Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy											Date: May 2021	
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 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	1,570.437	170.474	153.532	149.433	-	149.433	-	-	-	-	-	-
2178: *QRCC*	1,490.117	159.181	143.354	133.917	-	133.917	-	-	-	-	-	-
3172: *Joint Non-Lethal Weapons*	53.664	3.095	1.148	3.095	-	3.095	-	-	-	-	-	-
3358: *SSDS Training Improvement Program*	26.656	8.198	9.030	12.421	-	12.421	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

A. Mission Description and Budget Item Justification
The FY 2022 funding request was reduced by $11.724 million to account for the availability of prior year execution balances.

This program element provides Aircraft Carriers and Amphibious Class ships Ship Self Defense System (SSDS) MK 2 Combat System upgrades and integrates new equipment and systems to pace the threat and capture advances in technology. Examples of captured advanced technologies are: advanced information assurance and cyber defense; Fire Control Loop Improvement Project (FCLIP); Identification Friend or Foe (IFF) Mode 5 to include Far-Term Interoperability Improvement Project (FTIIP); and other command and control systems, advanced sensors, and weapon integration, all of which require corresponding SSDS MK 2 changes. The program element also includes the SSDS integrated Combat System project for embedded shipboard training, Common Aviation Command and Control System Afloat (CAC2S Afloat) integration, Naval Strike Missile (NSM) integration for LPD class ships, and the Non-Lethal weapons project in support of anti- terrorism/force protection missions.

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. SSDS MK 2 integrates a diverse set of fire control loop sensors and weapons (SPY-6(V)2, SPY-6(V)3, SLQ-32(V)6 SEWIP, RAM Block 2A/2B, ESSM Block 2, CIWS) and C4I systems (CANES) for each ship class (CVN68/78, LHA6, LHD1, LPD17, and LSD 41/49). SSDS MK 2 provides combat direction, and joint interoperability via the Cooperative Engagement Capability (CEC) Increment 1 and 2 and Tactical Digital Information Link (TADIL)-J/Link 16. System design emphasizes commonality and a single source software library that are major mechanisms for cost control and avoidances. SSDS uses a physically distributed, open system architecture computer network consisting of common hardware such as the Common Processor System (CPS) and the Common Display System (CDS). SSDS MK 2 integrates new combat system war-fighting capabilities and improvements, as well as DoD and Navy-mandated enhanced cybersecurity capabilities via incremental capability packages and computing infrastructure (previously Technology Insertion (TI)) improvement deliveries. PU 2178 efforts are divided into two major functional areas: SSDS Product Development/Combat Systems Integration, and Test and Evaluation/Certification.

Joint Non-Lethal Weapons (PU 3172) - provides a long range laser warning and dazzle system, maritime vessel stopper (MVS) 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 nonlethal capability gaps.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy	Date: May 2021
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)*

Visual Augmentation Systems (VAS) supports research, development, and testing of material solutions for VAS capability gaps encountered during missions in combat zones. Expeditionary force 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

SSDS Training Improvement Program (PU 3358) - 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 MK 2 capability improvements, IFF Mode 5 (to include 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 scenarios 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 other combat systems, and/or integration of re-usable common components developed by the TSTC/BFTT Program and AEGIS Advanced Training Domain (ATD)/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 a Live, Virtual and Constructive (LVC) environment. Continued development is required to integrate new capabilities and interfaces to provide training for SSDS combat system capability upgrades, and to address the Fleet's 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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	179.725	157.490	164.991	-	164.991
Current President's Budget	170.474	153.532	149.433	-	149.433
Total Adjustments	-9.251	-3.958	-15.558	-	-15.558
• Congressional General Reductions	-	-0.707			
• Congressional Directed Reductions	-	-4.395			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-2.300	0.000			
• SBIR/STTR Transfer	-6.951	0.000			
• Program Adjustments	0.000	1.144	-12.891	-	-12.891
• Rate/Misc Adjustments	0.000	0.000	-2.667	-	-2.667

Change Summary Explanation

FUNDING CHANGES SINCE THE PREVIOUS PRESIDENT'S BUDGET AT THE OVERALL PE LEVEL:

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy	Date: May 2021
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)*

- FY 2020 net decrease of $-9.251 reflects program adjustments as follows: $-2.300 to Project 2178 for higher priority department requirements; $-6.951 for the Small Business Innovative Research (SBIR) transfer.
- FY 2021 net decrease of $-3.958M reflects program adjustments as follows: $-0.707 for the application of a fair-share Congressional undistributed reduction; $ +1.144M to Project 3172 for OCO request; $-4.395 Historical Underexecution.
- FY 2022 net decrease of $-15.558M reflects adjustments as follows: $-1.167M to Project 3172 reflects movement of VAS from 0604755N/3172 to 0604230N/3445; $-11.724M to account for the availability of prior year execution balances; $-0.750M for Navy Working Capital Fund (NWCF) and $-1.917M for miscellaneous rate adjustments.

The FY 2022 PU 3358 increase of $$3.391M provides for developing the capability that will provide SSDS ships the ability to train using Live-Virtual-Constructive (LVC). Specifically, developing requirements documentation and developing modifications to provide the necessary sensor improvements to support LVC training At-Sea. Additionally, developing an Integrated Strike Group CEC Training At-Sea capability in support of the Fleet Training Wholeness (FTW) through LVC.

PU 2178 Program Schedule R4 changes:
The Program Office over the last year has been refining Program efforts and timelines. The budget has been restructured to reflect this refinement effort to accurately describe/reflect the program efforts. This includes the R4 schedule to clearly reflect the program schedule. Starting in FY22, these refinements and schedule reporting have been implemented. The majority of the FY21 to FY22 changes are directly attributable to this refinement effort.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy									Date: May 2021			
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 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
2178: *QRCC*	1,490.117	159.181	143.354	133.917	-	133.917	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

A. Mission Description and Budget Item Justification
Project 2178 FY 2022 funding request was reduced by $10.387 million to account for the availability of prior year execution balances.

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. 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 MK 2 provides combat direction, and joint interoperability via the Cooperative Engagement Capability (CEC) and Tactical Digital Information Link (TADIL)-J/Link 16. System design emphasizes commonality and a single source software library that are major mechanisms for cost control and avoidances. SSDS uses a physically distributed, open system architecture computer network consisting of common hardware such as the CPS/CDS. SSDS MK 2 integrates new combat system war-fighting capabilities and improvements via incremental capability packages and computing infrastructure (previously Technology Insertion) improvement deliveries. PU 2178 efforts are divided into two major functional areas: SSDS Product Development/ Combat Systems Integration, and Test and Evaluation/Certification.

SSDS Product Development encompasses systems engineering efforts, technology and capability insertion/integration, and cyber-security, including the development and integration of SSDS Build 10 with the required Technology Insertion TI12/12H computing and display configuration and the development and integration of SSDS Build 12 with the required TI16 computing and display configuration. SSDS Product Development will provide warfighter upgrades including implementation of common software components for System Track Management; integration of CPS and CDS; expansion of SSDS MK 2 Local Area Network (LAN) to a Combat System LAN; integration of new Combat System/C4I elements (SPY-6(V)2, SPY-6(V)3, SLQ-32(V)6 SEWIP, RAM Block 2A/2B, ESSM Block 2, CIWS, and CANES); implementation of shared, inheritable CS-level cybersecurity capabilities and Total Ship Training Capability.

SSDS Build 10 is fielded on CVN 78, CVN 72, LHD 2, LSD 46 and LHD 6. CVN 72 and LHD 2 have completed ship deployments; CVN 78 is currently undergoing ship operational testing and certification. LSD 46 and CVN 70 completed the first installation of the TI-12H hardware configuration and are undergoing system initialization, testing and certification. To improve efficiency and reduce SW build proliferation, the SSDS design is migrating an initial release of Build 12 with Advanced Training Domain capability to the TI-16 hardware configuration for initial installation on the CVN 73. SSDS Build 12 development will continue with additional releases to implement SSDS improvements to integrate the SPY-6 variants, ESSM Block 2, SEWIP Softkill Coordination Subsystem (SKCS) and Global Positioning System (GPS) based Positioning, Navigation, and Timing Service (GPNTS) and includes system engineering, critical experiments, software 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, logistics products and ashore training course development. FY 2022 includes completing the hardware prototyping and transition to production for the next SSDS hardware configuration, establishing a Common Computing Infrastructure allowing for targeted obsolesce and computing scaling upgrades vice wholesale modernization for ships so equipped.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

For Cybersecurity, initiatives under PU 2178 will provide the SSDS MK 2 Combat System (CS) layered protect and detect functionality and will introduce critical response functionality to respond to and recover from cyber-attacks. SSDS Cybersecurity is a phased multi-year effort to define, develop, and integrate DoD and Navy mandated enterprise Combat System cybersecurity solutions. These solutions enhance the cybersecurity framework pillars of Identify, Protect, React, and Restore and expand force level cyber defense capabilities for the Carrier and Amphibious Fleet against actions by sophisticated adversaries.

System engineering efforts for Joint Strike Fighter (JSF) F35B&C integration onboard LHA, LHD and CVN Class ships will provide improved F35 interoperability via Link 16 and
improved land domain command and control for the Amphibious Readiness Group/Marine Air Ground Task Force (ARG/MAGTF) commanders and staffs through integration of USMC Common Aviation Command and Control System (CAC2S) program of record with LHA/LHD SSDS combat system. CAC2S Afloat also provides access to Variable Message Format (VMF) communications network and provides both Maritime and Land Situational Awareness for the ARG/MAGTF commanders and Ship Self Defense System operators.

Combat System Integration under PU 2178 encompasses Combat System (CS) System-of-Systems modeling and simulation, system analysis/engineering (including Model-Based System Engineering), and system/software development for integration of sensors, weapons and C4I systems with SSDS MK 2 in Aircraft Carrier and Amphibious Class Ships. It also provides the system of systems engineering and development/integration of continued 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 Coordination Subsystem (SKCS), SEWIP Block 3 Electronic Attack along with additional capability integration for GPNTS, and RAM Block 2B.

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 (TADIL) 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.

CAC2S Afloat-SSDS provides capability to directly network with F-35, F/A-18 E/F, E/A-18G (and other joint tactical aircraft) and to downlink aircraft track and target data for enhanced command and control and force mission execution. Also provides a means to provide realtime aircraft mission status (weapons deployment, battle damage assessment, mission status, flight data and activity, communication channels, fuel state, time on station) and execution information at multiple locations onboard all networked ships and shore sites for force coordination of mission activity and coordination of remote fires for over the horizon (OTH) weapons. CAC2S-SSDS-NSM integration adds Naval Strike Missile (NSM) integration providing the ability to track OTH surface targets with F-35 (or other means) and deploy OTH NSM weapons against surface threat at long-range, providing a counter strike capability for LPD class ships. Ultimately this integration effort will enable the ARG/MAGTF the ability to properly execute expeditionary advanced base operation and operate in a contested littoral environment.

CAC2S Afloat integration encompasses system analysis/engineering, and system/software development for integration of multiple shipboard C5I system interfaces to include interfaces to GCCS-M, DCGS-N, JADOCS, TBMCS, SSDS, and the OTH Missile Launching System (OTH MLS).

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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/Certification under PU 2178 encompasses SSDS MK 2 Developmental Test and Evaluation (DT&E) providing for comprehensive testing and certification 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 Self-Defense Test Ship (SDTS) and land-based and shipboard cyber testing. 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 Combat System certification, the SSDS Test and Evaluation Master Plan (TEMP) execution and the Air Warfare Ship Self Defense CAPSTONE Enterprise TEMP execution which includes continuation of DT and FOT&E events for the 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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: SSDS MK2 Product Development/Combat Systems Integration	135.392	116.193	110.838	0.000	110.838
Articles:	-	-	-	-	-
FY 2021 Plans: For Build 12 -Conduct Build 12 Release 3 software design and development efforts with CSEA -Commence Build 12 Release 4 software design and development efforts with CSEA. -Conduct government Build 12 follow on Integrated Combat System integration engineering activities. -Provide required Build 12 Release 1 TAAF to support CVN 73 ship installation, test and certification events. -Continue designing, developing and implementing Cybersecurity capability improvements to secure the combat system enclave. -Complete the initial SSDS Build 12 cybersecurity phasing, implementation, development, and integration efforts with CSEA. For Computing and Display Infrastructure Hardware (Previously TI-22) -Complete hardware prototype design activities. -Commence hardware prototype transition to production activities. For Joint Strike Fighter F35B&C, F/A-18 E/F, E/A018G, and other Joint Tactical Aircraft -Completed CAC2S Afloat test and certification efforts for Close Air Support and Assault Support, Tactical Data (Link 16 MIDS JTRS 5 Variant) and Maritime Common Tactical Picture integration. -Continue systems and software test and certification efforts for improved integration of CAC2S with one way interface with SSDS					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
-Initiated and completed systems and software test and certification efforts for improved integration of CAC2S with introduction of the MIDS CMN-4 Link 16 terminal and GCCS-M interface -Initiate CAC2S Afloat design, development, integration, test and certification for the Shipboard C5I interfaces including SSDS, Naval Strike Missile [NSM], Ground Based Anti-Ship Missile [GBASM - USMC Variant], AFATDS, Link 16 [MIDS JTRS 5 variant], TBMCS, DCGS-N, and JADOCS). -Initiated/Completed Topside engineering studies for placement of Link 16 antenna onboard LHA, LHD, and LPD class ships. -Initiate development of CAC2S Afloat manpower analysis, integrated logistics and training products. -Initiate Flight 1 development (initial increment) for increased shipboard situational awareness and increased effectiveness for the ARG/MAGTF.					
FY 2022 Base Plans: For Build 12 -Continue/start Systems Engineering efforts for the following capability insertions, to include requirements development/updates, use cases, trade studies, and conduct SETR events as required: + AN/SPY-6(V)2/3 integration, including CVN 74 + RAM Block 2B + GPNTS/GEDMS + CAC2S-SSDS-NSM -Continue/start integration/lifecycle engineering efforts in support of the following capability insertions: + AN/SPY-6(V)2/3 integration, including CVN 74 + AN/SLQ-32(V)7 (Electronic Warfare Improvement) + ESSM Block 2 + RAM Block 2B + GPNTS/GEDMS + CAC2S-SSDS-NSM + CEC Underway Training/Live Virtual Construct					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
-Complete systems and software test and certification efforts for improved integration of CAC2S with one way interface with SSDS -Continue CAC2S Afloat design, development, integration, and test efforts for the Shipboard C5I interfaces (two way interface) including SSDS, Naval Strike Missile [NSM], Ground Based Anti-Ship Missile [GBASM - USMC Variant], AFATDS, TBMCS, DCGS-N, and JADOCS). -Complete CAC2S Afloat Flight 0+, initiate Flight 1 development and deployment bringing Naval Digital Aircraft Control capability for deployment and increased lethality of the JSF and embarked MEU. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The FY2022 funding request was reduced to account for the availability of prior year execution balances.					
Title: SSDS MK2 Development Test & Evaluation	23.789	27.161	23.079	0.000	23.079
Articles:	-	-	-	-	-
FY 2021 Plans: For SSDS Build 10 -Conduct Combat System Integration Test (CSIT) at SCSC for Objective Quality Evidence for CS software package for LHD4 For SSDS MK 2 Build 12 -Conduct Build 12 Capability Package 2 land-based testing. -Completed Build 12 Capability Package 1 FSIT and FQT. -Commence Build 12 Capability Package 2 FSIT and FQT. -Commence Build 12 Capability Package 3 FSIT. -Conduct CSIT at SCSC for Objective Quality Evidence for ICS software package for CVN 73 certification -Conduct Delta Cybersecurity Table Top (CTT) for Capability Packages 2/3 For SSDS Build 9 -Conduct USS Secure Cybersecurity Testing Functional Assessment of Cyber Backfit Solution (V)1					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
-Completed Combat System Integration Test (CSIT) at SCSC for Objective Quality Evidence for 9.08.06 CS ***FY 2022 Base Plans:*** FY 2022 Base Plans: For SSDS MK 2 Build 12 -Conduct USS Secure Testing: Vulnerability Regression Test 1 -Continue Baseline 12 Cyber Table Top (CTT) for Capability Packages 2/3 -Complete Build 12 Capability Package 2 FSIT and FQT. -Complete Build 12 Capability Package 3 FSIT and conduct Capability Package 3 FQT -Continue Combat System Integration Test (CSIT) at SCSC for Objective Quality Evidence for ICS software package for CVN 73 certification -Conduct Combat System Integration Test (CSIT) at SCSC for Objective Quality Evidence for ICS software package for 12.13.03 software CVN 71/72 certification -Conduct delta Combat System Integration Test (CSIT) at SCSC for Objective Quality Evidence for ICS software package for 12.13.03 LHD 7 & LPD 17/23/28 certification For SSDS Build 10 -Conduct Combat System Integration Test (CSIT) at SCSC for Objective Quality Evidence for CS software package for LHD2 For SSDS Build 9 -Conduct Combat System Integration Test (CSIT) at SCSC for Objective Quality Evidence for 9.08.06 CS For SSDS Build 6 -Completed Combat System Integration Test (CSIT) at SCSC for Objective Quality Evidence for 6.06.04 CS ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY2021 to FY2022 decrease of $4.082M from $27,161M to $23.079M is due the completion of a SW baseline testing and a decrease in the number of CSITs events that will be conducted in FY22					
Accomplishments/Planned Programs Subtotals	159.181	143.354	133.917	0.000	133.917

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• OPN/ BLI 5231 (SSDS): *SSDS*	83.933	94.534	100.282	-	100.282	-	-	-	-	-	-
• RDTEN/0607658N: *Cooperative Engagement Capability*	122.817	133.962	176.486	-	176.486	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

D. Acquisition Strategy

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 June 2020 and an additional extension to Q2 FY21 is planned to provide continued support of the SSDS MK 2 to complete the contract scope requirements for CVN and Amphibious ship Modernization ACB 12 on TI-12 and TI-12H (SSDS Software Build 10).

A new competitive contract for a SSDS Combat System Engineering Agent (CSEA)/Software Design Agent (SDA) was awarded in FY 2019 with a ten (10)-year PoP from FY19-FY29. This contract provides support for the Aircraft Carrier and Amphibious Ship Class SSDS Combat System (CS) element development of ACB 20 (SSDS Software Build 12) and follow-on technology upgrades based on the evolution of the SSDS MK 2 Combat Systems Build 10 (ACB 12/TI-12/TI-12H). The current requirements 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.

For SSDS MK2 TI-12H/TI-16 hardware, the SSDS program uses competitive build to specification production contracts, and leverages common enterprise COTS products for computing, storage, display, network, conversion, and cyber security.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy		Date: May 2021
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 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PD - Build 12//TI-16 - SW Dev CSEA	C/CPIF	CSEA Contract : Moorestown, NJ	0.000	3.543	Dec 2019	29.255	Dec 2020	32.676	Dec 2021	-		32.676	-	-	-
PD - Build 12/TI-16 - SE Spt	C/CPFF	JHU/APL : Laurel, MD	0.000	0.632	Dec 2019	3.250	Dec 2020	3.250	Dec 2021	-		3.250	-	-	-
PD - Build 12//TI-16/Trng Course/Dev	WR	NSWC PHD : Pt Hueneme, CA	0.000	1.082	Nov 2019	0.950	Nov 2020	0.450	Nov 2021	-		0.450	-	-	-
PD - Build 12//TI-16/ Metrics/On Site spt	WR	NSWC Corona : Corona, CA	0.000	0.000		0.589	Nov 2020	0.500	Nov 2021	-		0.500	-	-	-
PD - Build 12//TI-16 - SE spt	WR	NSWC DD : Dahlgren, VA	0.000	0.457	Nov 2019	4.175	Nov 2020	4.000	Nov 2021	-		4.000	-	-	-
PD - Build 12//TI-16-SE spt	C/CPFF	Gryphon : Washington, DC	0.000	0.000		1.450	Dec 2020	1.250	Dec 2021	-		1.250	-	-	-
PD - Cyber Resiliency / BDC REQT & ENG	SS/CPFF	JHU/APL : Laurel, MD	4.500	3.257	Dec 2019	4.400	Nov 2020	3.500	Nov 2021	-		3.500	-	-	-
PD - Cyber Resiliency / BDC HW EDM	WR	CDSA DN : Dam Neck, VA	0.864	0.000		0.568	Oct 2020	0.750	Oct 2021	-		0.750	-	-	-
PD - Cyber Resiliency / BDC ILS	WR	NSWC PHD : Port Hueneme, CA	1.107	0.000		0.513	Oct 2020	0.225	Oct 2021	-		0.225	-	-	-
PD - Cyber Resiliency / BDC SEIT	C/CPIF	Gryphon/DELTA : Washington DC	1.100	0.632	Dec 2019	0.900	Nov 2020	1.000	Nov 2021	-		1.000	-	-	-
PD - Cyber Resiliency / BDC CSEA	C/CPIF	CSEA Contract : Moorestown NJ	4.000	17.932	Oct 2019	21.218	Oct 2020	8.552	Dec 2021	-		8.552	-	-	-
PD - Cyber Resiliency / BDC CSTK DEV'T	C/CPIF	Progeny Systems Corp : Manassas, VA	4.393	3.932	Jan 2020	1.000	Oct 2020	1.100	Oct 2021	-		1.100	-	-	-
PD-Cyber Resiliency / BDC SE	WR	NSWC - DD : Dahlgren, VA	4.146	0.932	Oct 2019	1.371	Oct 2020	1.439	Oct 2021	-		1.439	-	-	-
PD - TI-16TR/TI22 - HW Engineering	C/CPFF	Gryphon : Washington DC	0.000	0.682	Dec 2019	1.525	Nov 2020	1.575	Nov 2021	-		1.575	-	-	-
PD - TI-16TR/TI22 -HW Engineering	WR	NSWC-DD : Dalhgren, VA	6.403	9.286	Nov 2019	7.189	Oct 2020	7.250	Oct 2021	-		7.250	-	-	-
PD - HQ Travel	Various	PEO IWS : Washington DC	0.670	0.175	Oct 2019	0.178	Dec 2020	0.200	Dec 2021	-		0.200	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PD - F35B Integration / LHA / LHD	C/CPFF	JHU/APL : Laurel, MD	6.983	0.932	Dec 2019	1.952	Nov 2020	1.906	Nov 2021	-		1.906	-	-	-
PD - F35B Integration / LHA / LHD	WR	NSWC DD : Dalhgren, VA	6.711	3.932	Nov 2019	1.559	Oct 2020	2.000	Oct 2021	-		2.000	-	-	-
PD - F35B Integration / LHA / LHD	C/CPIF	SEI&T : Washington DC	3.846	0.000		0.350	Dec 2020	0.400	Dec 2021	-		0.400	-	-	-
PD - F35B/C - ICS Link 16 Integration	C/CPFF	JHU/APL : Laurel, MD	1.100	1.182	Dec 2019	1.952	Nov 2020	0.000		-		0.000	-	-	-
PD - F35B Integration / LHA / LHD	TBD	PEO LS : Quantico, VA	0.000	8.432	Dec 2019	3.100	Dec 2020	2.100	Dec 2021	-		2.100	-	-	-
PD - F35B/C - ICS Link 16 Integration	WR	NSWC DD : Dalhgren, VA	1.000	1.931	Nov 2019	1.191	Oct 2020	1.250	Oct 2021	-		1.250	-	-	-
PD - F35B Integration / LHA / LHD	C/CPIF	CSEA : Moorestown NJ	0.000	6.002	Oct 2019	3.127	Oct 2020	2.888	Oct 2021	-		2.888	-	-	-
PD - F35B/C - ICS Link 16 Integration	C/CPIF	SEI&T : Washington DC	0.500	0.682	Dec 2019	0.685	Dec 2020	0.000		-		0.000	-	-	-
PD - F35B Integration / LHA / LHD	TBD	PEO C4I : San Diego, CA	0.000	1.435	Dec 2019	2.000	Dec 2020	1.250	Dec 2021	-		1.250	-	-	-
PD - PM Prod Development	C/CPIF	various : various	39.529	2.994	Dec 2019	3.100	Dec 2020	3.300	Dec 2021	-		3.300	-	-	-
CSI - Build 12 (Less SPY-6 Var) - SE	WR	NSWC DD : Dalhgren, VA	11.919	3.750	Nov 2019	2.226	Oct 2020	3.000	Oct 2021	-		3.000	-	-	-
CSI - Build 12 (Less EASR) - SEI&T	C/CPFF	Gryphon : Washington DC	5.295	1.956	Dec 2019	0.452	Dec 2020	0.500	Dec 2021	-		0.500	-	-	-
CSI - Build 12 (Less SPY-6 Var) - SE	SS/CPFF	JHU/APL : Laurel, MD	11.364	3.082	Dec 2019	1.050	Nov 2020	3.250	Nov 2021	-		3.250	-	-	-
CSI - Build 12 (Less SPY-6 Var) - SE	C/CPIF	CSEA Contract : Moorestown NJ	11.935	5.395	Oct 2019	2.357	Oct 2020	4.358	Dec 2021	-		4.358	-	-	-
CSI - FTIIP - SE	WR	NSWC-DD : Dahlgren, VA	6.168	1.156	Nov 2019	2.750	Oct 2020	1.500	Oct 2021	-		1.500	-	-	-
CSI - FTIIP - SE	WR	CDSA DN : Dam Neck, VA	0.616	0.000		0.613	Oct 2020	0.500	Oct 2021	-		0.500	-	-	-

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CSI - FTIIP - SE	WR	NSWC PHD : Port Hueneme, CA	0.215	0.456	Nov 2019	1.025	Oct 2020	1.000	Oct 2021	-		1.000	-	-	-
CSI - FTIIP - SEI&T	C/CPFF	Gryphon : Washington DC	3.565	1.447	Dec 2019	1.150	Dec 2020	1.150	Dec 2021	-		1.150	-	-	-
CSI - ICS SE - SEI&T	C/CPFF	Gryphon : Washington DC	5.466	2.282	Dec 2019	1.750	Dec 2020	1.250	Dec 2021	-		1.250	-	-	-
CSI - ICS SE	SS/CPFF	JHU/APL : Laurel, MD	7.172	1.581	Dec 2019	1.250	Nov 2020	1.500	Nov 2021	-		1.500	-	-	-
CSI - SPY-6 Var / ERS SE	C/CPIF	CSEA Contract : Moorestown NJ	9.100	2.133	Oct 2019	4.023	Oct 2020	5.295	Oct 2021	-		5.295	-	-	-
CSI - SPY-6 Var / ERS SE	WR	NSWC PHD : Port Huneme, CA	1.008	0.277	Nov 2019	0.000		0.339	Nov 2021	-		0.339	-	-	-
CSI - SPY-6 Var / ESS SE	SS/CPFF	JHU/APL : Laurel, MD	7.040	0.882	Dec 2019	0.000		0.568	Dec 2021	-		0.568	-	-	-
CSI - SPY-6 Var / ESS SE	WR	NSWC DD : Dalhgren, VA	9.059	1.766	Nov 2019	0.000		1.832	Nov 2021	-		1.832	-	-	-
CSI - SPY-6 Var / ESS / SEI&T	C/CPFF	Gryphon : Washington DC	7.536	1.538	Dec 2019	0.000		1.600	Dec 2021	-		1.600	-	-	-
PD - ACB12/TI12 / LSD - SE / ILS	WR	CDSA DN : Dam Neck, VA	22.927	0.000		0.000		0.000		-		0.000	-	-	-
PD - ACB12/TI12 / LSD - SE&I/Force Pt	C/CPIF	RSC (IIS) : Suffolk, VA	0.976	0.000		0.000		0.000		-		0.000	-	-	-
PD - ACB12/TI12 / LSD - LBET/Training I	WR	NSWC PHD : Pt Hueneme, CA	34.541	3.453	Nov 2019	0.000		0.000		-		0.000	-	-	-
PD - ACB12/TI12 / LSD - CVN78 LBET/Metrics/On-site Support	WR	NSWC Corona : Corona, CA	1.473	0.432	Nov 2019	0.000		0.000		-		0.000	-	-	-
PD - ACB12/TI12 / LSD -Navy Link Cert/Cross-Domain Spt	WR	SPAWAR : San Diego, CA	0.435	0.000		0.000		0.000		-		0.000	-	-	-
PD - ACB12/TI12 / LSD - Moriah Integration	WR	NAVAIR : Lakehurst, NJ	0.309	0.000		0.000		0.000		-		0.000	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy		Date: May 2021
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PD - ACB12/TI-16/TI12H - Navy Link Cert/Cross-Domain Sprt	WR	SPAWAR : San Diego, CA	0.326	0.000		0.000		0.385	Oct 2021	-		0.385	-	-	-
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	-	-	-
PD - ACB12/TI12 / LSD - PSEA / SW Dev	SS/CPIF	RSC IDS (5128) : San Diego, CA	148.247	17.198	Jan 2020	0.000		0.000		-		0.000	-	-	-
PD - ACB12/ CVN78 LBET w/DBR/RES	SS/CPIF	RSC IDS : Sudbury, MA	5.080	0.000		0.000		0.000		-		0.000	-	-	-
PD - ACB12/TI12 / LSD / AMIIP - PSEA / SW Dev	SS/CPAF	RSC IDS (5122) : San Diego, CA	38.416	0.000		0.000		0.000		-		0.000	-	-	-
PD - ACB12/ CVN78 LBET w/CEC	SS/CPIF	RSC IDS : St. Petersburg, FL	1.275	0.000		0.000		0.000		-		0.000	-	-	-
PD - ACB12/TI12 / LSD - SE	SS/CPFF	JHU/APL : Laurel, MD	74.394	0.000		0.000		0.000		-		0.000	-	-	-
PD - ACB12/ CVN78 LBET w/TPX-42	WR	NAVAIR : St. Indigoes, MD	0.111	0.000		0.000		0.000		-		0.000	-	-	-
PD - ACB12/TI12 / LSD - SE	WR	NSWC DD : Dalhgren, VA	85.062	4.584	Nov 2019	0.000		0.000		-		0.000	-	-	-
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	-	-	-
PD - ACB12/TI-16/TI12H - HW Eng	WR	NSWC DD : Dalhgren, VA	12.663	0.834	Nov 2019	0.000		0.000		-		0.000	-	-	-
PD - ACB12/TI-16/TI12H - SW Migration PSEA	SS/CPIF	RSC IDS (5128) : San Diego, CA	49.603	0.000		0.000		0.000		-		0.000	-	-	-
PD - ACB12/TI-16/TI12H - SE	SS/CPFF	JHU/APL : Laurel, MD	3.486	0.000		0.000		0.000		-		0.000	-	-	-
PD - ACB12/TI-16/TI12H - LBET/Training Course Development	WR	NSWC-PHD : Pt Hueneme, CA	2.575	0.000		0.000		0.000		-		0.000	-	-	-
PD - ACB12/TI-16/TI12H - Metrics/On-Site Sprt	WR	NSWC Corona : Corona, CA	1.087	0.000		0.000		0.000		-		0.000	-	-	-

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PD - ACB12/TI-16/TI12H - CPS Engnr	C/IDIQ	GTS : Virginia Beach, VA	0.042	0.000		0.000		0.000		-		0.000	-	-	-
PD - SE/Dev/Integrate	SS/CPAF	Rayth(5412) (RIDS) : Portsmouth, RI	83.451	0.000		0.000		0.000		-		0.000	-	-	-
PD - Misc - Prior Year Cum Cost	C/BA	Misc : Washington DC	278.994	0.000		0.000		0.000		-		0.000	-	-	-
CSI - Build 12 (Less SPY-6 Var) - SE	WR	NSWC COR : Corona, CA	0.450	0.557	Nov 2019	0.000		0.000		-		0.000	-	-	-
CSI - Build 12 (Less SPY-6 Var) - SE	WR	NSWC PHD : Port Huneme, CA	1.573	1.432	Nov 2019	0.000		0.000		-		0.000	-	-	-
CSI - Build 12 (Less SPY-6 Var) - SE	WR	NUWC KP : Keyport, WA	0.336	0.200	Nov 2019	0.000		0.000		-		0.000	-	-	-
CSI - Build 12 (Less SPY-6 Var) - SE	SS/CPAF	Rayth (RIDS) : Portsmouth, RI	1.075	0.000		0.000		0.000		-		0.000	-	-	-
CSI - FCLIP Phase 2 - PSEA	SS/CPIF	RSC IDS (5128) : San Diego, CA	25.094	0.000		0.000		0.000		-		0.000	-	-	-
CSI - FCLIP Phase 2 - SE	SS/CPFF	JHU/APL : Laurel, MD	13.316	0.606	Dec 2019	0.000		0.000		-		0.000	-	-	-
CSI - FCLIP Phase 2 - SE	WR	NSWC-DD : Dahlgren, VA	3.437	0.245	Nov 2019	0.000		0.000		-		0.000	-	-	-
CSI - FCLIP Phase 2 - SE	WR	CDSA DN : Dam Neck, VA	0.125	0.000		0.000		0.000		-		0.000	-	-	-
CSI - FCLIP Phase 2 - SE	WR	NSWC PHD : Pt Hueneme, CA	2.166	1.052	Nov 2019	0.000		0.000		-		0.000	-	-	-
CSI - FCLIP Phase 2 - SE / Planning	C/CPIF	Delta Resources : Alexandria, VA	0.339	0.000		0.000		0.000		-		0.000	-	-	-
CSI - FCLIP Phase 2 - SE & I	C/CPIF	RSC IIS (4112) : Suffolk, VA	2.136	0.000		0.000		0.000		-		0.000	-	-	-
CSI - FCLIP Phase 2 - SEI&T	C/CPFF	Gryphon/Delta : Washington DC	3.497	0.000		0.000		0.000		-		0.000	-	-	-
CSI - FCLIP Phase 2 - SE Multi-Link Antenna	TBD	IWS 5 : TBD	0.250	0.000		0.000		0.000		-		0.000	-	-	-

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CSI - FCLIP Phase 2 - SE RAM/ESSM	WR	NAWC : China Lake	2.488	0.000		0.000		0.000		-		0.000	-	-	-
CSI - FCLIP Phase 2 - SE RAM/CIWS	SS/CPFF	RSC(5432/5410) : Tucson, AZ	2.962	0.000		0.000		0.000		-		0.000	-	-	-
CSI - FCLIP Phase 2 - SE	WR	NSWC : Crane, IN	0.250	0.000		0.000		0.000		-		0.000	-	-	-
CSI - FCLIP Phase 2 - SE	WR	NSWC COR : Corona, CA	0.252	0.244	Nov 2019	0.000		0.000		-		0.000	-	-	-
CSI - FCLIP Phase 2 - SE / SW Dev	SS/CPAF	Rayth (RIDS) : Portsmouth, RI	10.455	0.000		0.000		0.000		-		0.000	-	-	-
CSI - FCLIP Phase 2 - SE	WR	NUWC KP : Keyport, WA	0.469	0.000		0.000		0.000		-		0.000	-	-	-
CSI - FTIIP - PSEA - SW Dev	SS/CPIF	RSC IDS (5128) : San Diego, CA	16.934	2.241	Dec 2019	0.000		0.000		-		0.000	-	-	-
CSI - FTIIP - SE	C/BA	JHU/APL : Laurel, MD	1.031	0.431	Dec 2019	0.000		0.000		-		0.000	-	-	-
CSI - FTIIP - SE&I	C/CPIF	RSC IIS (4112) : Suffolk, VA	0.495	0.000		0.000		0.000		-		0.000	-	-	-
CSI - FTIIP - SE	WR	NUWC KP : Keyport, WA	0.386	0.225	Nov 2019	0.000		0.000		-		0.000	-	-	-
CSI - ICS SE - PSEA SE	SS/CPIF	RSC IDS (5128) : San Diego, CA	1.354	0.000		0.000		0.000		-		0.000	-	-	-
CSI - ICS SE - SE&I	C/CPIF	RSC (IIS) : Suffolk, VA	2.404	0.000		0.000		0.000		-		0.000	-	-	-
CSI - ICS SE - SEA 05C	C/BA	SEA 05C : Washington DC	0.617	0.000		0.000		0.000		-		0.000	-	-	-
CSI - ICS SE	WR	NSWC DD : Dalhgren, VA	7.211	1.677	Nov 2019	0.000		0.000		-		0.000	-	-	-
CSI - ICS SE	WR	CDSA DN : Dam Neck, VA	0.515	0.000		0.000		0.000		-		0.000	-	-	-
CSI - ICS SE	WR	NUWC KP : Keyport, WA	0.897	0.186	Nov 2019	0.000		0.000		-		0.000	-	-	-

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CSI - ICS SE	C/CPIF	Delta Resources : Virginia Beach, VA	0.205	0.000		0.000		0.000		-		0.000	-	-	-
CSI - ICS SE	FFRDC	MITRE : McLean, VA	0.300	0.000		0.000		0.000		-		0.000	-	-	-
CSI - ICS SE	C/CPIF	CSEA Contract : Moorestown NJ	0.500	0.431	Oct 2019	0.000		0.000		-		0.000	-	-	-
CSI - SPY-6 Var / ESS SE	WR	CDSA DN : Dam Neck, VA	0.273	0.000		0.000		0.000		-		0.000	-	-	-
CSI - SPY-6 Var / ESS SE	C/CPAF	RSC (5202) : St. Pete, FL	1.034	0.000		0.000		0.000		-		0.000	-	-	-
PD-Cyber Resiliency/BDC PSEA SW Devt	SS/CPIF	RSC IDS (5128) : San Diego, CA	10.552	0.932	Dec 2019	0.000		0.000		-		0.000	-	-	-
PD-Cyber Resiliency/BDC NETWORK TOPOLOGY	WR	G2OPS : Washington, DC	0.874	0.542	Dec 2019	0.000		0.000		-		0.000	-	-	-
PD-Cyber Resiliency/BDC modeling	WR	NSWC PD : Philadelphia, PA	0.250	0.125	Nov 2019	0.000		0.000		-		0.000	-	-	-
		Subtotal	1,161.364	135.392		116.193		110.838		-		110.838	-	-	N/A

Remarks

FY 2019-FY 2021 includes collaborative SSDS and ICS maturation efforts through the test, analyze and fix process 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 FY 2019, a new contract was awarded on a competitive basis for a Combat System Engineering Agent/Software Design Agent (CSEA/SDA) for development of SSDS ACB20 and follow baselines.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DT&E (PHD)	WR	NSWC PHD : Port Hueneme, CA	116.315	5.816	Nov 2019	5.915	Oct 2020	4.025	Oct 2021	-		4.025	-	-	-
DT&E (SCSC-WI)	WR	SCSC-WI : Wallops Is, VA	86.424	5.026	Nov 2019	7.625	Nov 2020	7.750	Nov 2021	-		7.750	-	-	-
DT&E (JHU/APL)	SS/CPFF	JHU/APL : Laurel, MD	31.572	2.517	Dec 2019	2.550	Nov 2020	1.550	Nov 2021	-		1.550	-	-	-

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Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DT&E (Corona)	WR	NSWC Corona : Corona, CA	18.941	2.450	Nov 2019	2.500	Oct 2020	1.500	Oct 2021	-		1.500	-	-	-
DT&E/CST (DD - CST)	WR	NSWC DD : Dahlgren, VA	38.071	5.240	Nov 2019	4.871	Oct 2020	4.504	Oct 2021	-		4.504	-	-	-
DT&E (COTF)	WR	OPTEVFOR : Norfolk, VA	7.366	1.172	Nov 2019	1.250	Oct 2020	0.750	Oct 2021	-		0.750	-	-	-
DT&E (engility)	C/CPIF	Engility : Virginia Beach, VA	5.921	1.318	Dec 2019	0.000		0.000		-		0.000	-	-	-
DT&E (SAIC)	C/CPIF	SAIC : Reston, VA	0.000	0.000	Dec 2019	1.450	Nov 2020	1.500	Nov 2021	-		1.500	-	-	-
DT&E (CSEA) LM	C/CPFF	CSEA : Moorestown, NJ	0.000	0.000		0.000		1.500	Dec 2021	-		1.500	-	-	-
DT&E Raytheon - PSEA	SS/CPIF	RSC (5128) : San Diego, CA	0.182	0.000		1.000	Dec 2020	0.000		-		0.000	-	-	-
DT&E (RAM/CIWS// ESSM) (RSC)	SS/CPFF	RSC(5432/5410) : Tucson, AZ	4.928	0.250	Dec 2019	0.000		0.000		-		0.000	-	-	-
DT&E (CDSA-DN)	WR	CDSA DN : Dam Neck, VA	4.656	0.000		0.000		0.000		-		0.000	-	-	-
DT&E (SPAWAR-SD)	WR	SPAWAR : San Diego, CA	5.780	0.000		0.000		0.000		-		0.000	-	-	-
DT&E (Raytheon - St. Pete)	SS/CPAF	RSC (5202) : St. Pete, FL	4.708	0.000		0.000		0.000		-		0.000	-	-	-
DT&E (RAM/ESSM) (China Lake)	WR	NAWC : China Lake, CA	1.150	0.000		0.000		0.000		-		0.000	-	-	-
DT&E (Raytheon - SE&I)	C/CPIF	Rayth - IIS : Suffolk, Va.	0.571	0.000		0.000		0.000		-		0.000	-	-	-
DT&E (GD/AIS - IWS 1.0)	SS/CPAF	GD/AIS : Fairfax Va.	0.266	0.000		0.000		0.000		-		0.000	-	-	-
DT&E (Raytheon - RIDS)	SS/CPAF	RSC (5412) : Portsmouth, RI	1.902	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	328.753	23.789		27.161		23.079		-		23.079	-	-	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604755N / *Ship Self Def (Detect & Cntrl)*	Project (Number/Name) 2178 / *QRCC*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,490.117	159.181		143.354		133.917		-		133.917	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

Ship Self Defense System Schedule

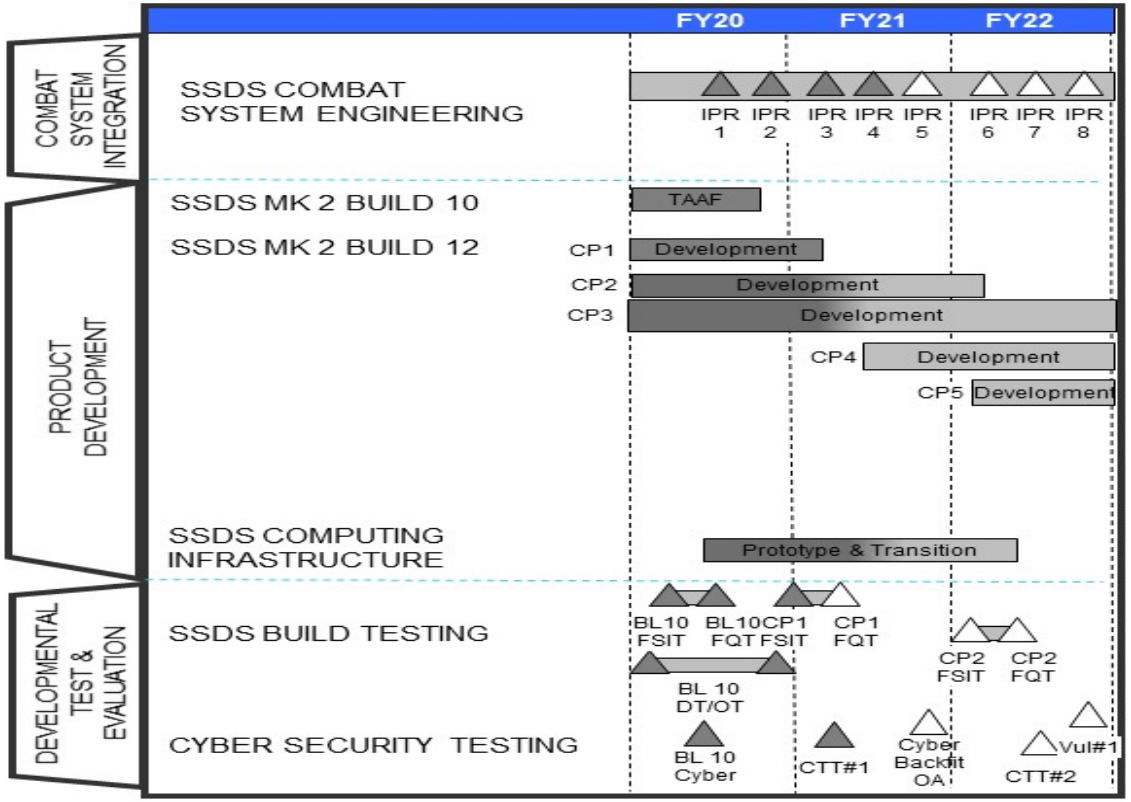

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntr l)*	**Project (Number/Name)** 2178 / *QRCC*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2178				
SSDS MK 2 - IPR 1	3	2020	3	2020
SSDS MK 2- IPR 2	4	2020	4	2020
SSDS MK 2 BUILD 10 - TAAF	2	2020	4	2020
SSDS MK 2 BUILD 12 - CP 1	1	2020	1	2021
SSDS MK 2 BUILD 12 - CP 2	1	2020	4	2022
SSDS MK 2 BUILD 12 - CP 3	1	2020	2	2022
SSDS COMPUTING INFRASTRUCTURE - PRODUCT DEVELOPMENT	3	2020	3	2022
SSDS MK 2 BUILD TEST - BL10 FSIT	2	2020	2	2020
SSDS MK 2 BUILD TEST - BL10 FQT	3	2020	3	2020
SSDS MK 2 BUILD TEST - BL10 DT/OT	1	2020	4	2020
CYBER SECURITY TESTING - BL10 CYBER	3	2020	3	2020
SSDS MK 2 - IPR 3	1	2021	1	2021
SSDS MK 2 - IPR 4	3	2021	3	2021
SSDS MK 2 - IPR 5	4	2021	4	2021
SSDS MK 2 BUILD 12 - CP 4	4	2021	4	2022
SSDS MK 2 BUILD TEST - CP1 FSIT	1	2021	1	2021
SSDS MK 2 BUILD TEST - CP1 FQT	2	2021	2	2021
CYBER SECURITY TESTING - CTT # 1	2	2021	2	2021
CYBER SECURITY TESTING CYBER BACKFIT OA	4	2021	4	2021
SSDS MK 2 - IPR 6	1	2022	1	2022
SSDS MK 2 - IPR 7	3	2022	3	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
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 - IPR 8	4	2022	4	2022
SSDS MK 2 BUILD 12 - CP 5	2	2022	4	2022
SSDS MK 2 BUILD TEST - CP 2 FSIT	1	2022	1	2022
SSDS MK 2 BUILD TEST - CP 2 FQT	2	2022	2	2022
CYBER SECURITY TESTING - CTT # 2	3	2022	3	2022
CYBER SECURITY TESTING - Vul # 1	4	2022	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy			Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
3172: *Joint Non-Lethal Weapons*	53.664	3.095	1.148	3.095	-	3.095	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 3172 FY2022 funding request was reduced by $0.887 million to account for the availability of prior year execution balances.

Develop non-lethal weapon systems in support of anti-terrorism/force protection missions. Technologies include, but are not limited to: ocular interrupters, vessel propeller occlusion systems, and acoustic hailing devices. Current efforts are focused on the Long-Range Ocular Interrupter (LROI) 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. LROI will generate a non-lethal, eye safe laser that will provide 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.

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, which will stop or slow
marine platforms by occlusion of any type of marine propeller or propulsion.

The United States Navy Service Common Visual Augmentation Systems (VAS) Program of Record manages, procures, and maintains night vision devices, thermal detection devices, day/night weapons optics, and lasers in support of Navy combat capabilities with regard to the detection, recognition, classification, tracking, and destruction of hostile air and surface forces. The USN VAS Program also manages research into the future of visual augmentation systems and engages with Navy and DoD VAS stakeholders to ensure the Navy maintains competitive advantage over near-peer adversaries.

Research, Development, Test and Evaluation, Navy funding provides the United States Navy Service Common Visual Augmentation Systems (VAS) Program of Record with the ability to maintain competitive advantage over the nation's near peer adversaries by leveraging the military research community, other DoD VAS programs, academia and commercial industry in order to transition mature technologies (active, passive, multi-domain imaging sensors, laser systems, display systems, optics, image processing) that align with US Navy and DoD priorities.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Joint Non-Lethal Weapons Development	3.095	1.148	3.095	0.000	3.095
Articles:	-	-	-	-	-
FY 2021 Plans: Test and identify deployment method for MVS drogue technologies. Complete MVS launcher, deployment methodology, and drogue line optimization. Begin system deployment testing, environmental testing, Electromagnetic immunity testing, safety approvals for drogue and deployment for MVS. OCO: Initiation of Increment II of VAS PoR to perform R&D and testing of material solutions to address VAS capability gaps.					
FY 2022 Base Plans: Complete system deployment testing, environmental testing, Electromagnetic immunity testing, safety approvals for drogue and deployment for MVS.					
FY 2022 OCO Plans: N/A					
FY 2021 to FY 2022 Increase/Decrease Statement: MVS development was delayed due to decrease in FY21 funding. The increase in FY22 will allow for completion of development and testing efforts to support FY22 procurement.					
Accomplishments/Planned Programs Subtotals	3.095	1.148	3.095	0.000	3.095

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• OPN/8128: *NCW Forces Active*	165.360	139.693	110.647	-	110.647	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The Navy Non-Lethal Effects (NNLE) Family of Systems (FoS) ACAT IVM Program of Record will focus on development efforts on the Maritime Vessel Stopping (MSV).

Expeditionary Imaging VAS systems will be tested based on KPPs identified. These units will go through user assessment for their feedback.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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*

DoN VAS will assess USSOCOM VAS RDT&E efforts to determine applicability to address DoN VAS capability gaps and assess legacy/obsolescence projections to fill in any further capability gaps.

Starting in FY 2022, VAS RDT&E will be transferred to PE 0604230N Project 3445 / Visual Augmentation System Development.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy		Date: May 2021
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 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering NNLE	WR	NSWC Panama City : Panama City, FL	5.426	0.649	Jan 2020	0.000		1.817	Nov 2021	-		1.817	-	-	-
System Engineering	MIPR	Army SOC : TBD	0.400	0.282	Jan 2020	0.000		0.000		-		0.000	-	-	-
System Engineering NNLE	WR	NSWC Dahlgren : Dahlgren, VA	17.841	0.000	Jan 2020	0.000		0.000		-		0.000	-	-	-
System Engineering	WR	NSWC Port Hueneme : Port Hueneme, CA	0.628	0.000		0.000		0.000		-		0.000	-	-	-
System Engineering	WR	NSWC Crane : Crane, IN	1.455	0.714	Jan 2020	0.000		0.000		-		0.000	-	-	-
		Subtotal	25.750	1.645		0.000		1.817		-		1.817	-	-	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Services (NSWC) NNLE	WR	NSWC Dahlgren : Dahlgren, VA	4.000	0.250	Oct 2019	0.000		0.000		-		0.000	-	-	-
Engineering Services NNLE	MIPR	Army NVESD : Ft. Belvoir, VA	0.750	0.800	Feb 2020	0.000		0.000		-		0.000	-	-	-
Program Management	WR	NUWC Newport : Newport, RI	2.857	0.000		0.000		0.000		-		0.000	-	-	-
Engineering Services (NSWC) NNLE	WR	NSWC Panama City : Panama City, FL	2.075	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	9.682	1.050		0.000		0.000		-		0.000	-	-	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy		Date: May 2021
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 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation NNLE	WR	NSWC Dahlgren : Dahlgren, VA	3.609	0.000	Mar 2020	0.000		0.000		-		0.000	-	-	-
Test and Evaluation	MIPR	Military Sealift Command : Washington, DC	2.200	0.000		0.000		0.000		-		0.000	-	-	-
Test and Evaluation	WR	NSWC Carderock : Carderock, MD	0.193	0.000		0.000		0.000		-		0.000	-	-	-
Test and Evaluation NNLE	WR	NSWC Panama City : Panama City, FL	0.000	0.400	Dec 2019	0.004	Dec 2020	0.869	Nov 2021	-		0.869	-	-	-
Test and Evaluation	WR	COMOPTEVFOR : Norfolk, VA	4.925	0.000		0.000		0.000		-		0.000	-	-	-
Test and Evaluation VAS	WR	NSWC Crane : Crane, IN	0.000	0.000		0.800	Jan 2021	0.000		-		0.000	-	-	-
		Subtotal	10.927	0.400		0.804		0.869		-		0.869	-	-	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management NNLE	WR	NSWC Panama City : Panama City, FL	0.125	0.000	Jan 2020	0.000		0.409	Nov 2021	-		0.409	-	-	-
Program Management NNLE	WR	NSWC Dahlgren : Dahlgren, VA	7.180	0.000	Jan 2020	0.000		0.000		-		0.000	-	-	-
Program Management VAS	WR	NSWC Crane : Crane, IN	0.000	0.000		0.344	Jan 2021	0.000		-		0.000	-	-	-
		Subtotal	7.305	0.000		0.344		0.409		-		0.409	-	-	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
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*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	53.664	3.095		1.148		3.095		-		3.095	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
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*

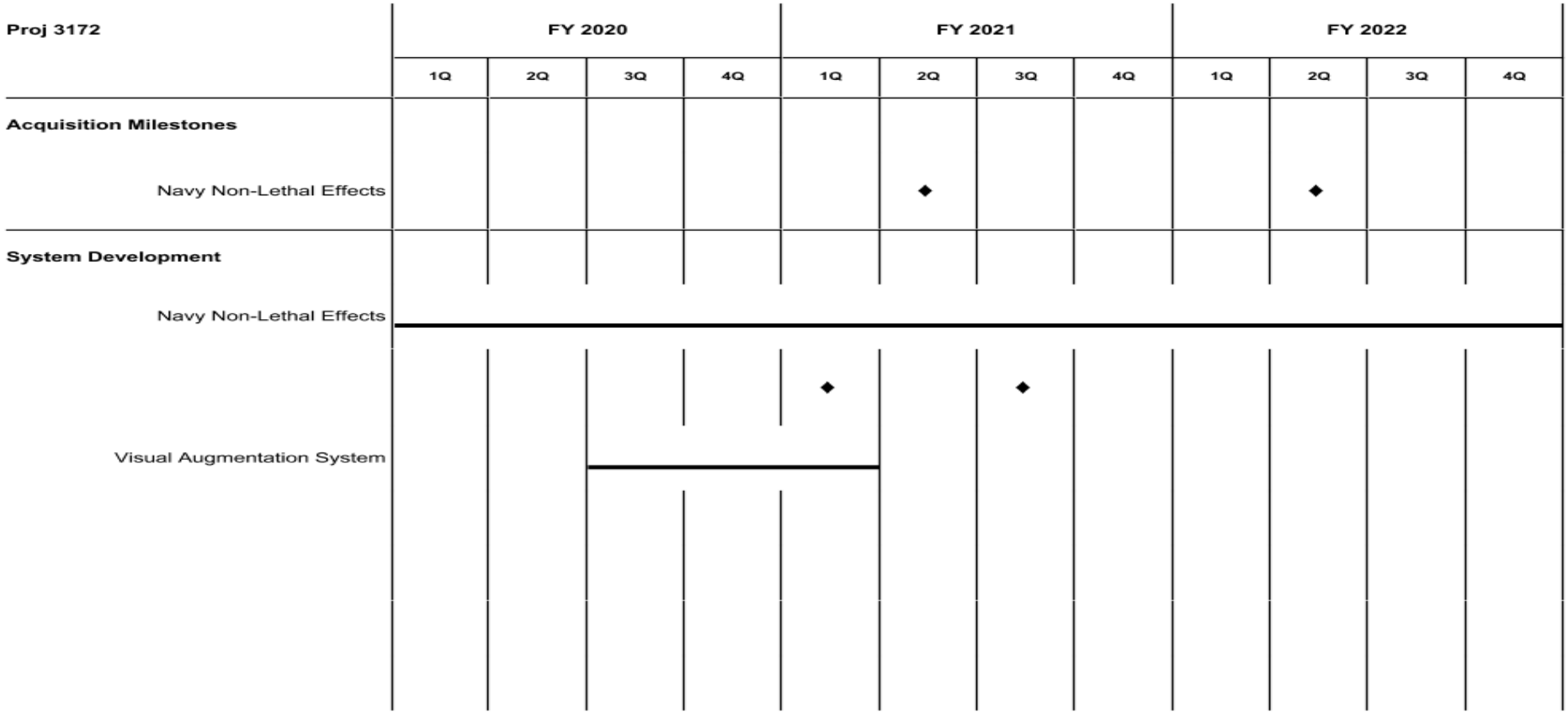

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3172 / *Joint Non-Lethal Weapons*

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) Production Decision	2	2021	2	2021
Acquisition Milestones: Navy Non-Lethal Effects: Maritime Vessel Stopping (MVS) Contract Award	2	2022	2	2022
System Development: Navy Non-Lethal Effects: Long-Range Ocular Interrupter (LROI) Doc Development	1	2020	4	2022
System Development: Navy Non-Lethal Effects: Long-Range Ocular Interrupter (LROI) Delivery Order Award	1	2021	1	2021
System Development: Navy Non-Lethal Effects: Maritime Vessel Stopping (MVS) Issue Request for Proposal	3	2021	3	2021
System Development: Visual Augmentation System: Expeditionary Imaging Test &Evaluation	3	2020	1	2021

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy												Date: May 2021
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 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
3358: *SSDS Training Improvement Program*	26.656	8.198	9.030	12.421	-	12.421	-	-	-	-	-	-
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 incremental capability packages, 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 12xAF. 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 architecturally extensible to meet interoperability and capability enhancement challenges in the future.

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 2022 Navy		Date: May 2021
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*

Continue 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.

Continue development and integration of 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 is an enabler for proficiency training of NIFC-CA capability.

Complete development of 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 enable training of AEGIS and SSDS IFF MODE 5/S, and address Mode 4 Inoculation.

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 to 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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: SSDS Total Ship Training Capability	8.198	9.030	12.421	0.000	12.421
Articles:	-	-	-	-	-
FY 2021 Plans: -Continue LVC sensor improvements for SSDS MK2, allowing for Real vs. Synthetic target discrimination at the sensor level. Target sensors include AN/SPQ-9B and development of the common improved Training Sensor DDS Interface, DN 18-05. -Complete requirements for developing, and begin integration of the PHALANX Close-In Weapon System (CIWS) simulation capability that includes CIWS operator training capability and supports Fast Attack Craft (FAC)/Fast Inshore Attack Craft (FIAC) training capability with SSDS Build 12.X. Phase 1 of this effort includes satisfying CIWS FCLIP Phase 2 requirements and integration with SSDD. Phase 2 includes Operator Training and supports Surface mode operations. -Initiate Future Advanced Training Domain (ATD v. 1.2) hosting requirements into SSDS, including PLA alignment.					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
-Initiate integration and testing of Strike Group Cooperative Engagement Capability (CEC) Underway capability onto SSDS Combat Systems Baselines. -Continue Anti-Submarine Warfare (ASW) Training improvements with CV-TSC to support multi-warfare integrated training on SSDS, including the MH-60R Simulator and integration with the electronic warfare system, SLQ-32(V)6.					
FY 2022 Base Plans: -Continue LVC sensor improvements for SSDS MK2, allowing for Real vs. Synthetic target discrimination at the sensor level. Target sensors include AN/SPS-73(V)18, AN/SPS-48G, AN/SPS-49A with the common Training Sensor DDS Interface, DN 18-05, and the AN/SPY-6 training integration with WS-35955. -Continue development of Advanced Training Domain (ATD) for SSDS BL 12.x. Begin integration with SSDS BL12 with TI12 and TI12H when appropriate ICDs developed. -Continue integration and testing of Strike Group Cooperative Engagement Capability (CEC) Underway capability onto SSDS Combat Systems Baselines. -Complete Anti-Submarine Warfare (ASW) Training improvements with CV-TSC to support multi-warfare integrated training on SSDS, including the MH-60R Simulator and integration with the electronic warfare system, SLQ-32(V)6. -Complete requirements for developing, and begin integration of ATD with the SLQ-32(V)7 training capability. The introduction of (V)7 on SSDS may defer the need for this capability. -Complete integration of PHALANX Close-In Weapon System (CIWS) simulation capability with SSDS Build 12.X., Phase 1. -Establish Phase 2 of PHALANX Close-In Weapon System (CIWS) simulation capability with SSDS Build 12.X. requirements to include Operator Training supporting Surface Mode operations.					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
-Initiate and Complete requirements for developing, and begin integration of upgrades to ATD to support training for RAM 2B, with SSDS. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY21 to FY22 increase of $3.391M from $9.030M to $12.421M is to develop the capability that will provide SSDS ships the ability to train using Live-Virtual-Constructive (LVC). LVC improves the Navy's competitive advantage via high-end training and enable strike group training in a contested environment in accordance with strategic documents. Specifically, developing requirements documentation and developing modifications to provide the necessary sensor improvements to support LVC training At-Sea. Additionally, developing an Integrated Strike Group CEC Training At-Sea capability in support of the Fleet Training Wholeness (FTW) through LVC.					
Accomplishments/Planned Programs Subtotals	8.198	9.030	12.421	0.000	12.421

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• RDTEN/0204571N/1427: *Surface Tactical Team Trainer (PU 1427)*	65.134	43.167	34.744	-	34.744	-	-	-	-	-	-
• RDTEN/0604307N/3357: *AEGIS Training Improv. Prog. (PU 3357)*	9.683	8.667	7.018	-	7.018	-	-	-	-	-	-

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.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntr l)*	**Project (Number/Name)** 3358 / *SSDS Training Improvement Program*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TSTC SME Plan & Prep	WR	NSWC CN : Corona, CA	0.000	0.650	Nov 2019	0.487	Nov 2020	0.950	Nov 2021	-		0.950	-	-	-
TSTC Sys Eng	WR	NSWC DD : Dahlgren, VA	1.540	1.536	Nov 2019	0.807	Nov 2020	1.859	Nov 2021	-		1.859	-	-	-
TSTC Sys Eng	WR	CDSA DN : Dam Neck, VA	2.286	0.000		0.000		0.000		-		0.000	-	-	-
TSTC Sys Eng / Integration	C/CPIF	Raytheon (4112) : Suffolk, VA	1.430	0.000	Dec 2019	0.000	Dec 2020	0.000		-		0.000	-	-	-
TSTC FTW FCLIP / CSEA	C/CPIF	CSEA contract : Moorestown NJ	1.130	2.950	Dec 2019	1.923	Dec 2020	3.381	Dec 2021	-		3.381	-	-	-
TSTC TDL Gateway	C/CPIF	SPAWAR PMW 150 : San Diego, CA	0.421	0.000		0.000		0.000		-		0.000	-	-	-
TSTC Sys Eng / PSEA	SS/CPIF	RSC (5128) : San Diego, CA	5.018	0.000		0.000		0.000		-		0.000	-	-	-
TSTC Sys Eng / MH-60R Training Capability	WR	Keyport (NUWC) : Keyport, RI	1.159	0.000		0.000		0.000		-		0.000	-	-	-
TSTC Planning Support	C/CPIF	TMB : Washington, DC	0.025	0.000		0.000		0.000		-		0.000	-	-	-
TSTC ATD	TBD	IWS 1.0 : Washington, DC	5.779	1.695	Dec 2019	2.458	Dec 2020	3.281	Dec 2021	-		3.281	-	-	-
TSTC ESSM BLK2/EW Upgrades	TBD	Various : Various	4.050	0.000		0.000		0.000		-		0.000	-	-	-
TSTC EW	TBD	IWS 2.0 : Washington, DC	1.019	0.000		0.000		0.000		-		0.000	-	-	-
TSTC NCTE	WR	Corona(NSWC) : Corona, CA	0.405	0.000		0.000		0.000		-		0.000	-	-	-
TSTC GWS	TBD	IWS 3.0 : Washington, DC	0.041	0.000		0.000		0.000		-		0.000	-	-	-
TSTC FTW SENSOR	TBD	PEO IWS 2.0 : Washington, DC	2.353	0.976	Dec 2019	1.102	Dec 2020	0.750	Dec 2021	-		0.750	-	-	-
TSTC FTW / STRIKE CEC	TBD	PEO IWS 6.0 : Washington, DC	0.000	0.391	Dec 2019	1.253	Dec 2020	1.700	Dec 2021	-		1.700	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy		Date: May 2021
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 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TSTC FTW ASW	TBD	PEO IWS 5.0 : Washington, DC	0.000	0.000		1.000	Dec 2020	0.500	Dec 2021	-		0.500	-	-	-
		Subtotal	26.656	8.198		9.030		12.421		-		12.421	-	-	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	26.656	8.198		9.030		12.421		-		12.421	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
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*

Ship Self Defense System Schedule

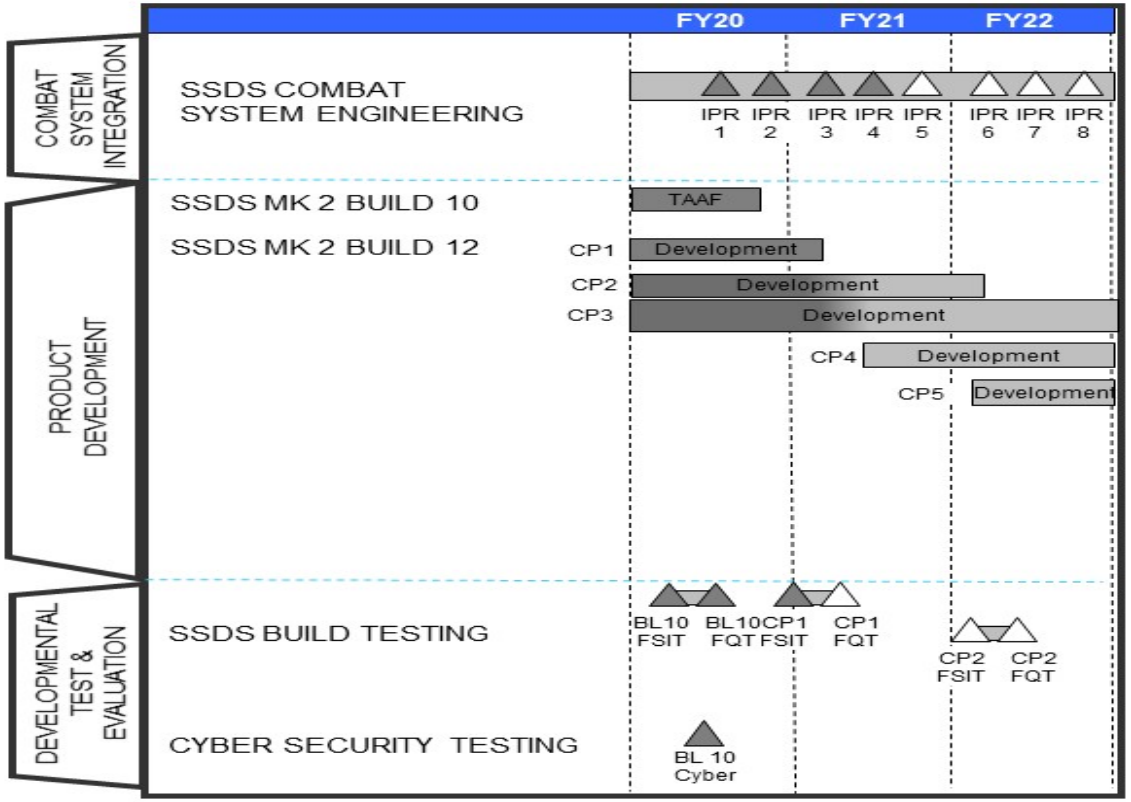

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3358 / *SSDS Training Improvement Program*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3358				
SSDS MK 2 - IPR 1	3	2020	3	2020
SSDS MK 2 - IPR 2	4	2020	4	2020
SSDS MK 2 BUILD 10 - TAAF	2	2020	4	2020
SSDS MK 2 BUILD 12 - CP 1	1	2020	1	2021
SSDS MK 2 BUILD 12 - CP 2	1	2020	1	2022
SSDS MK 2 BUILD 12 - CP 3	1	2020	4	2022
SSDS MK 2 BUILD TEST - BL10 FSIT	2	2020	2	2020
SSDS MK 2 BUILD TEST - BL 10 FQT	3	2020	3	2020
CYBER SECURITY TESTING - BL 10 CYBER	3	2020	3	2020
SSDS MK 2 - IPR 3	1	2021	1	2021
SSDS MK 2 - IPR 4	3	2021	3	2021
SSDS MK 2 - IPR 5	4	2021	4	2021
SSDS MK 2 BUILD 12 - CP 4	4	2021	4	2022
SSDS MK 2 BUILD TEST - CP 1 FSIT	1	2021	1	2021
SSDS MK 2 BULD TEST - CP 1 FQT	2	2021	2	2021
SSDS MK 2 - IPR 6	1	2022	1	2022
SSDS MK 2 - IPR 7	3	2022	3	2022
SSDS MK 2 - IPR 8	4	2022	4	2022
SSDS MK 2 BUILD 12 - CP 5	2	2022	4	2022
SSDS MK 2 BUILD TEST - CP 2 FSIT	1	2022	1	2022
SSDS MK 2 BUILD TEST - CP 2 FQT	2	2022	2	2022