Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
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 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	47.477	5.954	8.348	7.605	-	7.605	9.283	5.894	5.752	5.874	Continuing	Continuing
3216.: *Tactical Support Center-Integration*	26.673	4.180	6.131	7.032	-	7.032	7.629	4.331	4.423	4.516	Continuing	Continuing
4005: *In-Service Carrier Systems Development*	20.804	1.774	2.217	0.573	-	0.573	1.654	1.563	1.329	1.358	Continuing	Continuing

A. Mission Description and Budget Item Justification

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

- (3216) - The primary role of the AN/SQQ-34 Aircraft Carrier Tactical Support Center (CV-TSC) is fulfillment of Anti-Submarine Warfare (ASW) and Surface Warfare (SUW) coordination functions utilizing data received from multiple sources (including Off-Board Aircraft Sensor and Track Data, Local Platform ASW/SUW Sensors, Link-16 Track Data, Ship Self Defense System (SSDS) Platform Track Data, Global Command and Control System 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) in effectively applying available resources to support CVN self-defense. This includes the generation of real-time ASW/SUW information and recommendations, tactical planning and employment of ASW/SUW aircraft operating organically from the Aircraft Carrier or under the tactical control of the Carrier Strike Group (CSG), ASW/SUW sensor data processing and analysis, and distribution of tactically significant data to the appropriate decision makers. Aircraft supported include MH-60R/S, P-8, UCLASS, Triton, and future ASW/SUW aircraft.

Beginning in FY16, Project 3216 will support the design and development of a multi-application, cross-platform boundary 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 2017 Navy					Date: February 2016
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 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**
Previous President's Budget	5.959	8.348	7.539	-	7.539
Current President's Budget	5.954	8.348	7.605	-	7.605
Total Adjustments	-0.005	0.000	0.066	-	0.066
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.005	0.000			
• Program Adjustments	0.000	0.000	0.195	-	0.195
• Rate/Misc Adjustments	0.000	0.000	-0.129	-	-0.129

Change Summary Explanation

Funding: Decrease in Carrier Systems Development by $0.321 million in FY 17 as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

Funding: The FY 2017 funding request was reduced by $0.884 million to account for the availability of prior years execution balance.

Funding: Added FY 17 funding to support the design and development of a Boundary Defense Capability.

Schedule:
Changes in the availability of certification event venue impacted the Software Build Schedules.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
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 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3216.: *Tactical Support Center-Integration*	26.673	4.180	6.131	7.032	-	7.032	7.629	4.331	4.423	4.516	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The FY 16 to FY 17 increase is due to adding additional funding for cybersecurity efforts.

The primary role of the AN/SQQ-34 Aircraft Carrier Tactical Support Center (CV-TSC) is fulfillment of Anti-Submarine Warfare (ASW) and Surface Warfare (SUW) coordination functions utilizing data received from various sources (including Off-Board Aircraft Sensor and Track Data, Local Platform ASW/SUW Sensors, Link-16 Track Data, Ship Self Defense System (SSDS) Platform Track Data, Global Command and Control System 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) in effectively applying available resources to support CVN self-defense. This includes the generation of real-time ASW/SUW information and recommendations, tactical planning and employment of ASW/SUW aircraft operating organically from the Aircraft Carrier or under the tactical control of the Carrier Strike Group (CSG), ASW/SUW sensor data processing and analysis, and distribution of tactically significant data to the appropriate decision makers. Aircraft supported or to be supported include MH-60R/S, P-8, UCLASS, Triton, and future ASW/SUW aircraft.

CV-TSC functionality updates are implemented through an evolutionary acquisition approach, providing phased incremental builds that are developed, tested, certified and fielded. Functional improvements are 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; and 6) improving embedded simulation and training capabilities to enable operator proficiencies.

This project also provides development of cybersecurity efforts. The purpose of this effort is to define and develop enterprise Combat System cybersecurity solutions that will provide a set of boundary defense capabilities for the Combat System, a set of centralized Combat Systems-level cybersecurity capabilities, and a set of element-level cybersecurity protections. The boundary defense capabilities will protect and detect threats entering and leaving the Combat System. The centralized Combat System-level cybersecurity capabilities will provide cyber situational awareness and management (e.g. malware detection, file integrity verification, etc.) of various cybersecurity protection and detection capabilities. Element-level cybersecurity protections will provide additional measures to ensure system integrity. Planning will also commence for the integration of the Combat System elements and sensors into the boundary defense and centralized cybersecurity capabilities.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: CV-TSC Development / Integration	4.180	4.131	3.780	0.000	3.780

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Articles:	-	-	-	-	-
FY 2015 Accomplishments: - Continued development of CV-TSC Build 8.0 software version. - Conducted incremental software build reviews. - Conducted development testing with key interfacing systems. - Completed major system architectural modifications to support Combat System Product Line Architecture (PLA). - Conducted multiple Fleet Working Groups to provide input and feedback to functionality being developed. - Delivered engineering releases of software version to Combat Systems Test (CST) facilities to support early certification testing. ***FY 2016 Plans:*** - Complete development of initial release of CV-TSC Build 8.0 software version. - Complete certifications required for fielding CV-TSC Build 8.0 software version to include Information Assurance (IA) Accreditation, Integrated Shipboard Network System (ISNS) and Consolidated Afloat Networks and Enterprise Services (CANES) Certifications, PEO IWS Element Certification, and CST Certification. - Begin systems engineering efforts and development on software version 9.0 follow-on build. - Conduct incremental requirements, design, and test reviews. - Conduct CST events for CVN-72 (4Q16). ***FY 2017 Base Plans:*** - Continue systems engineering efforts and development on software version 9.0 follow-on build. - Conduct incremental requirements, design, and test reviews. ***FY 2017 OCO Plans:*** N/A					
Title: NAVSEA Boundary Defense Capability	0.000	2.000	3.252	0.000	3.252
Articles:	-	-	-	-	-
Description: The purpose of this effort is to define and develop enterprise Combat System cybersecurity solutions that will provide a set of boundary defense capabilities for the Combat System, a set of centralized Combat Systems-level cybersecurity capabilities, and a set of element-level cybersecurity protections. The boundary defense capabilities will protect and detect threats entering and leaving the Combat System. The centralized Combat System-level cybersecurity capabilities will provide cyber situational awareness and					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
management (e.g. malware detection, file integrity verification, etc.) of various cybersecurity protection and detection capabilities. Element-level cybersecurity protections will provide additional measures to ensure system integrity. Planning will also commence for the integration of the Combat System elements and sensors into the boundary defense and centralized cybersecurity capabilities. The development of a cyber-resilient Combat System security architecture will include the integration of cybersecurity into Combat System and element-level system engineering processes, to include developing and flowing Combat System cybersecurity requirements down to the individual elements and sensors to ensure a consistent cyber security posture across the entire Combat System. Development of enterprise Combat System risk management processes will occur, to include the following: a vulnerability management process across the Combat System to provide the flexibility for periodic cybersecurity updates once security capabilities are fielded; and system-of-systems risk assessment methodology to support Combat System execution of the Risk Management Framework. ***FY 2015 Accomplishments:*** N/A ***FY 2016 Plans:*** - Design and develop multi-application, cross-platform boundary defense equipment for control system enclaves, followed by engineering for CVN 68 Class integration. ***FY 2017 Base Plans:*** - Continue design and development of multi-application, cross-platform boundary defense equipment for control system enclaves, followed by engineering for CVN 68 Class integration. - Initiate non-recurring engineering efforts for Machinery and Combat Systems in surface platforms and cybersecurity for critical data transfer systems. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	4.180	6.131	7.032	0.000	7.032

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• OPN/2176: *Undersea Warfare Support Equipment (N98/CV-TSC only)*	0.299	0.336	0.315	-	0.315	0.336	0.340	0.348	0.355	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:
Investigate, demonstrate, and implement multi-application, cross-platform boundary defense equipment for control system enclaves, followed by engineering for CVN 68 Class integration. Execute non-recurring engineering efforts for Machinery and Combat Systems in surface platforms and cybersecurity for critical data transfer systems.

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:
- 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 2017 Navy		Date: February 2016
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 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering / H/W & S/W Devel / Integration	WR	NAWC/Pax River : MD	0.625	0.150	Jan 2015	0.100	Feb 2016	0.100	Nov 2016	-		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	1.100	0.750	Jan 2015	0.400	Nov 2015	0.400	Nov 2016	-		0.400	Continuing	Continuing	Continuing
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	15.969	2.200	Nov 2014	2.601	Oct 2015	2.250	Nov 2016	-		2.250	Continuing	Continuing	Continuing
System Eng / S/W Development	C/CPFF	Adaptive Methods : VA	1.554	0.600	Jan 2015	0.500	Dec 2015	0.500	Dec 2016	-		0.500	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*	0.679	0.200	Feb 2015	0.250	Dec 2015	0.250	Dec 2016	-		0.250	Continuing	Continuing	Continuing
Boundary Defense Capability Design/ Development	WR	NSWC/Philadelphia : PA	0.000	0.000		2.000	Feb 2016	3.252	Dec 2016	-		3.252	Continuing	Continuing	Continuing
		Subtotal	24.762	3.900		5.851		6.752		-		6.752	-	-	-

Remarks

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

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Certification	WR	NUWC//Keyport : WA	1.430	0.225	Nov 2014	0.225	Oct 2015	0.225	Nov 2016	-		0.225	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
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 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Certification	WR	NUWC/Newport : RI	0.125	0.000		0.000		0.000		-		0.000	0.000	0.125	-
		Subtotal	1.555	0.225		0.225		0.225		-		0.225	-	-	-

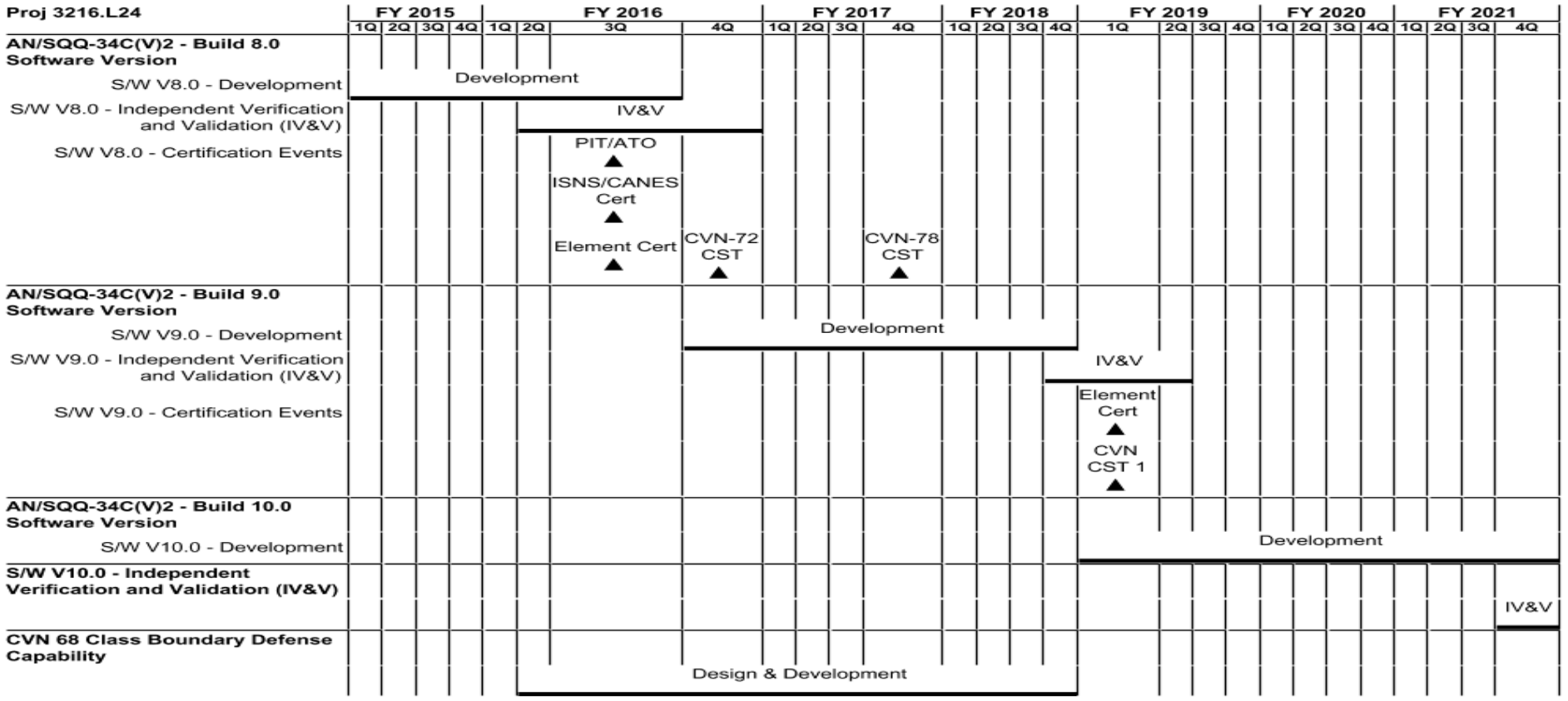
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPAF	BAE Systems : MD	0.356	0.055	Feb 2015	0.000		0.000		-		0.000	0.000	0.411	-
Program Management Support	C/CPIF	CGI Federal : VA	0.000	0.000		0.055	Dec 2015	0.055	Dec 2016	-		0.055	Continuing	Continuing	Continuing
		Subtotal	0.356	0.055		0.055		0.055		-		0.055	-	-	-

	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	26.673	4.180		6.131		7.032		-		7.032	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 3216. / *Tactical Support Center-Integration*



2017PB - 0603512N - 3216.L24

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
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**
Proj 3216.L24				
AN/SQQ-34C(V)2 - Build 8.0 Software Version: S/W V8.0 - Development: S/W V8.0 - Development (continued)	1	2015	3	2016
AN/SQQ-34C(V)2 - Build 8.0 Software Version: S/W V8.0 - Independent Verification and Validation (IV&V): S/W V8.0 - IV&V	2	2016	4	2016
AN/SQQ-34C(V)2 - Build 8.0 Software Version: S/W V8.0 - Certification Events: S/W V8.0 - Platform IT/Authority to Operate (PIT/ATO) Certification	3	2016	3	2016
AN/SQQ-34C(V)2 - Build 8.0 Software Version: S/W V8.0 - Certification Events: S/W V8.0 - ISNS/CANES Certification	3	2016	3	2016
AN/SQQ-34C(V)2 - Build 8.0 Software Version: S/W V8.0 - Certification Events: S/W V8.0 - Element Certification	3	2016	3	2016
AN/SQQ-34C(V)2 - Build 8.0 Software Version: S/W V8.0 - Certification Events: S/W V8.0 - CVN-72 Combat System Test (CST)	4	2016	4	2016
AN/SQQ-34C(V)2 - Build 8.0 Software Version: S/W V8.0 - Certification Events: S/W V8.0 - CVN-78 Combat System Test (CST)	4	2017	4	2017
AN/SQQ-34C(V)2 - Build 9.0 Software Version: S/W V9.0 - Development: S/W V9.0 - Development	4	2016	4	2018
AN/SQQ-34C(V)2 - Build 9.0 Software Version: S/W V9.0 - Independent Verification and Validation (IV&V): S/W V9.0 - IV&V	4	2018	2	2019
AN/SQQ-34C(V)2 - Build 9.0 Software Version: S/W V9.0 - Certification Events: S/W V9.0 - Element Certification	1	2019	1	2019
AN/SQQ-34C(V)2 - Build 9.0 Software Version: S/W V9.0 - Certification Events: S/W V9.0 - CVN Combat System Test (CST) 1	1	2019	1	2019
AN/SQQ-34C(V)2 - Build 10.0 Software Version: S/W V10.0 - Development: S/W V10.0 - Development	1	2019	4	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
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**
S/W V10.0 - Independent Verification and Validation (IV&V): S/W V10.0 - IV&V	4	2021	4	2021
CVN 68 Class Boundary Defense Capability: CVN 68 Class Boundary Defense Capability Design & Development	2	2016	4	2018

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
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 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
4005: *In-Service Carrier Systems Development*	20.804	1.774	2.217	0.573	-	0.573	1.654	1.563	1.329	1.358	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. 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,

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: In-Service Carrier Systems Development	1.774	2.217	0.573	0.000	0.573
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Fiscal Year 2015 plans included support to Aircraft Carrier technologies. Modifications, upgrades and development of systems and software ongoing in support of In-Service aircraft carrier modernization initiatives and TOC reduction initiatives. Specific projects completed include CVN Integrated Topside effort (awaiting final assessment report), Antenna to Antenna Effort (awaiting final assessment report), Integrated Bridge Control Data Logger, PCS proof of concept.					
FY 2016 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Fiscal Year 2016 plans include 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. ***FY 2017 Base Plans:*** Fiscal Year 2017 plans include 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. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	1.774	2.217	0.573	0.000	0.573

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 2017 Navy			Date: February 2016
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 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ship Integration	WR	NAVSEA : Phil	1.649	0.270	Nov 2014	0.729	Nov 2015	0.215	Nov 2016	-		0.215	0.000	2.863	-
Ship Integration	WR	NAVSEA : Dahlgren	0.197	0.000		0.000		0.000		-		0.000	0.000	0.197	-
Ship Integration	WR	NAVSEA : Carderock	0.000	0.000		0.225	Nov 2015	0.000		-		0.000	0.000	0.225	-
		Subtotal	1.846	0.270		0.954		0.215		-		0.215	0.000	3.285	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	WR	NAVSEA : Phil	7.643	0.489	Nov 2014	0.150	Nov 2015	0.050	Nov 2016	-		0.050	0.000	8.332	-
Program Management Support	WR	NAVSEA : Phil	2.852	0.225	Nov 2014	0.150	Nov 2015	0.050	Nov 2016	-		0.050	0.000	3.277	-
Training Development	WR	NAVSEA : Phil	1.085	0.180	Nov 2014	0.100	Nov 2015	0.000	Nov 2016	-		0.000	0.000	1.365	-
Integrated Logistics Support	WR	NAVSEA : Phil	1.439	0.115	Nov 2014	0.050	Nov 2015	0.050	Nov 2016	-		0.050	0.000	1.654	-
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	0.000	0.000		0.050	Nov 2015	0.050	Nov 2016	-		0.050	0.000	0.100	-
		Subtotal	13.644	1.009		0.500		0.200		-		0.200	0.000	15.353	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 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	0.000	0.000	Nov 2014	0.175	Nov 2015	0.050	Nov 2016	-		0.050	0.000	0.225	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
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 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAVSEA : Phil	4.831	0.495	Nov 2014	0.588	Nov 2015	0.108	Nov 2016	-		0.108	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	NAVSEA : Dahlgren	0.261	0.000		0.000		0.000		-		0.000	0.000	0.261	-
		Subtotal	5.306	0.495		0.763		0.158		-		0.158	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 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	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	20.804	1.774		2.217		0.573		-		0.573	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
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*

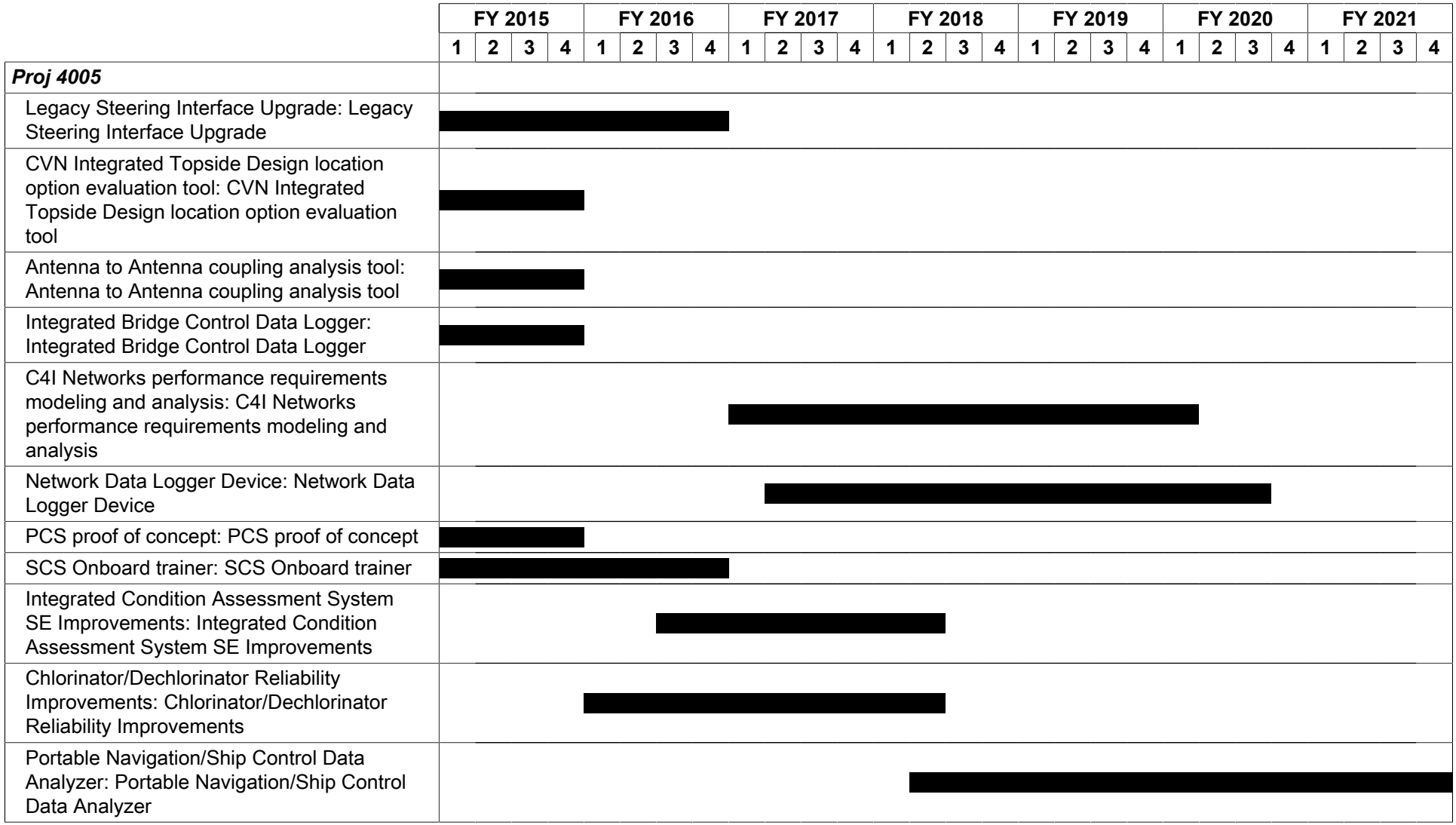


Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 4005 / *In-Service Carrier Systems Development*

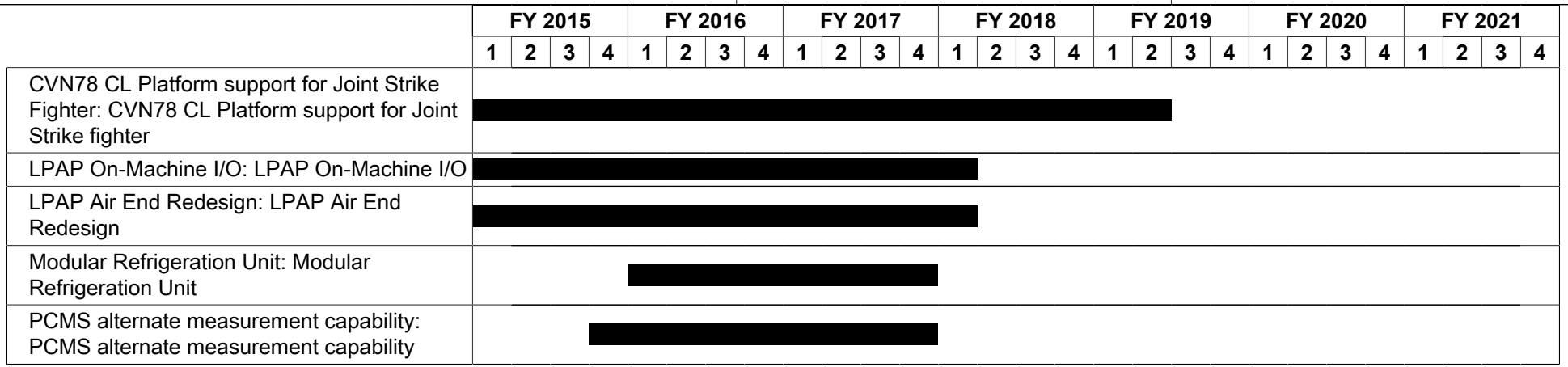


Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 4005 / *In-Service Carrier Systems Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 4005				
Legacy Steering Interface Upgrade: Legacy Steering Interface Upgrade	1	2015	4	2016
CVN Integrated Topside Design location option evaluation tool: CVN Integrated Topside Design location option evaluation tool	1	2015	4	2015
Antenna to Antenna coupling analysis tool: Antenna to Antenna coupling analysis tool	1	2015	4	2015
Integrated Bridge Control Data Logger: Integrated Bridge Control Data Logger	1	2015	4	2015
C4I Networks performance requirements modeling and analysis: C4I Networks performance requirements modeling and analysis	1	2017	1	2020
Network Data Logger Device: Network Data Logger Device	2	2017	3	2020
PCS proof of concept: PCS proof of concept	1	2015	4	2015
SCS Onboard trainer: SCS Onboard trainer	1	2015	4	2016
Integrated Condition Assessment System SE Improvements: Integrated Condition Assessment System SE Improvements	3	2016	2	2018
Chlorinator/Dechlorinator Reliability Improvements: Chlorinator/Dechlorinator Reliability Improvements	1	2016	2	2018
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	2015	2	2019
LPAP On-Machine I/O: LPAP On-Machine I/O	1	2015	1	2018
LPAP Air End Redesign: LPAP Air End Redesign	1	2015	1	2018
Modular Refrigeration Unit: Modular Refrigeration Unit	1	2016	4	2017
PCMS alternate measurement capability: PCMS alternate measurement capability	4	2015	4	2017