Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020	
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 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**Cost To Complete**	**Total Cost**
Total Program Element	505.934	101.451	128.673	83.956	-	83.956	51.823	35.540	32.884	30.805	Continuing	Continuing
0604: *Training Range & Instr Dev*	151.770	2.333	5.574	3.527	-	3.527	3.587	3.813	3.778	3.854	Continuing	Continuing
1427: *Surface Tactical Team Trainer (STTT)*	134.106	40.505	67.790	51.597	-	51.597	37.228	19.313	16.242	16.571	Continuing	Continuing
2124: *Air Warfare Training*	51.074	1.058	1.700	1.581	-	1.581	1.613	1.742	1.711	1.746	Continuing	Continuing
3093: *TACTS/LATR Replacement*	140.350	56.818	51.245	23.183	-	23.183	7.997	10.672	11.153	8.634	Continuing	Continuing
3356: *High Fidelity Surface Trainers*	28.634	0.737	2.364	4.068	-	4.068	1.398	0.000	0.000	0.000	0.000	37.201

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 (LATR) improvements, technology improvements for fixed and portable Anti-Submarine Warfare training ranges, and Tactical Training Range (TTR) infrastructure improvements to include: Joint Display Subsystem, Radar Acquisition Display Subsystem, Electronic Warfare server, Link 16 interface, TTR Rotary Wing Tracking System technology improvements, Radiant Mercury Cross Domain Solution and Smart Antenna technology for automated frequency deconfliction.

1427 - Surface Tactical Team Trainer (STTT) develops modifications during sustainment of Battle Force Tactical Training (BFTT) system and modernization into the Advanced Training Domain (ATD). Both BFTT and ATD are the core system that is used to integrate the weapon system elements, and combat system components to create the Total Ship Training Capability (TSTC). BFTT and ATD continue 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.

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. Supports the Navy Aviation Simulation Master Plan (NASMP) upgrade efforts and Type/Model/Series programs with advanced visual system display configurations requirements. Provides for Open Architecture (OA), and common systems interface applications. Assesses 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

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy	Date: February 2020
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*

improvements for LVC capability which includes the "Mobility" Part-Task Trainers and the Multiplex Data Bus Controller Translator Transmitter enabling technologies. 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. AWTD investigates training applications of emerging technologies such as Augmented Reality (AR), Virtual Reality (VR), and Mixed Reality (MR) Head Mounted Displays (HMD), haptic feedback devices, and cross domain solutions/ cybersecurity solutions (e.g., Blockchain technology).

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 data link, and will provide rangeless operation capability to Forward Deployed Naval Forces (FDNF). TCTS Increment II will provide encryption and an enhanced threat environment, as well as airborne participant instrumentation for multiple fixed and rotary wing platforms. Engineering Development Model (EDM) units will be developed in FY19 and FY20 and will support Engineering and Developmental Testing events thru FY21. The EDMs will be specifically utilized for testing in the following areas: Environmental Qualification, Software, High Accelerated Lifecycle, Ground System Integration, Airborne Subsystem Air Worthiness and Performance, Shipboard Ground Station, Internal Mount and Rack Mounted Subsystem (Internal Mount) Airworthiness and Performance and JSF Airworthiness and Performance.

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. Additionally, this line funds the development of the Surface Training and Readiness Management System (STRMS). This line also provides funds for research and development of updates to the Surface Navigation Maintenance Technician Training course of instruction. 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 and developing advanced technology for collecting Sailor performance data to determine measured benefit of delivered training. NOTE: In FY18, Mine Warfare Synthetic Training requirements previously captured within PE 0204571N / Project 3356 [(High Fidelity Surface Trainer)] were realigned to PE 0603502N / Project 1235 [(Mine Warfare Planning and Analysis)].

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy					Date: February 2020
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*			
B. Program Change Summary ($ in Millions)	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**
Previous President's Budget	104.903	129.873	64.931	-	64.931
Current President's Budget	101.451	128.673	83.956	-	83.956
Total Adjustments	-3.452	-1.200	19.025	-	19.025
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-1.200			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.313	0.000			
• SBIR/STTR Transfer	-3.138	0.000			
• Program Adjustments	0.000	0.000	19.125	-	19.125
• Rate/Misc Adjustments	-0.001	0.000	-0.100	-	-0.100

Change Summary Explanation

3093:
TACTS/LATR Replacement:
- Authority to Operate (ATO) updated to Phase 1 ATO and changed from 3QTR 2020 to 3QTR 2021
- Test Readiness Review / Flight Readiness Review / Functional Configuration Audit / System Verification Review changed from 1QTR 2020 - 1QTR 2022 to 2QTR 2020 - 2QTR 2023
- Developmental Test B - Multiple Events for Phases 1-3 changed from 1QTR 2020 - 4QTR 2021 to 2QTR 2020 - 1QTR 2024
- Developmental Test C - Multiple Events for Phases 1-3 changed from 2QTR 2022 - 2QTR 2023 to 3QTR 2022 - 4QTR 2025
- Next Generation Technology Upgrade-1 changed from FY 2023 to FY2024
- Next Generation Technology Upgrade-2 changed from FY 2024 to FY2025
- POD MS C updated to Phase 1 (POD) MS C
- Production Decision Internal Mount (PD IM) updated to Phase 2 (JSF IM) Production Decision
- POD IOC updated to Phase I IOC
- IM IOC updated to Phase 2 IOC
- LRIP AS/GS updated to LRIP 1
- LRIP IM updated to LRIP 2
- FRP updated to FRP 1
- PCA POD updated to Phase 1
- PCA IM updated to PCA Phase 2
- Phase 3 (IM & IRSS) added in 1QTR 2024
- Phase 3 IOC added in 1QTR 2025

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy	Date: February 2020
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*

- Phase 2 ATO added in 3QTR 2022
- Phase 3 ATO added in 1QTR 2024
- FRP 2 added in 1QTR 2024 - 1QTR 2025
- FRP 3 added in 1QTR 2025 - 4QTR 2025
- PCA Phase 3 added in 1QTR 2025
- Large Area Tracking Range (LATR) capability gaps (Phase 3) added from 1QTR FY 2021 - 1QTR 2024
- Removed Production Milestones associated with the Next Generation Technology Upgrades
- Reduced EDM quantities in FY 2019 from 41 to 26
- Reduced EDM quantities in FY 2020 from 16 to 10
- Added the purchase of 21 EDM quantities in FY21
- FY21 increase of $9.807M to address Large Area Tracking Range (LATR) capability gaps.
- FY21 increase of $9.218M to accelerate development efforts in order to accelerate TCTS II F-35 Internal Mount (IM) production.

3356:
FY19 SBIR/STTR Transfer reduction of (.019)
FY20 Congressional Directed Reduction of funding for LCS Navy Training System Plan Execution ($1.200).

1427:
FY19 Reduction by ($0.313) BTR, SBIR/STTR Transfer reduction of (1.228)

2124:
FY19 SBIR/STTR Transfer reduction of (.025)

3093:
SBIR/STTR Transfer reduction of (1.812)

0604
SBIR/STTR Transfer reduction of (.055)

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
0604: *Training Range & Instr Dev*	151.770	2.333	5.574	3.527	-	3.527	3.587	3.813	3.778	3.854	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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 (LATR) improvements, technology improvements for fixed and portable Anti-Submarine Warfare training ranges, and Tactical Training Range (TTR) infrastructure improvements to include: Joint Display Subsystem, Radar Acquisition Display Subsystem, Electronic Warfare server, Link 16 interface, TTR Rotary Wing Tracking System technology improvements, Radiant Mercury Cross Domain Solution and Smart Antenna technology for automated frequency deconfliction.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: LATR	1.099	2.877	1.833	0.000	1.833
Articles:	-	-	-	-	-
Description: Design, integrate and test modules to eliminate obsolete components in the Large Area Tracking Range (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 FY25. Complete ground system and PIP refresh sub-projects, in conjunction 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 2020 Plans: Develop and test Large Area Tracking Range (LATR) ground software 6.5 changes to incorporate Live Virtual Constructive (LVC) Technology. Continue to develop operational system improvements and solutions to reduce LATR obsolescence issues.					
FY 2021 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Develop and test Large Area Tracking Range (LATR) ground software 6.6 upgrades. Continue to develop operational system improvements and solutions to reduce LATR obsolescence issues. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The decrease of $1.044 from FY 2020 to FY 2021 represents the reduced requirements for operational system improvements and solutions for LATR obsolescence issues as the system reaches the end of its service life.					
Title: TTR	0.667	2.034	1.031	0.000	1.031
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. Develop and test Smart Antenna technology for automated frequency deconfliction. Disruptions and limitations in the Live-to-Virtual (LV) tactical radio communication segment of the Navy Continuous Training Environment (NCTE) network have interfered with the goals and objectives of Fleet Synthetic Training (FST) events. The Smart Antenna improves utilization of the frequency spectrum in the relay tower by performing calculations to predict RF interference and then avoid RF interference by assigning interfering frequency pairs to antenna pairs with greater isolation, thereby deconflicting frequencies. ***FY 2020 Plans:*** Develop and test 2020.1 upgrades to the Joint Display Subsystem (JDS), Radar Acquisition Display Subsystem (RADS), and Electronic Warfare (EW) server to remain in concert with evolving threat and tactical training requirements. Develop operational systems improvements to the Rotary Wing Tracking System. Develop and test Tactical Training Ranges (TTR) ground software changes to incorporate Live, Virtual and Constructive (LVC) technology. Integrate, test & deliver Smart Antenna deconfliction software and Technical Data Package. Demonstrate Smart Antenna technology during a LVC event. ***FY 2021 Base Plans:*** Develop and test 2021.1 upgrades to the Joint Display Subsystem (JDS), Radar Acquisition Display Subsystem (RADS), and Electronic Warfare (EW) server to remain in concert with evolving threat and tactical training requirements. Develop and test Tactical Training Ranges (TTR) ground software changes to incorporate Live, Virtual and Constructive (LVC) technology. ***FY 2021 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The decrease of $1.003 from FY 2020 to FY 2021 is due to the completion of the Smart Antenna deconfliction effort. FY 2021 represents funds required to develop and test Tactical Training Ranges (TTR) ground software changes.					
Title: Ocean Systems	0.567	0.663	0.663	0.000	0.663
Articles:	-	-	-	-	-
Description: Research, develop, and test technology improvements for fixed and portable Anti-Submarine Warfare (ASW) training ranges. ***FY 2020 Plans:*** To complete and deliver Phase 4 of the Next Generation Technology Development at various Anti-Submarine Warfare (ASW) training ranges. ***FY 2021 Base Plans:*** To complete and deliver Phase 5 of the Next Generation Technology Development at various Anti-Submarine Warfare (ASW) training ranges. ***FY 2021 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	2.333	5.574	3.527	0.000	3.527

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• OPN/4204: *Weapons Range Support Equipment (WRSE)/ LSRTU/Ocean Systems*	91.552	99.448	81.877	-	81.877	109.623	111.394	113.954	118.231	Continuing	Continuing

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
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*

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.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
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*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Development	C/CPFF	JACOBS ENG : RIDGECREST, CA	13.159	0.000		2.047	Feb 2020	1.531	Nov 2020	-		1.531	0.000	16.737	16.737
Hardware Development	WR	NUWC : NEWPORT, RI	0.455	0.228	Nov 2018	0.383	Dec 2019	0.300	Nov 2020	-		0.300	Continuing	Continuing	Continuing
Hardware Development	WR	NAWCTSD : ORLANDO, FL	0.000	0.000		1.135	Jan 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Hardware Development	C/IDIQ	FGS, LLC : LA PLATA, MD	0.000	0.040	Jul 2019	0.000		0.000		-		0.000	0.000	0.040	0.040
Software Development	C/CPFF	JACOBS ENG : RIDGECREST, CA	5.439	0.000		0.181	Feb 2020	0.165	Nov 2020	-		0.165	0.000	5.785	5.785
Software Development	WR	NAWC-AD : PAX RIVER, MD	9.035	1.018	Nov 2018	0.455	Nov 2019	0.430	Nov 2020	-		0.430	Continuing	Continuing	Continuing
Software Development	WR	NAWC-WD : CHINA LAKE, CA	0.000	0.000		0.350	Nov 2019	0.350	Nov 2020	-		0.350	Continuing	Continuing	Continuing
Prior Year Prod Dev No Longer Funded in the FYDP	Various	Various : Various	100.665	0.000		0.000		0.000		-		0.000	0.000	100.665	100.665
		Subtotal	128.753	1.286		4.551		2.776		-		2.776	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWC-AD : PAX RIVER, MD	1.742	0.080	Nov 2018	0.567	Nov 2019	0.295	Nov 2020	-		0.295	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWC-WD : CHINA LAKE, CA	0.626	0.667	Nov 2018	0.085	Nov 2019	0.085	Nov 2020	-		0.085	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC : CORONA, CA	0.985	0.000		0.121	Nov 2019	0.121	Nov 2020	-		0.121	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWC-WD : POINT MUGU, CA	0.050	0.000		0.025	Jan 2020	0.025	Nov 2020	-		0.025	Continuing	Continuing	Continuing
Systems Engineering	WR	NUWC : KEYPORT, WA	0.000	0.300	Nov 2018	0.000		0.000		-		0.000	0.000	0.300	0.300

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
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*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Support No Longer Funded in the FYDP	Various	Various : Various	10.576	0.000		0.000		0.000		-		0.000	0.000	10.576	10.576
		Subtotal	13.979	1.047		0.798		0.526		-		0.526	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year T&E No Longer Funded in the FYDP	Various	Various : Various	5.299	0.000		0.000		0.000		-		0.000	0.000	5.299	5.299
		Subtotal	5.299	0.000		0.000		0.000		-		0.000	0.000	5.299	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWC-AD : PAX RIVER, MD	0.077	0.000		0.225	Nov 2019	0.225	Nov 2020	-		0.225	Continuing	Continuing	Continuing
Prior Year Support No Longer Funded in the FYDP	Various	Various : Various	3.662	0.000		0.000		0.000		-		0.000	0.000	3.662	3.662
		Subtotal	3.739	0.000		0.225		0.225		-		0.225	Continuing	Continuing	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	151.770	2.333		5.574		3.527		-		3.527	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
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*

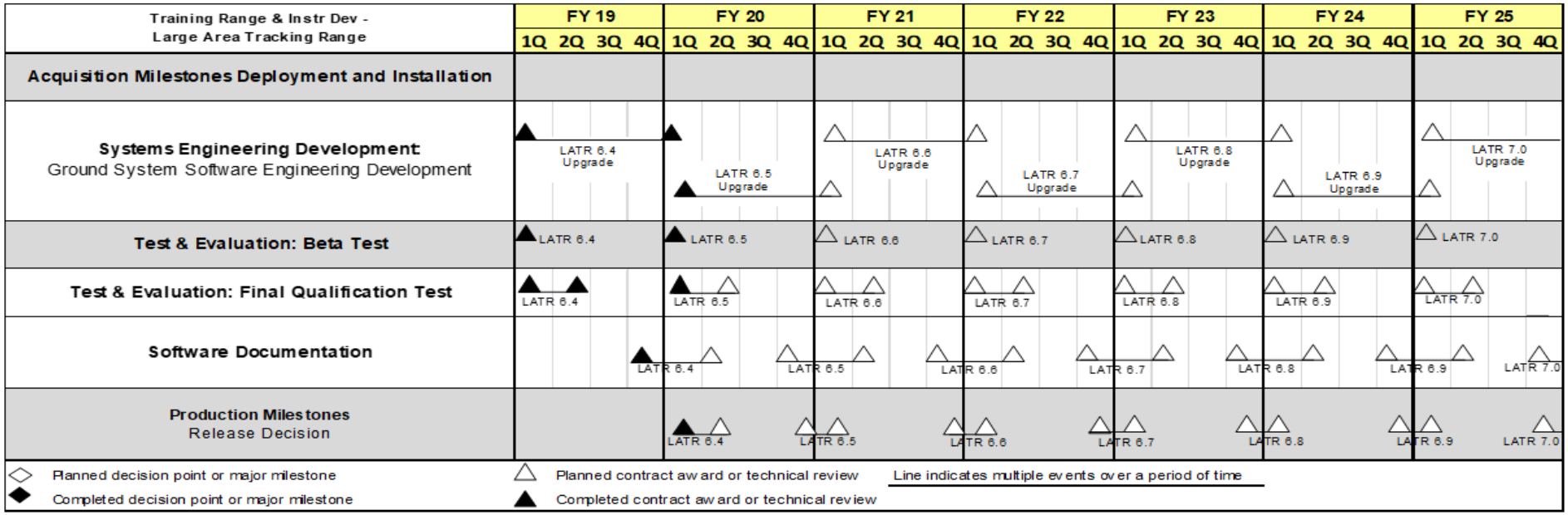

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 0604 / *Training Range & Instr Dev*

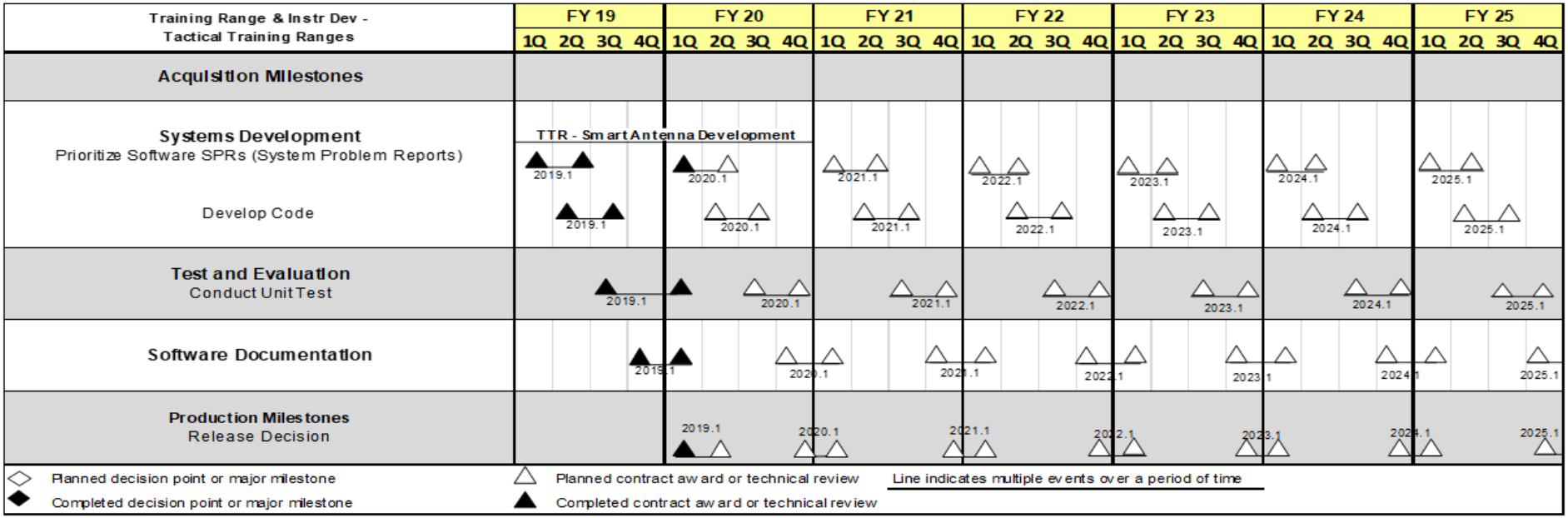

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 0604 / *Training Range & Instr Dev*

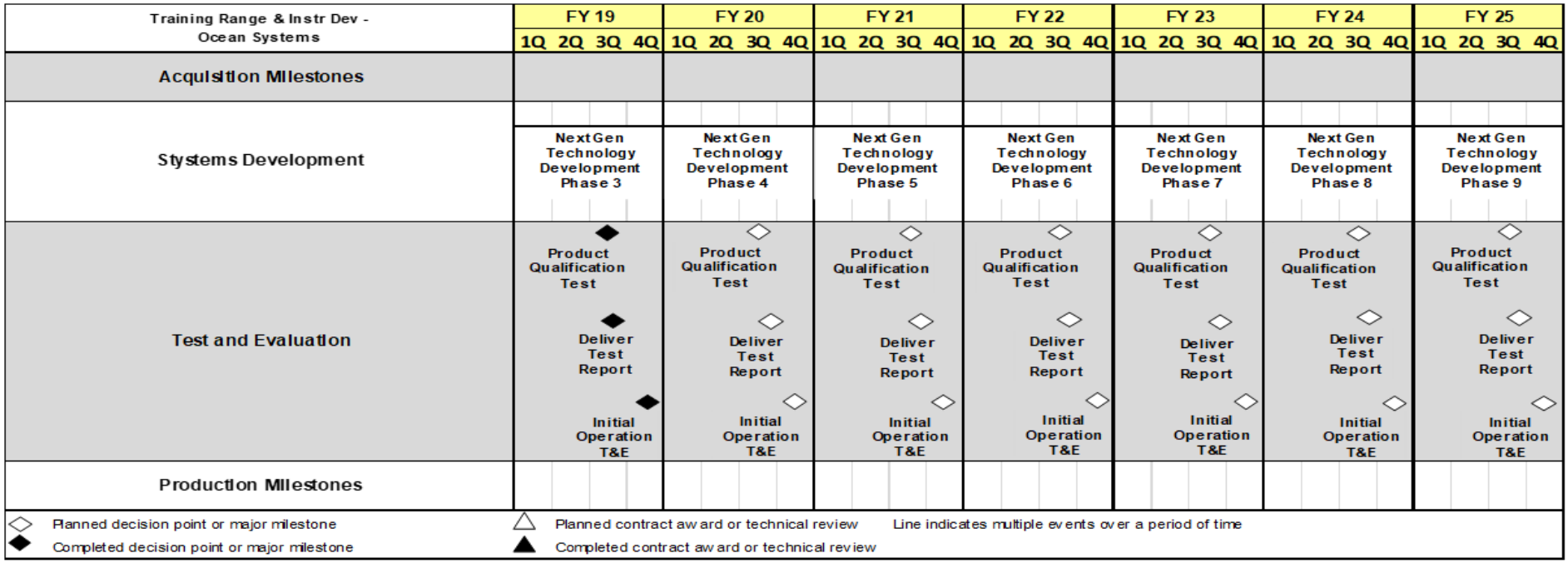

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 0604 / *Training Range & Instr Dev*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Training Range & Instr Dev - Large Area Tracking Range				
System Development: LATR - 6.4 Software Engineering Development	1	2019	1	2020
System Development: LATR - 6.5 Software Engineering Development	1	2020	1	2021
System Development: LATR - 6.6 Software Engineering Development	1	2021	1	2022
System Development: LATR - 6.7 Software Engineering Development	1	2022	1	2023
System Development: LATR - 6.8 Software Engineering Development	1	2023	1	2024
System Development: LATR - 6.9 Software Engineering Development	1	2024	1	2025
System Development: LATR - 7.0 Software Engineering Development	1	2025	4	2025
Test & Evaluation: Beta Testing: LATR - 6.4 Beta Test	1	2019	1	2019
Test & Evaluation: Beta Testing: LATR - 6.5 Beta Test	1	2020	1	2020
Test & Evaluation: Beta Testing: LATR - 6.6 Beta Test	1	2021	1	2021
Test & Evaluation: Beta Testing: LATR - 6.7 Beta Test	1	2022	1	2022
Test & Evaluation: Beta Testing: LATR - 6.8 Beta Test	1	2023	1	2023
Test & Evaluation: Beta Testing: LATR - 6.9 Beta Test	1	2024	1	2024
Test & Evaluation: Beta Testing: LATR - 7.0 Beta Test	1	2025	1	2025
Test & Evaluation: Final Qualification Test: LATR - 6.4 Final Qualification Test	1	2019	2	2019
Test & Evaluation: Final Qualification Test: LATR - 6.5 Final Qualification Test	1	2020	2	2020
Test & Evaluation: Final Qualification Test: LATR - 6.6 Final Qualification Test	1	2021	2	2021
Test & Evaluation: Final Qualification Test: LATR - 6.7 Final Qualification Test	1	2022	2	2022
Test & Evaluation: Final Qualification Test: LATR - 6.8 Final Qualification Test	1	2023	2	2023
Test & Evaluation: Final Qualification Test: LATR - 6.9 Final Qualification Test	1	2024	2	2024
Test & Evaluation: Final Qualification Test: LATR - 7.0 Final Qualification Test	1	2025	2	2025
Production Milestones: Software Documentation: LATR - 6.4	4	2019	2	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
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*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Production Milestones: Software Documentation: LATR - 6.5	4	2020	2	2021
Production Milestones: Software Documentation: LATR - 6.6	4	2021	2	2022
Production Milestones: Software Documentation: LATR - 6.7	4	2022	2	2023
Production Milestones: Software Documentation: LATR - 6.8	4	2023	2	2024
Production Milestones: Software Documentation: LATR - 6.9	4	2024	2	2025
Production Milestones: Software Documentation: LATR - 7.0	4	2025	4	2025
Production Milestones: Release Decision: LATR - 6.4	1	2020	2	2020
Production Milestones: Release Decision: LATR - 6.5	4	2020	1	2021
Production Milestones: Release Decision: LATR - 6.6	4	2021	1	2022
Production Milestones: Release Decision: LATR - 6.7	4	2022	1	2023
Production Milestones: Release Decision: LATR - 6.8	4	2023	1	2024
Production Milestones: Release Decision: LATR - 6.9	4	2024	1	2025
Production Milestones: Release Decision: LATR - 7.0	4	2025	4	2025
Training Range & Instr Dev - Tactical Training Ranges				
System Development: TTR - SMART ANTENNA DEVELOPMENT	1	2019	4	2020
System Development: Prioritize Software System Problem Reports (SPRs): TTR - 2019.1	1	2019	2	2019
System Development: Prioritize Software System Problem Reports (SPRs): TTR - 2020.1	1	2020	2	2020
System Development: Prioritize Software System Problem Reports (SPRs): TTR - 2021.1	1	2021	2	2021
System Development: Prioritize Software System Problem Reports (SPRs): TTR - 2022.1	1	2022	2	2022
System Development: Prioritize Software System Problem Reports (SPRs): TTR - 2023.1	1	2023	2	2023
System Development: Prioritize Software System Problem Reports (SPRs): TTR - 2024.1	1	2024	2	2024

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
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*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
System Development: Prioritize Software System Problem Reports (SPRs): TTR - 2025.1	1	2025	2	2025
System Development: Develop Code: TTR - 2019.1	2	2019	3	2019
System Development: Develop Code: TTR - 2020.1	2	2020	3	2020
System Development: Develop Code: TTR - 2021.1	2	2021	3	2021
System Development: Develop Code: TTR - 2022.1	2	2022	3	2022
System Development: Develop Code: TTR - 2023.1	2	2023	3	2023
System Development: Develop Code: TTR - 2024.1	2	2024	3	2024
System Development: Develop Code: TTR - 2025.1	2	2025	3	2025
Test & Evaluation: Conduct Unit Test: TTR - 2019.1	3	2019	1	2020
Test & Evaluation: Conduct Unit Test: TTR - 2020.1	3	2020	4	2020
Test & Evaluation: Conduct Unit Test: TTR - 2021.1	3	2021	4	2021
Test & Evaluation: Conduct Unit Test: TTR - 2022.1	3	2022	4	2022
Test & Evaluation: Conduct Unit Test: TTR - 2023.1	3	2023	4	2023
Test & Evaluation: Conduct Unit Test: TTR - 2024.1	3	2024	4	2024
Test & Evaluation: Conduct Unit Test: TTR - 2025.1	3	2025	4	2025
Production Milestones: Software Documentation: TTR - 2019.1	4	2019	1	2020
Production Milestones: Software Documentation: TTR - 2020.1	4	2020	1	2021
Production Milestones: Software Documentation: TTR - 2021.1	4	2021	1	2022
Production Milestones: Software Documentation: TTR - 2022.1	4	2022	1	2023
Production Milestones: Software Documentation: TTR - 2023.1	4	2023	1	2024
Production Milestones: Software Documentation: TTR - 2024.1	4	2024	1	2025
Production Milestones: Software Documentation: TTR - 2025.1	4	2025	4	2025
Production Milestones: Release Decision: TTR - 2019.1	1	2020	2	2020
Production Milestones: Release Decision: TTR - 2020.1	4	2020	1	2021
Production Milestones: Release Decision: TTR - 2021.1	4	2021	1	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
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*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Production Milestones: Release Decision: TTR - 2022.1	4	2022	1	2023
Production Milestones: Release Decision: TTR - 2023.1	4	2023	1	2024
Production Milestones: Release Decision: TTR - 2024.1	4	2024	1	2025
Production Milestones: Release Decision: TTR - 2025.1	4	2025	4	2025
Ocean Systems				
System Development: Next Gen Technology Development Phase 3	1	2019	4	2019
System Development: Next Gen Technology Development Phase 4	1	2020	4	2020
System Development: Next Gen Technology Development Phase 5	1	2021	4	2021
System Development: Next Gen Technology Development Phase 6	1	2022	4	2022
System Development: Next Gen Technology Development Phase 7	1	2023	4	2023
System Development: Next Gen Technology Development Phase 8	1	2024	4	2024
System Development: Next Gen Technology Development Phase 9	1	2025	4	2025
Test & Evaluation: Product Qualification Test: Phase 3	3	2019	3	2019
Test & Evaluation: Product Qualification Test: Phase 4	3	2020	3	2020
Test & Evaluation: Product Qualification Test: Phase 5	3	2021	3	2021
Test & Evaluation: Product Qualification Test: Phase 6	3	2022	3	2022
Test & Evaluation: Product Qualification Test: Phase 7	3	2023	3	2023
Test & Evaluation: Product Qualification Test: Phase 8	3	2024	3	2024
Test & Evaluation: Product Qualification Test: Phase 9	3	2025	3	2025
Test & Evaluation: Deliver Test Report: Phase 3	3	2019	3	2019
Test & Evaluation: Deliver Test Report: Phase 4	3	2020	3	2020
Test & Evaluation: Deliver Test Report: Phase 5	3	2021	3	2021
Test & Evaluation: Deliver Test Report: Phase 6	3	2022	3	2022
Test & Evaluation: Deliver Test Report: Phase 7	3	2023	3	2023
Test & Evaluation: Deliver Test Report: Phase 8	3	2024	3	2024
Test & Evaluation: Deliver Test Report: Phase 9	3	2025	3	2025

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
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*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Test & Evaluation: Initial Operation T&E: Phase 3	4	2019	4	2019
Test & Evaluation: Initial Operation T&E: Phase 4	4	2020	4	2020
Test & Evaluation: Initial Operation T&E: Phase 5	4	2021	4	2021
Test & Evaluation: Initial Operation T&E: Phase 6	4	2022	4	2022
Test & Evaluation: Initial Operation T&E: Phase 7	4	2023	4	2023
Test & Evaluation: Initial Operation T&E: Phase 8	4	2024	4	2024
Test & Evaluation: Initial Operation T&E: Phase 9	4	2025	4	2025

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
1427: *Surface Tactical Team Trainer (STTT)*	134.106	40.505	67.790	51.597	-	51.597	37.228	19.313	16.242	16.571	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Department's submission reflects the results of a deep dive into Fleet Training Wholeness (FTW) and how to provide a means for Strike Group Training in a contested environment, in accordance with Chief of Naval Operations guidance and Fleet Training Wholeness 2025 objectives. The analysis determined the most cost effective means to provide this training is via a combination of Live Virtual Constructive (LVC) capabilities. The department of the Navy has identified 21 LVC Capabilities that began in FY19 leveraging combat system product line architecture components, contract vehicles, warfare center subject matter experts, and engineering practices for iterative development. The deep dive identified that there is no other cost effective way train in a contested environment. The foundation for LVC has already been established. FY20 continues the iterative investment strategy to provide initial at sea LVC capability to train a Strike Groups in the environment they expected to fight in. The development, integration and testing of LVC's, along with ensuring interoperability with surface and air communities, will be accomplished across Integrated Warfare Systems (IWS), Navy Continuous Training Environment (NCTE), and the Navy's Tactical Training Network.

Surface Tactical Team Trainer (STTT) develops modifications during sustainment of Battle Force Tactical Training (BFTT) system and modernization into the Advanced Training Domain (ATD). Both BFTT and ATD are the core system that is used to integrate the weapon system elements, and combat system components to create the Total Ship Training Capability (TSTC). BFTT and ATD continue 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 Composite Training Unit Exercise (COMPTUEX) FST
at Sea integration into LVC environment. Continued Development is required to integrate new capabilities and interfaces to provide training for AEGIS and Ships Self Defense System (SSDS) combat system capability upgrades, and to address the Fleet's LVC FTW initiative. Additionally, modernization is needed to support the Department of Defense (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 Base Line (BL) 9.2.2 And Follow, and Ships Self Defense System (SSDS) BL 12.xAF. ATD is being hosted along with the AEGIS and SSDS combat system on Technical Insertion (TI)-16 common processing and display hardware. ATD is being designed to be the core of the Total Ship Training Capability, and is projected to be more reliable, simpler to use, and architected to be extensible to meet interoperability and capability enhancement challenges in the future.

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

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
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)*

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 MH-60R simulator to enable single ship basic and sustainment training, and distributed multi-ship pier-side Fleet Synthetic Training (FST) events.

Develop and Integrate Cooperative Engagement Capability (CEC) Enhanced Training (CET) to enable single ship basic and sustainment training, and distributed multi-ship pier-side FST events. CET also provide enable proficiency training of Naval Integrated Fire Control - Counter Air (NIFC-CA) capability.

Develop CEC Interim Training (CIT) capability to enable multi-ship pier-side FST events.

Develop and integrate upgrades to Battleforce Electronic Warfare Trainer (BEWT) to support soft kill training with NULKA Decoys.

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

Develop and integrate commensurate training improvements to Ships Self Defense System in support of Enhanced Sea Sparrow Missile (ESSM) and Electronic Warfare (EW) tactical improvements.

Integrate Navy Continuous Training Environment (NCTE) networking and cyber security upgrades.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Surface Tactical Team Trainer (STTT)	13.057	14.590	11.897	0.000	11.897
Articles:	-	-	-	-	-
FY 2020 Plans: Conduct Battle Force Tactical Training (BFTT) 5.1.2 element certification for installation on SSDS BL 10.x Ships. Failure to complete element certifications will prevent shipboard installation from occurring. Complete Training Domain (ATD) 1.0 system testing and integration with AEGIS BL 9.2.2 and SSDS BL 12.0. Failure to complete testing and integration efforts, will result in no training capability for AEGIS BL 9.2.2, and SSDS BL 12.0, and will increase scope and testing required for ATD 1.1. Complete development and begin testing of Advanced Training Domain (ATD 1.1) on Aegis BL 10.x and SSDS BL 12.x. Failure to complete testing and integration efforts, will result in no training capability being delivered for AEGIS BL 10.x, and SSDS BL 12.x					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Develop Engineering Change Proposal to BFTT to incorporate ATD Human Machine Interface (HMI) functionality to modernize BFTT on ships without TI-16 computing and display infrastructure. Delay of this effort would impact ability to establish a common user interface for conducting training across the fleet, and to provide rapid updates to fleet users. Begin documenting requirements and functional updates for ATD 1.2 baseline, in support of Fleet Training Wholeness efforts for underway Live, Virtual and Constructive Training. Complete development, and begin testing and integration of CIWS Simulator, Joint Tactical Terminal (JTT) Simulator, and Gun Weapons Training Capability with ATD 1.1. Delays will impact the ability to train to new capabilities being integrated into the AEGIS and SSDS combat systems. Develop the Advanced Off-board Electronic Warfare (AOEW) training capability within the Battle-force Electronic Warfare Trainer (BEWT), and Surface Electronic Warfare Team Trainer (SEWTT). ***FY 2021 Base Plans:*** Conduct Element Certification of ATD 1.0 with AEGIS BL 9.2.2 and SSDS BL 12.0 Continue integration and test of ATD 1.1 with AEGIS BL 10.0 and SSDS BL 12.x Finalize preliminary design and begin critical design of ATD 1.2 Continue test and integration of the Advanced Off-board Electronic Warfare (AOEW) training capability within the Battle-force Electronic Warfare Trainer (BEWT), and Surface Electronic Warfare Team Trainer (SEWTT). ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding decreased by $2.693M from FY20 to FY21 due to the completion of Surface Tactical Team Trainer tasks such as ATD 1.1 and CIWS Simulator development.					
Title: Fleet Training Wholeness	17.835	30.600	29.500	0.000	29.500
Articles:	-	-	-	-	-
FY 2020 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Continue developing changes to implement capability to distribute of training data over the live CEC data links to support underway Strike Group training, exercising advanced tactical capabilities during fleet synthetic training exercises. Failure to update CEC will prevent fleet from training to AEGIS and SSDS Combat Systems capability advancements and is a critical capability for FTW. Deliver and integrate shipboard radar simulation over live capability for Aegis and SSDS. Continue engineering assessments to identify changes required to AEGIS and SSDS combat systems to allow simulated contacts to be overlaid with tactical contacts. This is a critical enabler for implementing live, virtual, constructive capabilities in support of fleet synthetic training underway. Begin development of integrated combat system data collection and after-action review capability that will provide an effective means for instructors to assess operator, and crew performance during training events. Failure to develop assessment tools will impact ability to quantitatively assess operator and crew performance during training exercises. Complete synthetic tactical radio integration and testing that enables exercise coordination between ships and shore sites for fleet synthetic events. Failure to develop synthetic tactical radios will impact ability to coordinate training exercises without the need of temporarily installed communication devices, and impact ability to link ships at sea to integrated shore based trainers. ***FY 2021 Base Plans:*** Continue development, and integration of CEC Underway Training capability. Continue development, test and integration of simulation over live capabilities within the ship radar systems. Continue development of integrated combat system data collection and after-action review capability that will provide an effective means for instructors to assess operator, and crew performance during training events. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Funding decrease of $1.1M is due to Fleet training wholeness projects being completed such as NGSSR and SPQ-9B developments closing out in FY20.					
Title: DDG 1000 Wholeness/Surface Strike	9.613	14.000	2.000	0.000	2.000
Articles:	-	-	-	-	-
FY 2020 Plans: Continue development and begin integration of the DDG 1000 On-Board Trainer (OBT) within the DDG 1000 shipboard Data Center. Conduct testing to ensure interoperability with the Navy Continuous Training Environment (NCTE) to support pier-side multi-ship fleet synthetic training exercises. Capability will allow DDG 1000 class ships to participate in distributed Fleet Synthetic Training (FST) events. FST events are used for advance warfare training, and work ups to strike group deployment certification. Failure to execute plans, will prevent DDG 1000 to participate, with the other ships, other services and coalition partners in FST events. ***FY 2021 Base Plans:*** Complete development and integration of the DDG 1000 On-Board Trainer (OBT) within the DDG 1000 shipboard Data Center. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The decrease of $12M from FY20 to FY21 reflects funding required in FY21 to complete the development and integration of the DDG 1000 OBT. The funding in FY20 is significant in order to complete the testing with NCTE and participate in FST events.					
Title: CIAT TO SEA	0.000	8.600	8.200	0.000	8.200
Articles:	-	-	-	-	-
FY 2020 Plans: Conduct engineering to leverage the Combined Integrated Air and Missile Defense (IAMD) and Anti-Submarine Warfare (ASW) Trainer (CIAT) simulations for integration into the AEGIS Combat System Virtualization efforts, to provide high fidelity training capability to the fleet. ***FY 2021 Base Plans:*** Continue engineering efforts to integrate the higher fidelity Combined Integrated Air and Missile (IAMD) and Anti-Submarine Warfare (ASW) Trainer (CIAT) capabilities into the AEGIS shipboard systems. ***FY 2021 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding decreased of $.400M from FY20 to FY21 reflects the development of engineering change that is not required in FY21. The program will continue engineering efforts to integrate IAMD and CIAT capabilities into AEGIS shipboard systems.					
Accomplishments/Planned Programs Subtotals	40.505	67.790	51.597	0.000	51.597

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• RDTE/0604307N/3357: *Aegis Training Improvement Program*	6.746	10.078	8.706	-	8.706	8.081	6.190	5.313	5.420	Continuing	Continuing
• RDTE/0604755N/3358: *SSDS Training Improvement Program*	7.524	8.532	10.787	-	10.787	12.617	10.887	9.271	9.456	Continuing	Continuing
• OPN/5664/MB040/MB5IN: *Other Training Equipment (Surface BFTT/ TSTC portion only) New BLI FY17*	24.403	92.570	92.187	-	92.187	83.945	41.717	44.963	37.819	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.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
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)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Development	C/FFP	GTS : Virginia Beach, VA	16.028	0.580	Dec 2018	0.620	Dec 2019	0.600	Dec 2020	-		0.600	Continuing	Continuing	Continuing
Systems Engineering	WR	SEA02/NSWC Dam Neck/NSWC Dahlgren : NAVSEA/ Dam Neck/NSWC Dahlgren	35.271	15.079	Dec 2018	26.053	Dec 2019	27.255	Dec 2020	-		27.255	Continuing	Continuing	Continuing
		Subtotal	51.299	15.659		26.673		27.855		-		27.855	Continuing	Continuing	N/A

Remarks

Systems Engineering Increases for developing the engineering change to implement the ability for the combat systems and sensors to augment live exercises with simulation, begin engineering solutions to embed the Combined IAMD and ASW Trainer on the next AEGIS Baseline, and to develop the engineering changes to incorporate the DDG 1000 On-Board Trainer (OBT) within the ships data centers.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	WR	NSWC Dam Neck/ SEA 02 : WR/REQN	52.009	17.206	Dec 2018	33.332	Dec 2019	15.808	Dec 2020	-		15.808	Continuing	Continuing	Continuing
		Subtotal	52.009	17.206		33.332		15.808		-		15.808	Continuing	Continuing	N/A

Remarks

Software Development increases for developing combat system and sensor software changes to implement the capability to augment live exercises with simulation; develop the CIWS Simulation for integration on to SSDS and AEGIS; and develop the software modifications to integrate DDG 1000 On-board Trainer. Decrease from FY20 to FY21 is due to DDG 1000 development which will be completed in FY21.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NSWC Dam Neck/ SEA 02 : WR/REQN	17.377	6.125	Dec 2018	6.164	Dec 2019	6.204	Dec 2020	-		6.204	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
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)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Need Item Text	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
		Subtotal	17.377	6.125		6.164		6.204		-		6.204	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NSWC Dam Neck/ SEA02 : WR/REQN	13.421	1.515	Dec 2018	1.621	Dec 2019	1.730	Dec 2020	-		1.730	Continuing	Continuing	Continuing
		Subtotal	13.421	1.515		1.621		1.730		-		1.730	Continuing	Continuing	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	134.106	40.505		67.790		51.597		-		51.597	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
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)*

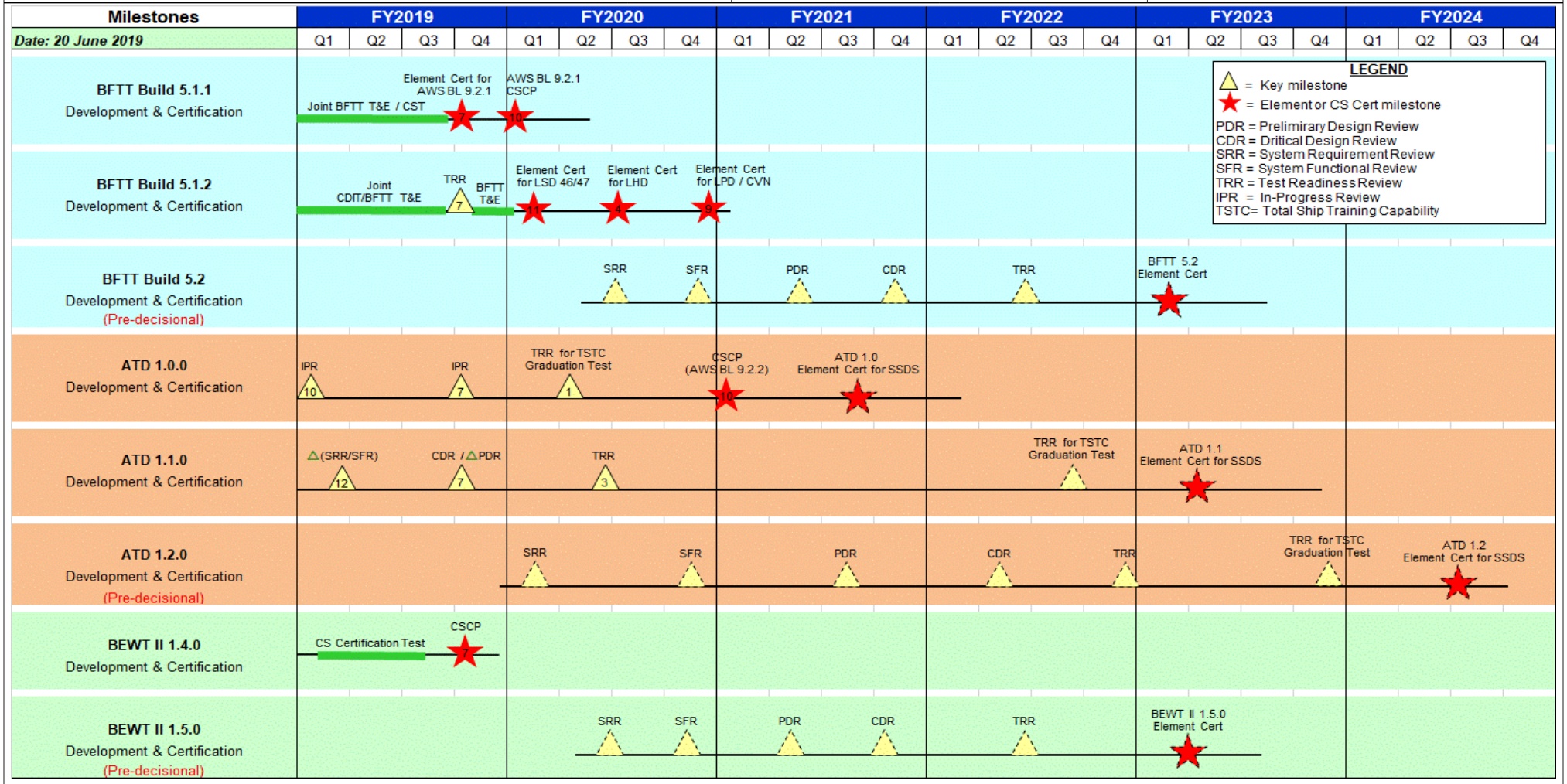

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 1427 / *Surface Tactical Team Trainer (STTT)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1427				
BFTT Build 5.1.1 Element Cert AWS 9.2.1	3	2019	3	2019
BFTT Build 5.1.2 TRR	4	2019	4	2019
BFTT Build 5.1.2 Element Cert for LSD 46	1	2020	1	2020
ATD 1.0 IPR	1	2019	1	2019
ATD 1.1 CDR	4	2019	4	2019
BEWT II 1.4.0 Element Cert CSCP	4	2019	4	2019
BFTT 5.1.1 Element Cert CSCP for AWS 9.2.1	1	2020	1	2020
BFTT BUILD 5.1.2 Element Cert for LHD 6	3	2020	3	2020
ATD 1.0 TRR for TSTC Graduation Test	2	2020	2	2020
ATD 1.1 TRR	3	2020	3	2020
ATD 1.0 Element Cert for SSDS (est.)	3	2021	3	2021
ATD 1.0 Element Cert CSCP AWS BL 9.2.2	1	2021	1	2021
ATD 1.1 TRR for TSTC Graduation test (est.)	3	2022	3	2022
ATD 1.2.0 Development & Certification SRR	1	2020	1	2020
ATD 1.2.0 SFR	4	2020	4	2020
ATD 1.2.0 PDR	3	2021	3	2021
ATD 1.2.0 CDR	2	2022	2	2022
ATD 1.2.0 TRR	3	2022	3	2022
BEWT II 1.5.0 Element Cert	2	2023	2	2023
ATD 1.1 Element Cert for SSDS	2	2023	2	2023
ATD 1.2.0 TRR for TSTC Graduation Test	4	2023	4	2023
ATD 1.2 Element Cert for SSDS	3	2024	3	2024

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
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)*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
BEWT II 1.5.0 Development & Certification SRR	2	2020	2	2020
BEWT II 1.5.0 SFR	4	2020	4	2020
BEWT II 1.5.0 PDR	2	2021	2	2021
BEWT II 1.5.0 CDR	4	2021	4	2021
BEWT II 1.5.0 TRR	2	2022	2	2022
BFTT 5.2 Element Cert	1	2023	1	2023

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
2124: *Air Warfare Training*	51.074	1.058	1.700	1.581	-	1.581	1.613	1.742	1.711	1.746	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 PMA-205 Strategic 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 capabilities 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, 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, Augmented Reality (AR), Virtual Reality (VR) and Mixed Reality (MR) technology, NAVAIR Portable Source Initiative improvements, common correlated data set technologies and heterogeneous data fusion, 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 and simulator sickness research, communications 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.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: HUMAN/INSTRUCTIONAL SYSTEMS INTEGRATION	0.618	0.960	0.841	0.000	0.841
Articles:	-	-	-	-	-
Description: Develop common After Action Review (AAR) and platform-unique post mission assessment, Intelligent Tactical SAF, and high fidelity simulator component technologies to include AR/VR/MR HMD technologies. After Action Review (AAR), and high fidelity components such as Intelligent SAF designs lower Navy Aviation Simulation Master Plan (NASMP) upgrade and simulator life-cycle costs. Integrate Voice-Capable semi-automated forces (SAF) component 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 & United States Marine Corps mission areas, intelligent instructor operator components, automated					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
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 Forces (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 2020 Plans:*** Continue fidelity improvements for synthetic entity systems (e.g. NGTS, JSAF), including virtual crewman and wingman capability and speech recognition control. Develop heterogenous data fusion capability to support intelligent, semi-automated performance measurement and debrief capability in support of Live, Virtual and Constructive (LVC) training environments. Continue development of the Post Mission Assessment for Tactical Training (PMATT) for rotary wing and multiplatform environments. Perform training effectiveness experiments on low footprint, AR/VR/MR based training devices / sims. Develop technologies to fuse and leverage metrics from disparate, heterogenous databases to support currency and training requirements analysis (e.g., CVN LSO database). ***FY 2021 Base Plans:*** Complete fidelity improvements for synthetic entity systems (e.g. NGTS, JSAF), including virtual crewman and wingman capability and speech recognition control. Develop heterogenous data fusion capability to support intelligent, semi-automated performance measurement and debrief capability in support of Live, Virtual and Constructive (LVC) training environments. Integrate expandable flight deck crew trainer with Virtual Wingman capability based on Commercial Off the Shelf (COTS) virtual and augmented reality technology. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Reduction of $0.119M from FY 2020 to FY 2021 reflects decreased contract software development efforts.					
Title: SENSORS AND ENVIRONMENT	0.240	0.240	0.240	0.000	0.240
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-					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
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 to include Augmented Reality (AR), Virtual Reality (VR), and Mixed Reality (MR). 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 2020 Plans:*** Continue investigation of collaborative environmental database for time-critical terrain updates for deployable mission rehearsal trainers. Develop AR/VR/MR Head Mounted Display (HMD) to provide near human visual acuity. Develop haptic feedback capability to support AR/VR/MR interaction. Develop Near Eye Display (NED) Metrology system for verifying the performance of Virtual and Augmented Reality goggle displays. Develop and test metrics and procedures for equating the performance of virtual and augmented reality display systems to legacy Navy Aviation Simulation Master Plan (NASMP) display systems. Continue development of tests and metrics to evaluate performance and utility of Mixed Reality training devices (i.e., HMD that integrates virtual world with real world). ***FY 2021 Base Plans:*** Complete Collaborative Database Rapid Terrain Generation Phase 1 which delivers enhanced terrain recognition capability. Develop AR/VR/MR Head Mounted Display (HMD) to provide near human visual acuity. Develop haptic feedback capability to support AR/VR/MR interaction. Develop and test metrics and procedures for equating the performance of virtual and augmented reality display systems to legacy Navy Aviation Simulation Master Plan (NASMP) display systems. Continue development of tests and metrics to evaluate performance and utility of Mixed Reality training devices (i.e., HMD that integrates virtual world with real world). ***FY 2021 OCO Plans:*** N/A					
Title: LIVE VIRTUAL CONSTRUCTIVE (LVC), AND VISUALS	0.200	0.500	0.500	0.000	0.500
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
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. 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, Air 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 2020 Plans:*** Continue analytical and developmental support for emergent programs of record in Live, Virtual and Constructive (LVC), integrated warfare, acoustic simulation environments, warfighter performance assessment, threat system enhancements, and sensor/ visualization modeling. Develop integrated expandable flight deck crew trainer based on Commercial Off the Shelf (COTS) virtual and augmented reality technology. Develop prototype virtual reality Landing Signal Officer (LSO) Station for the expandable flight deck crew trainer. Develop cross domain solutions to support LVC, integrated warfare, and distributed mission training. Develop metrics for cross platform NIFC-CA and integrated warfighting capability. ***FY 2021 Base Plans:*** Continue analytical and developmental support for emergent programs of record in Live, Virtual and Constructive (LVC), cross domain solution, integrated warfare, acoustic simulation environments, warfighter performance assessment, threat system enhancements, and sensor/ visualization modeling. Deliver Flight Deck Training Expansion Pack incorporating Signal Officer (LSO) training capability. ***FY 2021 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	1.058	1.700	1.581	0.000	1.581

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 2124 / *Air Warfare Training*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• APN/0705:: *COMMON GROUND EQUIPMENT - TRAINING*	179.652	251.078	314.364	-	314.364	268.092	283.460	229.895	253.219	Continuing	Continuing

Remarks

D. Acquisition Strategy

Air Warfare Training Development (AWTD) is a BA 07 RDT&E joint technology transition program tied to the PMA-205 Strategic Plan, Navy Aviation Simulation Master Plan (NASMP), United States Marine Corps 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.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	Project (Number/Name) 2124 / *Air Warfare Training*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	C/CPFF	Bohemia Interactive : ORLANDO, FL	0.772	0.000		0.277	Mar 2020	0.220	Mar 2021	-		0.220	0.000	1.269	1.269
Software Development	C/CPFF	Aptima : WOBURN, MA	0.424	0.000		0.232	Mar 2020	0.200	Mar 2021	-		0.200	0.000	0.856	0.856
Software Development	WR	NAWCTSD : ORLANDO, FL	24.908	0.894	Nov 2018	0.550	Nov 2019	0.520	Nov 2020	-		0.520	Continuing	Continuing	Continuing
Prior Year Prod Dev No Longer Funded in the Budget or Out Years	Various	Various : Various	10.692	0.000		0.000		0.000		-		0.000	0.000	10.692	10.692
		Subtotal	36.796	0.894		1.059		0.940		-		0.940	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCAD : PATUXENT RIVER, MD	0.068	0.000		0.120	Nov 2019	0.120	Nov 2020	-		0.120	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCTSD : ORLANDO, FL	0.020	0.000		0.150	Nov 2019	0.150	Nov 2020	-		0.150	Continuing	Continuing	Continuing
Prior Year Support No Longer Funded in the Budget or Out Years	Various	Various : Various	3.874	0.000		0.000		0.000		-		0.000	0.000	3.874	3.874
		Subtotal	3.962	0.000		0.270		0.270		-		0.270	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWC AD : PAX RIVER, MD	7.588	0.000		0.060	Nov 2019	0.060	Nov 2020	-		0.060	Continuing	Continuing	Continuing
		Subtotal	7.588	0.000		0.060		0.060		-		0.060	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	Project (Number/Name) 2124 / *Air Warfare Training*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	Precise : LEXINGTON PARK, MD	0.547	0.149	Feb 2019	0.124	Feb 2020	0.124	Feb 2021	-		0.124	0.000	0.944	0.944
Travel	Allot	NAVAIR : PAX RIVER, MD	0.555	0.015	Nov 2018	0.010	Nov 2019	0.010	Nov 2020	-		0.010	Continuing	Continuing	Continuing
Program Management Support	WR	NAWCTSD : ORLANDO, FL	0.089	0.000		0.177	Nov 2019	0.177	Nov 2020	-		0.177	Continuing	Continuing	Continuing
Prior year Mgmt Sup no longer funded in the FYDP	Various	Various : Various	1.537	0.000		0.000		0.000		-		0.000	0.000	1.537	1.537
		Subtotal	2.728	0.164		0.311		0.311		-		0.311	Continuing	Continuing	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	51.074	1.058		1.700		1.581		-		1.581	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 2124 / *Air Warfare Training*

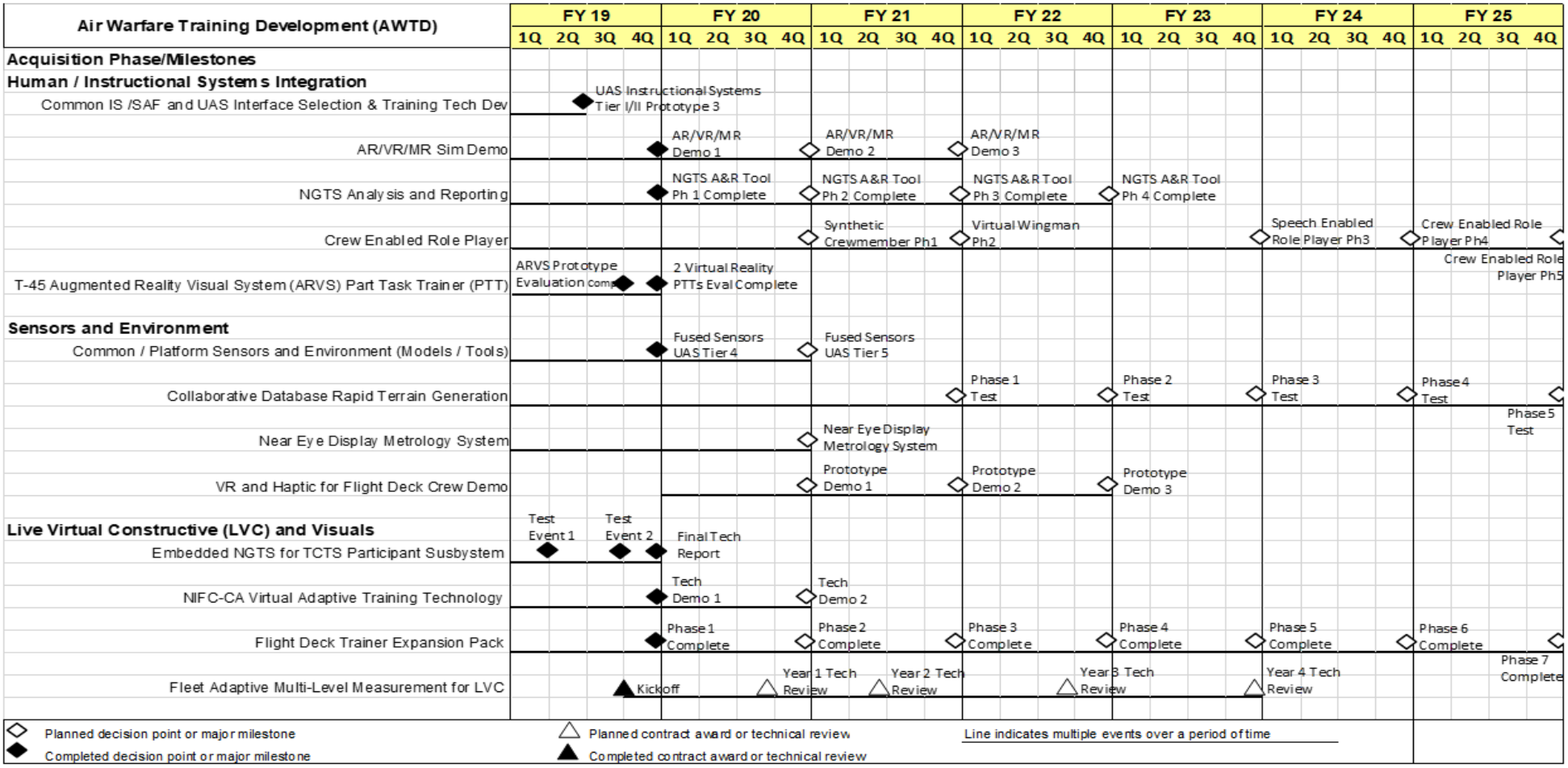

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 2124 / *Air Warfare Training*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Human/Instructional Systems Integration				
Systems Development: Common Instruction Systems/SAF and Unmanned Aerial Systems Interface Selection and Training Tech Dev	1	2019	2	2019
Systems Development: Augmented Reality/ Virtual Reality/ Mixed Reality Sim Demo	1	2019	4	2021
Systems Development: NGTS Analysis and Reporting	1	2019	4	2022
Systems Development: Crew Enabled Role Player	1	2019	4	2025
Systems Development: T-45 Augmented Reality Visual System (ARVS) Part Task Trainer (PTT)	1	2019	4	2019
Production Milestones: AR/VR/MR Sim Demo 1	4	2019	4	2019
Production Milestones: AR/VR/MR Sim Demo 2	4	2020	4	2020
Production Milestones: AR/VR/MR Sim Demo 3	4	2021	4	2021
Production Milestones: UAS INSTR. SYS. Tier I/II 3	2	2019	2	2019
Production Milestones: NGTS Analysis and Reporting - Phase I	4	2019	4	2019
Production Milestones: Crew Enabled Role Player - Synthetic Crew Member	4	2020	4	2020
Production Milestones: NGTS Analysis and Reporting - Phase 2	4	2020	4	2020
Production Milestones: Crew Enabled Role Player - Virtual Wingman	4	2021	4	2021
Production Milestones: NGTS Analysis and Reporting - Phase 3	4	2021	4	2021
Production Milestones: NGTS Analysis and Reporting - Phase 4	4	2022	4	2022
Production Milestones: Crew Enabled Role Player - Speech Enabled Synthetic Role Player	4	2023	4	2023
Production Milestones: T-45 Augmented Reality Visual System (ARVS) Prototype Evaluation Complete	3	2019	3	2019
Production Milestones: T-45 Virtual Reality (VR) Part Task Trainer (PTT) Eval Complete	4	2019	4	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 2124 / *Air Warfare Training*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Production Milestones: Crew Enabled Role Player - Phase IV	4	2024	4	2024
Production Milestones: Crew Enabled Role Player - Phase V	4	2025	4	2025
Sensors and Environment				
Systems Development: Common/Platform Sensors and Environment (Models/Tools)	1	2019	4	2020
Systems Development: Collaborative Database Rapid Terrain Generation	1	2019	4	2025
Systems Development: Near Eye Display Metrology System	1	2019	4	2020
Systems Development: VR and Haptic for Flight Deck Crew Demo	1	2020	4	2022
Production Milestones: FUSED SENSORS UAS/Tier 4	4	2019	4	2019
Production Milestones: FUSED SENSORS UAS/Tier 5	4	2020	4	2020
Production Milestones: Near Eye Display Metrology System	4	2020	4	2020
Production Milestones: VR and Haptic for Flight Deck Crew Demo	4	2020	4	2020
Production Milestones: VR and Haptic for Flight Deck Crew Demo 2	4	2021	4	2021
Production Milestones: VR and Haptic for Flight Deck Crew Demo 3	4	2022	4	2022
Production Milestones: Collaborative Database Rapid Terrain Generation Phase I	4	2021	4	2021
Production Milestones: Collaborative Database Rapid Terrain Generation Phase II	4	2022	4	2022
Production Milestones: Collaborative Database Rapid Terrain Generation Phase III	4	2023	4	2023
Production Milestones: Collaborative Database Rapid Terrain Generation Phase IV	4	2024	4	2024
Production Milestones: Collaborative Database Rapid Terrain Generation Phase V	4	2025	4	2025
Live Virtual Constructive (LVC), and Visuals				
Systems Development: Embedded NGTS for TCTS Participant Susbystem	1	2019	4	2019
Systems Development: NIFC-CA Virtual Adaptive Training Technology	1	2019	4	2020
Systems Development: Flight Deck Trainer Expansion Pack	1	2019	4	2025
Systems Development: Fleet Adaptive Multi-Level Measurement for LVC	4	2019	4	2023
Production Milestones: Embedded NGTS for TCTS Participant Subsystem	1	2019	1	2019
Production Milestones: Embedded NGTS for TCTS Participant Subsystem 2	3	2019	3	2019
Production Milestones: NIFC-CA Adaptive Training Tech 1	4	2019	4	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 2124 / *Air Warfare Training*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Production Milestones: NIFC-CA Adaptive Training Tech 2	4	2020	4	2020
Production Milestones: Flight Deck Training Expansion Pack - Phase 1	4	2019	4	2019
Production Milestones: Flight Deck Training Expansion Pack - Phase 2	4	2020	4	2020
Production Milestones: Flight Deck Training Expansion Pack - Phase 3	4	2021	4	2021
Production Milestones: Flight Deck Training Expansion Pack - Phase 4	4	2022	4	2022
Production Milestones: Flight Deck Training Expansion Pack - Phase 5	4	2023	4	2023
Production Milestones: Flight Deck Training Expansion Pack - Phase 6	4	2024	4	2024
Production Milestones: Flight Deck Training Expansion Pack - Phase 7	4	2025	4	2025
Production Milestones: Fleet Adaptive Multi-Level Measurement for LVC 1	3	2019	3	2019
Production Milestones: Fleet Adaptive Multi-Level Measurement for LVC 2	3	2020	3	2020
Production Milestones: Fleet Adaptive Multi-Level Measurement for LVC 3	2	2021	2	2021
Production Milestones: Fleet Adaptive Multi-Level Measurement for LVC 4	3	2022	3	2022
Production Milestones: Fleet Adaptive Multi-Level Measurement for LVC 5	4	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
3093: *TACTS/LATR Replacement*	140.350	56.818	51.245	23.183	-	23.183	7.997	10.672	11.153	8.634	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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 data link, and will provide rangeless operation capability to Forward Deployed Naval Forces (FDNF). TCTS Increment II will provide encryption and an enhanced threat environment, as well as airborne participant instrumentation for multiple fixed and rotary wing platforms. Engineering Development Model (EDM) units are being developed in FY19 through FY21 and will support Engineering and Developmental Testing events through FY24. The EDMs will be specifically utilized for testing in the following areas: Environmental Qualification, Software, High Accelerated Lifecycle, Ground System Integration, Airborne Subsystem Air Worthiness and Performance, Shipboard Ground Station, Internal Mount and Rack Mounted Subsystem (Internal Mount) Airworthiness and Performance and JSF Airworthiness and Performance.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: TACTS/LATR REPLACEMENT	56.818	51.245	23.183	0.000	23.183
Articles:	26	10	21	-	21
Description: TCTS: Qualify and complete the On-Range and Rangeless Pod system fielding for all USN Tactical Training Ranges and Carrier Air Wing Five (CVW-5) CVN installation, including the complete Integrated Logistics products and training. Define Test & Training Enabling Architecture (TENA) compliant interface between TCTS and an Advanced 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 2020 Plans: FY20 will include Test Readiness Review (TRR) and a Flight Readiness Review (FRR). These reviews will ensure readiness to start contractor system testing and follow-on government subsystem testing (Developmental Test-B). FY20 will continue steps toward completion of the National Security Agency (NSA) Certification.					
FY 2021 Base Plans: FY21 will continue Developmental Test-B. Systems Engineering Technical Review (SETR) events will be conducted, including a System Verification Review (SVR), Production Assessment Review (PAR), and Functional Configuration Audit (FCA). Research and development to address Large Area Tracking Range (LATR) capability gaps will begin in FY21. National Security Agency (NSA) Certification will continue in FY21 and will include the completion of System Authority to Operate (ATO) for the Pods. Milestone C for the Pods					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
will be accomplished in FY21 and Low-Rate Initial Production (LRIP) will begin, while development of the other system form factors continue. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The decrease of $28.062 from FY2020 to FY2021 in TCTS Increment II is due to a planned Milestone C in FY21. The program will move into the production phase of acquisition life cycle where Low-Rate Initial Production (LRIP) will begin. The funding for production efforts are tied to OPN/4204: Weapons Range Support Equipment (WRSE) and APN/0725: Other Production Charges/Tactical Combat Training System (TCTS). Development for additional Participant Subsystems form factors will continue.					
Accomplishments/Planned Programs Subtotals	56.818	51.245	23.183	0.000	23.183

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• OPN/4204: *Weapons Range Support Equipment (WRSE)*	91.552	99.448	81.877	-	81.877	109.623	111.394	113.954	118.231	Continuing	Continuing
• APN/0725: *Other Production Charges/Tactical Combat Training System (TCTS)*	1.444	0.000	21.194	-	21.194	21.602	22.054	22.498	22.948	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-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
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 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Development	C/CPIF	COLLINS AEROSPACE : CEDAR RAPIDS, IA	60.314	47.750	Oct 2018	40.368	Oct 2019	17.810	Oct 2020	-		17.810	0.000	166.242	166.242
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	0.000	10.901	-
		Subtotal	71.215	47.750		40.368		17.810		-		17.810	0.000	177.143	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWC-AD : PAX RIVER, MD	11.033	3.310	Nov 2018	4.565	Nov 2019	2.282	Nov 2020	-		2.282	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	JACOBS ENG : Ridgecrest, CA	0.000	0.700	Dec 2018	0.906	Mar 2020	0.500	Nov 2020	-		0.500	0.000	2.106	2.106
Systems Engineering	WR	SPAWAR : NORTH CHARLESTON, SC	0.113	0.030	Nov 2018	0.438	Jan 2020	0.073	Nov 2020	-		0.073	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	Precise : LEXINGTON PARK, MD	0.239	0.089	Nov 2018	0.100	Dec 2019	0.050	Nov 2020	-		0.050	0.000	0.478	0.478
Systems Engineering	WR	SPAWAR : SAN DIEGO, CA	0.000	0.406	Nov 2018	0.000		0.000		-		0.000	0.000	0.406	0.406
Logistics	WR	NAWC-AD : PAX RIVER, MD	1.004	0.897	Nov 2018	0.880	Nov 2019	0.440	Nov 2020	-		0.440	Continuing	Continuing	Continuing
Logistics Sup	C/CPFF	Synectic Solutions, Inc. : LEXINGTON PARK, MD	0.332	0.173	Jun 2019	0.176	Aug 2020	0.090	Feb 2021	-		0.090	0.000	0.771	0.771
Logistics	WR	FRC SW : San Diego, CA	0.000	0.059	Apr 2019	0.118	Nov 2019	0.059	Nov 2020	-		0.059	Continuing	Continuing	Continuing
Prior Year Support No Longer Funded in the Budget or Out Years	Various	Various : Various	29.146	0.000		0.000		0.000		-		0.000	0.000	29.146	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	Project (Number/Name) 3093 / *TACTS/LATR Replacement*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	41.867	5.664		7.183		3.494		-		3.494	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWC-AD : PAX RIVER, MD	2.210	0.890	Nov 2018	1.197	Nov 2019	0.460	Nov 2020	-		0.460	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	AMRDEC : REDSTONE ARSENAL, AL	0.002	0.014	Nov 2018	0.008	Oct 2019	0.000		-		0.000	0.000	0.024	0.024
Developmental Test & Evaluation	WR	GSA : Atlanta, GA	0.048	0.401	Jan 2019	0.151	Nov 2019	0.000		-		0.000	0.000	0.600	0.600
Developmental Test & Evaluation	WR	NAWC-WD : China Lake, MD	0.000	0.010	Jun 2019	0.000		0.000		-		0.000	0.000	0.010	0.010
Developmental Test & Evaluation	WR	NSA : Fort Meade, MD	0.000	0.007	Jun 2019	0.500	Nov 2019	0.500	Nov 2020	-		0.500	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	0.000	3.425	-
		Subtotal	5.685	1.322		1.856		0.960		-		0.960	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prog Mgnt Sup	WR	NAWC-AD : PAX RIVER, MD	5.208	1.784	Nov 2018	1.656	Nov 2019	0.828	Nov 2020	-		0.828	Continuing	Continuing	Continuing
Travel	Allot	NAVAIR : PAX RIVER, MD	0.109	0.018	Oct 2018	0.030	Oct 2019	0.015	Oct 2020	-		0.015	Continuing	Continuing	Continuing
Prog Mgnt Sup	C/CPFF	Precise : LEXINGTON PARK, MD	0.207	0.280	Feb 2019	0.152	Feb 2020	0.076	Feb 2021	-		0.076	0.000	0.715	0.715

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	Project (Number/Name) 3093 / *TACTS/LATR Replacement*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
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	0.000	16.059	-
		Subtotal	21.583	2.082		1.838		0.919		-		0.919	Continuing	Continuing	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	140.350	56.818		51.245		23.183		-		23.183	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 3093 / *TACTS/LATR Replacement*

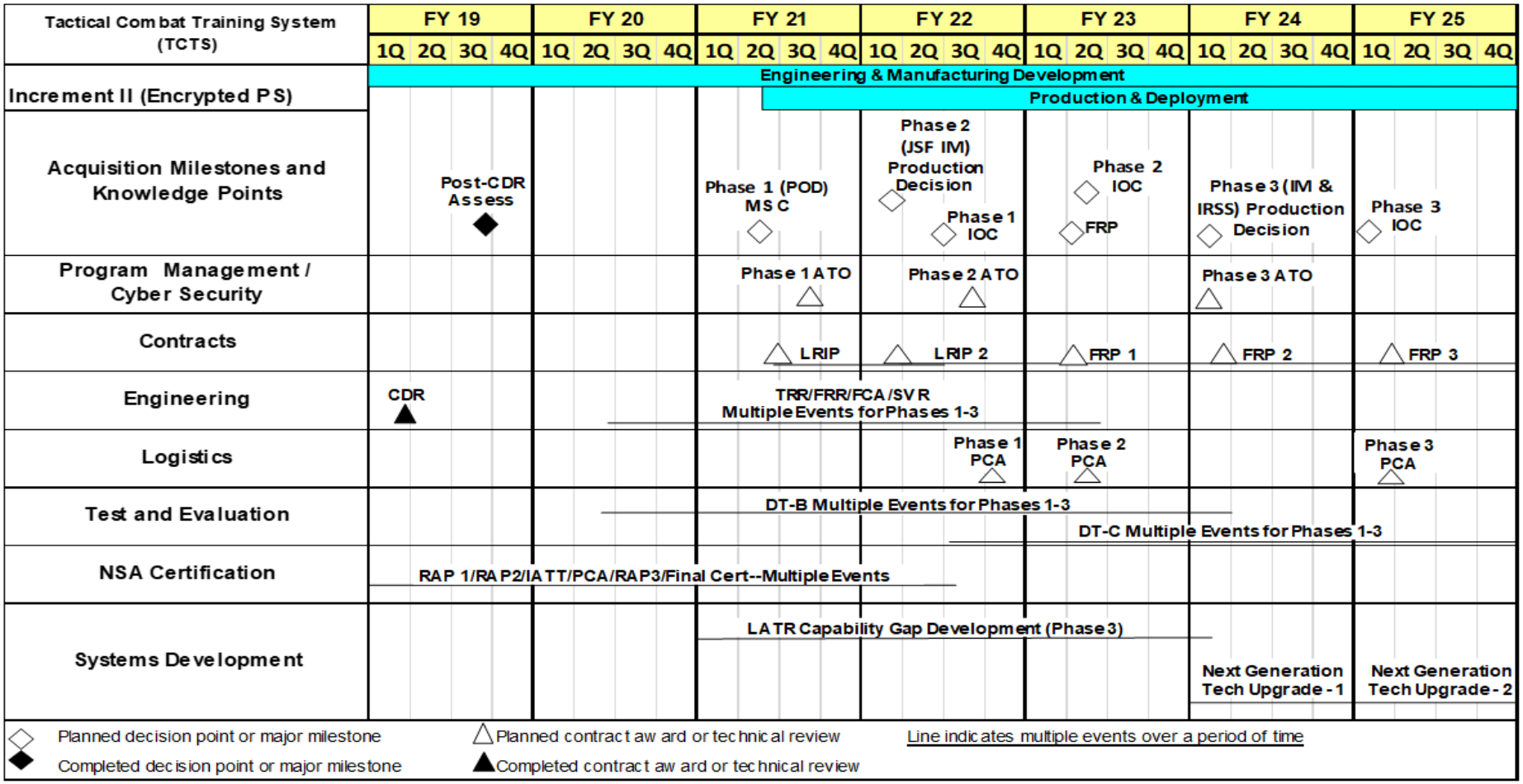

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 3093 / *TACTS/LATR Replacement*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
TACTS/LATR Replacement				
Acquisition Milestones and Knowledge Points: Post CDR Assessment	3	2019	3	2019
Acquisition Milestones and Knowledge Points: Phase 1 (POD) MS C	2	2021	2	2021
Acquisition Milestones and Knowledge Points: Phase 2 (JSF Internal Mount) Production Decision	1	2022	1	2022
Acquisition Milestones and Knowledge Points: Phase 1 (POD) IOC	2	2022	2	2022
Acquisition Milestones and Knowledge Points: FRP	2	2023	2	2023
Acquisition Milestones and Knowledge Points: Phase 2 (JSF Internal Mount) IOC	2	2023	2	2023
Acquisition Milestones and Knowledge Points: Phase 3 (IM & IRSS) Production Decision	1	2024	1	2024
Acquisition Milestones and Knowledge Points: Phase 3 (IM & IRSS) IOC	1	2025	1	2025
Program Management/Cyber Security: Phase 1 (POD) Authority to Operate	3	2021	3	2021
Program Management/Cyber Security: Phase 2 (JSF Internal Mount) Authority to Operate	3	2022	3	2022
Program Management/Cyber Security: Phase 3 (IM & IRSS) Authority to Operate	1	2024	1	2024
Contracts: LRIP 1	2	2021	2	2022
Contracts: LRIP 2	1	2022	1	2023
Contracts: Full Rate Production 1	2	2023	2	2024
Contracts: Full Rate Production 2	1	2024	1	2025
Contracts: Full Rate Production 3	1	2025	4	2025
Engineering: Critical Design Review	1	2019	1	2019
Engineering: Test Readiness Review / Flight Readiness Review / Functional Configuration Audit / System Verification Review	2	2020	2	2023
Logistics: Phase 1 (POD) Physical Configuration Audit	4	2022	4	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 3093 / *TACTS/LATR Replacement*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Logistics: Phase 2 (JSF Internal Mount) Physical Configuration Audit	2	2023	2	2023
Logistics: Phase 3 (IM & IRSS) Physical Configuration Audit	1	2025	1	2025
Test & Evaluation: Developmental Test B - Multiple Events for Phases 1-3	2	2020	1	2024
Test & Evaluation: Developmental Test C - Multiple Events for Phases 1-3	3	2022	4	2025
NSA Certification: RAP 1/RAP 2/IATT/PCA/RAP 3/Final Cert	1	2019	3	2022
Systems Development: Large Area Tracking Range (LATR) Capability Gap Development (Phase 3)	1	2021	1	2024
Systems Development: Next Generation Technology Upgrade Phase 1	1	2024	4	2024
Systems Development: Next Generation Technology Upgrade Phase 2	1	2025	4	2025

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
3356: *High Fidelity Surface Trainers*	28.634	0.737	2.364	4.068	-	4.068	1.398	0.000	0.000	0.000	0.000	37.201
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. This line provides funds for development of a High Fidelity Aegis Combined Integrated Air and Missile Defense (IAMD) and Anti-Submarine Warfare (ASW)
Trainer (CIAT) to enable tactics, techniques, and procedure development and allow advanced warfare training (AWT) Phase II and Surface Warfare Advanced Tactical training 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 Department of the Navy requirements. This line also provides funds for research and development of updates to the Surface Navigation Maintenance Technician Training course of instruction. 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. It includes development of the Surface Training and Readiness Management System (STRMS) required for the identification of quantifiable operator competencies for each mission area and associated tracking system development and testing.

NOTE: In FY18, Mine Warfare Synthetic Training requirements previously captured within PE 0204571N / Proj 3356 (High Fidelity Surface Trainer) were realigned to PE 0603502N Surface & Shallow Water MCM / Proj 1235 (Mine Warfare Planning and Analysis).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Combined IAMD ASW Trainer (CIAT)	0.737	0.200	0.202	0.000	0.202
Articles:	-	-	-	-	-
FY 2020 Plans: Test and integrate developed models and capabilities prior to system installation. Research and develop models and capabilities to integrate into the system which would keep pace with emergent tactical capabilities in the Fleet such as Electronic Warfare and NIFC-CA					
FY 2021 Base Plans: Complete research and development for supporting Aegis baselines within CIAT architecture. Evaluate computing equipment					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
alternatives for CIAT V2 configuration. Evaluate Operating Environment (OE) network configuration updates required for CIAT V2 configuration. Perform critical experiments as needed for CIAT V2. Update appropriate Subsystem Requirements Documents for CIAT V2. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The increase from FY 2020 to FY 2021 (+$0.005) is in line with inflation associated with the RDT&EN appropriation.					
Title: Air Defense Strike Group Facility	0.000	1.764	1.266	0.000	1.266
Articles:	-	-	-	-	-
FY 2020 Plans: Research and develop VACSSim simulators and CEC Engagement Processor (CEP) Simulators to integrate within the Integrated Training Facility (ITF) Engineering Development Model (EDM). Additional functionality to VACSSim will be researched and developed to include additional AEGIS Baselines and submodes. These simulators will integrate with NAVAIR simulators (E2D, F35) to create an overarching simulation environment that will be the only way to train Carrier Strike Groups on high-end threats and capabilities related to Naval Integrated Fire Control Counter Air (NIFC-CA). The ITF capabilities are a requirement of the NIFC-CA Flag Steering Committee and part of the CNO-directed Fleet Training Wholeness effort. ***FY 2021 Base Plans:*** Continue to research and develop VACSSim simulators and CEP Simulators to integrate within the ITF. This will include Baseline 7.1 and Ballistic Missile Defense 4.0 Development. The ITF capabilities are a requirement of the Naval Integrated Fire Control Counter Air (NIFC-CA) Flag Steering Committee and part of the CNO-directed Fleet Training Wholeness effort. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
The FY21 decrease in the ADSGF funding requirement is due to the fact that High Fidelity Surface Trainer ADSGF (ITF) will complete system integration testing and evaluation required to achieve Initial Operating Capability (IOC) in Q4FY21.					
Title: Navigation Systems Technician (NAVSYSTECH) Capacity	0.000	0.400	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2020 Plans: n/a					
FY 2021 Base Plans: Research and develop updates to the Surface Navigation Maintenance Technician Training course of instruction. The Navigation System Maintenance Trainer supports system level operations and maintenance level training at CSCS Unit Dam Neck, VA. Develop Navigation Systems Technician (NAVSYSTECH) simulator to integrate field changes to the system for modernized course performance objectives. Design and develop training solutions that include GPS-Based Positioning, Navigation and Timing Service (GPNTS) modernization.					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: FY21 decrease associated with the completion of the development phase of this program.					
Title: Surface Training Readiness Management System (STRMS)	0.000	0.000	2.600	0.000	2.600
Articles:	-	-	-	-	-
FY 2020 Plans: N/A					
FY 2021 Base Plans: Research and develop advanced technologies that will enable development of capability to identify quantifiable operator competencies for each mission area and associated tracking system for the purpose of determining training effectiveness ashore and at sea.					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: FY21 is the first year for programmed funding for this initiative. The increase will directly support the adoption of a training and readiness matrix to define and track numerous shipboard training requirements and to					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
develop measures of overall ship readiness that accurately describe what is necessary to achieve and maintain certification in each warfare area.					
Accomplishments/Planned Programs Subtotals	0.737	2.364	4.068	0.000	4.068

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The software development and advanced technology upgrades for High Fidelity Surface Trainers are accounted for in this RDT&E line. These upgrades will provide an enabling technology to an existing training system.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
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*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SYSTEMS ENG	WR	NSWC DAHLGREN : DAHLGREN,VA	18.134	0.737	Dec 2018	0.400	Jan 2020	1.702	Nov 2020	-		1.702	0.000	20.973	Continuing
SYSTEMS ENG	WR	NSWC CARDEROCK : CARDEROCK, MD	6.320	0.000		0.000		0.000		-		0.000	0.000	6.320	-
SYSTEMS ENG	WR	NUWC NEWPORT : NEWPORT, RI	2.076	0.000		0.000		0.000		-		0.000	0.000	2.076	-
SYSTEMS ENG	MIPR	U.S. ARMY SMDC : HUNTSVILLE, AL	0.147	0.000		0.000		0.000		-		0.000	0.000	0.147	-
SYSTEMS ENG	WR	NAWCTSD : ORLANDO, FL	1.957	0.000		0.400	Jan 2020	0.000		-		0.000	0.000	2.357	-
SYSTEMS ENG	TBD	LOCKHEED MARTIN : TBD	0.000	0.000		1.564	Jan 2020	1.066	Nov 2020	-		1.066	0.000	2.630	Continuing
SYSTEMS ENG	WR	NSWC PORT HUENEME : PORT HUENEME, CA	0.000	0.000		0.000		1.300	Dec 2020	-		1.300	0.000	1.300	-
		Subtotal	28.634	0.737		2.364		4.068		-		4.068	0.000	35.803	N/A

Remarks

FY21 funding increase supports the following:
1) Development of the Surface Training and Readiness Management System (STRMS) required for the identification of quantifiable operator competencies for each mission area and associated tracking system development and testing for the purpose of determining training effectiveness ashore and at sea.

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	28.634	0.737		2.364		4.068		-		4.068	0.000	35.803	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
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*

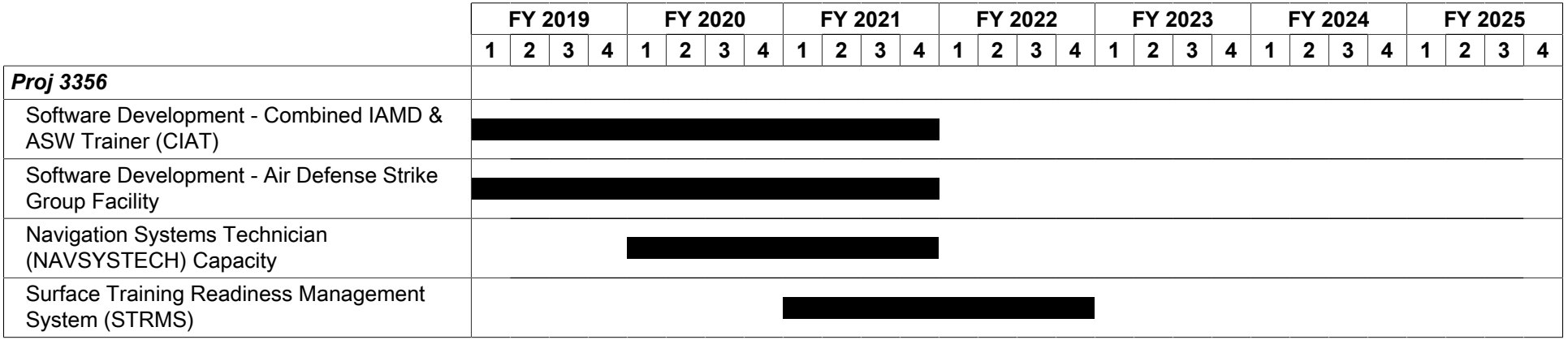

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 3356 / *High Fidelity Surface Trainers*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3356				
Software Development - Combined IAMD & ASW Trainer (CIAT)	1	2019	4	2021
Software Development - Air Defense Strike Group Facility	1	2019	4	2021
Navigation Systems Technician (NAVSYSTECH) Capacity	1	2020	4	2021
Surface Training Readiness Management System (STRMS)	1	2021	4	2022