Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603512N *I Carrier Systems Development*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	61.644	7.516	9.296	5.440	-	5.440	5.401	5.531	5.637	5.778	Continuing	Continuing
3216: *Tactical Support Center-Integration*	36.849	6.943	7.636	4.248	-	4.248	4.385	4.483	4.566	4.670	Continuing	Continuing
4005: *In-Service Carrier Systems Development*	24.795	0.573	1.660	1.192	-	1.192	1.016	1.048	1.071	1.108	Continuing	Continuing

A. Mission Description and Budget Item Justification

The FY 2019 funding request was reduced by $.033 million to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

This Navy unique program addresses all technology areas associated with Navy/Marine Corps aircraft operations aboard ships. The program includes:

- (3216) - The AN/SQQ-34 Aircraft Carrier Tactical Support Center (CV-TSC) delivers Anti-Submarine Warfare (ASW) and Surface Warfare (SUW) combat capability to the Aircraft Carrier. CV-TSC integrates sensor data from Off-Board Aircraft, Organic Platform Sensors, Link-16 Track Data, Ship Self Defense System (SSDS) Track Data, Global Command and Control System (GCCS) Over-the-Horizon Track Data, and Environmental and Threat Databases to assess the threat and assist the Tactical Action Officer (TAO) and Composite Warfare Commander (CWC) to effectively employ overall CVN self-defense capabilities. CV-TSC generates real-time ASW/SUW information and recommendations, tactical planning and employment of ASW/SUW aircraft, ASW/SUW sensor data processing and analysis, and distribution of tactically significant data. Aircraft supported include: MH-60R/S, P-8, MQ-4C Triton, and future ASW/SUW aircraft.

Beginning in FY 2016 and concluding in FY 2018, Project 3216 is supporting the design and development of a multi-application, cross-platform defense capability as directed by the Chief of Naval Operations (CNO) and Assistant Secretary of the Navy Research, Development & Acquisition (ASN (RDA)) via the Task Force Cyber Awakening (TFCA) Advisory Board.

- (4005) - The In-Service Carrier Systems Development Demonstration and Validation program exploits available technologies to deliver an affordable, robust, operator-friendly automation control environment for Navy Aircraft Carrier shipboard equipment. The program provides the system architecture, requirements/specification development, technology selection, software development (including software baseline), as well as land-based and shipboard testing of new technologies to improve shipboard operations and to reduce workload, manpower requirements, and Total Ownership Costs (TOC).

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*			R-1 Program Element (Number/Name) PE 0603512N *I Carrier Systems Development*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	7.605	9.296	5.918	-	5.918
Current President's Budget	7.516	9.296	5.440	-	5.440
Total Adjustments	-0.089	0.000	-0.478	-	-0.478
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.089	0.000			
• Program Adjustments	0.000	0.000	-0.033	-	-0.033
• Rate/Misc Adjustments	0.000	0.000	-0.445	-	-0.445

Change Summary Explanation

Funding: The net FY 2019 decrease is based on the Project 3216 Boundary Defense Capability (BDC) efforts concluding in this PE. However, the FY 2019 planned increase to the Project 3216 CV-TSC budget is the result of additional efforts initiated in FY 2019 (i.e. definition and development for FCR-4).

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603512N / *Carrier Systems Development*	Project (Number/Name) 3216 / *Tactical Support Center-Integration*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3216: *Tactical Support Center-Integration*	36.849	6.943	7.636	4.248	-	4.248	4.385	4.483	4.566	4.670	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The CV-TSC project delivers ASW and SUW combat capability to the Aircraft Carrier. CV-TSC integrates sensor data from Off-Board Aircraft, Organic Platform Sensors, Link-16 Track Data, SSDS Track Data, Global Command and Control System (GCCS) Over-the-Horizon Track Data, and Environmental and Threat Databases to assess the threat and assist the TAO and CWC to effectively employ overall CVN self-defense capabilities. CV-TSC generates real-time ASW/SUW information and recommendations, tactical planning and employment of ASW/SUW aircraft, ASW/SUW sensor data processing and analysis, and distribution of tactically significant data. Aircraft supported include: MH-60R/S, P-8, MQ-4C Triton, and future ASW/SUW aircraft. System development is accomplished through the following initiatives:
1) Maintaining interoperability with the local CVN warfare systems through current and future interfaces;
2) Continuing to support mission data exchange and tactical control with current and future ASW/SUW aircraft and their mission systems;
3) Improving track and sensor processing and analysis techniques as new track and sensor data becomes available;
4) Improving mission planning support for the ASW/SUW missions conducted from the CVN;
5) Improving data recording, reconstruct, and distribution to meet the decreasing timelines associated with getting tactically significant data to other end users both on and off platform;
6) Improving embedded simulation and training capabilities to enable operator proficiencies; and
7) Implementing cyber-security measures.

This project also provides development of Boundary Defense Capability (Cybersecurity) capabilities (from FY 2016 to FY 2018): The purpose of this effort is to define and develop enterprise Hull Mechanical & Electrical (HM&E) System cybersecurity solutions that will provide: protections from cyber-attacks such as boundary defense capabilities that will protect threats entering and leaving HM&E systems, physical protections, message authentication and encryption methods; Detection solutions for system anomalies and attacks at the boundaries, on hosts, networks and backplanes; and provide for operator awareness (e.g. malware detection, file integrity verification, etc.); Reaction solutions that will enable operator and system responses to an attacks; and Recovery methods that will enable for a system to quickly get back to a good known state. Planning will also commence for the integration of cyber solutions into specific HM&E control systems (e.g. Machinery Control, Steering Control, etc.).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: CV-TSC Development / Integration / Test / Certification	3.731	4.222	4.248	0.000	4.248
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 3216 / *Tactical Support Center-Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: CV-TSC's evolutionary acquisition approach to developing, testing, certifying, and fielding system upgrades and cyber-security patches is implemented through phased Fleet Capability Releases (FCR). ***FY 2018 Plans:*** - Complete the requirements definition phase for FCR-3 and commence the system engineering for and development of FCR-3. - Conduct incremental requirements, design, and test reviews of FCR-3. - Update System Engineering Plan (SEP). - Transition requirements into a systems engineering modeling tool. - Modify interface requirement specifications for changing interfaces. - Start the Transition Information Assurance (IA) Accreditation to Risk Management Framework (RMF). ***FY 2019 Base Plans:*** - Complete the development phase for FCR-3. - Initiate the requirements definition phase and development efforts for FCR-4. - Complete certifications required for fielding, to include IA Accreditation, ISNS and CANES Certifications, PEO IWS Element Certification, and CST Certification. - Complete the Transition Information Assurance (IA) Accreditation to Risk Management Framework (RMF). Prioritize capability improvements to Public Key Enforcement (PKE) compliance, interoperability with multiple variants of SSDS PLA, and the Common Data Link System (CDLS) multilink. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 planned increase is the result of additional efforts initiated in FY 2019 (i.e. definition and development for FCR-4) and is attributable to general inflation rate adjustments.					
Title: NAVSEA Boundary Defense Capability (Cybersecurity)	3.212	3.414	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: The purpose of this effort is to define and develop enterprise Hull Mechanical & Electrical (HM&E) System cybersecurity solutions that will provide: protections from cyber-attacks such as boundary defense capabilities that will protect threats entering and leaving HM&E systems, physical protections, message					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 3216 / *Tactical Support Center-Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
authentication and encryption methods; Detection solutions for system anomalies and attacks at the boundaries, on hosts, networks and backplanes; and provide for operator awareness (e.g. malware detection, file integrity verification, etc.); Reaction solutions that will enable operator and system responses to an attacks; and Recovery methods that will enable for a system to quickly get back to a good known state. Planning will also commence for the integration of cyber solutions into specific HM&E control systems (e.g. Machinery Control, Steering Control, etc.). The development of a cyber-resilient HM&E architecture will include the integration of cybersecurity solutions and system engineering processes to individual HM&E Systems and their Components to ensure a consistent cyber security posture across the entire HM&E Enclave. Development of enterprise HM&E risk management processes will occur, to include the following: a vulnerability assessment and management process across the HM&E Enclave and a methodology to support the execution of the Risk Management Framework and Cybersafe Assessments. ***FY 2018 Plans:*** Continue design and development of multi-application, cross-platform cybersecurity solutions for control system enclaves, followed by engineering for CVN 68 Class integration. - Initiate non-recurring engineering efforts for HM&E Control Systems. - Perform engineering and planning for Boundary Defense Capability Temporary Alterations. - Develop infra-structure, processes and procedures in support of Risk Management Framework (RMF) and Cybersafe. - Perform system change engineering and analysis for upgrading systems to supported operating systems. - Develop Cybersecurity Situational Awareness strategy for CVN 68 Class ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2018 to FY 2019 Increase/Decrease Statement: The FY 2019 decrease is based on BDC efforts concluding in this PE.					
Accomplishments/Planned Programs Subtotals	6.943	7.636	4.248	0.000	4.248

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 3216 / *Tactical Support Center-Integration*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/2176: *Undersea Warfare Support Equipment (N98/CV-TSC only)*	0.315	0.338	0.334	-	0.334	0.343	0.353	0.359	0.367	Continuing	Continuing

Remarks

D. Acquisition Strategy

CV-TSC Development/Integration:
CV-TSC utilizes an incremental development approach that aims to deliver frequent capability updates to the Fleet. This approach allows required capability to be delivered to address emerging Fleet needs and provides frequent opportunities to ensure interoperability is synchronized with the Ship Self Defense System (SSDS) Advanced Capability Builds (ACBs). The acquisition strategy places heavy emphasis on the use of open architecture best practices to ensure ease of upgrades and to make developed products available to other platforms.

NAVSEA Boundary Defense Capability (Cybersecurity):
Investigate, demonstrate, and implement multi-application, cross-platform cybersecurity solutions for HM&E control system enclaves, followed by engineering for CVN 68 Class integration. Execute non-recurring engineering efforts for HM&E Control Systems. Perform engineering and planning for Boundary Defense Capability Temporary Alterations.

E. Performance Metrics

CV-TSC Development/Integration:
- Achieve Configuration Control Board (CCB) certification for installation of CV-TSC Build 8.0 software version.
- Achieve Platform Information Technology (PIT) Information Assurance (IA) accreditation of CV-TSC Build 8.0 software version.
- Achieve Consolidate Afloat Network Enterprise System (CANES) interoperability certification of CV-TSC Build 8.0 software version.
- Achieve element certification of CV-TSC Build 8.0 software version. - Achieve Combat System test certification of CV-TSC Build 8.0 software version.

NAVSEA Boundary Defense Capability (Cybersecurity):
- Define and develop cross-platform control system cybersecurity requirements.
- Define and develop cross-platform control system cybersecurity risk management processes.
- Define and develop a set of cross-platform control system cybersecurity boundary defense solutions.
- Define and develop a set of cross-platform, centralized, systems-level cybersecurity solutions.
- Define and develop a set of cross-platform, element-level cybersecurity protections.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603512N / *Carrier Systems Development*	Project (Number/Name) 3216 / *Tactical Support Center-Integration*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering / H/W & S/W Devel / Integration	WR	NAWC/Pax River : MD	0.875	0.100	Nov 2016	0.100	Nov 2017	0.100	Nov 2018	-		0.100	Continuing	Continuing	Continuing
Engineering / H/W & S/W Devel / Integration	WR	NRL : DC	0.325	0.000		0.000		0.000		-		0.000	0.000	0.325	-
Engineering / H/W & S/W Devel / Integration	WR	NSWC/Carderock : MD	2.250	0.400	Jan 2017	0.400	Nov 2017	0.000		-		0.000	0.000	3.050	-
Engineering / H/W & S/W Devel / Integration	WR	NSWC/Dahlgren : VA	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	-
Engineering / H/W & S/W Devel / Integration	WR	NUWC/Keyport : WA	20.770	2.248	Nov 2016	2.541	Oct 2017	2.846	Nov 2018	-		2.846	Continuing	Continuing	Continuing
System Eng / S/W Development	C/CPFF	Adaptive Methods : VA	2.654	0.453	Dec 2016	0.563	Dec 2017	0.595	Dec 2018	-		0.595	Continuing	Continuing	Continuing
System Eng / S/W Development	C/CPFF	JHU/APL : MD	0.250	0.000		0.000		0.000		-		0.000	0.000	0.250	-
System Eng / S/W Development	WR	SPAWAR : CA	4.160	0.000		0.000		0.000		-		0.000	0.000	4.160	-
Engineering / H/W & S/W Development	C/CPFF	VAR* : VAR*	1.038	0.250	Jan 2017	0.338	Dec 2017	0.338	Dec 2018	-		0.338	Continuing	Continuing	Continuing
Boundary Defense Capability Design/ Development	WR	NSWC/Philadelphia : PA	1.026	1.500	Oct 2016	1.520	Dec 2017	0.000		-		0.000	0.000	4.046	-
Boundary Defense Capability Design/ Development	C/CPFF	VAR* : VAR*	0.930	1.712	Dec 2016	1.894	Jan 2018	0.000		-		0.000	0.000	4.536	-
		Subtotal	34.378	6.663		7.356		3.879		-		3.879	Continuing	Continuing	N/A

Remarks

*Consists of multiple performing activities with funding for each not greater than $1M per year.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 3216 / *Tactical Support Center-Integration*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Certification	WR	NUWC//Keyport : WA	1.880	0.225	Nov 2016	0.225	Oct 2017	0.314	Nov 2018	-		0.314	Continuing	Continuing	Continuing
Test and Certification	WR	NUWC/Newport : RI	0.125	0.000		0.000		0.000		-		0.000	0.000	0.125	-
		Subtotal	2.005	0.225		0.225		0.314		-		0.314	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPAF	BAE Systems : MD	0.411	0.000		0.000		0.000		-		0.000	0.000	0.411	-
Program Management Support	C/CPIF	CGI Federal : VA	0.055	0.055	Nov 2016	0.055	Nov 2017	0.055	Dec 2018	-		0.055	Continuing	Continuing	Continuing
		Subtotal	0.466	0.055		0.055		0.055		-		0.055	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	36.849	6.943		7.636		4.248		-		4.248	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 3216 / *Tactical Support Center-Integration*

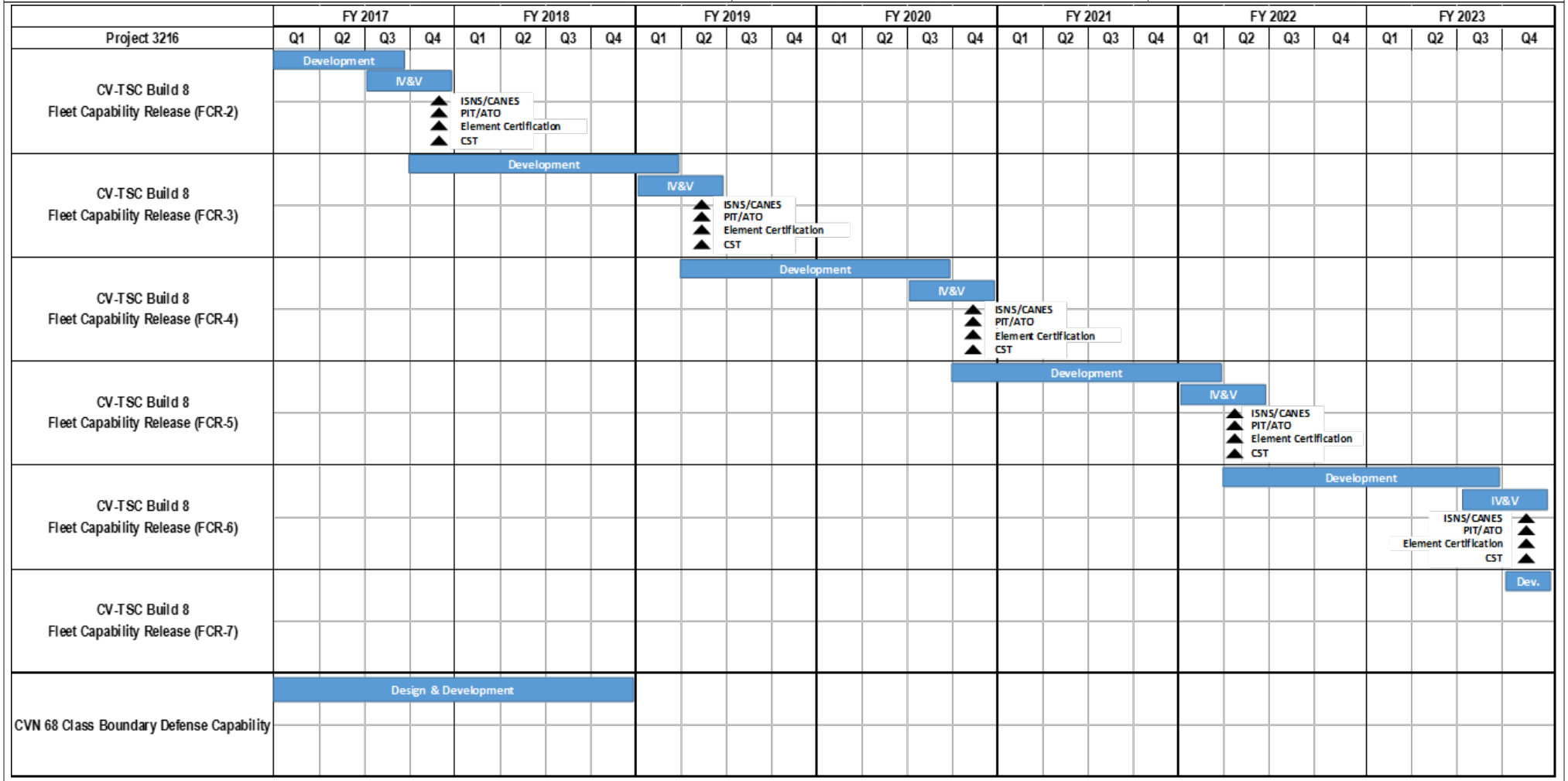

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 3216 / *Tactical Support Center-Integration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CV-TSC Build 8 Software Fleet Capability Release				
CV-TSC Build 8 FCR-2: CV-TSC Build 8 FCR-2 Development	1	2017	3	2017
CV-TSC Build 8 FCR-2: CV-TSC Build 8 FCR-2 IV&V	3	2017	4	2017
CV-TSC Build 8 FCR-2: CV-TSC Build 8 FCR-2 PIT/ATO	4	2017	4	2017
CV-TSC Build 8 FCR-2: CV-TSC Build 8 FCR-2 ISNS / CANES Certification	4	2017	4	2017
CV-TSC Build 8 FCR-2: CV-TSC Build 8 FCR-2 Element Certification	4	2017	4	2017
CV-TSC Build 8 FCR-2: CV-TSC Build 8 FCR-2 CVN-78 Combat System Test (CST)	4	2017	4	2017
CV-TSC Build 8 FCR-3: CV-TSC Build 8 FCR-3 Development	4	2017	1	2019
CV-TSC Build 8 FCR-3: CV-TSC Build 8 FCR-3 IV&V	1	2019	2	2019
CV-TSC Build 8 FCR-3: CV-TSC Build 8 FCR-3 PIT/ATO	2	2019	2	2019
CV-TSC Build 8 FCR-3: CV-TSC Build 8 FCR-3 ISNS / CANES Certification	2	2019	2	2019
CV-TSC Build 8 FCR-3: CV-TSC Build 8 FCR-3 Element Certification	2	2019	2	2019
CV-TSC Build 8 FCR-3: CV-TSC Build 8 FCR-3 Combat System Test (CST)	2	2019	2	2019
CV-TSC Build 8 FCR-4: CV-TSC Build 8 FCR-4 Development	2	2019	3	2020
CV-TSC Build 8 FCR-4: CV-TSC Build 8 FCR-4 IV&V	3	2020	4	2020
CV-TSC Build 8 FCR-4: CV-TSC Build 8 FCR-4 PIT/ATO	4	2020	4	2020
CV-TSC Build 8 FCR-4: CV-TSC Build 8 FCR-4 ISNS / CANES Certification	4	2020	4	2020
CV-TSC Build 8 FCR-4: CV-TSC Build 8 FCR-4 Element Certification	4	2020	4	2020
CV-TSC Build 8 FCR-4: CV-TSC Build 8 FCR-4 Combat System Test (CST)	4	2020	4	2020
CV-TSC Build 8 FCR-5: CV-TSC Build 8 FCR-5 Development	4	2020	1	2022
CV-TSC Build 8 FCR-5: CV-TSC Build 8 FCR-5 IV&V	1	2022	2	2022
CV-TSC Build 8 FCR-5: CV-TSC Build 8 FCR-5 PIT/ATO	2	2022	2	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 3216 / *Tactical Support Center-Integration*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CV-TSC Build 8 FCR-5: CV-TSC Build 8 FCR-5 ISNS / CANES Certification	2	2022	2	2022
CV-TSC Build 8 FCR-5: CV-TSC Build 8 FCR-5 Element Certification	2	2022	2	2022
CV-TSC Build 8 FCR-5: CV-TSC Build 8 FCR-5 Combat System Test (CST)	2	2022	2	2022
CV-TSC Build 8 FCR-6: CV-TSC Build 8 FCR-6 Development	2	2022	3	2023
CV-TSC Build 8 FCR-6: CV-TSC Build 8 FCR-6 IV&V	3	2023	4	2023
CV-TSC Build 8 FCR-6: CV-TSC Build 8 FCR-6 PIT/ATO	4	2023	4	2023
CV-TSC Build 8 FCR-6: CV-TSC Build 8 FCR-6 ISNS / CANES Certification	4	2023	4	2023
CV-TSC Build 8 FCR-6: CV-TSC Build 8 FCR-6 Element Certification	4	2023	4	2023
CV-TSC Build 8 FCR-6: CV-TSC Build 8 FCR-6 Combat System Test (CST)	4	2023	4	2023
CV-TSC Build 8 FCR-7: CV-TSC Build 8 FCR-7 Development	4	2023	4	2023
CVN 68 Class Boundary Defense Capability				
CVN 68 Class Boundary Defense Capability: CVN 68 Class Boundary Defense Capability Design & Development	1	2017	4	2018

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603512N / *Carrier Systems Development*	Project (Number/Name) 4005 / *In-Service Carrier Systems Development*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
4005: *In-Service Carrier Systems Development*	24.795	0.573	1.660	1.192	-	1.192	1.016	1.048	1.071	1.108	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The In-Service Carrier Systems Demonstration and Validation program exploits available technologies to deliver an affordable, robust, operator-friendly automation control environment for Navy Aircraft Carrier shipboard equipment. The program provides the system architecture, requirements/specification development, technology selection, software development (including software baseline), as well as land-based and shipboard testing of new technologies to improve shipboard operations and to reduce workload, manpower requirements, and Total Ownership Costs as well as addressing equipment obsolescence issues. Initial technologies include the Ship Control System Governor Software Development, Tank Preservation, Uninterruptible Power Supply (UPS) Replacements, Advanced Damage Control System (ADCS), Weapons Elevator Control Accumulator Replacement, the Integrated Condition Assessment System, the On-Machine I/O development for LPAPs and LPAP air end redesign, Modular Refrigeration Unit (MRU). Demonstration technologies include Advanced Damage Control System (ADCS) software improvements, Input/Output Controller (IOC) Replacement, Fleet Wireless Personal digital Assistant (PDA), Weapons Elevator Laser Positioning System, Legacy Steering Interface upgrades, CVN Integrated Topside Design (ITD) location option evaluation tools, Antenna to Antenna coupling analysis tools, and Passive countermeasures System (PCMS) alternate measurement capability. Wireless systems, smart sensors, lighting systems, knowledge-based systems, automated casualty control, automated technology for workload reduction, linked smart devices, common software tools for interoperability, and self-healing network are technologies being considered for future applications including the following: Integrated Bridge control Data Logger, C4I Network Performance Modeling and Analysis, Network Data Logger Device, Portable Communication System (PCS) proof of concept, Ship Control System (SCS) Onboard trainer, CVN 78 class platform support for Joint Strike Fighter Integration, Development of a Standardized tool to be used to perform structural analyses to assess the adequacy of corroded and degraded structure.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: In-Service Carrier Systems Development	0.573	1.660	1.192	0.000	1.192
Articles:	-	-	-	-	-
FY 2018 Plans: Fiscal Year 2018 plans include continued support to Aircraft Carrier technologies. Modifications, upgrades and development of systems and software will be ongoing in support of In-Service aircraft carrier modernization initiatives and TOC reduction initiatives as well as addressing equipment obsolescence issues.					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 4005 / *In-Service Carrier Systems Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Fiscal Year 2019 plans include continued support to Aircraft Carrier technologies. Modifications, upgrades and development of systems and software will be ongoing in support of In-Service aircraft carrier modernization initiatives and TOC reduction initiatives as well as addressing equipment obsolescence issues. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Program decrease due to completion of large LPAP projects (LPAP On-Machine I/O and LPAP Air End Redesign) in FY18.					
Accomplishments/Planned Programs Subtotals	0.573	1.660	1.192	0.000	1.192

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Investigate, demonstrate, and implement available technologies to deliver a robust, operator-friendly automation control environment for Navy Aircraft Carrier shipboard equipment to reduce workload, manpower requirements, and Total Ownership Costs (TOC).

E. Performance Metrics

Successfully complete Ship Control System Governor Software Development, AC Plant Model Capacity Optimization, Uninterruptible Power Supply (UPS) Replacements, Advanced Damage Control System (ADCS) Software Improvements, Automatic Fire Sensing and Suppression System/Flooding and Casualty Control Software (AFSSS/FCCS) Software Development Test, Input/Output Controller (IOC) replacement demonstration, Tank Preservation models, Weapons Elevator Laser Positioning demonstration, Legacy Steering Interface Upgrades, CVN Integrated Topside Design (ITD) location option evaluation tool development, Antenna to Antenna coupling analysis tool development, Universal Portable Command and Control Unit (PCCU) development, Ship Control System (SCS) Trainer, Integrated Bridge Control Data Logger, Weapons Elevator Control Accumulator Replacement, and C4I Network Performance Requirements Modeling and Analysis.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603512N / *Carrier Systems Development*	Project (Number/Name) 4005 / *In-Service Carrier Systems Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ship Integration	WR	NAVSEA : Phil	2.648	0.215	Nov 2016	0.733	Nov 2017	0.537	Nov 2018	-		0.537	0.000	4.133	-
Ship Integration	WR	NAVSEA : Dahlgren	0.197	0.000		0.000		0.000		-		0.000	0.000	0.197	-
Ship Integration	WR	NAVSEA : Carderock	0.225	0.000		0.100	Nov 2017	0.100	Nov 2018	-		0.100	0.000	0.425	-
		Subtotal	3.070	0.215		0.833		0.637		-		0.637	0.000	4.755	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	WR	NAVSEA : Phil	8.282	0.050	Nov 2016	0.054	Nov 2017	0.050	Nov 2018	-		0.050	0.000	8.436	-
Program Management Support	WR	NAVSEA : Phil	3.227	0.050	Nov 2016	0.150	Nov 2017	0.100	Nov 2018	-		0.100	0.000	3.527	-
Training Development	WR	NAVSEA : Phil	1.365	0.000	Nov 2016	0.050	Nov 2017	0.050	Nov 2018	-		0.050	0.000	1.465	-
Integrated Logistics Support	WR	NAVSEA : Phil	1.604	0.050	Nov 2016	0.100	Nov 2017	0.085	Nov 2018	-		0.085	0.000	1.839	-
Software Development	WR	NAVSEA : Dahlgren	0.308	0.000		0.000		0.000		-		0.000	0.000	0.308	-
Program Management Support	WR	NAVSEA : Dahlgren	0.317	0.000		0.000		0.000		-		0.000	0.000	0.317	-
Program Management Support	WR	NAVSEA : Carderock	0.050	0.050	Nov 2016	0.050	Nov 2017	0.050	Nov 2018	-		0.050	0.000	0.200	-
		Subtotal	15.153	0.200		0.404		0.335		-		0.335	0.000	16.092	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	SPAWAR : Atlantic	0.214	0.000		0.000		0.000		-		0.000	0.000	0.214	-
Developmental Test & Evaluation	WR	NAVSEA : Carderock	0.175	0.050	Nov 2016	0.000		0.000		-		0.000	0.000	0.225	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603512N / *Carrier Systems Development*	Project (Number/Name) 4005 / *In-Service Carrier Systems Development*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAVSEA : Phil	5.914	0.108	Nov 2016	0.423	Nov 2017	0.220	Nov 2018	-		0.220	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	NAVSEA : Dahlgren	0.261	0.000		0.000		0.000		-		0.000	0.000	0.261	-
		Subtotal	6.564	0.158		0.423		0.220		-		0.220	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DAWF	Various	Various : Various	0.008	0.000		0.000		0.000		-		0.000	0.000	0.008	-
		Subtotal	0.008	0.000		0.000		0.000		-		0.000	0.000	0.008	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	24.795	0.573		1.660		1.192		-		1.192	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 4005 / *In-Service Carrier Systems Development*

In-Service Carrier Systems Development

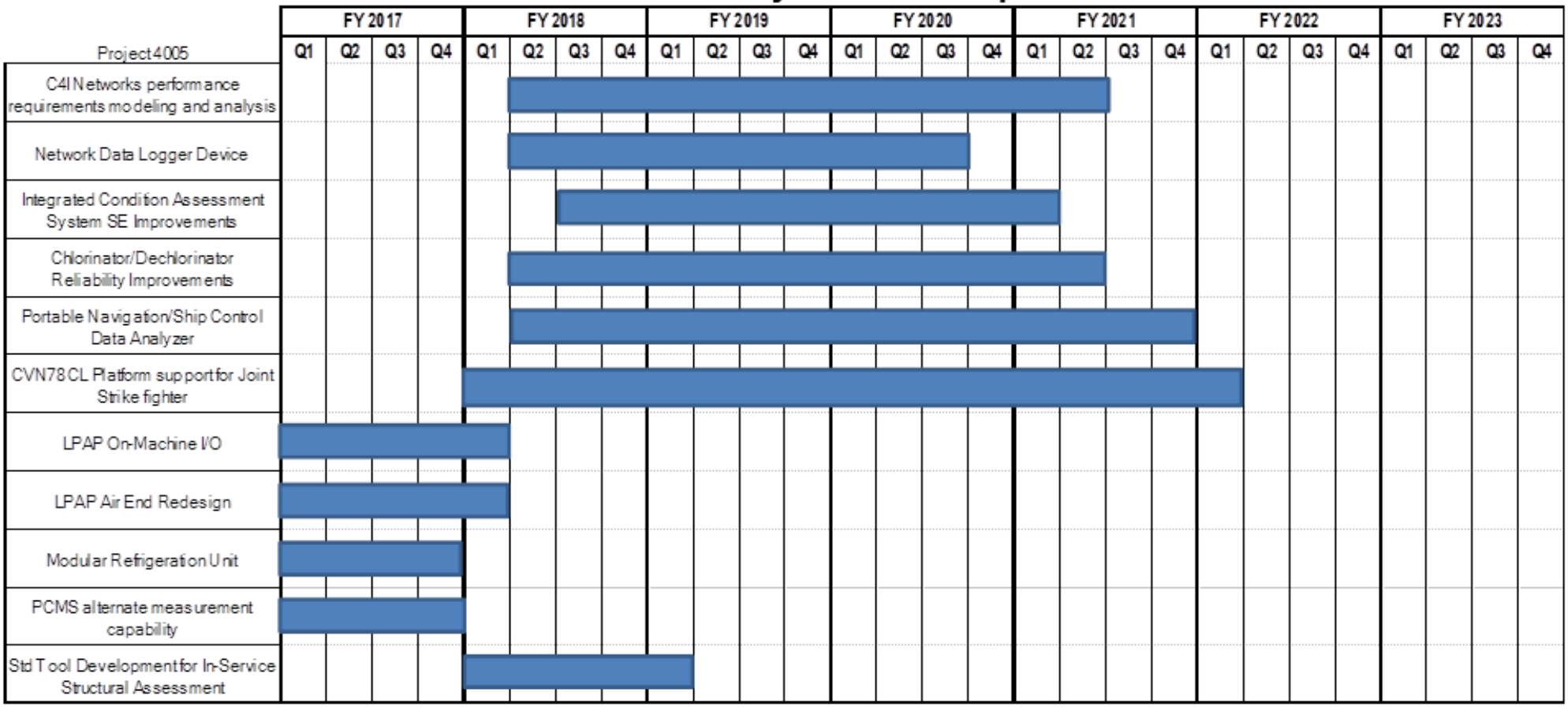

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 4005 / *In-Service Carrier Systems Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 4005				
C4I Networks performance requirements modeling and analysis: C4I Networks performance requirements modeling and analysis	2	2018	2	2021
Network Data Logger Device: Network Data Logger Device	2	2018	3	2020
Integrated Condition Assessment System SE Improvements: Integrated Condition Assessment System SE Improvements	3	2018	1	2021
Chlorinator/Dechlorinator Reliability Improvements: Chlorinator/Dechlorinator Reliability Improvements	2	2018	2	2021
Portable Navigation/Ship Control Data Analyzer: Portable Navigation/Ship Control Data Analyzer	2	2018	4	2021
CVN78 CL Platform support for Joint Strike Fighter: CVN78 CL Platform support for Joint Strike fighter	1	2018	1	2022
LPAP On-Machine I/O: LPAP On-Machine I/O	1	2017	1	2018
LPAP Air End Redesign: LPAP Air End Redesign	1	2017	1	2018
Modular Refrigeration Unit: Modular Refrigeration Unit	1	2017	4	2017
PCMS alternate measurement capability: PCMS alternate measurement capability	1	2017	4	2017
Std Tool Development for In-Service Structural Assessment: Std Tool Development for In-Service Structural Assessment and risk definition	2	2018	4	2019