSDS was assessed Operationally Effective and Operationally Suitable for the LPD 17 Class and LHD 8. The Combat Systems (CVN, LPD, LHD) were assessed Not Operationally Effective against several Anti-Ship Cruise Missiles (ASCM). There are system of systems performance issues and design limitations. The issues are divided into four categories: detect, engage, test resources, and threat representation.
- All of the major training deficiencies have been addressed and are pending Verification of Correction of Deficiency (VCD) by COTF. Revised SSDS NTSP was signed 30 Jul 2012.
- OPNAV N96 is working with PEO IWS, DASN, and COTF to address the shortfalls in performance testing with the following initiatives:

a. Develop, test and field combat system improvements through the Fire Control Loop Improvement Project (FCLIP) Phase 1 with SSDS MK2 integration of: High Diver improvements to SPS-48E and CEC; SPQ-9B tracking improvements; North Atlantic Treaty Organization (NATO) Seasparrow Surface Missile System (NSSMS) MK 9 Target Illuminator improvements.

b. Integrate, test, and field SEWIP Block 2, and NULKA improvements.

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c. Expand the use of Modeling and Simulation.
d. Develop FCLIP Phase 2 capabilities for RAM Block 2 Multi-Target processing, NSSMS MK9 TI Multi-Target discrimination and reporting, ESSM 2T Up-link and CIWS integration with CEC / SSDS MK2.
e. Consider follow on high return self-defense improvements with FCLIP and Advanced Capability Builds (ACB).
- Additional T&E and certification initiatives include:
a. Conduct element and platform level cyber-security testing using land based test site (LBTS) facilities.
b. Move away from platform centric certification testing towards baseline configuration centric testing for combat systems certification testing.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PD - ACB12/TI12 / LSD - PSEA / SW Dev't	SS/CPIF	RSC IDS (5128) : San Diego, CA	96.740	25.068	Dec 2016	8.006	Dec 2017	20.340	Dec 2018	-		20.340	Continuing	Continuing	Continuing
PD - ACB12/TI12 / LSD / AMIIP - PSEA / SW Dev't	SS/CPAF	RSC IDS (5122) : San Diego, CA	38.416	0.000		0.000		0.000		-		0.000	0.000	38.416	-
PD - ACB12/TI12 / LSD - SE	SS/CPFF	JHU/APL : Laurel, MD	71.032	2.112	Dec 2016	1.250	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
PD - ACB12/TI12 / LSD - SW Dev/PL-STM	SS/CPAF	Gen. Dyn. (5100) : Fairfax, VA	3.628	0.000		0.000		0.000		-		0.000	0.000	3.628	-
PD - ACB12/TI12 / LSD - SE	WR	NSWC DD : Dalhgren, VA	75.750	6.169	Nov 2016	1.150	Dec 2017	1.993	Dec 2018	-		1.993	Continuing	Continuing	Continuing
PD - ACB12/TI12 / LSD - SE / ILS	WR	CDSA DN : Dam Neck, VA	22.927	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
PD - ACB12/TI12 / LSD - SE&I/Force Pt	C/CPIF	RSC (IIS) : Suffolk, VA	0.976	0.000		0.000		0.000		-		0.000	0.000	0.976	-
PD - ACB12/TI12 / LSD - LBET/TrainingI	WR	NSWC PHD : Pt Hueneme, CA	30.023	1.751	Nov 2016	0.975	Dec 2017	1.792	Nov 2018	-		1.792	Continuing	Continuing	Continuing
PD - ACB12/TI12 / LSD - CVN78 LBET/Metrics/On-site Support	WR	NSWC Corona : Corona, CA	0.412	0.736	Nov 2016	0.125	Nov 2017	0.200	Nov 2018	-		0.200	0.000	1.473	-
PD - ACB12/TI12 / LSD -Navy Link Cert/Cross-Domain Sprt	WR	SPAWAR : San Diego, CA	0.225	0.210	Nov 2016	0.000		0.000		-		0.000	0.000	0.435	-
PD - ACB12/TI12 / LSD - Moriah Integration	WR	NAVAIR : Lakehurst, NJ	0.309	0.000		0.000		0.000		-		0.000	0.000	0.309	-
PD - ACB12/ CVN78 LBET w/DBR/RES	SS/CPIF	RSC IDS : Sudbury, MA	0.000	5.080	Jan 2017	0.000		0.000		-		0.000	0.000	5.080	-
PD - ACB12/ CVN78 LBET w/CEC	SS/CPIF	RSC IDS : St. Petersburg, FL	0.000	1.275	Jan 2017	0.000		0.000		-		0.000	0.000	1.275	-
PD - ACB12/ CVN78 LBET w/TPX-42	WR	NAVAIR : St. Inigoes, MD	0.000	0.111	Mar 2017	0.000		0.000		-		0.000	0.000	0.111	-
PD - ACB12/TI-16/TI12H - HW Dev / ILS / EDM Proc (DN)	WR	CDSA DN : Dam Neck, VA	11.451	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PD - ACB12/TI-16/TI12H - HW Engr	WR	NSWC DD : Dalhgren, VA	2.418	7.765	Nov 2016	2.480	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
PD - ACB12/TI-16/TI12H - SW Migration PSEA	SS/CPIF	RSC IDS (5128) : San Diego, CA	11.799	11.572	Dec 2016	27.566	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
PD - ACB12/TI-16/TI12H - SE	SS/CPFF	JHU/APL : Laurel, MD	0.461	1.025	Dec 2016	2.000	Dec 2017	0.000		-		0.000	0.000	3.486	-
PD - ACB12/TI-16/TI12H - LBET/Training Course Development	WR	NSWC-PHD : Pt Hueneme, CA	0.000	0.575	Nov 2016	2.000	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
PD - ACB12/TI-16/TI12H - Metrics/On-Site Sprt	WR	NSWC Corona : Corona, CA	0.251	0.418	Nov 2016	0.418	Nov 2017	0.000		-		0.000	0.000	1.087	-
PD - ACB12/TI-16/TI12H - CPS Engnr	C/IDIQ	GTS : Virginia Beach, VA	0.042	0.000		0.000		0.000		-		0.000	0.000	0.042	-
PD - ACB12/TI-16/TI12H - Navy Link Cert/Cross-Domain Sprt	WR	SPAWAR : San Diego, CA	0.000	0.000		0.326	Nov 2017	0.000		-		0.000	0.000	0.326	-
PD - Cyber Resiliency / BDC PSEA SW DEV'T	SS/CPIF	RSC IDS (5128) : San Diego, CA	1.785	4.346	Dec 2016	5.223	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
PD - Cyber Resiliency / BDC PSEA SW DEV'T	SS/CPFF	JHU/APL : Laurel, MD	0.462	0.775	Dec 2016	0.791	Dec 2017	1.000	Dec 2018	-		1.000	Continuing	Continuing	Continuing
PD - Cyber Resiliency / BDC PSEA SW DEV'T	WR	NSWC-DD : Dalhgren, VA	0.708	2.016	Nov 2016	1.610	Nov 2017	0.931	Nov 2018	-		0.931	Continuing	Continuing	Continuing
PD - Cyber Resiliency / BDC PSEA SW DEV'T	WR	CDSA DN : Dam Neck, VA	0.864	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
PD - Cyber Resiliency / BDC PSEA SW DEV'T	C/CPIF	Progeny Systems Corp : Manasas, Va	0.181	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
PD - Cyber Resiliency / BDC PSEA SW DEV'T	WR	G2OPS : Washington DC	0.000	0.207	Apr 2017	0.211	Nov 2017	0.500	Nov 2018	-		0.500	0.000	0.918	-
PD - Cyber Resiliency / BDC PSEA SW DEV'T	WR	NSWC PHD : Port Hueneme, CA	0.000	0.657	Nov 2016	0.670	Nov 2017	0.650	Nov 2018	-		0.650	0.000	1.977	-
PD - Cyber Resiliency / BDC PSEA SW DEV'T	WR	NSWCPD : Philadelphia, PA	0.000	0.000		0.000		0.100	Nov 2018	-		0.100	0.000	0.100	-

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PD - Cyber Resiliency / BDC PSEA SW DEV'T	C/CPIF	Gryphon/DELTA : Washington DC	0.000	0.000		0.000		0.829	Dec 2018	-		0.829	0.000	0.829	-
PD - Cyber Resiliency / BDC PSEA SW DEV'T	C/CPAF	CSEA Contract : TBD	0.000	0.000		0.000		3.990	Dec 2018	-		3.990	0.000	3.990	-
PD - TI-16TR/TI22 - HW Engineering	WR	CDSA DN : Dam Neck, VA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
PD - TI-16TR/TI22 -HW Engineering	WR	NSWC-DD : Dalhgren, VA	0.000	0.100	Nov 2016	0.920	Nov 2017	5.383	Nov 2018	-		5.383	0.000	6.403	-
PD - HQ Travel	Various	PEO IWS : Washington DC	0.250	0.120	Dec 2016	0.150	Nov 2017	0.150	Nov 2018	-		0.150	Continuing	Continuing	Continuing
PD - SE/Dev/Integrate	SS/CPAF	Rayth(5412) (RIDS) : Portsmouth, RI	83.451	0.000		0.000		0.000		-		0.000	0.000	83.451	-
PD - F35B Integration / LHA / LHD	C/CPFF	JHU/APL : Laurel, MD	0.000	0.000		0.000		8.462	Dec 2018	-		8.462	0.000	8.462	-
PD - F35B Integration / LHA / LHD	WR	NSWC DD : Dalhgren, VA	0.000	0.000		0.000		7.692	Nov 2018	-		7.692	0.000	7.692	-
PD - F35B Integration / LHA / LHD	C/CPIF	SEI&T : Washington DC	0.000	0.000		0.000		3.846	Dec 2018	-		3.846	0.000	3.846	-
PD - F35B/C - ICS Link 16 Integration	C/CPFF	JHU/APL : Laurel, MD	0.000	0.000		0.000		1.100	Dec 2018	-		1.100	0.000	1.100	-
PD - F35B/C - ICS Link 16 Integration	WR	NSWC DD : Dalhgren, VA	0.000	0.000		0.000		1.000	Nov 2018	-		1.000	0.000	1.000	-
PD - F35B/C - ICS Link 16 Integration	C/CPIF	SEI&T : Washington DC	0.000	0.000		0.000		0.500	Dec 2018	-		0.500	0.000	0.500	-
PD - Misc - Prior Year Cum Cost	C/BA	Misc : Washington DC	278.994	0.000		0.000		0.000		-		0.000	0.000	278.994	-
PD - PM Prod Development	C/CPIF	various : various	30.983	2.603	Dec 2016	2.943	Dec 2017	3.000	Dec 2018	-		3.000	0.000	39.529	-
CSI - ACB20 (Less EASR) - SE	WR	NSWC COR : Corona, CA	0.000	0.000		0.000		0.450	Nov 2018	-		0.450	0.000	0.450	-
CSI - ACB20 (Less EASR) - SE	WR	NSWC DD : Dalhgren, VA	0.000	0.000		5.520	Nov 2017	6.399	Nov 2018	-		6.399	0.000	11.919	-

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CSI - ACB20 (Less EASR) - SE	WR	NSWC PHD : Port Huneme, CA	0.000	0.000		0.323	Nov 2017	1.250	Nov 2018	-		1.250	0.000	1.573	-
CSI - ACB20 (Less EASR) - SE	WR	NUWC KP : Keyport, WA	0.000	0.000		0.161	Nov 2017	0.175	Nov 2018	-		0.175	0.000	0.336	-
CSI - ACB20 (Less EASR) - SE	SS/CPAF	Rayth (RIDS) : Portsmouth, RI	0.000	0.000		1.075	Dec 2017	0.000		-		0.000	0.000	1.075	-
CSI - ACB20 (Less EASR) - SEI&T	C/CPIF	Gryphon/Delta : Washington DC	0.000	0.000		4.375	Dec 2017	2.233	Dec 2018	-		2.233	0.000	6.608	-
CSI - ACB20 (Less EASR) - SE	SS/CPFF	JHU/APL : Laurel, MD	0.000	0.000		5.458	Dec 2017	5.906	Dec 2018	-		5.906	0.000	11.364	-
CSI - ACB20 (Less EASR) - SE	C/CPAF	CSEA Contract : TBD	0.000	0.000		0.000		11.935	Dec 2018	-		11.935	0.000	11.935	-
CSI - FCLIP Phase 2 - PSEA	SS/CPIF	RSC IDS (5128) : San Diego, CA	7.167	5.030	Dec 2016	7.527	Dec 2017	5.370	Dec 2018	-		5.370	Continuing	Continuing	Continuing
CSI - FCLIP Phase 2 - SE	SS/CPFF	JHU/APL : Laurel, MD	7.110	2.350	Dec 2016	2.258	Dec 2017	1.598	Nov 2018	-		1.598	Continuing	Continuing	Continuing
CSI - FCLIP Phase 2 - SE	WR	NSWC-DD : Dahlgren, VA	1.418	0.279	Nov 2016	0.724	Nov 2017	1.016	Nov 2018	-		1.016	Continuing	Continuing	Continuing
CSI - FCLIP Phase 2 - SE	WR	CDSA DN : Dam Neck, VA	0.125	0.000		0.000		0.000		-		0.000	0.000	0.125	-
CSI - FCLIP Phase 2 - SE	WR	NSWC PHD : Pt Hueneme, CA	0.406	0.000		0.452	Nov 2017	1.308	Nov 2018	-		1.308	Continuing	Continuing	Continuing
CSI - FCLIP Phase 2 - SE / Planning	C/CPIF	Delta Resources : Alexandria, VA	0.339	0.000		0.000		0.000		-		0.000	0.000	0.339	-
CSI - FCLIP Phase 2 - SE & I	C/CPIF	RSC IIS (4112) : Suffolk, VA	2.136	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
CSI - FCLIP Phase 2 - SEI&T	C/CPIF	Gryphon/Delta : Washington DC	0.000	0.527	Dec 2016	1.151	Dec 2017	2.019	Dec 2018	-		2.019	0.000	3.697	-
CSI - FCLIP Phase 2 - SE Multi-Link Antenna	TBD	IWS 5 : TBD	0.250	0.000		0.000		0.000		-		0.000	0.000	0.250	-
CSI - FCLIP Phase 2 - SE RAM/ESSM	WR	NAWC : China Lake	1.340	0.557	Nov 2016	0.591	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CSI - FCLIP Phase 2 - SE RAM/CIWS	SS/CPFF	RSC(5432/5410) : Tuscon, AZ	1.080	0.000		1.882	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
CSI - FCLIP Phase 2 - SE	WR	NSWC : Crane, IN	0.250	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
CSI - FCLIP Phase 2 - SE	WR	NSWC COR : Corona, CA	0.000	0.000		0.000		0.252	Nov 2018	-		0.252	0.000	0.252	-
CSI - FCLIP Phase 2 - SE / SW Dev't	SS/CPAF	Rayth (RIDS) : Portsmouth, RI	2.792	4.760	Dec 2016	2.903	Dec 2017	0.000		-		0.000	0.000	10.455	-
CSI - FCLIP Phase 2 - SE	WR	NUWC KP : Keyport, WA	0.200	0.000		0.269	Nov 2017	0.000		-		0.000	0.000	0.469	-
CSI - FTIIP - PSEA - SW Dev't	SS/CPIF	RSC IDS (5128) : San Diego, CA	1.413	1.631	Dec 2016	7.429	Dec 2017	6.461	Dec 2018	-		6.461	Continuing	Continuing	Continuing
CSI - FTIIP - SE	C/BA	JHU/APL : Laurel, MD	0.151	0.000		0.300	Nov 2017	0.580	Nov 2018	-		0.580	0.000	1.031	-
CSI - FTIIP - SE	WR	NSWC-DD : Dahlgren, VA	0.425	0.652	Nov 2016	3.602	Nov 2017	1.489	Nov 2018	-		1.489	Continuing	Continuing	Continuing
CSI - FTIIP - SE	WR	CDSA DN : Dam Neck, VA	0.616	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
CSI - FTIIP - SE&I	C/CPIF	RSC IIS (4112) : Suffolk, VA	0.495	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
CSI - FTIIP - SE	WR	NSWC PHD : Port Hueneme, CA	0.000	0.000		0.215	Nov 2017	0.000		-		0.000	0.000	0.215	-
CSI - FTIIP - SEI&T	C/CPIF	Gryphon/Delta : Washington DC	0.000	0.731	Nov 2016	1.034	Dec 2017	1.830	Dec 2018	-		1.830	0.000	3.595	-
CSI - FTIIP - SE	WR	NUWC KP : Keyport, WA	0.000	0.186	Nov 2016	0.000		0.200	Nov 2018	-		0.200	0.000	0.386	-
CSI - ICS SE - PSEA SE	SS/CPIF	RSC IDS (5128) : San Diego, CA	0.808	0.331	Dec 2016	0.215	Dec 2017	0.000		-		0.000	0.000	1.354	-
CSI - ICS SE - SE&I	C/CPIF	RSC (IIS) : Suffolk, VA	2.404	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
CSI - ICS SE - SEA 05C	C/BA	SEA 05C : Washington DC	0.237	0.165	Dec 2016	0.215	Nov 2017	0.000		-		0.000	0.000	0.617	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604755N / *Ship Self Def (Detect & Cntrl)*	Project (Number/Name) 2178 / *QRCC*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CSI - ICS SE - SEI&T	C/CPIF	Gryphon/Delta : Washington DC	0.000	1.427	Dec 2016	1.622	Nov 2017	2.817	Nov 2018	-		2.817	0.000	5.866	-
CSI - ICS SE	SS/CPFF	JHU/APL : Laurel, MD	2.455	1.819	Dec 2016	1.450	Dec 2017	1.448	Dec 2018	-		1.448	Continuing	Continuing	Continuing
CSI - ICS SE	WR	NSWC DD : Dalhgren, VA	3.068	0.839	Nov 2016	1.669	Nov 2017	1.635	Nov 2018	-		1.635	Continuing	Continuing	Continuing
CSI - ICS SE	WR	CDSA DN : Dam Neck, VA	0.515	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
CSI - ICS SE	WR	NUWC KP : Keyport, WA	0.300	0.103	Nov 2016	0.269	Nov 2017	0.225	Nov 2018	-		0.225	0.000	0.897	-
CSI - ICS SE	C/CPIF	Delta Resources : Virginia Beach, VA	0.205	0.000		0.000		0.000		-		0.000	0.000	0.205	-
CSI - ICS SE	FFRDC	MITRE : McClean, VA	0.300	0.000		0.000		0.000		-		0.000	0.000	0.300	-
CSI - ICS SE	C/CPAF	CSEA Contract : TBD	0.000	0.000		0.000		0.500	Dec 2018	-		0.500	0.000	0.500	-
CSI - EASR / ESS SE	SS/CPFF	JHU/APL : Laurel, MD	1.067	0.750	Dec 2016	3.575	Dec 2017	1.648	Dec 2018	-		1.648	Continuing	Continuing	Continuing
CSI - EASR / ESS SE	WR	NSWC DD : Dalhgren, VA	0.274	1.444	Nov 2016	2.970	Nov 2017	4.371	Nov 2018	-		4.371	Continuing	Continuing	Continuing
CSI - EASR / ESS / SEI&T	C/CPIF	Gryphon/Delta : Washington DC	0.640	1.256	Dec 2016	2.344	Nov 2017	3.296	Nov 2018	-		3.296	0.000	7.536	-
CSI - EASR / ESS SE	WR	CDSA DN : Dam Neck, VA	0.273	0.000		0.000		0.000		-		0.000	0.000	0.273	-
CSI - EASR / ESS SE	C/CPAF	RSC (5202) : St. Pete, FL	0.246	0.000		0.788	Nov 2017	0.000		-		0.000	0.000	1.034	-
CSI - EASR / ERS SE	WR	NSWC PHD : Port Huneme, CA	0.000	0.000		0.323	Nov 2017	0.685	Nov 2018	-		0.685	0.000	1.008	-
CSI - EASR / ERS SE	C/CPAF	CSEA Contract : TBD	0.000	0.000		0.000		9.100	Dec 2018	-		9.100	0.000	9.100	-
		Subtotal	805.043	99.528		121.503		139.654		-		139.654	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

- For the CVN 78, FY18-FY19 includes major, collaborative CS efforts to support DT/OT/OPEVAL and achieve requisite deployment capabilities for Ship Self Defense and Strike Group Interoperability though extensive integrated testing and software updates.
- In FY17-FY19, new contracts have been/will be awarded on a competitive basis in support of SSDS for Systems Engineering Integration & Test (SEI&T)(awarded to Gryphon Technologies, Inc. in FY17) and a Combat system Engineering Agent/Software Design Agent (CSEA/SDA) contract (planned for award in early FY19).

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DT&E (PHD)	WR	NSWC PHD : Port Hueneme, CA	98.329	6.671	Nov 2016	5.286	Nov 2017	6.690	Nov 2018	-		6.690	Continuing	Continuing	Continuing
DT&E (SCSC-WI)	WR	SCSC-WI : Wallops Is, VA	68.310	5.200	Nov 2016	6.954	Nov 2017	8.112	Nov 2018	-		8.112	Continuing	Continuing	Continuing
DT&E (JHU/APL)	SS/CPFF	JHU/APL : Laurel, MD	22.122	3.165	Dec 2016	2.929	Dec 2017	3.356	Dec 2018	-		3.356	Continuing	Continuing	Continuing
DT&E (Corona)	WR	NSWC Corona : Corona, CA	11.618	2.870	Nov 2016	2.959	Nov 2017	2.603	Nov 2018	-		2.603	Continuing	Continuing	Continuing
DT&E (RAM/CIWS// ESSM) (RSC)	SS/CPFF	RSC(5432/5410) : Tucson, AZ	3.688	0.412	Nov 2016	0.424	Nov 2017	0.404	Nov 2018	-		0.404	Continuing	Continuing	Continuing
DT&E/CST (DD - CST)	WR	NSWC DD : Dahlgren, VA	20.104	6.211	Nov 2016	6.404	Nov 2017	6.014	Nov 2018	-		6.014	Continuing	Continuing	Continuing
DT&E (COTF)	WR	OPTEVFOR : Norfolk, VA	4.640	1.194	Nov 2016	1.231	Nov 2017	1.243	Nov 2018	-		1.243	Continuing	Continuing	Continuing
DT&E (CDSA-DN)	WR	CDSA DN : Dam Neck, VA	4.656	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
DT&E (engility)	C/CPIF	Engility : Virginia Beach, VA	1.820	1.217	Dec 2016	1.292	Dec 2017	1.592	Dec 2018	-		1.592	0.000	5.921	-
DT&E (SPAWAR-SD)	WR	SPAWAR : San Diego, CA	5.780	0.000		0.000		0.000		-		0.000	0.000	5.780	-
DT&E (Raytheon - St. Pete)	SS/CPAF	RSC (5202) : St. Pete, FL	4.708	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604755N / *Ship Self Def (Detect & Cntrl)*	Project (Number/Name) 2178 / *QRCC*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DT&E (RAM/ESSM) (China Lake)	WR	NAWC : China Lake, CA	1.150	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
DT&E (Raytheon - SE&I)	C/CPIF	Rayth - IIS : Sofolk, Va.	0.571	0.000		0.000		0.000		-		0.000	0.000	0.571	-
DT&E Raytheon - PSEA	SS/CPIF	RSC (5128) : San Diego, CA	0.182	0.000		0.000		0.000		-		0.000	0.000	0.182	-
DT&E (GD/AIS - IWS 1.0)	SS/CPAF	GD/AIS : Fairfax Va.	0.266	0.000		0.000		0.000		-		0.000	0.000	0.266	-
DT&E (Raytheon - RIDS)	SS/CPAF	RSC (5412) : Portsmouth, RI	1.902	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	249.846	26.940		27.479		30.014		-		30.014	Continuing	Continuing	N/A

Remarks

- Accomplishment of SSDS MK2 CS integration and certification testing for ship system installation and deployment;
- Accomplishment of the CVN78 CSSQT and SSDS MK2 ACB-12/TI-12 integrated CS test and evaluation (At-Sea aboard CVN78 and aboard the Self Defense Test Ship (SDTS).

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,054.889	126.468		148.982		169.668		-		169.668	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

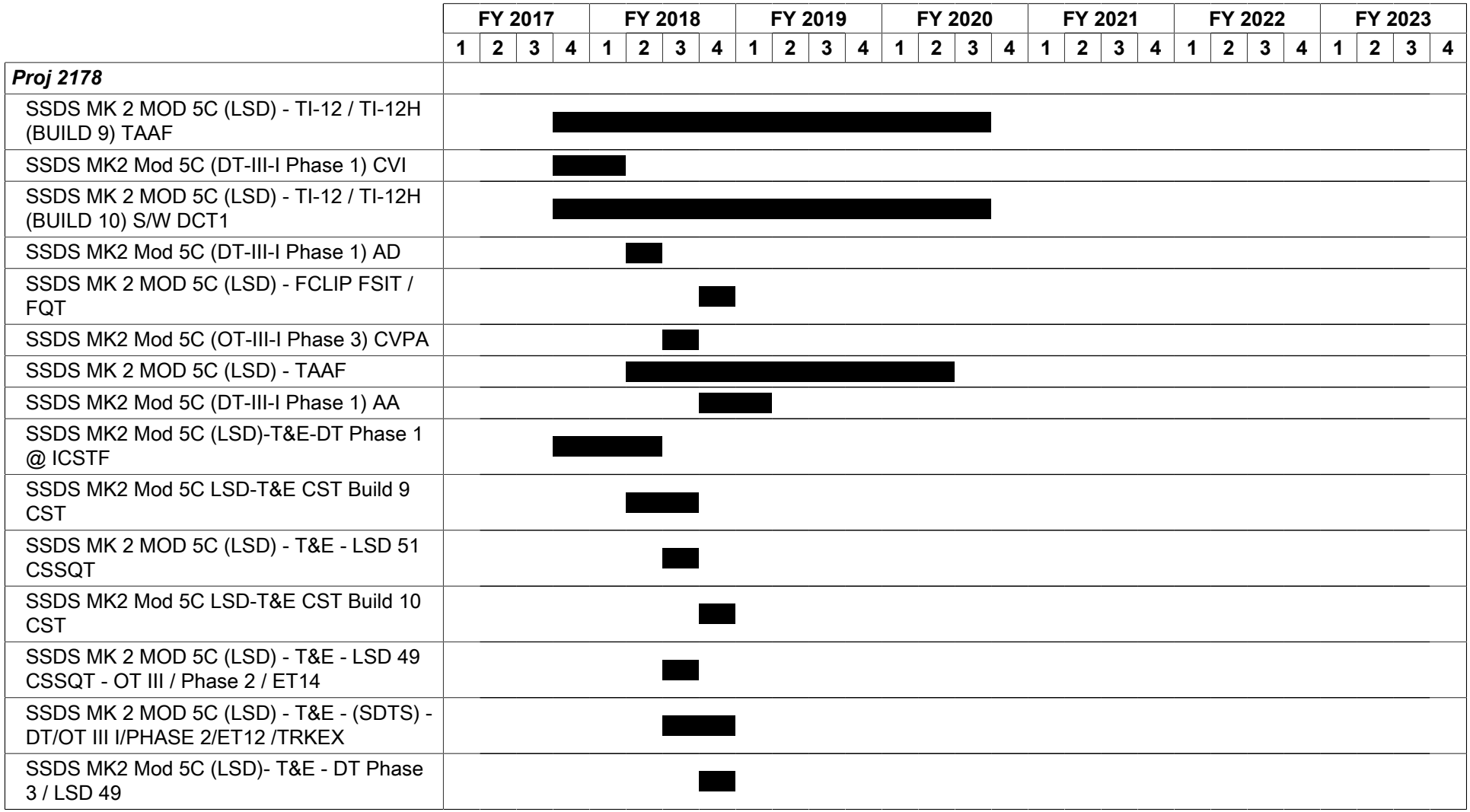

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

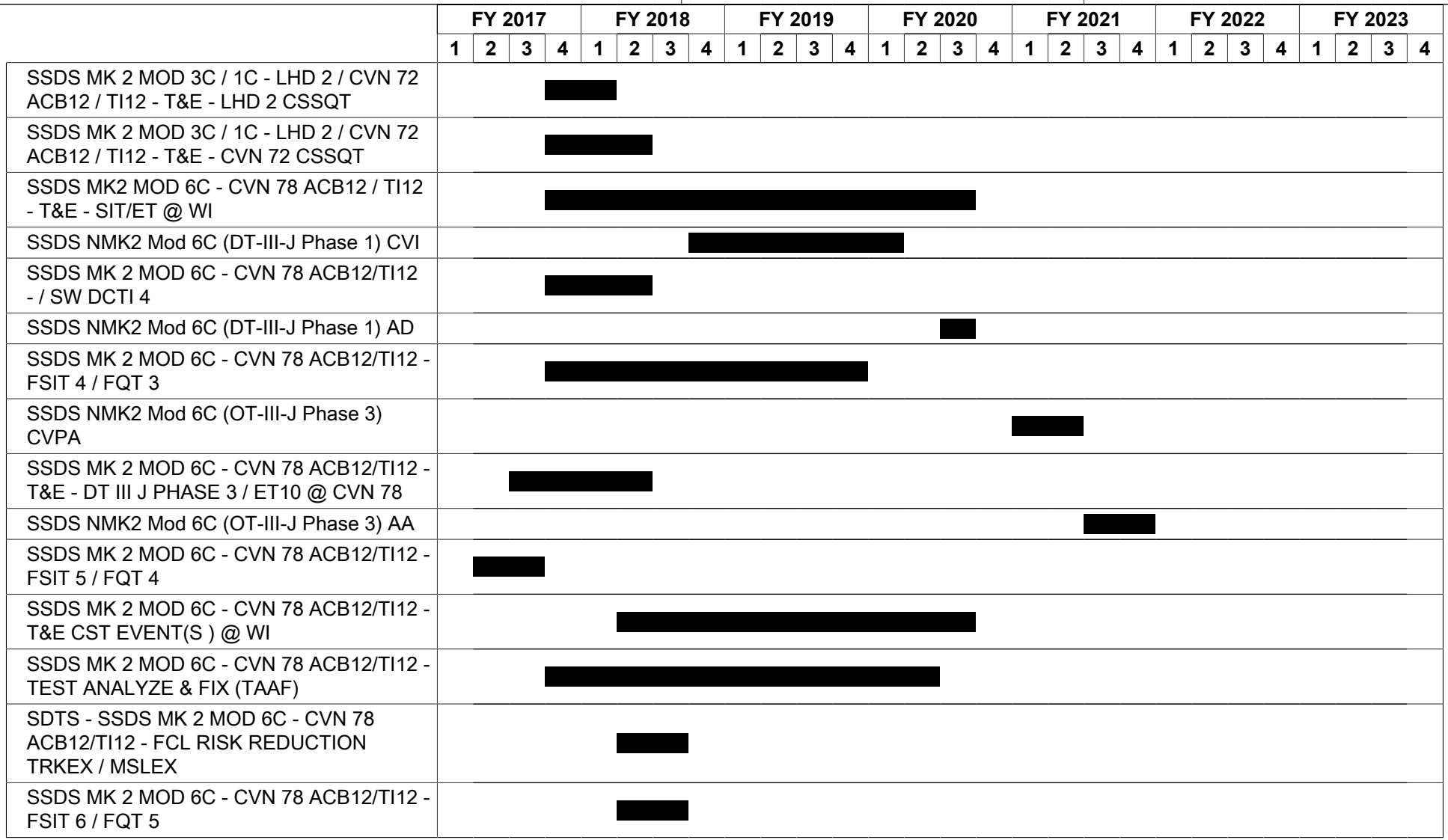

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

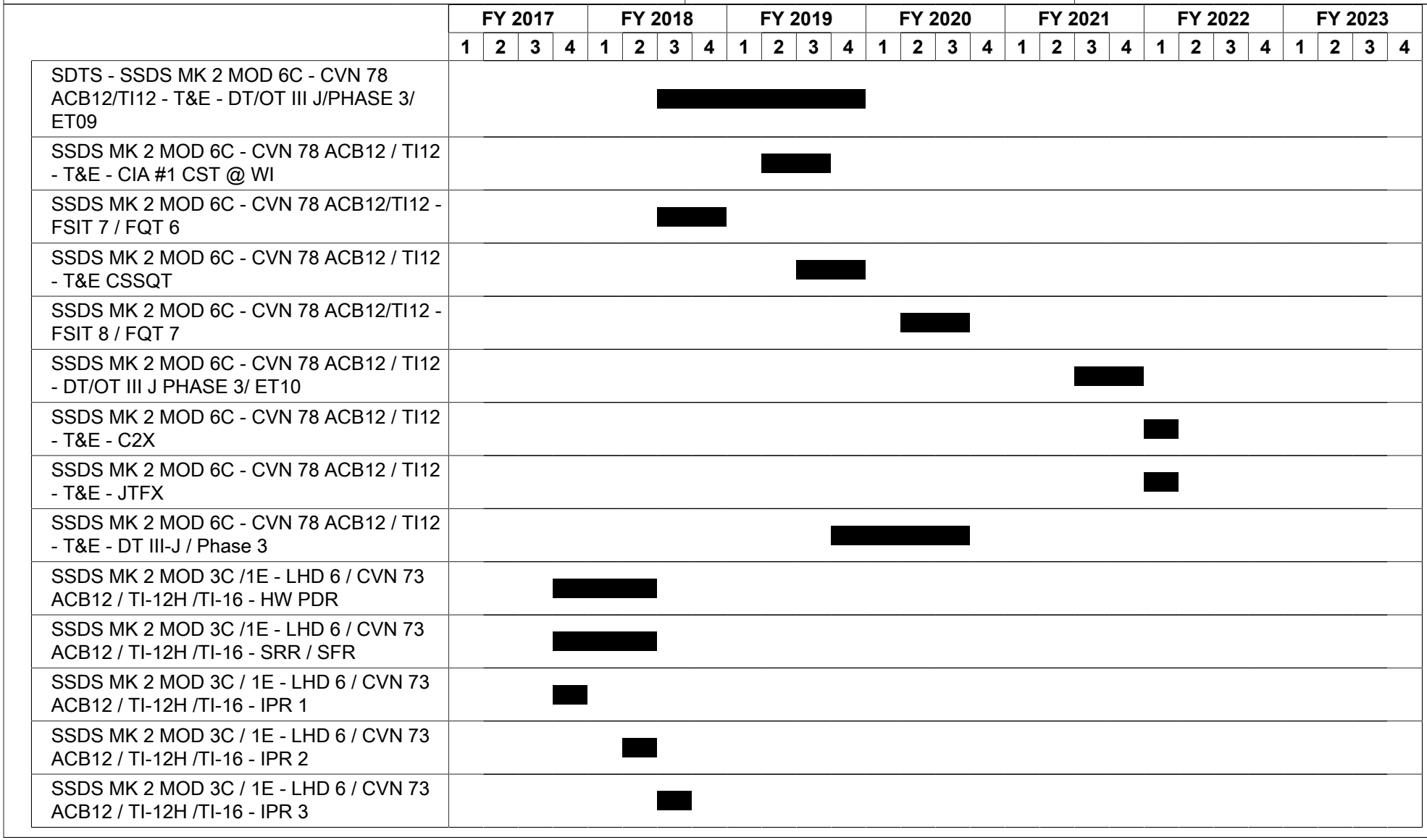

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

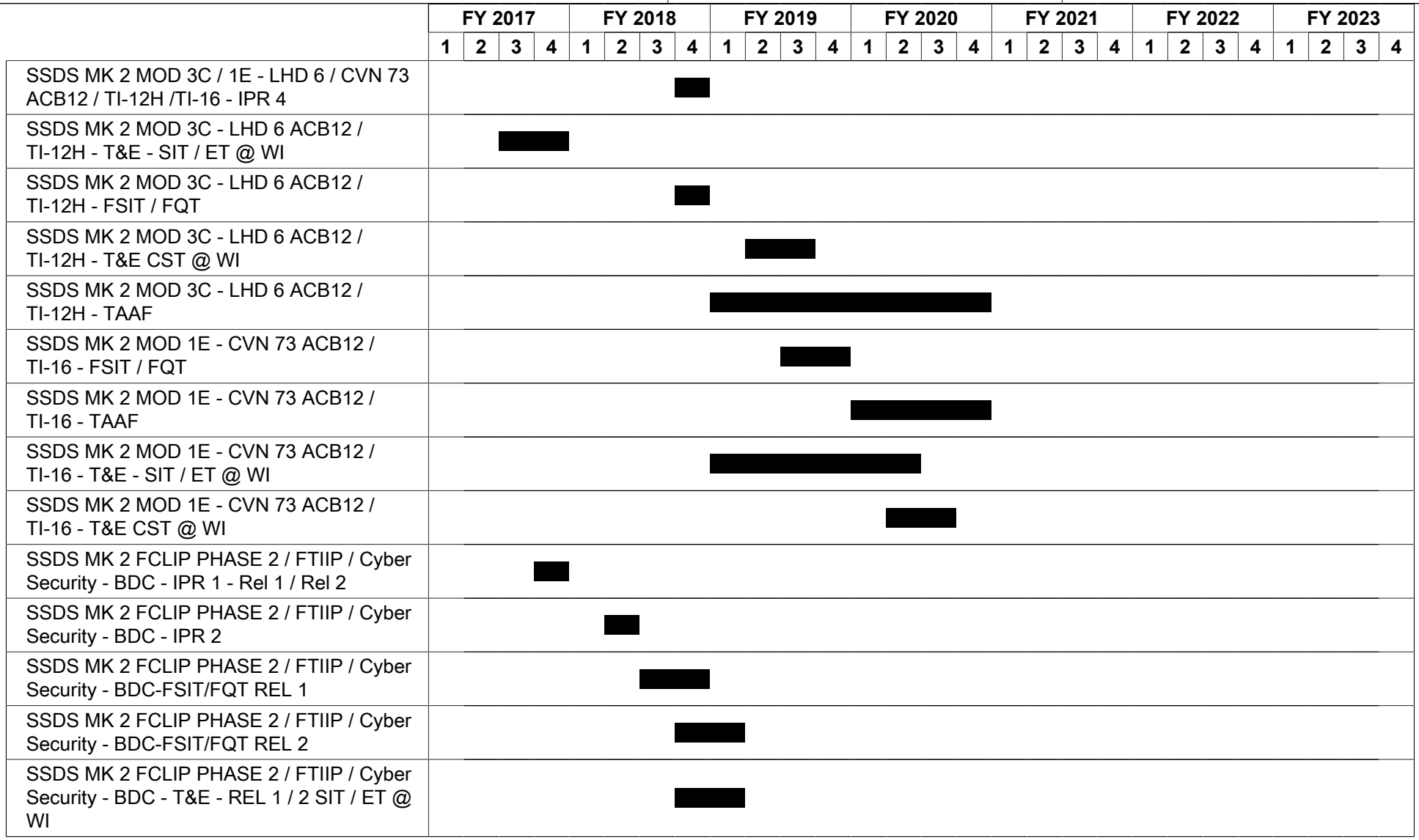

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

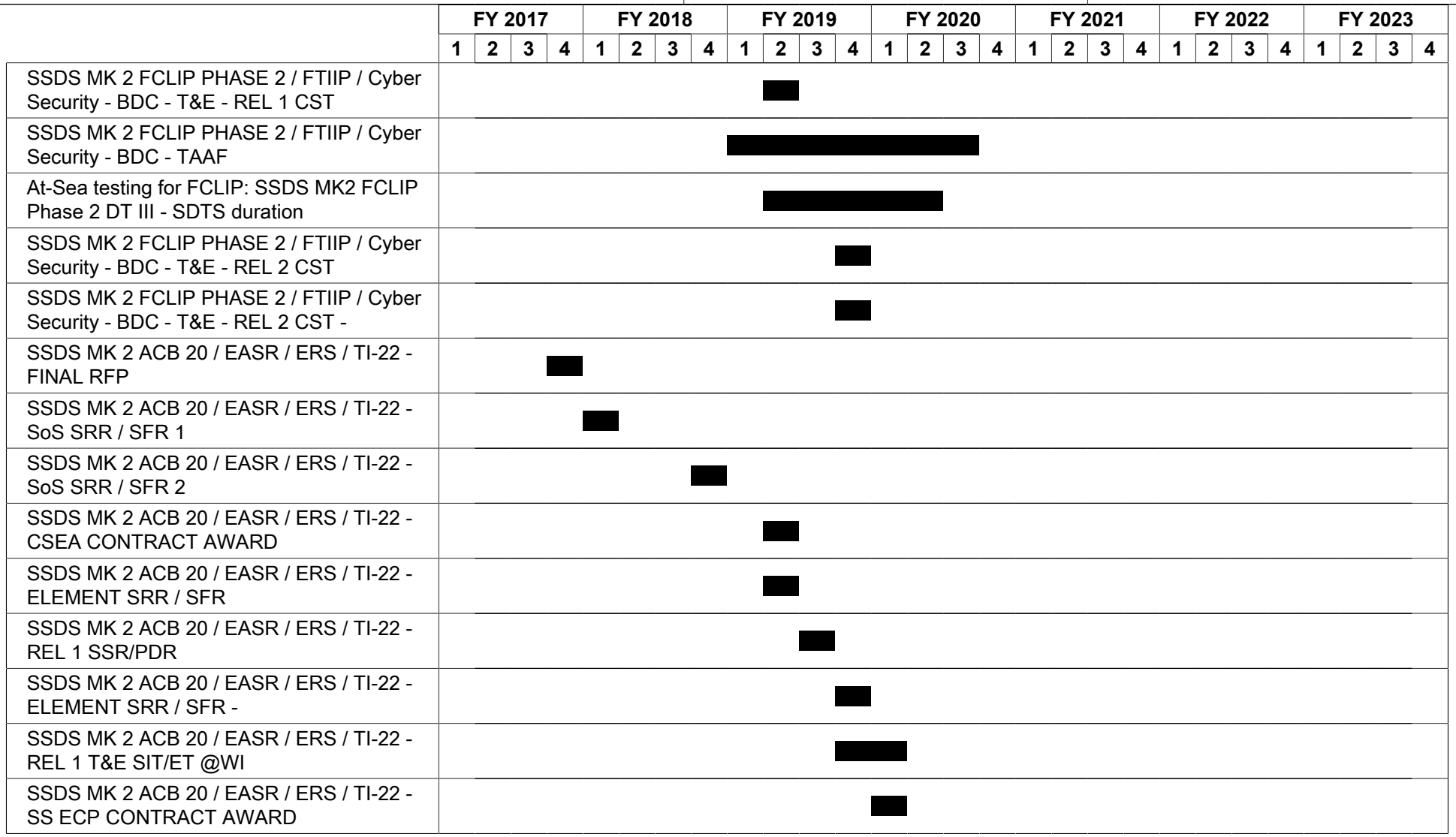

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

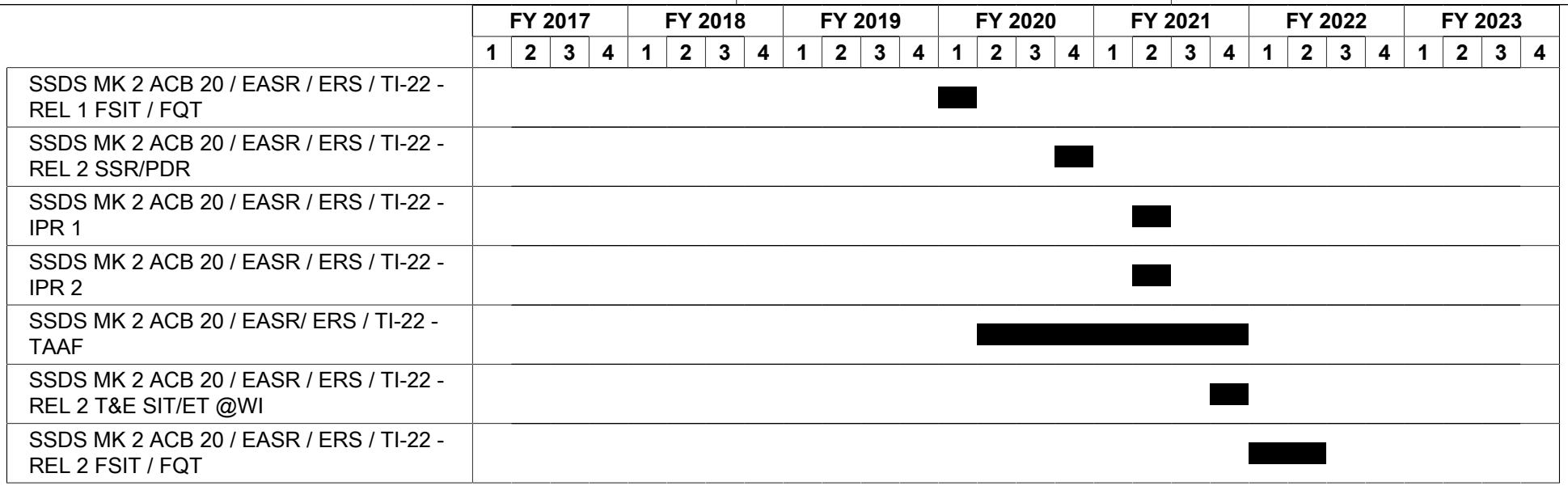

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2178				
SSDS MK 2 MOD 5C (LSD) - TI-12 / TI-12H (BUILD 9) TAAF	4	2017	3	2020
SSDS MK2 Mod 5C (DT-III-I Phase 1) CVI	4	2017	1	2018
SSDS MK 2 MOD 5C (LSD) - TI-12 / TI-12H (BUILD 10) S/W DCT1	4	2017	3	2020
SSDS MK2 Mod 5C (DT-III-I Phase 1) AD	2	2018	2	2018
SSDS MK 2 MOD 5C (LSD) - FCLIP FSIT / FQT	4	2018	4	2018
SSDS MK2 Mod 5C (OT-III-I Phase 3) CVPA	3	2018	3	2018
SSDS MK 2 MOD 5C (LSD) - TAAF	2	2018	2	2020
SSDS MK2 Mod 5C (DT-III-I Phase 1) AA	4	2018	1	2019
SSDS MK2 Mod 5C (LSD)-T&E-DT Phase 1 @ ICSTF	4	2017	2	2018
SSDS MK2 Mod 5C LSD-T&E CST Build 9 CST	2	2018	3	2018
SSDS MK 2 MOD 5C (LSD) - T&E - LSD 51 CSSQT	3	2018	3	2018
SSDS MK2 Mod 5C LSD-T&E CST Build 10 CST	4	2018	4	2018
SSDS MK 2 MOD 5C (LSD) - T&E - LSD 49 CSSQT - OT III / Phase 2 / ET14	3	2018	3	2018
SSDS MK 2 MOD 5C (LSD) - T&E - (SDTS) - DT/OT III I/PHASE 2/ET12 /TRKEX	3	2018	4	2018
SSDS MK2 Mod 5C (LSD)- T&E - DT Phase 3 / LSD 49	4	2018	4	2018
SSDS MK 2 MOD 3C / 1C - LHD 2 / CVN 72 ACB12 / TI12 - T&E - LHD 2 CSSQT	4	2017	1	2018
SSDS MK 2 MOD 3C / 1C - LHD 2 / CVN 72 ACB12 / TI12 - T&E - CVN 72 CSSQT	4	2017	2	2018
SSDS MK2 MOD 6C - CVN 78 ACB12 / TI12 - T&E - SIT/ET @ WI	4	2017	3	2020
SSDS NMK2 Mod 6C (DT-III-J Phase 1) CVI	4	2018	1	2020
SSDS MK 2 MOD 6C - CVN 78 ACB12/TI12 - / SW DCTI 4	4	2017	2	2018
SSDS NMK2 Mod 6C (DT-III-J Phase 1) AD	3	2020	3	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SSDS MK 2 MOD 6C - CVN 78 ACB12/TI12 - FSIT 4 / FQT 3	4	2017	4	2019
SSDS NMK2 Mod 6C (OT-III-J Phase 3) CVPA	1	2021	2	2021
SSDS MK 2 MOD 6C - CVN 78 ACB12/TI12 -T&E - DT III J PHASE 3 / ET10 @ CVN 78	3	2017	2	2018
SSDS NMK2 Mod 6C (OT-III-J Phase 3) AA	3	2021	4	2021
SSDS MK 2 MOD 6C - CVN 78 ACB12/TI12 - FSIT 5 / FQT 4	2	2017	3	2017
SSDS MK 2 MOD 6C - CVN 78 ACB12/TI12 -T&E CST EVENT(S) @ WI	2	2018	3	2020
SSDS MK 2 MOD 6C - CVN 78 ACB12/TI12 - TEST ANALYZE & FIX (TAAF)	4	2017	2	2020
SDTS - SSDS MK 2 MOD 6C - CVN 78 ACB12/TI12 - FCL RISK REDUCTION TRKEX / MSLEX	2	2018	3	2018
SSDS MK 2 MOD 6C - CVN 78 ACB12/TI12 - FSIT 6 / FQT 5	2	2018	3	2018
SDTS - SSDS MK 2 MOD 6C - CVN 78 ACB12/TI12 - T&E - DT/OT III J/PHASE 3/ ET09	3	2018	4	2019
SSDS MK 2 MOD 6C - CVN 78 ACB12 / TI12 - T&E - CIA #1 CST @ WI	2	2019	3	2019
SSDS MK 2 MOD 6C - CVN 78 ACB12/TI12 - FSIT 7 / FQT 6	3	2018	4	2018
SSDS MK 2 MOD 6C - CVN 78 ACB12 / TI12 - T&E CSSQT	3	2019	4	2019
SSDS MK 2 MOD 6C - CVN 78 ACB12/TI12 - FSIT 8 / FQT 7	2	2020	3	2020
SSDS MK 2 MOD 6C - CVN 78 ACB12 / TI12 - DT/OT III J PHASE 3/ ET10	3	2021	4	2021
SSDS MK 2 MOD 6C - CVN 78 ACB12 / TI12 - T&E - C2X	1	2022	1	2022
SSDS MK 2 MOD 6C - CVN 78 ACB12 / TI12 - T&E - JTFX	1	2022	1	2022
SSDS MK 2 MOD 6C - CVN 78 ACB12 / TI12 - T&E - DT III-J / Phase 3	4	2019	3	2020
SSDS MK 2 MOD 3C /1E - LHD 6 / CVN 73 ACB12 / TI-12H /TI-16 - HW PDR	4	2017	2	2018
SSDS MK 2 MOD 3C /1E - LHD 6 / CVN 73 ACB12 / TI-12H /TI-16 - SRR / SFR	4	2017	2	2018
SSDS MK 2 MOD 3C / 1E - LHD 6 / CVN 73 ACB12 / TI-12H /TI-16 - IPR 1	4	2017	4	2017
SSDS MK 2 MOD 3C / 1E - LHD 6 / CVN 73 ACB12 / TI-12H /TI-16 - IPR 2	2	2018	2	2018
SSDS MK 2 MOD 3C / 1E - LHD 6 / CVN 73 ACB12 / TI-12H /TI-16 - IPR 3	3	2018	3	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SSDS MK 2 MOD 3C / 1E - LHD 6 / CVN 73 ACB12 / TI-12H /TI-16 - IPR 4	4	2018	4	2018
SSDS MK 2 MOD 3C - LHD 6 ACB12 / TI-12H - T&E - SIT / ET @ WI	3	2017	4	2017
SSDS MK 2 MOD 3C - LHD 6 ACB12 / TI-12H - FSIT / FQT	4	2018	4	2018
SSDS MK 2 MOD 3C - LHD 6 ACB12 / TI-12H - T&E CST @ WI	2	2019	3	2019
SSDS MK 2 MOD 3C - LHD 6 ACB12 / TI-12H - TAAF	1	2019	4	2020
SSDS MK 2 MOD 1E - CVN 73 ACB12 / TI-16 - FSIT / FQT	3	2019	4	2019
SSDS MK 2 MOD 1E - CVN 73 ACB12 / TI-16 - TAAF	1	2020	4	2020
SSDS MK 2 MOD 1E - CVN 73 ACB12 / TI-16 - T&E - SIT / ET @ WI	1	2019	2	2020
SSDS MK 2 MOD 1E - CVN 73 ACB12 / TI-16 - T&E CST @ WI	2	2020	3	2020
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - IPR 1 - Rel 1 / Rel 2	4	2017	4	2017
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - IPR 2	2	2018	2	2018
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC-FSIT/FQT REL 1	3	2018	4	2018
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC-FSIT/FQT REL 2	4	2018	1	2019
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - T&E - REL 1 / 2 SIT / ET @ WI	4	2018	1	2019
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - T&E - REL 1 CST	2	2019	2	2019
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - TAAF	1	2019	3	2020
At-Sea testing for FCLIP: SSDS MK2 FCLIP Phase 2 DT III - SDTS duration	2	2019	2	2020
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - T&E - REL 2 CST	4	2019	4	2019
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - T&E - REL 2 CST -	4	2019	4	2019
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - FINAL RFP	4	2017	4	2017
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - SoS SRR / SFR 1	1	2018	1	2018
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - SoS SRR / SFR 2	4	2018	4	2018
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - CSEA CONTRACT AWARD	2	2019	2	2019
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - ELEMENT SRR / SFR	2	2019	2	2019
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - REL 1 SSR/PDR	3	2019	3	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - ELEMENT SRR / SFR -	4	2019	4	2019
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - REL 1 T&E SIT/ET @WI	4	2019	1	2020
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - SS ECP CONTRACT AWARD	1	2020	1	2020
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - REL 1 FSIT / FQT	1	2020	1	2020
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - REL 2 SSR/PDR	4	2020	4	2020
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - IPR 1	2	2021	2	2021
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - IPR 2	2	2021	2	2021
SSDS MK 2 ACB 20 / EASR/ ERS / TI-22 - TAAF	2	2020	4	2021
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - REL 2 T&E SIT/ET @WI	4	2021	4	2021
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - REL 2 FSIT / FQT	1	2022	2	2022

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604755N / *Ship Self Def (Detect & Cntrl)*	Project (Number/Name) 3172 / *Joint Non-Lethal Weapons*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3172: *Joint Non-Lethal Weapons*	40.427	4.177	5.177	2.892	1.100	3.992	3.018	3.085	3.142	3.213	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Develop non-lethal weapon systems in support of anti-terrorism/force protection missions. Technologies include, but are not limited to: ocular interrupters, propulsion occlusion systems, and acoustic hailing devices. Current efforts are focused on the Long-Range Ocular Interrupter (LROI), Hailing Acoustic Laser and Light Tactical System (HALLTS), and Maritime Vessel Stopper (MVS) technologies. The LROI is intended to provide the U.S. Navy with the capability to deliver a bright light producing a dazzling or glare effect on a closing target to warn and/or suppress potential threats through increasing levels of visual degradation. The planned LROI will generate controlled, high-intensity output, providing warning and suppression effects. The extended range capability of LROI will effectively increase tactical decision-making time in support of escalation of force (EoF) tactics, techniques and procedures (TTP) across a broad range of military operations (ROMO). Further, the LROI will enhance Joint Force operations in determining the intent of a potential threat as early as possible.

HALLTS is a single-operator, personnel-portable, hailing and warning system developed to enhance the ability of security forces to effectively execute escalation of force and intent determination procedures. HALLTS integrates three commercial off-the-shelf (COTS) Navy-fielded non-lethal devices consisting of an acoustic hailing device, a high intensity white light and a dazzling LA-9/P green beam laser. HALLTS utilizes a common system controller interface and common mounting options while reducing the manpower requirements for operation of multiple non-lethal devices to more efficiently implement escalation of force procedures.

MVS technologies are systems designed to temporarily disable, slow, or stop waterborne vessels of varying degrees of size and different propulsion types in order to effectively execute escalation of force and intent determination procedures. The MVS technologies will provide the US Navy with lightweight, compact, biodegradable materials, which will stop or slow marine platforms by occlusion of any type of marine propeller or propulsor.

Develop Visual Augmentation Systems (VAS) in support of expeditionary / anti-terrorism / force protection missions. Technologies include, but are not limited to: image intensification devices, thermal imaging systems, and laser systems. Current efforts are focused on the M2HB/M2A1 Weapon Sight (M2WS), VAS Integration within the Advanced Bomb Suit Helmet, Visual Augmentation Module Portable Imager Recorder (VAMPIR), and AN/PVS-31B (White Phosphor) Wide Field of View Goggle. The purpose of the M2WS program is to provide an advanced day/night crew-served weapon sight capability to surface and expeditionary Navy personnel. The M2WS will provide for increased target detection ranges as well as provide for improved firing accuracy to minimize the number of rounds required to successfully hit the target. Integration of VAS within the bomb suit helmet will allow EOD technicians freedom of movement to operate in low light level conditions with a modular sensor/display and will provide increased capability to clearly detect, locate, and identify explosive ordnance. The VAMPIR is a hand-held multi-spectral imaging system that provides situational awareness, allowing the user to detect and recognize potential threat craft at the maximum possible range so that Navy forces can assess nearby craft and engage appropriately. The VAMPIR contains an integrated recording (video/audio) capability which is used to document the incident. The AN/PVS-31B (White Phosphor) Wide Field of View Goggle (WFOV) provides the user with a lightweight/white phosphor goggle with an increased field of view (FOV) from 40 degrees to 80

degrees. The increase in FOV provides the user with an additional 30% tactical advantage and improved situational awareness. The AN/PVS-31B WFOV enhances the user's capability during Close Quarters Combat (CQC) and Counter-IED threat identification/defeat missions.

OCO funding will be used to conduct necessary research and development to satisfy current Visual Augmentation Systems (VAS) capability gap defined for expeditionary warfighters. Expeditionary force must maintain situational awareness by using VAS equipment in operational conditions during low-light and no-light environments to obtain and maintain battlefield dominance during missions to Find, Fix, Track, Target, Engage and Assess (F2T2EA) enemy combatants. References: COMNECC ltr Ser N43/695 dated 2 Oct 14 (Visual Augmentation System Capability Requirements and Associated Capability Gaps); endorsed by USFFC ltr Ser N8/ N9/014 dated 17 Dec 14; approved by OPNAV N957 ltr Ser 17U140063 dated 23 May 17.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Joint Non-Lethal Weapons Development	4.177	5.177	2.892	1.100	3.992
Articles:	-	-	-	1	1
FY 2018 Plans: Complete Long Range Ocular Interrupter (LROI) program of record transition. Develop next generation solution that meets or exceeds LROI Letter of Requirement and issue RFP. Continue performing HALLTS engineering updates previously identified and continue to solicit Fleet user feedback. Continue development of dual-mount solution and required documentation, and conduct test and evaluation. Effort will include all acquisition documents leading up to RFP to fully meet the fielding requirements of units to NECC. Continue to pursue technologies that satisfy the occlusion requirements of the Maritime Vessel Stopping (MVS) Capability Development Document (CDD), refining both requirements and requirements documentation.					
FY 2019 Base Plans: Ensure HALLTS units are fielded to NECC to meet their unit requirements. Continue development of next generation LROI Letter of Requirement solution and implement any additional engineering updates as needed. Continue developing the MVS occlusion technologies and all acquisition documents leading up to RFP.					
FY 2019 OCO Plans: Will conduct necessary research and prototype development to determine a material solution to satisfy current Visual Augmentation Systems (VAS) capability gaps encountered during missions in combat zones while in theater. The warfighter lacks the ability to detect and recognize potential threat craft at the maximum possible range and at the earliest time in all weather environments during day and night. In addition, the warfighter needs the ability to record both audio/video encounters and incidents for after action reporting. Visual Augmentation					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3172 / *Joint Non-Lethal Weapons*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Systems are necessary to avoid accidental engagement of non-combatants while maintaining the greatest possible distance from threats. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease from FY18 to FY19 due to research and development phase for the LROI nearing completion; procurement of the system will begin in FY19.					
Accomplishments/Planned Programs Subtotals	4.177	5.177	2.892	1.100	3.992

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/8128: *NCW Forces Active*	5.744	6.235	7.805	-	7.805	7.805	7.961	0.000	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

The initial Long Range Ocular Interrupter (LROI) systems were designed, developed, and deployed as a Rapid Acquisition. Following an FY16 Military Utility Assessment (MUA), the LROI was recommended to
be a Program of Record (PoR), with engineering changes being made in the next generation to meet issues identified in the MUA. Once the PoR is established, a final developmental Technical Data Package (TDP) will be developed with user input incorporated. The developmental TDP will be included in the Request for Proposal (RFP) to industry to be further refined for a production-level TDP to be used for PoR. The RFP will be provided to industry to solicit offers for LRIP production after refining the TDP; subsequently, it will be provided to industry for full rate production.

The initial Hailing Acoustic Laser and Light Tactical System (HALLTS) systems were designed and developed using Physical Security Enterprise & Analysis Group (PSEAG) RDT&E funding. HALLTS units were included in the MUA in order to receive Fleet feedback and identify any needed engineering changes, including the development of a dual-mount to support HALLTS use by Navy Expeditionary Combat Command (NECC). A developmental Technical Data Package (TDP) will include user input. The RFP, including the TDP, will be provided to industry to solicit offers for LRIP and subsequently Full Rate Production.

The development of the M2WS will occur through two separately funded phases. Phase I was funded in FY 2016/2017 and consists of developing Production Demonstration Models (PDM) that are in accordance with all Performance Specification (PSPEC) requirements. Phase II will provide low rate initial production representative units which comply with all system requirements and subsequently for full rate production for a total of 825 systems to be fielded to NECC.
Initial VAMPIR systems will be developed and tested based on KPPs identified. These units will go through user assessment for their feedback. ECP will be performed to incorporate user inputs. The RFP, including the developmental TDP, will be provided to the industry to solicit offers for the LRIP production after refining the TDP and subsequently for full rate production for a total of 200 VAMPIR systems to be fielded to NECC.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3172 / *Joint Non-Lethal Weapons*

E. Performance Metrics

Transition to Program of Record (PoR) and development of next generation Long Range Ocular Interrupter (LROI), which will meet identified Fleet requirements. Develop Technical Data Package (TDP) that informs the related acquisition documents found in the RFP package. Develop Hailing Acoustic Laser and Light Tactical System (HALLTS) TDP and dual-mount design that satisfy the requirements of Navy Expeditionary Combat Command (NECC).

Successfully produce M2WS and VAMPIR systems to support NECC mission requirements and transition to FRP within the VAS PoR. Successfully conduct testing and fielding to fleet users.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3172 / *Joint Non-Lethal Weapons*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering	WR	NSWC Panama City : Panama City, FL	0.000	0.000		0.000		0.487	Jan 2019	-		0.487	Continuing	Continuing	Continuing
System Engineering	WR	NSWC Carderock : Carderock, MD	0.000	0.000		2.000	Apr 2018	0.000		-		0.000	Continuing	Continuing	Continuing
System Engineering	WR	NSWC Dahlgren : Dahlgren VA	14.855	2.202	Nov 2016	1.452	Jan 2018	1.123	Jan 2019	-		1.123	Continuing	Continuing	Continuing
System Engineering	WR	NSWC Port Hueneme : Port Hueneme CA	0.628	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
System Engineering	WR	NSWC Crane : Crane IN	0.580	0.000		0.353	Jan 2018	0.333	Jan 2019	1.100	Jan 2019	1.433	Continuing	Continuing	Continuing
		Subtotal	16.063	2.202		3.805		1.943		1.100		3.043	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Services (NSWC)	WR	NSWC Dahlgren : Dahlgren, VA	4.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Management	WR	NUWC Newport : Newport, RI	2.857	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Engineering Services (NSWC)	WR	NSWC Panama City : Panama City, FL	1.200	0.875	Nov 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	8.057	0.875		0.000		0.000		-		0.000	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3172 / *Joint Non-Lethal Weapons*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	WR	NSWC Dahlgren : Dahlgren VA	2.800	0.500	Nov 2016	0.309	Jan 2018	0.309	Jan 2019	-		0.309	Continuing	Continuing	Continuing
Test and Evaluation	MIPR	Military Sealift Command : Washington DC	2.200	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Test and Evaluation	WR	NSWC Carderock : Carderock MD	0.000	0.000		0.193	Apr 2018	0.074	Jan 2019	-		0.074	Continuing	Continuing	Continuing
Test and Evaluation	WR	COMOPTEVFOR : Norfolk VA	4.925	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	9.925	0.500		0.502		0.383		-		0.383	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	WR	NSWC Carderock : Carderock MD	0.000	0.000		0.635	Jan 2018	0.328	Jan 2019	-		0.328	Continuing	Continuing	Continuing
Program Management	WR	NSWC Dahlgren : Dahlgren VA	6.364	0.600	Nov 2016	0.235	Jan 2018	0.238	Jan 2019	-		0.238	Continuing	Continuing	Continuing
DAWDF	Various	Not Specified : Not Specified	0.018	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	6.382	0.600		0.870		0.566		-		0.566	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	40.427	4.177		5.177		2.892		1.100		3.992	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3172 / *Joint Non-Lethal Weapons*

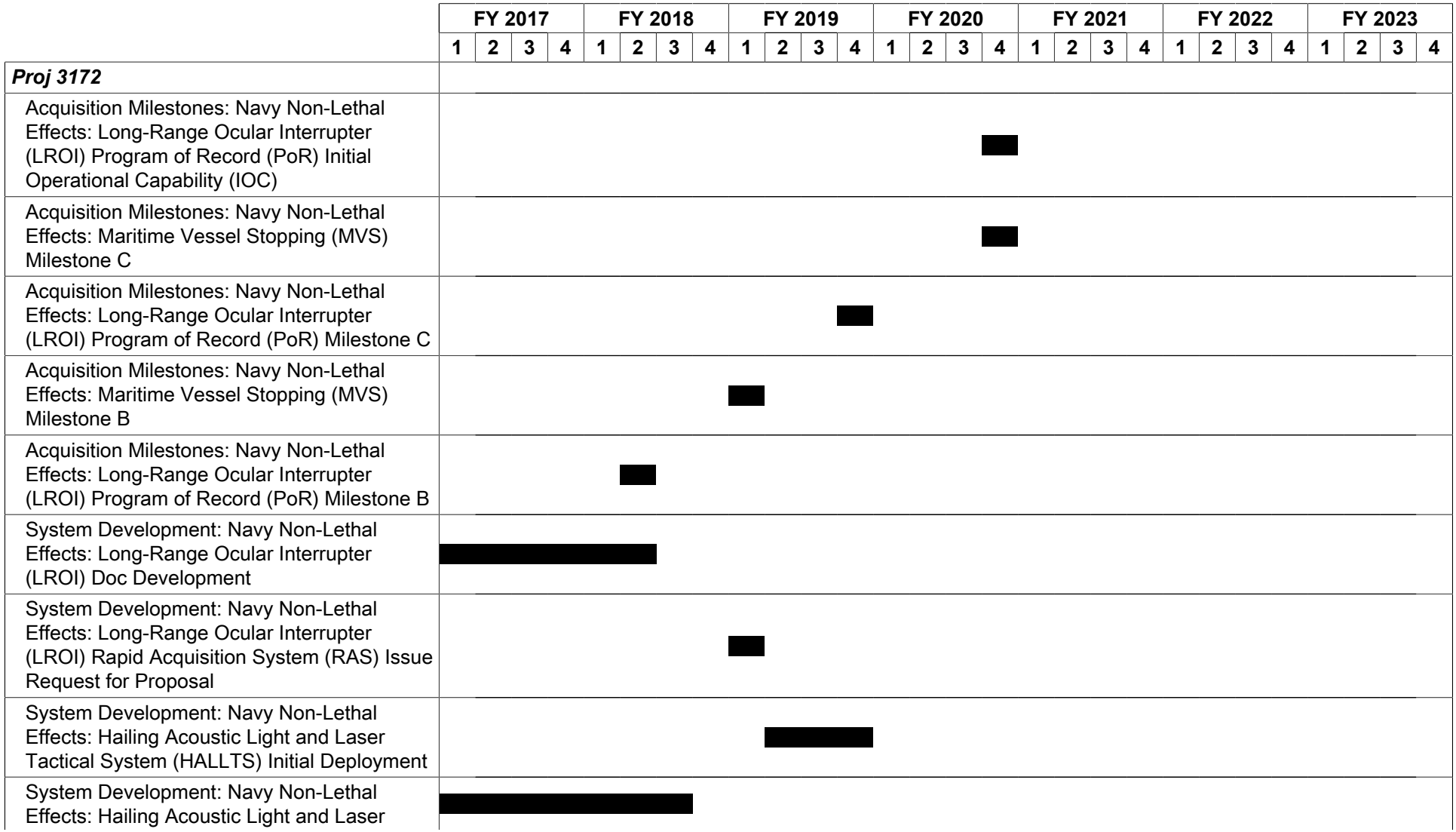

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3172 / *Joint Non-Lethal Weapons*

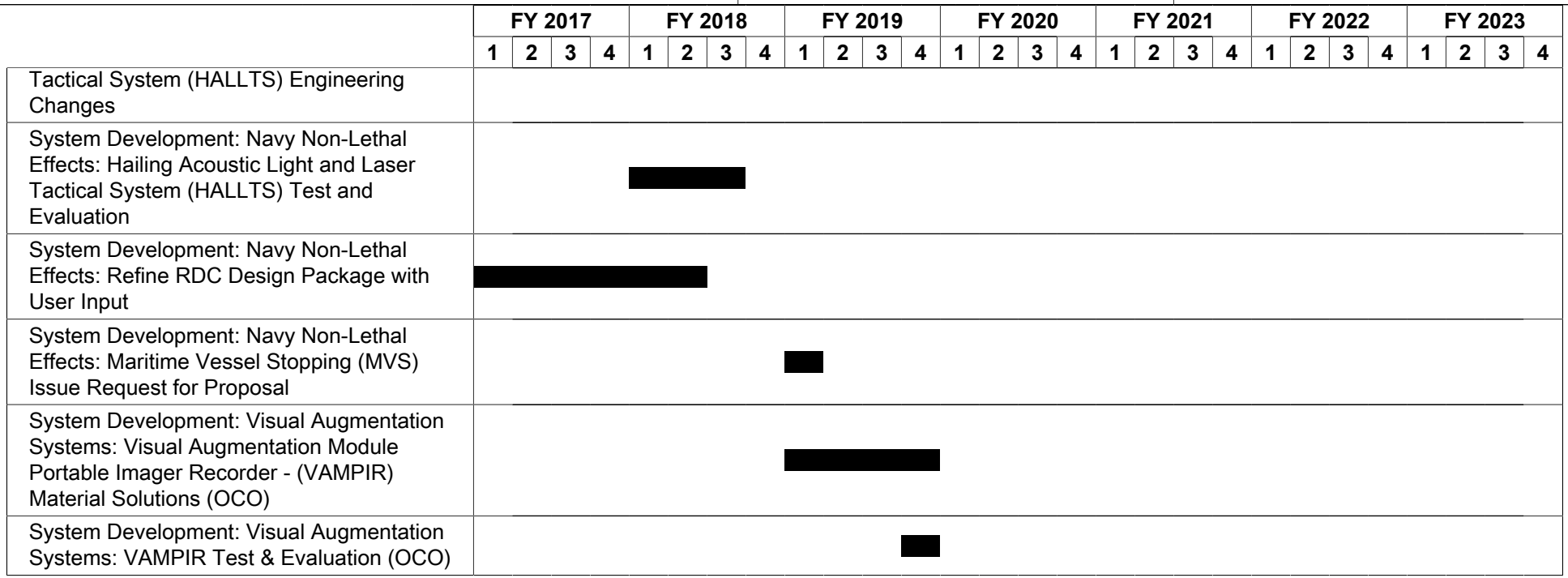

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3172 / *Joint Non-Lethal Weapons*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3172				
Acquisition Milestones: Navy Non-Lethal Effects: Long-Range Ocular Interrupter (LROI) Program of Record (PoR) Initial Operational Capability (IOC)	4	2020	4	2020
Acquisition Milestones: Navy Non-Lethal Effects: Maritime Vessel Stopping (MVS) Milestone C	4	2020	4	2020
Acquisition Milestones: Navy Non-Lethal Effects: Long-Range Ocular Interrupter (LROI) Program of Record (PoR) Milestone C	4	2019	4	2019
Acquisition Milestones: Navy Non-Lethal Effects: Maritime Vessel Stopping (MVS) Milestone B	1	2019	1	2019
Acquisition Milestones: Navy Non-Lethal Effects: Long-Range Ocular Interrupter (LROI) Program of Record (PoR) Milestone B	2	2018	2	2018
System Development: Navy Non-Lethal Effects: Long-Range Ocular Interrupter (LROI) Doc Development	1	2017	2	2018
System Development: Navy Non-Lethal Effects: Long-Range Ocular Interrupter (LROI) Rapid Acquisition System (RAS) Issue Request for Proposal	1	2019	1	2019
System Development: Navy Non-Lethal Effects: Hailing Acoustic Light and Laser Tactical System (HALLTS) Initial Deployment	2	2019	4	2019
System Development: Navy Non-Lethal Effects: Hailing Acoustic Light and Laser Tactical System (HALLTS) Engineering Changes	1	2017	3	2018
System Development: Navy Non-Lethal Effects: Hailing Acoustic Light and Laser Tactical System (HALLTS) Test and Evaluation	1	2018	3	2018
System Development: Navy Non-Lethal Effects: Refine RDC Design Package with User Input	1	2017	2	2018
System Development: Navy Non-Lethal Effects: Maritime Vessel Stopping (MVS) Issue Request for Proposal	1	2019	1	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3172 / *Joint Non-Lethal Weapons*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
System Development: Visual Augmentation Systems: Visual Augmentation Module Portable Imager Recorder - (VAMPIR) Material Solutions (OCO)	1	2019	4	2019
System Development: Visual Augmentation Systems: VAMPIR Test & Evaluation (OCO)	4	2019	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604755N / *Ship Self Def (Detect & Cntrl)*	Project (Number/Name) 3358 / *SSDS Training Improvement Program*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3358: *SSDS Training Improvement Program*	8.978	2.807	7.554	7.831	-	7.831	8.557	9.920	9.659	9.099	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

SSDS Training Improvement Program provides enhancements and upgrades to the SSDS Total Ship Training Capability (TSTC) components within the combat system, combat system elements, Battle-Force Tactical Training (BFTT), and Advanced Training Domain (ATD) to address needs for increased training capability and functionality in conjunction with SSDS MK2 Advanced Capability Builds (ACB)/Fire Control Loop Improvement Project (FCLIP), Far-Term Interoperability Improvement Project (FTIIP), Task Force Cyber Awakening (TFCA) Boundary Defense Capability (BDC), and Technical Insertion efforts under PU 2178 (QRCC). These enhancements will address current and future training requirements by implementing new functionality to enable the individual warfighter through distributed battle group events to engage in more complex training requirements to support fleet required training certification events. Capability Development and integration are related to Self Defense, Underwater, Surface, and other warfare areas. Capability enhancements and upgrades include development of re-useable common components that can be leveraged by SSDS MK2 combat systems, and/or integration of re-usable common components developed by the TSTC/BFTT Program and AEGIS Advanced Training Domain (ATD)/TSTC Total Ship Training Capability (TSTC) projects to meet AEGIS combat system training requirements. TSTC continues to integrate and update, as new tactical capabilities are being introduced, to enable crew operator proficiency training for basic and sustainment level training events, through distributed strike group certification fleet synthetic training (FST) events and including COMPTUEX FST at Sea integration into Live, Virtual and Constructive (LVC) environment. Continued Development is required to integrate new capabilities and interfaces to provide training for AEGIS and SSDS combat system capability upgrades, and to address the Fleet's Live, Virtual and Constructive (LVC) Fleet Training Wholeness initiative. Additionally, modernization is needed to support the DoD Training Transformation Plan, the Chief of Naval Operations Fleet Response Plan and Commander United States Fleet Forces Command Fleet Readiness Training Plan.

The Advanced Training Domain (ATD) is being developed to combine BFTT and the AEGIS Combat Training System (ACTS) into a common system that integrates with AEGIS BL 9.2.2AF, and SSDS BL 11.xAF. ATD is being hosted along with the AEGIS and SSDS combat system on TI-16 common processing and display hardware. ATD is being designed to be the core of the Total Ship Training Capability, and is projected to be more reliable, simpler to use, and architected to be extensible to meet interoperability and capability enhancement challenges in the future.

The BFTT is being updated to maintain integration and capability enhancements developed for the Cooperative Engagement Capability (CEC), Surface Electronic Warfare Improvement Program (SEWIP), and the Carrier Tactical Support Center (CV-TSC), and SSDS Fire Control Loop Improvement Program.

TSTC provides realistic joint warfare training across the spectrum of armed conflict, realistic unit level team training in all warfare areas (e.g. NIFC-CA and BMD missions to support IAMD). TSTC provides ships' Commanding Officers and Battle Group/Battle Force Commanders with the ability to conduct coordinated realistic, high stress, combat system level team training as an integral part of the Afloat Training Organization, the Tactical Training Groups and C2F/C3F FST/LVC events.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3358 / *SSDS Training Improvement Program*

Develop and integrate MH-60R simulator to enable embedded shipboard training in support of basic and sustainment training, as well as establishes the pathway to support pier-side Fleet Synthetic Training (FST) events.

Develop and Integrate Cooperative Engagement Capability (CEC) Enhanced Training (CET) to support basic and sustainment level training, as well as provide ability to distribute and establish CEC data link during pier-side fleet synthetic training exercises. CET will also provide enable proficiency training of NIFC-CA capability.

Develop and integrate CEC Interim Training (CIT) capability to support pier-side fleet synthetic training events. This is an interim capability support the distributed portion of the CET capability, until CET is fully deployed. This supports training of strike groups of new tactical capabilities that were integrated into the AEGIS BL9 ships, and provides the necessary functionality to allow ships to train as a strike group.

Develop and integrate upgrades to Battle-Force Electronic Warfare Trainer (BEWT) to support soft kill training with NULKA.

Develop Identification Friend or Foe (IFF) simulator to enable training of Modes 1, 2, 3A, 4, C, 5 and S on both AEGIS and SSDS ships. Capability will support AEGIS and SSDS IFF MODE 4/5 Integration program will address training Mode 4 Inoculation, and allow training of Modes 5 and S IFF.

Develop and integrate commensurate training improvements to SSDS ACB 20 for Enhanced Sea Sparrow Missile (ESSM) and Electronic Warfare (EW) tactical improvements.

Integrate Navy Continuous Training Environment (NCTE) networking and cyber security upgrades maintain authorization to participate in distributed shipboard training events.

TSTC integrated on SSDS provides the capability to complete system and operational level testing of the combat system.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: SSDS Total Ship Training Capability	2.807	7.554	7.831	0.000	7.831
Articles:	-	-	-	-	-
FY 2018 Plans: - For the SSDS MK2 ACB-20 Baseline, initiate the development of the requirements to support ESSM Block 2 simulation increased capability against closely spaced objects, and stream raids. Provide 2T uplink simulation that provided continuous targeting data to synthetic ESSM missile through intercept. - For the SSDS MK2 ACB-20 Baseline, initiate the development of the requirements to provide training for integrated and optimized employment of decoys, Electronic Attack (EA), and hard kill and soft kill weapons					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3358 / *SSDS Training Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
effects against emerging threats. Provide the capability to support training with Soft Kill Coordination, EW Battle Management, and AOEW. - Continue development of re-hosting Battle Force Tactical Training (BFTT) / Advanced Training Domain (ATD) capability into SSDS MK2 TI-16 Hardware. Develop final design and begin implementation in support of installation on CVN-73 and future baselines. - Continue supporting the development of Cooperative Engagement Capability (CEC) integrated training in support of Fleet Synthetic Training (FST). Support phase 3 (CEC Tactical Software Full Training Support) CEC Interim Training Capability (CIT). - Continue requirements to support simulating real world environments within SSDS MK2 shipboard sensors for Anti-Access / Area Denial (A2AD) training. ***FY 2019 Base Plans:*** - Initiate requirements for the SSDS Integrated Combat System (ICS) that will provide SSDS ships the ability to train using Live-Virtual-Constructive (LVC). LVC will improve the Navy's competitive advantage via high end training and enable contested environment strike group training in accordance with strategic documents. - For the SSDS MK2 ACB-20 Baseline, continue the development of the requirements to support ESSM Block 2 simulation increased capability against closely spaced objects, and stream raids. Provide 2T uplink simulation that provided continuous targeting data to synthetic ESSM missile through intercept. - For the SSDS MK2 ACB-20 Baseline, continue the design and development for integrated and optimized employment of decoys, Electronic Attack (EA), and hard kill and soft kill weapons effects against emerging threats. Provide the capability to support training with Soft Kill Coordination, EW Battle Management, and AOEW. - Continue development of re-hosting Battle Force Tactical Training (BFTT) / Advanced Training Domain (ATD) capability into SSDS MK2 TI-16 Hardware. Continue development and integration of this capability in support of installation on CVN-73 and future SSDS baselines.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3358 / *SSDS Training Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Continue supporting the development of Cooperative Engagement Capability (CEC) integrated training in support of Fleet Synthetic Training. Continue systems engineering of CEC Tactical Software Full Training Support. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Accomplishments/Planned Programs Subtotals	2.807	7.554	7.831	0.000	7.831

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDTEN/0204571N/1427: *Surface Tactical Team Trainer (PU 1427)*	12.145	15.274	32.433	-	32.433	43.236	34.644	24.140	17.717	Continuing	Continuing
• RDTEN/0604307N/3357: *AEGIS Training Improv. Prog. (PU 3357)*	10.355	7.856	6.946	-	6.946	7.863	7.766	6.404	5.474	Continuing	Continuing

Remarks

D. Acquisition Strategy

For the SSDS MK2 software development, including the integration of TSTC software improvements and the TI-16 Open Architecture Computing Environment, the acquisition strategy identified for SSDS MK2 for QRCC Project (PU 2178) (R-2A exhibit) applies.

E. Performance Metrics

Performance metrics for SSDS MK2 for QRCC Project (PU 2178) apply (R-2A exhibit). The milestones identified in the R-4A exhibit for PU2178 apply for the CVN78 SSDS MK2 ACB-12 / TI-12 baseline development and the integration of the DBR simulation software to provide CVN78 in-port and underway fire control loop training capabilities. The milestones for implementation of TSTC improvements into future SSDS MK2 ICS baselines for the SSDS MK2 FCLIP Phase 2 / FTIIP / Cyber Security BDC, and ACB-20 / EASR / ERS baselines in QRCC Project (PU 2178) apply and are listed in the R-4A exhibits for PU 3358.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604755N / *Ship Self Def (Detect & Cntrl)*	Project (Number/Name) 3358 / *SSDS Training Improvement Program*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TSTC Sys Eng / Safety	WR	DD : Dahlgren, VA	0.288	0.135	Nov 2016	0.350	Nov 2017	0.350	Nov 2018	-		0.350	Continuing	Continuing	Continuing
TSTC Sys Eng / ILS	WR	DN : Dam Neck, VA	1.370	0.916	Nov 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
TSTC Sys Eng / Integration	C/CPIF	RSC IIS (4112) : Suffolk, VA	1.076	0.000		0.079	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
TSTC TDL Gateway	WR	SPAWAR PMW 150 : San Diego, CA	0.206	0.215	Dec 2016	0.000		0.220	Nov 2018	-		0.220	0.000	0.641	-
TSTC Sys Eng / PSEA	SS/CPIF	RSC (5128) : San Diego, CA	1.688	1.407	Dec 2016	1.665	Nov 2017	1.701	Nov 2018	-		1.701	Continuing	Continuing	Continuing
TSTC Sys Eng / MH-60R Training Capability	WR	Keyport (NUWC) : Keyport, RI	0.275	0.134	Nov 2016	0.750	Nov 2017	0.500	Nov 2018	-		0.500	Continuing	Continuing	Continuing
TSTC Planning Support	C/CPIF	TMB : Washington, DC	0.025	0.000		0.000		0.000		-		0.000	0.000	0.025	-
TSTC ATD	TBD	IWS 1.0 : Washington, DC	0.000	0.000		3.038	Dec 2017	3.390	Dec 2018	-		3.390	0.000	6.428	-
TSTC ESSM BLK2/EW Upgrades	TBD	Various : Various	4.050	0.000		0.000		0.000		-		0.000	0.000	4.050	-
TSTC EW	TBD	IWS 2.0 : Washington, DC	0.000	0.000		1.226	Nov 2017	1.250	Nov 2018	-		1.250	0.000	2.476	-
TSTC NCTE	WR	Corona(NSWC) : Corona, CA	0.000	0.000		0.405	Nov 2017	0.420	Nov 2018	-		0.420	0.000	0.825	-
TSTC GWS	TBD	IWS 3.0 : Washington, DC	0.000	0.000		0.041	Dec 2017	0.000		-		0.000	0.000	0.041	-
		Subtotal	8.978	2.807		7.554		7.831		-		7.831	Continuing	Continuing	N/A

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	8.978	2.807		7.554		7.831		-		7.831	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3358 / *SSDS Training Improvement Program*

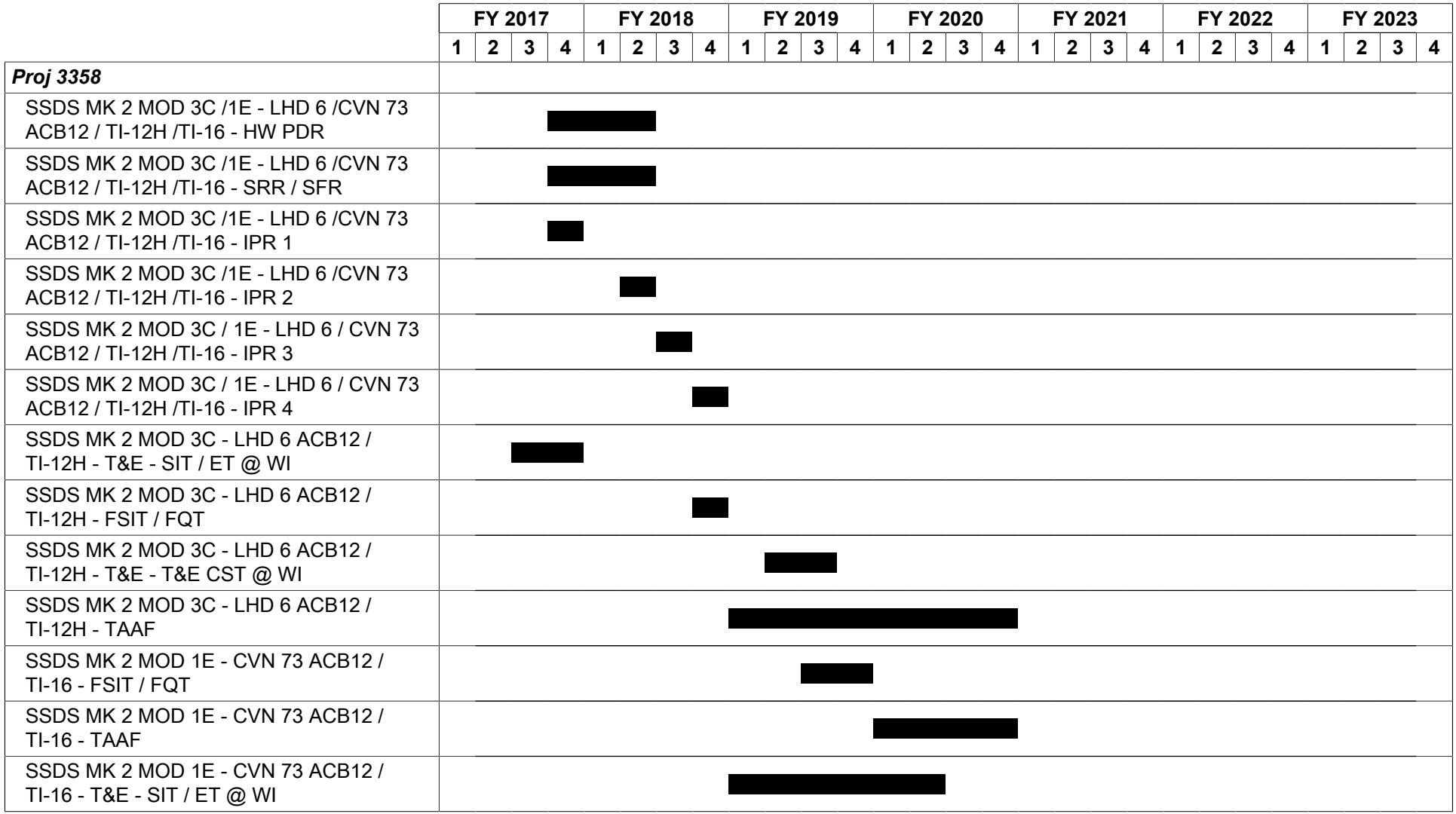

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3358 / *SSDS Training Improvement Program*

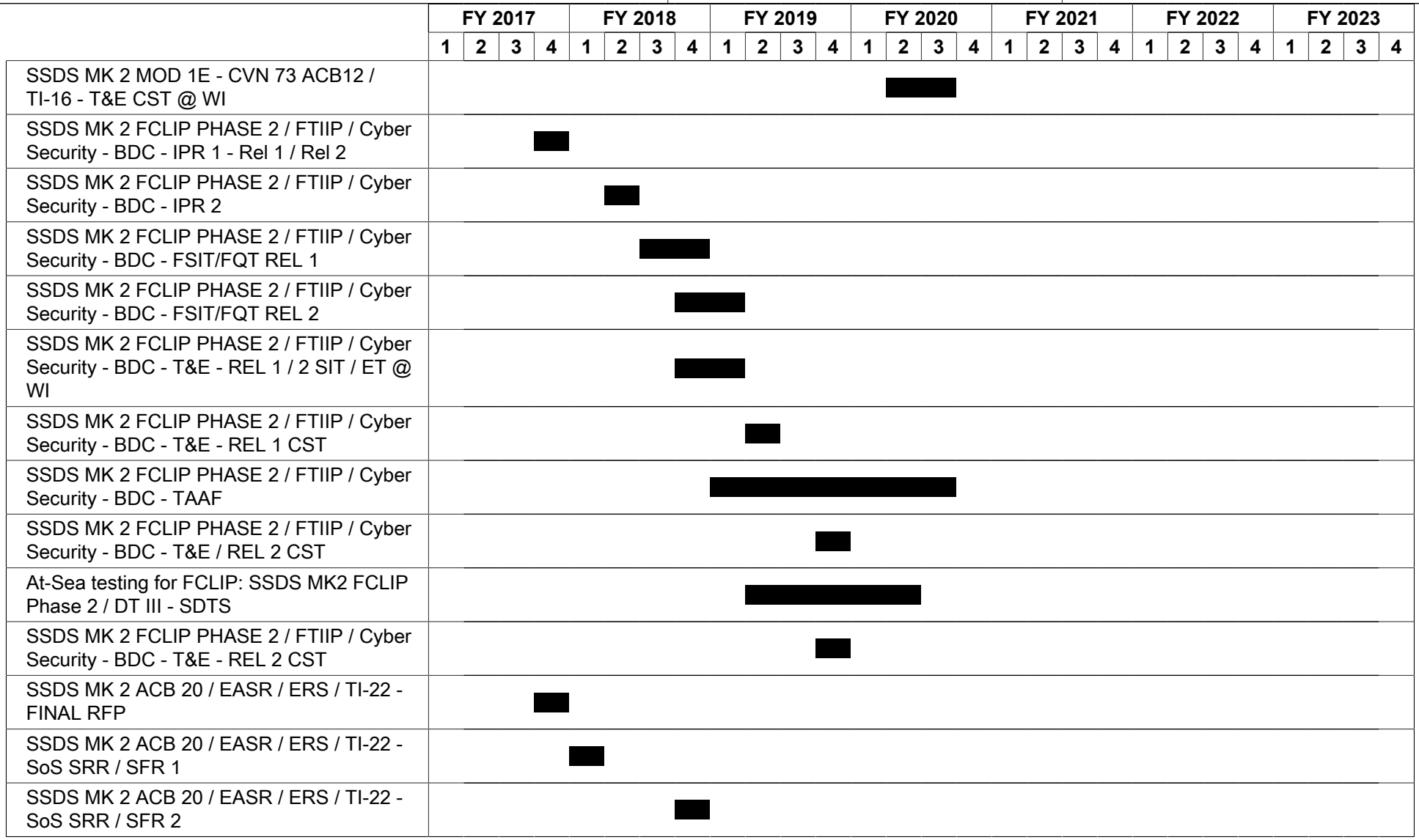

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3358 / *SSDS Training Improvement Program*

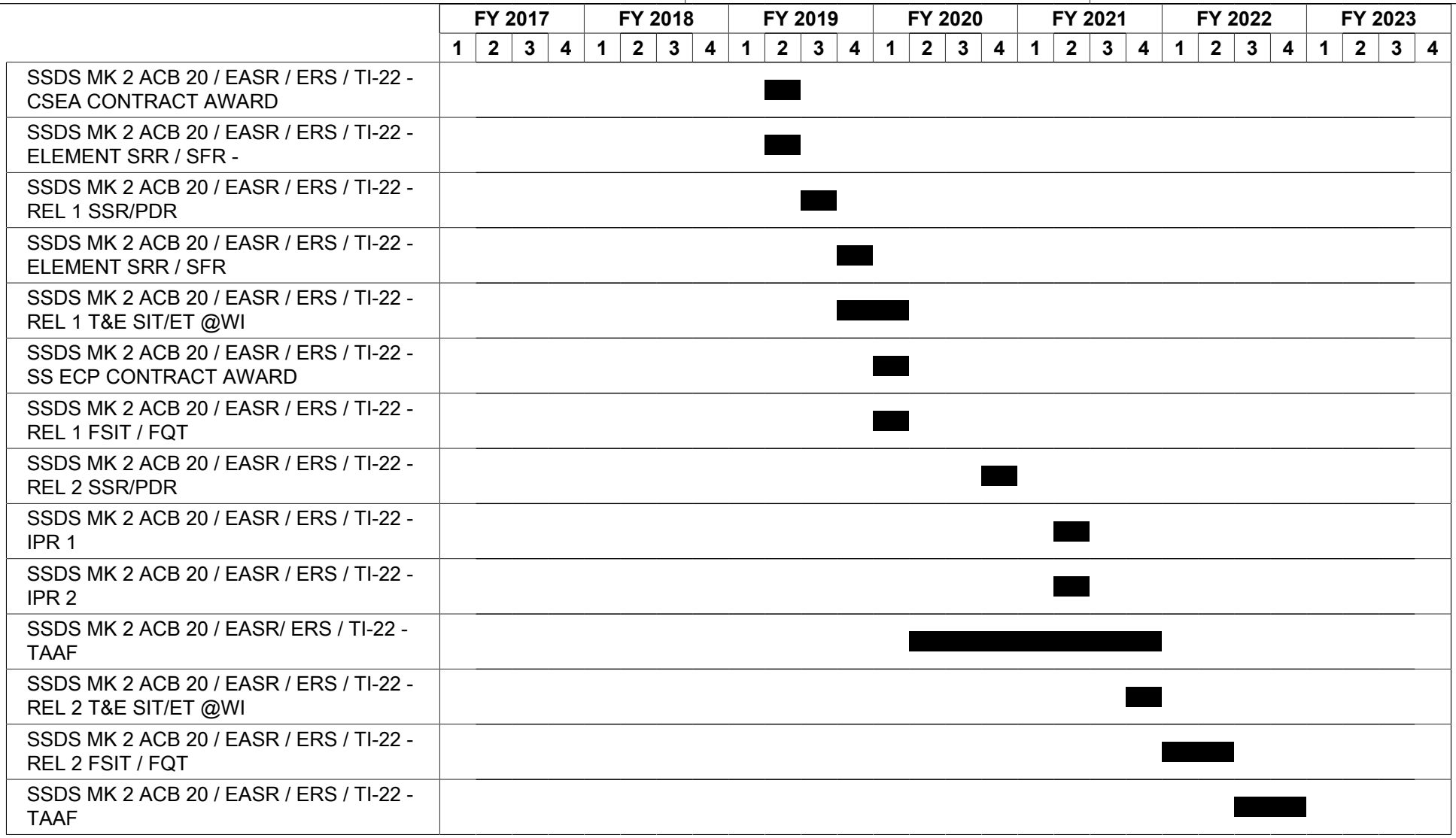

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3358 / *SSDS Training Improvement Program*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3358				
SSDS MK 2 MOD 3C /1E - LHD 6 /CVN 73 ACB12 / TI-12H /TI-16 - HW PDR	4	2017	2	2018
SSDS MK 2 MOD 3C /1E - LHD 6 /CVN 73 ACB12 / TI-12H /TI-16 - SRR / SFR	4	2017	2	2018
SSDS MK 2 MOD 3C /1E - LHD 6 /CVN 73 ACB12 / TI-12H /TI-16 - IPR 1	4	2017	4	2017
SSDS MK 2 MOD 3C /1E - LHD 6 /CVN 73 ACB12 / TI-12H /TI-16 - IPR 2	2	2018	2	2018
SSDS MK 2 MOD 3C / 1E - LHD 6 / CVN 73 ACB12 / TI-12H /TI-16 - IPR 3	3	2018	3	2018
SSDS MK 2 MOD 3C / 1E - LHD 6 / CVN 73 ACB12 / TI-12H /TI-16 - IPR 4	4	2018	4	2018
SSDS MK 2 MOD 3C - LHD 6 ACB12 / TI-12H - T&E - SIT / ET @ WI	3	2017	4	2017
SSDS MK 2 MOD 3C - LHD 6 ACB12 / TI-12H - FSIT / FQT	4	2018	4	2018
SSDS MK 2 MOD 3C - LHD 6 ACB12 / TI-12H - T&E - T&E CST @ WI	2	2019	3	2019
SSDS MK 2 MOD 3C - LHD 6 ACB12 / TI-12H - TAAF	1	2019	4	2020
SSDS MK 2 MOD 1E - CVN 73 ACB12 / TI-16 - FSIT / FQT	3	2019	4	2019
SSDS MK 2 MOD 1E - CVN 73 ACB12 / TI-16 - TAAF	1	2020	4	2020
SSDS MK 2 MOD 1E - CVN 73 ACB12 / TI-16 - T&E - SIT / ET @ WI	1	2019	2	2020
SSDS MK 2 MOD 1E - CVN 73 ACB12 / TI-16 - T&E CST @ WI	2	2020	3	2020
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - IPR 1 - Rel 1 / Rel 2	4	2017	4	2017
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - IPR 2	2	2018	2	2018
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - FSIT/FQT REL 1	3	2018	4	2018
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - FSIT/FQT REL 2	4	2018	1	2019
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - T&E - REL 1 / 2 SIT / ET @ WI	4	2018	1	2019
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - T&E - REL 1 CST	2	2019	2	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3358 / *SSDS Training Improvement Program*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - TAAF	1	2019	3	2020
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - T&E / REL 2 CST	4	2019	4	2019
At-Sea testing for FCLIP: SSDS MK2 FCLIP Phase 2 / DT III - SDTS	2	2019	2	2020
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - T&E - REL 2 CST	4	2019	4	2019
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - FINAL RFP	4	2017	4	2017
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - SoS SRR / SFR 1	1	2018	1	2018
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - SoS SRR / SFR 2	4	2018	4	2018
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - CSEA CONTRACT AWARD	2	2019	2	2019
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - ELEMENT SRR / SFR -	2	2019	2	2019
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - REL 1 SSR/PDR	3	2019	3	2019
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - ELEMENT SRR / SFR	4	2019	4	2019
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - REL 1 T&E SIT/ET @WI	4	2019	1	2020
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - SS ECP CONTRACT AWARD	1	2020	1	2020
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - REL 1 FSIT / FQT	1	2020	1	2020
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - REL 2 SSR/PDR	4	2020	4	2020
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - IPR 1	2	2021	2	2021
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - IPR 2	2	2021	2	2021
SSDS MK 2 ACB 20 / EASR/ ERS / TI-22 - TAAF	2	2020	4	2021
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - REL 2 T&E SIT/ET @WI	4	2021	4	2021
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - REL 2 FSIT / FQT	1	2022	2	2022
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - TAAF	3	2022	4	2022