Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy											Date: May 2017	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0204571N *I Consolidated Trng Sys Dev*							
COST ($ in Millions)	**Prior Years**	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**Cost To Complete**	**Total Cost**
Total Program Element	372.916	32.902	38.593	66.518	-	66.518	78.419	57.565	25.556	20.610	Continuing	Continuing
0604: *Training Range & Instr Dev*	145.085	3.435	3.310	0.003	-	0.003	3.755	5.110	3.632	3.709	Continuing	Continuing
1427: *Surface Tactical Team Trainer (STTT)*	97.223	9.857	12.289	15.274	-	15.274	15.387	15.454	13.541	11.153	Continuing	Continuing
2124: *Air Warfare Training*	45.852	2.226	1.462	1.585	-	1.585	1.733	1.741	1.663	1.697	Continuing	Continuing
3093: *TACTS/LATR Replacement*	68.450	12.676	14.962	48.473	-	48.473	57.544	35.260	6.720	4.051	Continuing	Continuing
3356: *High Fidelity Surface Trainers*	16.306	4.708	6.570	1.183	-	1.183	0.000	0.000	0.000	0.000	0.000	28.767

A. Mission Description and Budget Item Justification

0604 - Training Range and Instrumentation Development project develops specialized instrumentations for fleet readiness training while minimizing life cycle costs. Tasks include development of the following: Large Area Tracking Range improvements, technology improvements for fixed and portable Anti-Submarine Warfare training ranges, and Tactical Training Range (TTR) infrastructure improvements to include: the Joint Display Subsystem, Radar Acquisition Display Subsystem, Electronic Warfare server, Link 16 interface, TTR rotary platform technology improvements and the Radiant Mercury Cross Domain Solution.

1427 - Surface Tactical Team Trainer (STTT) develops modifications during sustainment of Battle Force Tactical Training (BFTT) system. This is required to maintain capabilities and interfaces to provide realistic combat system coordinated team, unit and Fleet Synthetic Training (FST) collective Group/Force level training events. In addition, BFTT supports the embedded trainer "family of systems" approach for the development of a Total Ship Training Capability (TSTC). Specific improvements include improved integration with the Navy Continuous Training Environment (NCTE) and development of a High Level Architecture (HLA) capable, integrated shipboard network to meet increasing Commander Naval Surface Forces (CNSF) and United States Fleet Forces Command (USFFC) FST requirements. The need for transforming training is documented within the DoD Training Transformation Plan, the Chief of Naval Operations Fleet Response Plan and Commander United States Fleet Forces Command Fleet Readiness Training Plan.

2124 - Air Warfare Training Development (AWTD) provides for risk mitigation and next generation platform, Unmanned Aerial Systems (UAS), Live Virtual Constructive (LVC) and associated visualization component development for distributed mission training, and for stand-alone and small footprint deployable devices. Support the Navy Aviation Simulation Master Plan (NASMP) upgrade efforts and Type/Model/Series programs with advanced visual system display configurations requirements. Provide for Open Architecture (OA), and common systems interface applications. Assess trainee cognitive requirements and the development and incorporation of next generation LVC, UAS constructive and associated visualization component technologies. Additionally, AWTD provides for advanced virtual component fidelity improvements for LVC capability which includes the "Mobility" Part-Task Trainers and the Multiplex Data Bus Controller Translator Transmitter enabling technologies.

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy	Date: May 2017
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0204571N *I Consolidated Trng Sys Dev*

LVC technologies will facilitate advanced, cost effective weapons and tactics training and emerging capability requirements in the Air-Sea Battle Space and Naval Integrated Fire Control-Counter Air capabilities development.

3093: The Tactical Combat Training System (TCTS) Increment II will provide an improved environment for air combat training utilizing a secure air-to-air and air-to-ground datalink, and will provide rangeless operation capability to Forward Deployed Naval Forces (FDNF). TCTS Inc II will provide encryption and an enhanced threat environment, as well as airborne participant instrumentation for multiple fixed and rotary wing platforms. FY18 represents a full year of engineering, manufacturing and development (EMD) for the program, which justifies the current control. The program's Preliminary Design Review (PDR) and Critical Design Review (CDR) will be completed in FY18. Both are major required Systems Engineering Technical Review (SETR) events and MDA/ASN(RD&A) knowledge points. FY18 funding will complete tasking necessary to prepare for Engineering Development Model (EDM) fabrication to begin in 1Q FY19. This schedule is necessary to support the MS C timeline and to meet the Fleet IOC need date of 2Q FY22 in order to address critical OPSEC concerns.

3356- Funds high fidelity Aegis Integrated Air and Missile Defense (IAMD) individual, instructor, strike group and team trainers for all Advanced Capability Build (ACB) and below Aegis baselines. This line also provides funds for the research and development of advanced technologies to support BMD 5.XX and Command, Control, Communication, Computer, and Intelligence (C4I) advanced technology upgrades to Aegis BMD Ashore Team Trainer at CSCS Unit Dam Neck. This line supports Surface Training Advanced Virtual Environment (STAVE) methodology by researching and developing trainers that will create an immersive and interactive learning environment and support both CNO High Velocity Learning and Ready Relevant Learning intent.

JUSTIFICATON FOR BUDGET ACTIVITY:
This program is funded under Operational Systems Development because it includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	34.325	38.593	41.924	-	41.924
Current President's Budget	32.902	38.593	66.518	-	66.518
Total Adjustments	-1.423	0.000	24.594	-	24.594
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.745	0.000			
• SBIR/STTR Transfer	-0.678	0.000			
• Program Adjustments	0.000	0.000	24.457	-	24.457
• Rate/Misc Adjustments	0.000	0.000	0.137	-	0.137

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy	Date: May 2017
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0204571N *I Consolidated Trng Sys Dev*

Change Summary Explanation

The FY 2018 funding request was also reduced by $3.946 million to account for the availability of prior year execution balances.

0604: FY18 reduced $3.946M due to Program Element (PE) prior year under execution. Scheduled 6.2 upgrade for FY18 have been changed to FY19. 6.6 upgrade removed from schedule to be planned for FY23. TTR 2018.1 and 2018.2 upgrade removed from system Development and Delivery schedule. Next Gen Phase 3 changed from FY18 to FY19, and Next Gen Phase 7 removed from current schedule, to be planned for System development and Delivery for FY23.

3093: Cost growth in FY18 from previous submission due to revised government Life Cycle Cost Estimate (LCCE). The revised LCCE supports the contract awarded in March 2017. Areas of cost growth include increased hardware development costs based on adjustments to the ground station necessary to account for a shipboard variant; additional Software Lines of Code (SLOC) due to implementation of an open systems architecture and limitations on reuse of legacy proprietary software code, and an increase due to systems engineering/ program management (SEPM) labor costs required to mature and integrate system components. Cost growth funded via prioritization within aviation training and range programs.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	Project (Number/Name) 0604 / *Training Range & Instr Dev*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
0604: *Training Range & Instr Dev*	145.085	3.435	3.310	0.003	-	0.003	3.755	5.110	3.632	3.709	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops specialized instrumentations for fleet readiness training while minimizing life cycle costs. Tasks include development of the following: Large Area Tracking Range (LATR) improvements, technology improvements for fixed and portable Anti-Submarine Warfare (ASW) training ranges, and Tactical Training Range (TTR) infrastructure improvements to include: the Joint Display Subsystem (JDS), Radar Acquisition Display Subsystem (RADS), Electronic Warfare (EW) server, Link 16 interface, TTR rotary platform technology improvements and the Cross Domain Solutions (CDS).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: LATR	1.250	2.515	0.003	0.000	0.003
Articles:	-	-	-	-	-

Description: Design, integrate and test modules to eliminate obsolete components in the LATR Pod. Design, integrate and test LATR software baseline upgrades. Design, integrate and test Participant Instrumentation Packages (PIP) modules to address obsolescence, high failure components and to improve operability and performance. Conduct and complete installation of the Ground System Rehosts. Conduct and complete security testing and assessment for LATR system certification and accreditation for Ground System Rehosts. Develop, test and integrate software and hardware modifications to system test sets. Develop, test and integrate LATR data translators. Conduct studies to identify sub-projects required through FY22. Complete ground system and PIP refresh sub-projects, in conjuction with, semi-annual system block upgrades. Conduct LATR Operational Security (OPSEC) Posture Improvements Sub-Project, Shipboard and Rotary Wing Technology Wing Upgrade (LSRTU) and LATR Navigation Technology Refresh (LNTR).

FY 2016 Accomplishments:

Develop and test LATR ground software version 6.0.0. Finalize LATR Shipboard and Rotary Wing Technology Upgrade (LSRTU) development, including Physical Configuration Audit, System Verification Review, Production Readiness Review and Developmental Test events in advance of Milestone C.

FY 2017 Plans:

Develop and test LATR ground Software version 6.1.0. Continue to develop operational system improvements and solutions to eliminate LATR obsolescence issues.

FY 2018 Base Plans:

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 0604 / *Training Range & Instr Dev*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Continue to develop operational system improvements and solutions to eliminate LATR Obsolescence issues. ***FY 2018 OCO Plans:*** N/A					
Title: TTR	1.980	0.554	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Develop and test upgrades to the Joint Display Subsystem (JDS), Radar Acquisition Display Subsystem (RADS), and Electronic Warfare (EW) server. Develop and test upgrades to the Link-16 Interface, JDS, RADS, and EW server. ***FY 2016 Accomplishments:*** Develop and test 2016.1 & 2016.2 upgrades to the JDS, RADS & EW Server. With the exception of FY 15, TTR fields two software block upgrades per year to allow the JDS, EW Server, and RADS to remain in concert with evolving threat and tactical training requirements. ***FY 2017 Plans:*** Develop and test 2017.1 & 2017.2 upgrades to the JDS, RADS & EW Server to remain in concert with evolving threat and tactical training requirements. Develop operational systems improvements to the Rotary Wing Tracking System. ***FY 2018 Base Plans:*** Funds for FY18 have been eliminated. ***FY 2018 OCO Plans:*** N/A					
Title: Ocean Systems	0.205	0.241	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Research, develop, and test technology improvements for fixed and portable Anti-Submarine Warfare (ASW) training ranges. ***FY 2016 Accomplishments:*** Conduct analysis of advanced technical solutions for Anti-Submarine Warfare (ASW) range capability at Pacific Missle Range Facility (PMRF), Barking Sands, Hawaii and future ocean range locations. ***FY 2017 Plans:***					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 0604 / *Training Range & Instr Dev*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Conduct analysis of advanced technical solutions for ASW range capability at Pacific Missile Range Facility (PMRF), Barking Sands, Hawaii and future ocean range locations. Research and investigate environmental parameters to support future project planning, and design fixed/portable range Concept of Operations (CONOPs). ***FY 2018 Base Plans:*** Funds for FY18 have been eliminated. ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	3.435	3.310	0.003	0.000	0.003

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• OPN/4204: *Weapons Range Support Equipment (WRSE)/ LSRTU/Ocean Systems*	3.709	0.500	15.708	-	15.708	13.373	19.013	5.815	4.325	0.000	62.443

Remarks

Related OPN cost codes include SCO12 Ocean Systems, SC034 LATR Shipboard Rotary Technology Upgrade, SC132 LNTR, and associated support elements (e.g. relevant portions of SC831 Production Engineering). Increase from PB17 to current submission reflects increase in OPN 4204 for procurement of LNTR and Portable Underwater Training Range (PUTR).

D. Acquisition Strategy

The Training Range and Instrumentation Development (TRID) program is a non-ACAT program. The integrated program teams that develop new TRID capabilities include government and contractor engineering personnel.

E. Performance Metrics

Metric/Description:
Naval Air Warfare Center-Aircraft Division (NAWC-AD): # of Large Area Tracking Range (LATR) system product improvements and new capabilities. Successful application of system engineering processes. Design and development of improvements. Site acceptance of product improvements with no Priority 1 or 2 problem reports. Completion of 1 upgrade per year.

Jacobs Eng: # of Large Area Tracking Range (LATR) system product improvements and new capabilities. Successful design, development and testing of product improvements and new capabilities. Site acceptance of product improvements with no Priority 1 or 2 problem reports.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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Naval Air Warfare Center Weapons Division(NAWC-WD): # of Tactical Training range (TTR) upgrades per year. Successful application of system engineering processes. Design and development of improvements. Site acceptance of product improvements with no Priority 1 or 2 problem reports. Completion of 2 upgrade per year.

Jacobs Eng: # of TTR system product improvements and new capabilities. Successful design, development, and testing of product improvements and new capabilities. Site acceptance of product improvements with no Priority 1 or 2 problem reports.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	Project (Number/Name) 1427 / *Surface Tactical Team Trainer (STTT)*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
1427: *Surface Tactical Team Trainer (STTT)*	97.223	9.857	12.289	15.274	-	15.274	15.387	15.454	13.541	11.153	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Surface Tactical Team Trainer project/BFTT Program provides enhancements and upgrades to the Total Ship Training Capability (TSTC) training components to support AEGIS and Ship Self Defense System (SSDS) needs for increased training capability and functionality during Fleet Synthetic Training (FST)/Live Virtual Constructive (LVC) events. The BFTT component develops new capabilities and integrates training capabilities developed by the AEGIS and SSDS TSTC into a consolidated integrated training system for use on AEGIS and SSDS ships. TSTC enhancements developed address current and future training requirements to align with the Combat System new and improved capabilities by implementing new functionality and by integrating capabilities being developed by both the AEGIS and SSDS Training Improvement Programs into a consolidated training system. TSTC developments and upgrades include the evolution to an open distributed architecture with maximum commonality across ship classes, integrating existing training systems, or leveraging capabilities developed by other programs.

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.

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

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Surface Tactical Team Trainer (STTT)	9.857	12.289	15.274	0.000	15.274
Articles:	-	-	-	-	-
FY 2016 Accomplishments: Completed Build 5.0 testing and Combat System Certification to support SLQ-32 (V)6 SEWIP BLK II integration in AEGIS Baseline 9A.0/9.C1 and legacy AWS Baseline ships. Continued development of TSTC which include BFTT Build 5.1, Advanced Training Domain (ATD) 1.0, Dual Band Radar Simulator, CEC Enhanced and Interim Training Capabilities, and Identification Friend/Foe Simulator. Completed BFTT 5.1 Critical Design Review and Test Readiness Review milestone events. BFTT 5.1 is planned to be integrated onto CVN-78, and AEGIS BL 9.C2 phases 0 and 1. Completed ATD 1.0 Systems Requirement Review, In-Process Review and System					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 1427 / *Surface Tactical Team Trainer (STTT)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Functional Review milestones. ATD is planned to be integration onto CVN-73 and AEGIS BL 9.C2 phase 2 TI-16 based combat systems. Completed development and integration of the Dual Band Radar simulator that is a key enabler for CVN-78 embedded training. Completed BFTT 5.1 developer integration testing on SSDS ACB 12+ with CVN-78. Continued Combat Systems level Integration engineering for Cooperative Engagement Capability (CEC) Enhanced Trainer (CET) training capabilities and commensurate updates to Cooperative Engagement Processor computer program. Began requirements development of AEGIS and SSDS ACB 20 TSTC training requirements, to include updates to naval capabilities documents, combat systems level requirement specifications, and interface requirements of the Air and Missile Defense Radar (AMDR) stimulation capability. Initiated development of NULKA simulation capability to enable combat systems soft kill training.					
FY 2017 Plans: Perform BFTT 5.1 element certification, conduct combat system test and evaluation, and deliver BFTT Build 5.1. Conduct ATD 1.0 preliminary design review and critical design reviews. Complete Build 5.1 testing and Certification for CVN-78 and AEGIS Baselines 9.A0/9.C1/9.C2. Deliver and Install BFTT 5.1 to support CVN78 SSDS MK2 Mod 6C engineering tests at Wallops Island and Shipboard Combat System light off event. Complete ATD 1.0 CDR. Initiate software development for ATD 1.0 and necessary integration engineering to support Aegis Baseline 9.C2 TSTC development. Conduct BFTT 5.1 element certification for AEGIS ACB 16 Phase 0, and SSDS CVN-78 and CVN-72 configurations. Complete development and deliver CEC Interim Training Capability to enable single and multi-ship integrated fire control training and continue development of embedded CEC training capability. Conduct NULKA and IFF simulation capability preliminary and critical design reviews. Continue development of embedded shipboard MH-60R Simulator and associated components. Initiate development of requirements to support TSTC capability improvements to support tactical training requirements of AEGIS and SSDS ACB 20, to include training system modifications to support integration of the Air and Missile Defense Radar (AMDR) stimulation capability, Enhanced Sea Sparrow Missile System, and Advanced Electronic Warfare.					
FY 2018 Base Plans: Conduct ATD 1.0 Test and Evaluation in support of AEGIS ACB 16 phase 2 and SSDS ACB 12+ TI-16 based combat systems. Deliver CEC Embedded Training capability, IFF Simulator, NULKA Simulator, and MH-60R Simulator for integration and testing.					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 1427 / *Surface Tactical Team Trainer (STTT)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Develop tactical representative training improvements to SSDS ACB 20 by developing Own-Ship Weapon Simulation based on ESSM BLK 2 models, and implement Electronic Warfare Training improvements based on SEWIP BLK 3 capabilities. Capabilities developed will be leveraged to enhance AEGIS as appropriate. Begin TSTC requirements developments of AMDR, ESSM and Advanced EW training capabilities. Begin TSTC requirements development for the DDG 1000 embedded shipboard training capability. ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	9.857	12.289	15.274	0.000	15.274

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• OPN/2762/MB040/MB5IN: *Other Training Equipment (Surface BFTT/TSTC portion only)*	27.816	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	192.763
• RDTE/0604307N/3357: *Aegis Training Improvement Program*	14.624	10.458	7.787	-	7.787	6.531	5.047	5.162	5.266	Continuing	Continuing
• RDTE/0604755N/3358: *SSDS Training Improvement Program*	3.074	2.864	7.593	-	7.593	7.495	7.520	8.889	9.067	Continuing	Continuing
• OPN/5664/TBD: *Other Training Equipment (Surface BFTT/TSTC portion only) New BLI FY17*	0.000	26.151	31.988	-	31.988	29.333	29.394	29.313	29.595	Continuing	Continuing

Remarks

D. Acquisition Strategy

The BFTT acquisition strategy for system development utilizes the Advanced Capability Build (ACB) development model, as mandated by OPNAV. Incremental acquisition and fielding, utilizing commercial off-the-shelf technology to the extent possible, is in accordance with OPNAV LTR Ser N86/9U179029 dtd 31 Jul 09.

E. Performance Metrics

TSTC BFTT Core component will be developed to meet the following developmental milestones. These milestones are in close alignment with AEGIS BL9.C2 and SSDS MK 2 development milestones and integration events. (see R-4)

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy			Date: May 2017
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Development	C/FFP	GTS : Virginia Beach, VA	14.592	0.368	Dec 2015	0.497	Dec 2016	0.571	Dec 2017	-		0.571	Continuing	Continuing	Continuing
Systems Engineering	WR	SEA02/NSWC Dam Neck/NSWC Dahlgren : NAVSEA/ Dam Neck/NSWC Dahlgren	22.283	3.889	Dec 2015	3.799	Dec 2016	5.824	Dec 2017	-		5.824	0.000	35.795	-
		Subtotal	36.875	4.257		4.296		6.395		-		6.395	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	WR	NSWC Dam Neck/ SEA 02 : WR/REQN	39.677	2.368	Dec 2015	4.803	Dec 2016	5.671	Dec 2017	-		5.671	0.000	52.519	-
		Subtotal	39.677	2.368		4.803		5.671		-		5.671	0.000	52.519	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NSWC Dam Neck/ SEA 02 : WR/REQN	11.231	2.429	Dec 2015	1.957	Dec 2016	1.767	Dec 2017	-		1.767	0.000	17.384	-
		Subtotal	11.231	2.429		1.957		1.767		-		1.767	0.000	17.384	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NSWC Dam Neck/ SEA02 : WR/REQN	9.440	0.803	Dec 2015	1.233	Dec 2016	1.441	Dec 2017	-		1.441	0.000	12.917	-
		Subtotal	9.440	0.803		1.233		1.441		-		1.441	0.000	12.917	-

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	Project (Number/Name) 1427 / *Surface Tactical Team Trainer (STTT)*	

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	97.223	9.857		12.289		15.274		-		15.274	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 1427 / *Surface Tactical Team Trainer (STTT)*

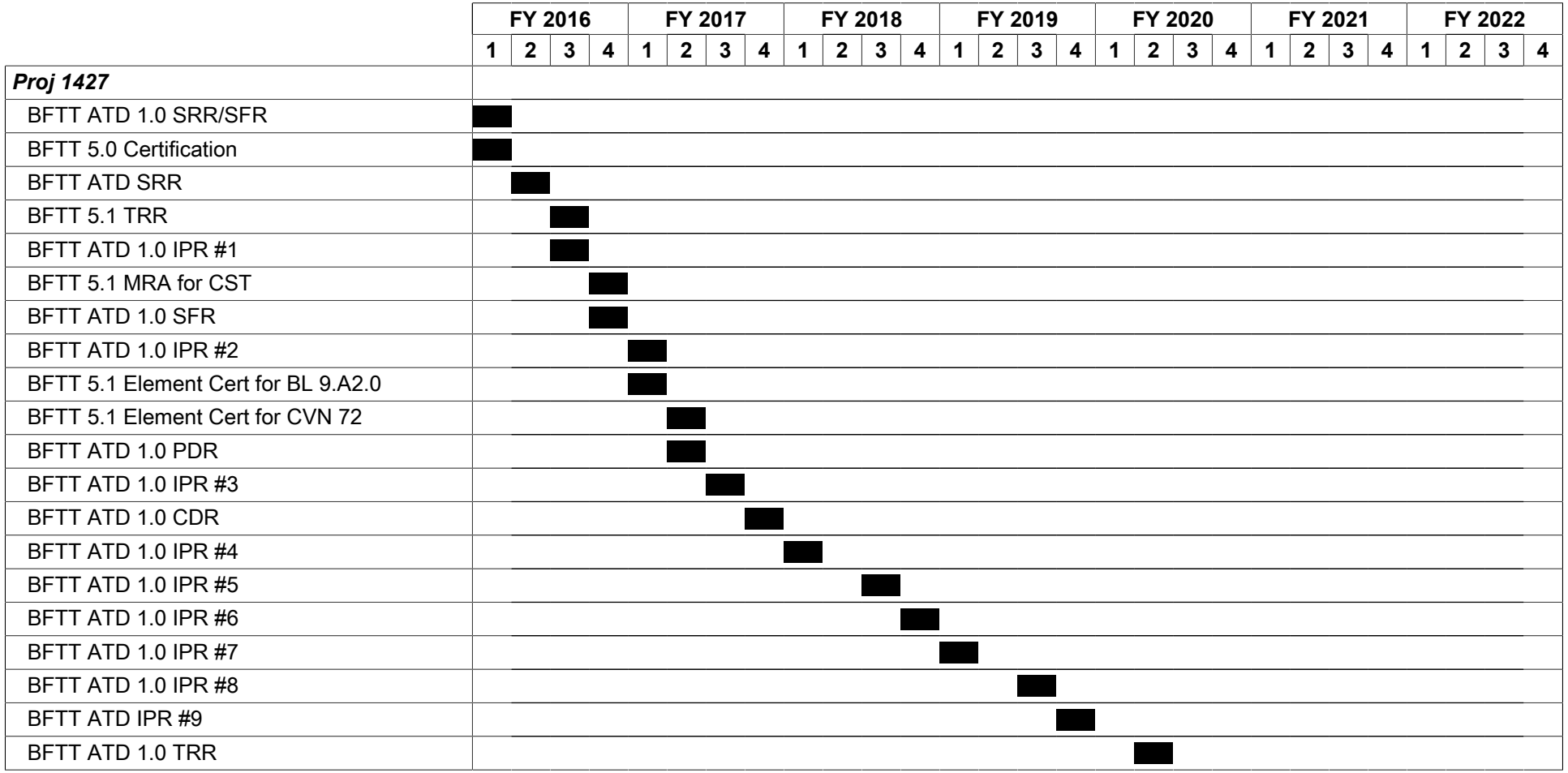

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 1427 / *Surface Tactical Team Trainer (STTT)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1427				
BFTT ATD 1.0 SRR/SFR	1	2016	1	2016
BFTT 5.0 Certification	1	2016	1	2016
BFTT ATD SRR	2	2016	2	2016
BFTT 5.1 TRR	3	2016	3	2016
BFTT ATD 1.0 IPR #1	3	2016	3	2016
BFTT 5.1 MRA for CST	4	2016	4	2016
BFTT ATD 1.0 SFR	4	2016	4	2016
BFTT ATD 1.0 IPR #2	1	2017	1	2017
BFTT 5.1 Element Cert for BL 9.A2.0	1	2017	1	2017
BFTT 5.1 Element Cert for CVN 72	2	2017	2	2017
BFTT ATD 1.0 PDR	2	2017	2	2017
BFTT ATD 1.0 IPR #3	3	2017	3	2017
BFTT ATD 1.0 CDR	4	2017	4	2017
BFTT ATD 1.0 IPR #4	1	2018	1	2018
BFTT ATD 1.0 IPR #5	3	2018	3	2018
BFTT ATD 1.0 IPR #6	4	2018	4	2018
BFTT ATD 1.0 IPR #7	1	2019	1	2019
BFTT ATD 1.0 IPR #8	3	2019	3	2019
BFTT ATD IPR #9	4	2019	4	2019
BFTT ATD 1.0 TRR	2	2020	2	2020

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	Project (Number/Name) 2124 / *Air Warfare Training*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
2124: *Air Warfare Training*	45.852	2.226	1.462	1.585	-	1.585	1.733	1.741	1.663	1.697	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project transitions new training and range system technologies for use in Naval Aviation training. Products from this effort are directly tied to the Navy Aviation Simulation Master Plan (NASMP), MH-60R/S master plan, Unmanned Aerial Systems (UAS) master plan, the Live Virtual Constructive (LVC) program, component technologies, including the Multiplex Data Bus Controller Translator Transmitter, F/A-18C-F Requirements Procurement Plan (RPP), open architecture implementation, multiple technology refresh efforts and the Multi-Mission Maritime Aircraft/P-8 programs. These efforts will support training optimization of future naval aviation training/preview/mission rehearsal systems (fixed, deployed, and unmanned). Tasks include: specification development to provide for common, modular, High Level Architecture compliant, high fidelity Distributed Mission Training and mission rehearsal capabilites ashore and afloat. Technologies to be developed and integrated include: intelligent semi-automated forces (SAF) technologies, automated performance measurement technology, advanced net-ready weapons simulation, Air to Air/ Air to Ground, visual/sensor enhancement, sensor/weather server, common post mission assessment technologies, tablet mission preview technology, advanced visual-sensor technology, high resolution helmet mounted, and/or flat panel displays, 20-20 visual acuity image generation, NAVAIR Portable Source Initiative improvements, common correlated data set technologies, common link, common software/database reuse technologies, advanced environmental effects modeling, fused radar/infra-red/electro-optic and acoustic sensor simulations, aerodynamic modeling, physics-based infra-red simulations, spatial disorientation research, comms degradation modeling, and final Test and Evaluation (T&E) within the Aviation Training Technology Integration Facility (ATTIF), Naval Air Warfare Center-Aircraft Division. This Manned-Flight Simulator (MFS) ATTIF capability provides a window to fleet aviators for critical comment, evaluation and fine tuning of new, interoperable, and innovative technologies such as LVC before final transition to the fleet. Naval Aviation Distributed Training Center, debrief/After Action Review (AAR), and intelligent training tools for the virtual environment are focused on human performance and trend analysis enhancements for fleet readiness and distributed mission training at all levels.

Metrics: These technology transitions seek to lower Total Ownership Costs of the training systems and life cycle costs, including: increasing software re-use, reduced instructor manning profiles, software-based fidelity enhancements and increased fleet readiness by enhancing overall system fidelity to the projected operating environments. NASMP readiness improvements are conservatively forecasted at 12-35% Training and Readiness improvement via synthetic environment upgrades and associated technology upgrades to stand-alone and networked simulators. Individual technology transition investments have routinely exceeded 300+% financial Return On Investment. Technology Readiness Levels, Training and Readiness, fleet readiness, and financial metrics are used.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: HUMAN/INSTRUCTIONAL SYSTEMS INTEGRATION	1.385	0.670	0.732	0.000	0.732
Articles:	-	-	-	-	-
Description: Develop common AAR and platform-unique post mission assessment, Intelligent Tactical SAF, and high fidelity simulator component technologies. AAR, and high fidelity components such as Intelligent SAF designs lower NASMP upgrade and simulator life-cycle costs. Integrate Voice-Capable SAF component					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 2124 / *Air Warfare Training*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
technologies, improve open common instructor interface effectiveness and provide for multi-SAF exercise utilization. Analyze, develop, and integrate common architecture components for F/A-18C-F, EA-18G, MH-60R/S, Unmanned Aerial Systems (UAS) platforms, E-2C/D & USMC mission areas, intelligent instructor operator components, automated performance measurement technologies, Tactical Aircraft/ Multi-Mission Maritime Aircraft/ Reduced Oxygen Breathing Device-Spatial Disorientation technologies/devices common graphic user interface initiatives, common threat system formats, Next Generation Threat System (NGTS) technology transitions, Joint Semi-Automated Forced (JSAF) compatibility, cross platform post mission performance measurement, Multi-purpose Reconfigurable Maintenance Training Systems, (MRTS) and after action review/ debrief innovations, thereby maximizing return on investment for instructional systems technology investments. ***FY 2016 Accomplishments:*** Provide continued support to the NAMRU research team to complete both Reduced Oxygen Breathing Device/ Hypoxia system configuration, test and evaluation, and final prototyping development/support for the Spatial Disorientation family of systems to meet new curricula and requirements. Provide training station/instructional systems support for standard post-mission assessment software, tactical trend analysis and Common Simulation Product development. ***FY 2017 Plans:*** Continue planned fidelity improvements for Next Generation Threat System (NGTS), including tactical behaviors and rapid scenario development using both actual operational behaviors and simulated recordings for "Patterns-of-life" white shipping, and other large entity sets with realistic behaviors. Continue development of Post Mission Assessment for Tactical Training (PMATT), Maritime, fixed and rotary wing, and investigate similar applications for cross-platform distributed training applications. Perform Advanced Development Simulation (ADS) component enhancements, and Technology Readiness Assessments (TRA) in relevant environments. ***FY 2018 Base Plans:*** Continue fidelity improvements for synthetic entity systems (e.g. NGTS, JSAF), including realistic blue force collaborative behavior and improved support for debrief in distributed training environments. Support test and evaluation of alternate solutions for mask-on hypoxia training. Continue Post Mission Assessment for Tactical Training (PMATT) with emphasis on automated scoring of live training events in fixed and rotary wing aircraft. Investigate strategies for efficient cross-platform after action review and debrief in distributed training settings. Perform Advanced Development Simulations (ADS) component enhancements and Technology Readiness Assessments in relevant environments. ***FY 2018 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 2124 / *Air Warfare Training*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
N/A					
Title: SENSORS AND ENVIRONMENT	0.640	0.487	0.525	0.000	0.525
Articles:	-	-	-	-	-

Description: Develop common and platform unique sensor, visual, and environmental simulation (atmospherics or acoustics) into fidelity upgrades with Commercial Off The Shelf and/or Government Off the Shelf (GOTS) Software. Perform risk reduction, advanced displays innovation, test and evaluation, integration, and production of Common Sensor Model, High Fidelity Active-Acoustics Sensor Operator Training, 3D Ocean effects, Anti-Submarine Warfare (ASW) acoustic fidelity assessments, 3D weather effects, 3D Ocean acoustic modeling, new Reduced Oxygen Breathing Device (ROBD)& Spatial Disorientation (SD), and legacy device technologies. Demonstrate GOTS capability for cost-effective database materialization, Material Properties Reference Dataset library, associated NAVAIR Portable Source Initiative specifications and processes for implementation on Distributed Mission Training, deployed trainers, legacy, and new visual system upgrade programs. In support of Navy Aviation Simulation Master Plan (NASMP) upgrade efforts, develop texture storage, sensor-environmental effects, NAVAIR Portable Source Initiative material reference processes/standards, automated technology applications for real time publishing, shadows, cultural lighting, combat, and weather effects and very high resolution visualization technologies, to include tablet-based mission preview for tactical aircrew.

FY 2016 Accomplishments:
Support final acquisition plan documentation, specifications, and testing for the Carrier Qualification (CQ) mobility part task trainer prototypes, and for all after action/post-mission assessment technologies. Using sensor fusion, and simulation-based displacement mapping, provide enhanced technology development for low-level flight operations training over water environments, and Terrain-Following, flight training in all weather, sensor environments. Provide enhanced threat presentations with improved tactical behaviors for Next-Generation Threat System application.

FY 2017 Plans:
Research the use of consumer-grade image generation engines to deliver simulator visuals that meet the standards of the Navy Aviation Simulator Master Plan. Evaluate augmented reality systems as a replacement for legacy visual systems in high-fidelity flight simulators. Investigate collaborative environmental databases, such as the Geospatial Metaverse, to improve environmental model standardization for cross-platform distributed training and creation time in support of mission rehearsal. Investigate Virtual Reality (VR) improvements and interface with fleet critical sensor and display systems.

FY 2018 Base Plans:

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 2124 / *Air Warfare Training*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Develop and test prototype augmented reality based alternate to F/A-18 TOFT visual system. Continue research on use of consumer-grade image generation engines to deliver Navy Aviation Simulator Master Plan quality visuals. Conduct experiments to test limits of collaborative environmental databases to provide time-critical terrain updates for deployable mission rehearsal trainers. Support development of enhanced environmental effects for Naval Aviation Survival Training Program's Virtual Reality Parachute Descent Trainer. ***FY 2018 OCO Plans:*** N/A					
Title: LIVE VIRTUAL CONSTRUCTIVE (LVC), AND VISUALS ***Articles:*** ***Description:*** Air Warfare Training Development provides for risk mitigation and next generation platform, Unmanned Aerial Systems, Live Virtual Constructive (LVC) and associated visualization component development for Navy aviation distributed mission training, and distributed training centers (NADTC), as well as for stand-alone and small footprint deployable devices. Provided integrated capability assessment for Ranges, Experimentation products, and Training. (Atlantic Test Range, NAWCAD 5.4, Training Systems Division, and PMA205) Support the NASMP upgrade efforts and Type/Model/Series programs with advanced visual system display configurations requirements. Assess trainee cognitive requirements and the development and incorporation of next generation Live Virtual Constructive (LVC), Unmanned Aerial Systems (UAS) constructive and associated debrief/After Action Review (AAR) visualization component technologies. Additionally, Anti-Warfare Training Development (AWTD) provides for advanced virtual component fidelity improvements for Live Virtual Constructive capability (such as "Mobility" Part-Task Trainers and the Multiplex Data Bus Controller Translator Transmitter (MDBCTT)). LVC technologies will facilitate advanced, cost effective weapons and tactics training and emerging capability requirements in the Air-Sea battlespace and Naval Integrated Fire Control-Counter Air (NIFC-CA) capabilities development. ***FY 2016 Accomplishments:*** Provide continued development and prototype Spatial Disorientation training system syllabus, visual system enhancements, and SD research. Provide Office of Naval Research LVC enhancements. Complete Multiplex Data Bus Controller Translator Transmitter initial integration/ demonstrations for F/A-18E/F embedded training capability. ***FY 2017 Plans:*** Conduct training evaluation on prototype Virtual Reality Deployable Mission Rehearsal Trainer technologies. Validate distributed training technology capability to support cross-platform training for integrated warfighting	0.201 -	0.305 -	0.328 -	0.000 -	0.328 -

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 2124 / *Air Warfare Training*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
capabilities. Investigate capability of low and medium fidelity simulators to support maintenance of complex mission skills in deployed settings. ***FY 2018 Base Plans:*** Provide analytical and developmental support for emergent programs of record in LVC, acoustic simulation environments, Warfighter performance assessment, threat system enhancements, Virtual Reality (VR), and sensor/visualization modeling. Provide man-in-the-loop /Technology Readiness Level (TRL) assessments at Manned Flight Simulator (MFS), and assess Distributed Mission Readiness Trainer (DMRT) family of systems, and other mobility-focused training devices for improved fleet training, Training and Readiness (T&R) metrics, and life-cycle cost reductions. ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	2.226	1.462	1.585	0.000	1.585

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• APN/0705: *COMMON GROUND EQUIPMENT - TRAINING*	184.385	184.083	192.123	-	192.123	186.851	191.066	186.910	190.636	Continuing	Continuing

Remarks

D. Acquisition Strategy

Air Warfare Training Development (AWTD) is a 6.7 RDT&E joint technology transition program tied to Navy Aviation Simulation Master Plan (NASMP), USMC upgrades and the various platform simulation master plans with the purpose of transitioning advanced training and mission preview/rehearsal technologies. AWTD provides risk mitigation, test and evaluation, and prototype development for stand-alone, manned, un-manned, distributed, open systems and deployed training systems for the warfighter utilizing an Integrated Product Team approach and a combination of reimbursable and direct cite/cost-plus time and material (T&M) contracts.

E. Performance Metrics

Naval Air Warfare Center-Training Systems Division (NAWC-TSD): # of transitions to Fleet Platforms. For each transition, successful Technical Readiness Level (TRL) testing and device Ready for Training (RFT) to Fleet platforms. Seminal transition events are either RFT or tech-refresh Authority to Operate.

NAWC-Aircraft Division (AD): Complete TRL & compliance testing for NASMP and Information Assurance directives.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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RSC, Inc.: Government acceptance of evaluation of Small Business Innovation Research (SBIR) device testing.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	Project (Number/Name) 3093 / *TACTS/LATR Replacement*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
3093: *TACTS/LATR Replacement*	68.450	12.676	14.962	48.473	-	48.473	57.544	35.260	6.720	4.051	Continuing	Continuing
Quantity of RDT&E Articles		-	-	41	-	41	16	-	-	-		

A. Mission Description and Budget Item Justification

3093: The Tactical Combat Training System (TCTS) Increment II will provide an improved environment for air combat training utilizing a secure air-to-air and air-to-ground datalink, and will provide rangeless operation capability to Forward Deployed Naval Forces (FDNF). TCTS Inc II will provide encryption and an enhanced threat environment, as well as airborne participant instrumentation for multiple fixed and rotary wing platforms.

FY18 represents a full year of engineering, manufacturing and development (EMD) for the program, which justifies the control. The program's Preliminary Design Review (PDR) and Critical Design Review (CDR) will be completed in FY18. Both are major required Systems Engineering Technical Review (SETR) events and MDA/ASN(RD&A) knowledge points.

FY18 funding will complete tasking necessary to prepare for Engineering Development Model (EDM) fabrication to begin in 1Q FY19. In FY18, 41 test articles will be procured to include 10 Airborne Subsystems (AS), 15 Rack-mounted Subsystems (RS), 6 Ground Subsystems (GS) and 10 Remote Range Units (RRU). In FY19, 16 test articles will be procured to include 6 RS and 10 RRU. This schedule is necessary to support the MS C timeline and to meet the Fleet IOC need date of 2Q FY22 in order to address critical OPSEC concerns.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: TACTS/LATR REPLACEMENT	12.676	14.962	48.473	0.000	48.473
Articles:	-	-	-	-	-
Description: TCTS: Qualify and complete the Rangeless Pod system fielding for CVW-5 CVN installation, including the complete Integrated Logistics products and training. Define Test & Training Enabling Achitecture (TENA) compliant interface between TCTS and an Advance Display System (ADS). Develop a Rack-Mounted subsystem for use on rotary wing and transport aircraft. Continue development of the encrypted data link. Develop related training range integration.					
FY 2016 Accomplishments: Conduct Source Selection on responses to the Request For Proposal. Conduct performance, cost, and technical readiness assessment on the proposals.					
FY 2017 Plans:					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 3093 / *TACTS/LATR Replacement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Conduct MS B and Contract Award, Conduct Integrated Baseline Review to establish a Performance Measurement Baseline with the contractor. Program and engineering events will include a Systems Engineering Technical Review (SETR), Systems Requirements Review II (SRR II), Systems Functional Review (SFR), Integrated Baseline Review (IBR) and a Preliminary Design Review (PDR). ***FY 2018 Base Plans:*** FY18 represents a full year of engineering, manufacturing and development (EMD) for the program that justifies the current control. It is an increase over previous year's funding since FY17 represents only a partial year of contracted effort. FY18 funding supports Preliminary Design Review (PDR), Critical Design Review (CDR), Systems Engineering Technical Review (SETR) events and post PDR assessments with the Milestone Decision Authority (MDA), per Assistant Secretary of the Navy (Research, Development and Acquisition) ASN(RDA) requested knowledge points. This also includes Engineering Development Model (EDM) fabrication and deliveries of both participant subsystems and ground stations to support Developmental Testing (DT) testing beginning in FY19. ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	12.676	14.962	48.473	0.000	48.473

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• OPN/4204: *Weapons Range Support Equipment (WRSE)/TCTS*	0.000	4.032	3.706	-	3.706	3.876	3.884	4.081	4.147	Continuing	Continuing
• APN/0725: *Other Production Charges/Tactical Combat Training System (TCTS)*	2.455	0.860	1.463	-	1.463	1.475	0.087	22.070	22.511	Continuing	Continuing

Remarks

D. Acquisition Strategy

Tactical Combat Training System will employ an evolutionary incremental acquisition strategy. This strategy will provide for the development of a system that meets the Operational Requirements Document.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 3093 / *TACTS/LATR Replacement*

E. Performance Metrics

Rockwell Collins, Inc.: National Security Agency (NSA) approved encrypted Data Link Transceiver (DLT). Successful Engineering Development Model testing of encrypted DLT requirements with NSA.

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	Project (Number/Name) 3093 / *TACTS/LATR Replacement*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Development	C/CPIF	ROCKWELL COLLINS, INC : CEDAR RAPIDS, IA	0.000	9.144	May 2017	8.318	Mar 2017	43.921	Oct 2017	-		43.921	Continuing	Continuing	Continuing
Prior Year Prod Dev No Longer Funded in the Budget or Out Years	Various	Various : Various	10.901	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	10.901	9.144		8.318		43.921		-		43.921	-	-	-

Remarks

The FY16 contract for $9M is currently pending a Senate rescission proposed in the FY17 Defense Appropriations Act. Increase in contract cost from FY17 to FY18 reflects revised Life Cycle Cost Estimate (LCCE). See 0204571N R-2 Change Summary for detailed explanation of the cost increase.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	C/CPFF	JACOBS ENGINEERING : RIDGECREST, CA	3.971	0.000		0.000		0.000		-		0.000	0.000	3.971	3.971
Systems Engineering	WR	NAWC-WD : CHINA LAKE, CA	0.683	0.179	Dec 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWC-AD : PAX RIVER, MD	7.026	1.517	Dec 2015	2.809	Jan 2017	2.756	Nov 2017	-		2.756	Continuing	Continuing	Continuing
Logistics	WR	NAWC-AD : PAX RIVER, MD	0.000	0.279	Dec 2015	0.000		0.000		-		0.000	0.000	0.279	0.279
Prior Year Support No Longer Funded in the Budget or Out Years	Various	Various : Various	24.144	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	35.824	1.975		2.809		2.756		-		2.756	-	-	-

Remarks

Jacobs Engineering formerly Tybrin Corporation.

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	Project (Number/Name) 3093 / *TACTS/LATR Replacement*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWC-AD : PAX RIVER, MD	1.337	0.164	Dec 2015	0.588	Jan 2017	0.588	Nov 2017	-		0.588	Continuing	Continuing	Continuing
Prior Year T&E No Longer Funded in the Budget or Out Years	Various	Various : Various	3.425	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	4.762	0.164		0.588		0.588		-		0.588	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prog Mgnt Sup	WR	NAWC-AD : PAX RIVER, MD	0.811	1.388	Dec 2015	3.237	Jan 2017	1.181	Nov 2017	-		1.181	Continuing	Continuing	Continuing
Travel	Allot	NAVAIR : PAX RIVER, MD	0.093	0.005	Dec 2015	0.010	Jan 2017	0.027	Nov 2017	-		0.027	Continuing	Continuing	Continuing
Prior Year Mgmt No Longer Funded in the Budget or Out Years	Various	Various : Various	16.059	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	16.963	1.393		3.247		1.208		-		1.208	-	-	-

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	68.450	12.676		14.962		48.473		-		48.473	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 3093 / *TACTS/LATR Replacement*

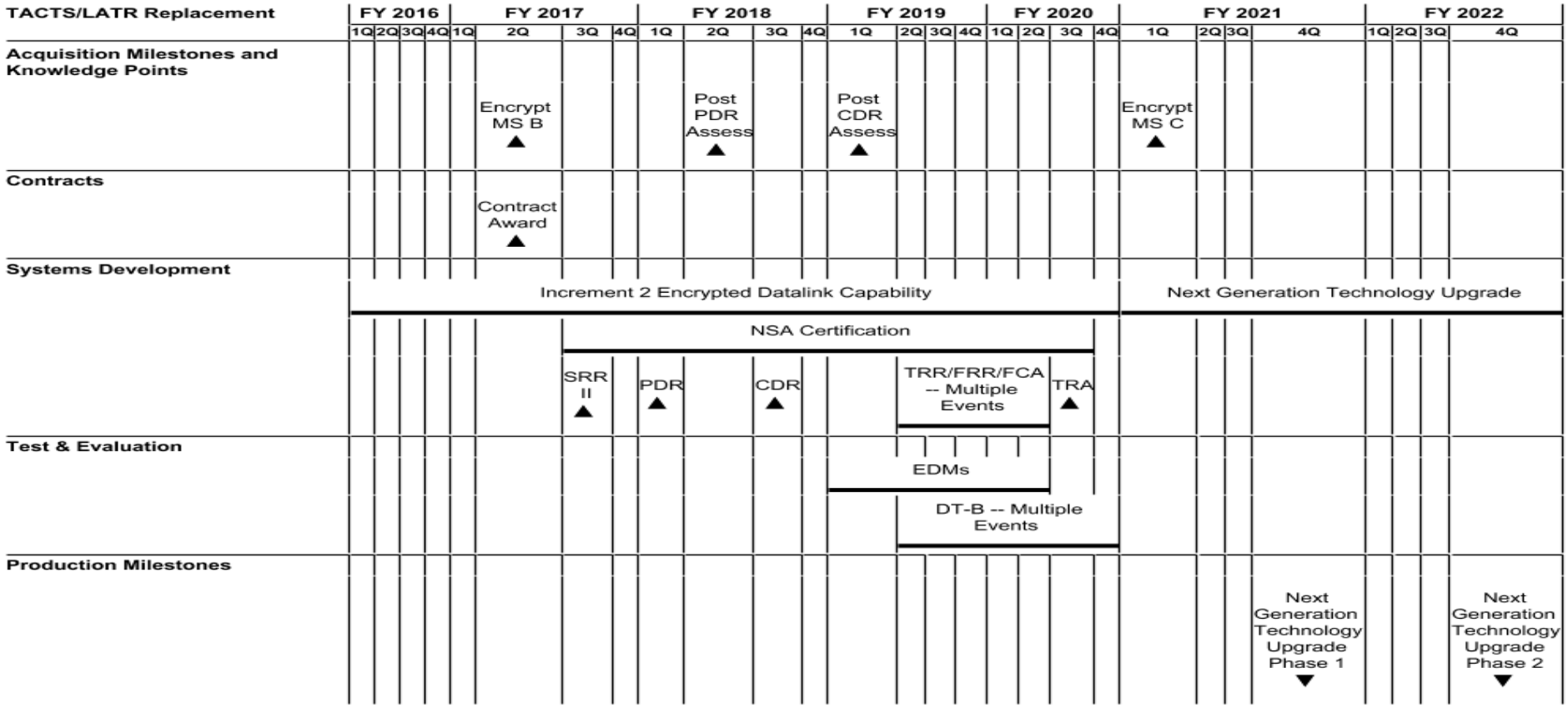

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 3093 / *TACTS/LATR Replacement*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
TACTS/LATR Replacement				
Acquisition Milestones and Knowledge Points: Encryption MS B	2	2017	2	2017
Acquisition Milestones and Knowledge Points: Post PDR Assessment	2	2018	2	2018
Acquisition Milestones and Knowledge Points: Encryption MS C	1	2021	1	2021
Acquisition Milestones and Knowledge Points: Post CDR Assessment	1	2019	1	2019
Contracts: Contract Award	2	2017	2	2017
Systems Development: Increment 2 Encrypted Datalink Capability	1	2016	4	2020
Systems Development: Next Generation Technology Upgrade	1	2021	4	2022
Systems Development: NSA Encryption Certification	3	2017	3	2020
Systems Development: System Readiness Review II	3	2017	3	2017
Systems Development: Preliminary Design Review	1	2018	1	2018
Systems Development: Critical Design Review	3	2018	3	2018
Systems Development: Test Readiness Review/ Flight Readiness Review/ Functional Configuration Audit	2	2019	2	2020
Systems Development: Technology Readiness Assessment	3	2020	3	2020
Test & Evaluation: Engineering Development Models	1	2019	2	2020
Test & Evaluation: Developmental Test - Multiple Events	2	2019	4	2020
Production Milestones: Next Generation Technology Upgrade Phase 1	4	2021	4	2021
Production Milestones: Next Generation Technology Upgrade Phase 2	4	2022	4	2022

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy										Date: May 2017		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*				Project (Number/Name) 3356 / *High Fidelity Surface Trainers*			
COST ($ in Millions)	**Prior Years**	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**Cost To Complete**	**Total Cost**
3356: *High Fidelity Surface Trainers*	16.306	4.708	6.570	1.183	-	1.183	0.000	0.000	0.000	0.000	0.000	28.767
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This line funds high fidelity Aegis Integrated Air and Missile Defense (IAMD) individual, instructor, strike group and team trainers to support all Advanced Capability Build (ACB) and below Aegis baselines, as well as the mine warfare mission. This line provides SEA 21 (PMS 339) funds for development of a High Fidelity Aegis Combined Integrated Air and Missile Defense (IAMD) and Anti-Submarine Warfare (ASW) Trainer (CIAT) to enable advanced warfare training (AWT) Phase II objectives to be accomplished ashore and to support Active and Passive Sonar Operations, Target Motion Analysis, Sonobuoy Localization, Command and Control, and execution of ASW Kill chain. Funds are provided for advanced component technology development, prototype evaluation, and technology readiness level assessment. Development of these trainers is in response to CNO Wholeness Review and COMNAVSURFOR requirements. This line also provides funds for the research and development of advanced technologies to support BMD 5.XX and Command, Control, Communication, Computer, and Intelligence (C4I) advanced technology upgrades to Aegis BMD Ashore Team Trainer at CSCS Unit Dam Neck. This line supports Surface Training Advanced Virtual Environment (STAVE) methodology by researching and developing trainers that will create an immersive and interactive learning environment and support both CNO High Velocity Learning and Ready Relevant Learning intent.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**
Title: Combined IAMD ASW Trainer (CIAT)	4.708	4.500	0.607	0.000	0.607
Articles:	-	-	-	-	-
FY 2016 Accomplishments: Developed simulations and system architecture for the High Fidelity Combined IAMD & ASW Trainer (CIAT). Researched and Developed Advanced technologies necessary to stimulate and emulate the AEGIS B/L 9 tactical system. Researched and Developed a solution to virtualize AEGIS legacy tactical code to be able to re-host the tactical software on COTS hardware. These solutions supported scenario driven watch team practice of standard operating procedures (SOPs), Tactical Techniques and Procedures (TTPs) and Pre-Planned Response (PPRs) against advanced threats in a realistic environment. Researched and Developed technologies and interfaces which will enable ASW trainers to be integrated with IAMD training system for integrated training events. Researched and Developed models to allow for Navy Integrated Fire Control-Counter Air (NIFC-CA) training.					
FY 2017 Plans: Complete development of simulations and system architecture for the High Fidelity Combined IAMD & ASW Trainer (CIAT). Research and Develop Advanced technologies necessary to stimulate and emulate the AEGIS B/L 9 tactical system. Research and Develop a solution to virtualize AEGIS legacy tactical code to be able to re-					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
host the tactical software on COTS hardware. These solutions will support scenario driven watch team practice of standard operating procedures (SOPs), Tactical Techniques and Procedures (TTPs) and Pre-Planned Response (PPRs) against advanced threats in a realistic environment. Research and Develop technologies and interfaces which will enable ASW trainers to be integrated with IAMD training system for integrated training events. Research and Develop models to allow for Navy Integrated Fire Control-Counter Air (NIFC-CA) training. ***FY 2018 Base Plans:*** Complete research and development spirals of all simulations and system architecture for the High Fidelity Combined IAMD & ASW Trainer (CIAT). Research and Develop Advanced technologies necessary to stimulate and emulate the AEGIS B/L 9 tactical system. Test and evaluate the developed solution to virtualize AEGIS legacy tactical code to be able to re-host the tactical software on COTS hardware. These solutions will support scenario driven watch team practice of standard operating procedures (SOPs), Tactical Techniques and Procedures (TTPs) and Pre-Planned Response (PPRs) against advanced threats in a realistic environment. Research and Develop technologies and interfaces which will enable ASW and Electronic Warfare (EW) trainers to be integrated with IAMD training system for integrated training events. Test and Integrate developed models to allow for Navy Integrated Fire Control-Counter Air (NIFC-CA) training. ***FY 2018 OCO Plans:*** N/A					
Title: Aegis BMD Ashore and Aegis BMD Ship Training ***Articles:*** ***FY 2016 Accomplishments:*** N/A ***FY 2017 Plans:*** Research and develop advance technologies to allow BMD 5.XX and C4I advanced technology upgrades to Aegis BMD Ashore Team Trainer at CSCS Unit Dam Neck. Upgrade serves as an enabling technology for the execution of training directed in CNSF 8820 series BMD Qualification instruction which requires watch teams to certify on the same BMD baseline as the BMD platform they are assigned. ***FY 2018 Base Plans:*** N/A ***FY 2018 OCO Plans:***	0.000 -	2.070 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 3356 / *High Fidelity Surface Trainers*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
N/A					
Title: Air Defense Strike Group Facility	0.000	0.000	0.576	0.000	0.576
Articles:	-	-	-	-	-
FY 2016 Accomplishments: N/A					
FY 2017 Plans: N/A					
FY 2018 Base Plans: Research and develop two Virtual Aegis Combat System Simulators (VACSSIM) to develop the Engineering Development Model for the Air Defense Strike Group Facility (ADSGF) shore-based air and surface simulation device. Research and develop advanced technologies to allow VACSSIM improvements in support of surface equities incorporated in Aegis B/L upgrades.					
FY 2018 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	4.708	6.570	1.183	0.000	1.183

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The software development for High Fidelity Surface Trainers is accounted for in this RDT&E line. All production kits are procured in OPN PE 0804731N BLI 5662/5664. The software development and introduction for the BMD 5.XX and C4I advanced technology upgrades to Aegis BMD Ashore Team Trainer is accounted for in this RDT&E line. These upgrades will provide an enabling technology to an existing training system.

E. Performance Metrics

NSWC Dahlgren: Approved Combined IAMD and ASW Trainer (CIAT). Successful engineering development model (EDM) introducing advanced technologies necessary to simulate/stimulate the AEGIS Combat System elements required for operators stated in AEGIS Ashore Baseline 9 Weapons Specification (WS) 21200 series.

NSWC Dahlgren: Incorporation of approved legacy Aegis baselines (7.2, 6.3) into the Virtual Aegis Combat System Simulator.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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NAWCTSD: Approved BMD 5.XX and C4I advanced technology upgrades to the Aegis BMD Ashore Team Trainer.

NSWC Carderock: Approved Combined IAMD & ASW Trainer (CIAT). Successful engineering development model introducing advanced technologies necessary to 1) simulate performance of AN/SQQ-89A(V)15 sonar system in alignment with fielding plan for initial Sonar software versions with capability to receive AN/SQQ-89A(V)15 coordinated routine modernizations and 2) replicate Combat Information Center (CIC) configuration and functionalities representative of AEGIS Baseline 9.

NUWC Newport: Approved Combined IAMD & ASW Trainer (CIAT). Develop ASW components to be integrated in the CIAT system for Technology Requirements Model (TRM) simulation of own ship and threat torpedoes, and emulations of sonar devices.