Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Navy	Date: April 2022
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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	88.638	7.406	7.182	11.567	-	11.567	10.085	7.789	7.788	7.697	Continuing	Continuing
3216: *Tactical Support Center-Integration*	59.755	6.235	6.004	8.519	-	8.519	6.916	4.755	4.840	4.914	Continuing	Continuing
4005: *In-Service Carrier Systems Development*	28.883	1.171	1.178	3.048	-	3.048	3.169	3.034	2.948	2.783	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Program Element (PE) addresses technology areas associated with Command and Control (C2) of the MH-60R/S Seahawk Helicopter, as well as the development of other technologies and enhancements for Aircraft Carrier-based systems.

SUMMARY OF MAJOR BUDGET REQUEST CHANGES IN THIS PE FROM FY 2022 TO FY 2023 (NET INCREASE OF $+4.385M):
PROJECT 3216 net increase ($+2.515M) reflects additional efforts required in FY 2023 associated with the commencement of CV-TSC Fleet Capability Release-6 (FCR-6) development, to include Minotaur Integration Phase II Improved Multi-Platform Fusion, as necessary to fully integrate sensor data from shipboard radar and electronic warfare (EW) systems into CV-TSC. In addition, a significant amount of foundational work is required in FY 2023 on the Minotaur Electro Optical / Infrared (EO/IR) bi-directional interface with the Geospatial Intelligence Unified Naval Streaming System (GUNSS).
PROJECT 4005 net increase ($+1.870M) reflects new CYBER Security requirements onboard all Aircraft Carriers in compliance with the Navy's strategy to Identify-Protect-Detect-Respond-Recover. The additional funding addresses significant gaps to provide the ongoing research, testing, and integration of tools to protect software and hardware from malicious cyber attacks.

PROJECT 3216: The AN/SQQ-34 Aircraft Carrier Tactical Support Center (CV-TSC) program delivers Anti-Submarine Warfare (ASW) and Surface Warfare (SUW) combat capability to the Aircraft Carrier. This Project provides incremental development to deliver frequent capability updates to the Fleet, developing, testing, certifying, and fielding system upgrades and cyber-security patches. The Project maintains interoperability with current and future interfaces; supports mission data exchange; improves track/sensor processing and analysis techniques; improves mission planning; improves data recording, reconstruction, and distribution; improves embedded simulation and training capabilities and implements cyber-security measures to effectively employ overall Aircraft Carrier, Nuclear powered (CVN) self-defense capabilities. CV-TSC integrates sensor data from Off-Board Aircraft, Organic Platform Sensors, Minotaur Multi-Sensor Fused Track Data, Link-16 Track Data, Ship Self Defense System (SSDS) Track Data (non-Product Line Architecture (non-PLA) and Product Line Architecture (PLA), 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 Carrier Strike Group (CSG) 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 assets, ASW/SUW sensor data processing and analysis, and distribution of tactically significant data. Aircraft supported include: MH-60R/S Seahawk, P-8 Poseidon, MQ-4C Triton, and future ASW/SUW systems.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Navy	Date: April 2022
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*

PROJECT 4005: The In-Service Carrier Systems Development Demonstration and Validation Program develops new technology and enhancements 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), manpower requirements, Total Ownership Costs (TOC), cyber-security engineering and integration, as well as land-based and shipboard testing of new technologies to improve shipboard operations.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	7.526	7.182	0.000	-	0.000
Current President's Budget	7.406	7.182	11.567	-	11.567
Total Adjustments	-0.120	0.000	11.567	-	11.567
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.120	0.000			
• Program Adjustments	0.000	0.000	0.000	-	0.000
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000
• Adjustments to Budget Year	-	-	11.567	-	11.567

Change Summary Explanation

FUNDING CHANGES SINCE THE PREVIOUS PRESIDENT'S BUDGET AT THE OVERALL PE LEVEL:
- FY 2021 decrease of $-0.120M is the result of the Small Business Innovative Research (SBIR) transfer.

PROJECT 3216 - FY 2022 TO FY 2023 BUDGET REQUEST INCREASE:
- FY 2022 ($6.004M) to FY 2023 ($8.519M) increase ($+2.515M) reflects additional efforts required in FY 2023 associated with the commencement of CV-TSC Fleet Capability Release-6 (FCR-6) development, to include Minotaur Integration Phase II Improved Multi-Platform Fusion, as necessary to fully integrate sensor data from shipboard radar and electronic warfare (EW) systems into CV-TSC. This integration effort includes developing interfaces with radars via the Ship Self Defense System (SSDS) and the Surface Electronic Warfare Improvement Program (SEWIP) in order to improve multi-platform sensor fusion. This effort also includes systems engineering support from four (4) different programs including CV-TSC, Minotaur Family of Services (MFoS), SSDS, and SEWIP. There will also be requisite software development, integration, cybersecurity, and testing investments, as well as System Engineering Technical Review (SETR) events to include System Requirements Review (SRR), Preliminary Design Review (PDR), Critical Design Review (CDR) and External Interface Testing (EIT). In addition, a significant amount of foundational work is required to be performed in FY 2023 on the Minotaur Electro Optical / Infrared (EO/IR) bi-directional interface with the Geospatial Intelligence Unified Naval Streaming System (GUNSS).

PROJECT 3216 - SCHEDULE CHANGES SINCE THE PREVIOUS PRESIDENT'S BUDGET:

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Navy	Date: April 2022
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*

CV-TSC FCR-5A (Initial Minotaur Integration) was delayed due to dependencies on interface definitions from the MH-60R which has an existing interface with the current (non-Minotaur) CV-TSC system. CV-TSC FCR-5A Independent Validation and Verification (IV&V) shifted from 2Q22-4Q22 to 3Q22-1Q23, CV-TSC FCR-5A Integrated Shipboard Network Systems / Consolidated Afloat Network and Enterprise Systems (ISNS/CANES) Certification shifted from 4Q22 to 2Q23, CV-TSC FCR-5A Platform Information Technology / Authorization to Operate (PIT/ATO) shifted from 4Q22 to 2Q23, CV-TSC FCR-5A Element Certification shifted from 4Q22 to 2Q23, and CV-TSC FCR-5A Combat System Test (CST) shifted from 4Q22 to 2Q23.

PROJECT 4005 - FY 2022 TO FY 2023 BUDGET REQUEST INCREASE:
The FY 2022 ($1.178M) to FY 2023 ($3.048M) program increase ($+1.870M) reflects new CYBER Security requirements onboard all Aircraft Carriers in compliance with the Navy's strategy to Identify-Protect-Detect-Respond-Recover. The additional funding addresses significant gaps to provide the ongoing research, testing, and integration of tools to protect software and hardware from malicious cyber attacks.

FY 2023 funding increase reflects the fact that the FY 2022 President’s Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy			Date: April 2022
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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
3216: *Tactical Support Center-Integration*	59.755	6.235	6.004	8.519	-	8.519	6.916	4.755	4.840	4.914	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The AN/SQQ-34 Aircraft Carrier Tactical Support Center (CV-TSC) Project delivers Anti-Submarine Warfare (ASW) and Surface Warfare (SUW) combat capability to the Aircraft Carrier. This Project provides incremental development to deliver frequent capability updates to the Fleet, developing, testing, certifying, and fielding system upgrades and cyber-security patches. The Project maintains interoperability with current and future interfaces; supports mission data exchange; improves track/sensor processing and analysis techniques; improves mission planning; improves data recording, reconstruction, and distribution; improves embedded simulation and training capabilities and implements cyber-security measures to effectively employ overall CVN self-defense capabilities. CV-TSC integrates sensor data from Off-Board Aircraft, Organic Platform Sensors, Minotaur Multi-Sensor Fused Track Data, Link-16 Track Data, Ship Self Defense System (SSDS) Track Data (non-Product Line Architecture (non-PLA) and Product Line Architecture (PLA)), 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 assets, ASW/SUW sensor data processing and analysis, and distribution of tactically significant data. Aircraft supported include: MH-60R/S Seahawk, P-8 Poseidon, MQ-4C Triton, and future ASW/SUW systems.

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 assets 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.

Fleet Capability Release 5A (FCR-5A) delivers the initial Minotaur Multi-Sensor Fusion integration/interface with CV-TSC and will be fielded on Aircraft Carriers and shore sites. Minotaur Multi-Sensor Fusion is required to provide increased battlespace awareness, and will significantly accelerate the find, fix, and track capabilities within the Maritime Intelligence Surveillance and Reconnaissance & Targeting (MIS&RT) function when CV-TSC is operating in a communications-denied environment.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: CV-TSC Development / Integration / Test / Certification	6.235	6.004	8.519	0.000	8.519
Articles:	-	-	-	-	-
Description: CV-TSC's evolutionary acquisition approach to developing, testing, certifying, and fielding system upgrades and cyber-security patches is implemented through a series of phased Fleet Capability Releases (FCRs).					
FY 2022 Plans: - Complete Independent Verification and Validation (IV&V) for FCR-5 (Technical Insertion (TI)-16). - Complete certifications required for fielding, to include Cybersecurity Risk Management Framework (RMF) Step 6 for Information Assurance (IA) Accreditation, Platform Information Technology (PIT) / Authorization to Operate (ATO), Integrated Shipboard Network System (ISNS) and Consolidated Afloat Network Enterprise Systems (CANES) Certifications, Program Executive Office (PEO) Integrated Warfare Systems (IWS) Element Certification, and Combat System Test (CST) Certification for FCR-5 (TI-16). - Complete FCR-5A (Initial Minotaur Integration) development. - Begin IV&V for FCR-5A (Initial Minotaur Integration).					
FY 2023 Base Plans: - Complete IV&V for FCR-5A (Initial Minotaur Integration). - Complete certifications required for fielding, to include Cybersecurity RMF Step 6 for IA, PIT/ATO, ISNS and CANES Certifications, PEO IWS Element Certification, and CST Certification for FCR-5A (Initial Minotaur Integration). - Begin FCR-6 development to include integration of sensor data from shipboard radar and electronic warfare (EW) systems, additional support of the Integrated Bridge System on Ships (IBS-S), improved Infrastructure as a Service (IaaS), an interface with Minotaur on CANES to incorporate non-organic data (Indications & Warning (I&W) tracks) into CV-TSC for the surface/subsurface tactical picture, an MH-60R change to include a Minotaur interface over the Common Data Link (CDL) Line of Sight (LoS) link to the CVN combat system network via CV-TSC, and a Minotaur Electro Optical/Infrared (EO/IR) bi-directional interface with Geospatial Intelligence Unified Naval Streaming System (GUNSS).					
FY 2023 OCO Plans: N/A					
FY 2022 to FY 2023 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
The FY 2022 ($6.004M) to FY 2023 ($8.519M) increase ($+2.515M) is due to the initiation and ramping up of CV-TSC Fleet Capability Release-6 (FCR-6) development efforts associated with Minotaur Integration Phase II - Improved Multi-Platform Fusion, which will integrate sensor data from shipboard radar and electronic warfare (EW) systems. In FY 2023, effort focuses specifically on the Minotaur Electro Optical / Infrared (EO/IR) bi-directional interface with the Geospatial Intelligence Unified Naval Streaming System (GUNSS), a foundational element of CV-TSC FCR-6.					
Accomplishments/Planned Programs Subtotals	6.235	6.004	8.519	0.000	8.519

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• OPN/2176: *Undersea Warfare Support Equipment (N98/CV-TSC only)*	0.150	2.643	2.336	-	2.336	2.393	1.502	0.401	0.409	Continuing	Continuing

Remarks

D. Acquisition Strategy

- CV-TSC utilizes an incremental development approach that aims to deliver frequent capability updates via Fleet Capability Releases (FCRs). 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.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy			Date: April 2022
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 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CV-TSC Development / Integration	C/CPFF	Adaptive Methods : VA	4.610	0.712	Nov 2020	0.486	Feb 2022	0.310	Dec 2022	-		0.310	Continuing	Continuing	Continuing
CV-TSC Development / Integration	C/CPFF	JHU/APL : MD	0.250	0.000		0.660	Feb 2022	0.770	Dec 2022	-		0.770	Continuing	Continuing	Continuing
CV-TSC Development / Integration	WR	NAWC/Pax River : MD	1.388	0.207	Jan 2021	0.175	Nov 2021	0.140	Nov 2022	-		0.140	Continuing	Continuing	Continuing
CV-TSC Development / Integration	WR	NRL : DC	0.325	0.000		0.000		0.000		-		0.000	0.000	0.325	-
CV-TSC Development / Integration	WR	NSWC/Carderock : MD	2.650	0.000		0.000		0.000		-		0.000	0.000	2.650	-
CV-TSC Development / Integration Text	WR	NSWC/Crane : IN	0.000	0.000		0.140	Mar 2022	0.165	Nov 2022	-		0.165	Continuing	Continuing	Continuing
CV-TSC Development / Integration	WR	NSWC/Dahlgren : VA	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	-
CV-TSC Development / Integration	WR	NUWC/Keyport : WA	31.076	4.287	Nov 2020	3.223	Nov 2021	5.139	Nov 2022	-		5.139	Continuing	Continuing	Continuing
CV-TSC Development / Integration	WR	SPAWAR : CA	4.160	0.000		0.000		0.000		-		0.000	0.000	4.160	-
CV-TSC Development / Integration	C/CPFF	VAR* : VAR*	2.395	0.488	Dec 2020	0.410	Dec 2021	0.970	Dec 2022	-		0.970	Continuing	Continuing	Continuing
Boundary Defense Capability Design/ Development	WR	NSWC/Philadelphia : PA	4.046	0.000		0.000		0.000		-		0.000	0.000	4.046	-
Boundary Defense Capability Design/ Development	C/CPFF	VAR* : VAR*	4.495	0.000		0.000		0.000		-		0.000	0.000	4.495	-
		Subtotal	55.495	5.694		5.094		7.494		-		7.494	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 2023 Navy			Date: April 2022
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 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CV-TSC Test / Certification	WR	NUWC//Keyport : WA	2.968	0.330	Nov 2020	0.600	Nov 2021	0.610	Nov 2022	-		0.610	Continuing	Continuing	Continuing
CV-TSC Test / Certification	WR	NUWC/Newport : RI	0.125	0.000		0.100	Mar 2022	0.100	Nov 2022	-		0.100	Continuing	Continuing	Continuing
		Subtotal	3.093	0.330		0.700		0.710		-		0.710	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support - Acquisition, Business & Finance	C/CPAF	BAE Systems : MD	0.411	0.000		0.000		0.000		-		0.000	0.000	0.411	-
Program Management Support - Acquisition, Business & Finance	C/CPFF	CACI : VA	0.134	0.000		0.000		0.000		-		0.000	0.000	0.134	-
Program Management Support - Acquisition, Business & Finance	C/CPFF	Booz Allen Hamilton : VA	0.000	0.041	Mar 2021	0.040	Mar 2022	0.130	Dec 2022	-		0.130	Continuing	Continuing	Continuing
Program Management Support - Systems Engineering and Technical Assistance (SETA)	C/CPFF	CGI Federal : VA	0.558	0.000		0.000		0.000		-		0.000	0.000	0.558	-
Program Management Support - Systems Engineering and Technical Assistance (SETA)	C/CPFF	KMS Solutions : VA	0.000	0.150	Feb 2021	0.150	Mar 2022	0.165	Dec 2022	-		0.165	Continuing	Continuing	Continuing
Program Office Travel	Allot	NAVSEA PEO IWS5 : DC	0.064	0.020	Dec 2020	0.020	Oct 2021	0.020	Oct 2022	-		0.020	Continuing	Continuing	Continuing
		Subtotal	1.167	0.211		0.210		0.315		-		0.315	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603512N / *Carrier Systems Development*	Project (Number/Name) 3216 / *Tactical Support Center-Integration*	

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	59.755	6.235		6.004		8.519		-		8.519	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 3216 / *Tactical Support Center-Integration*

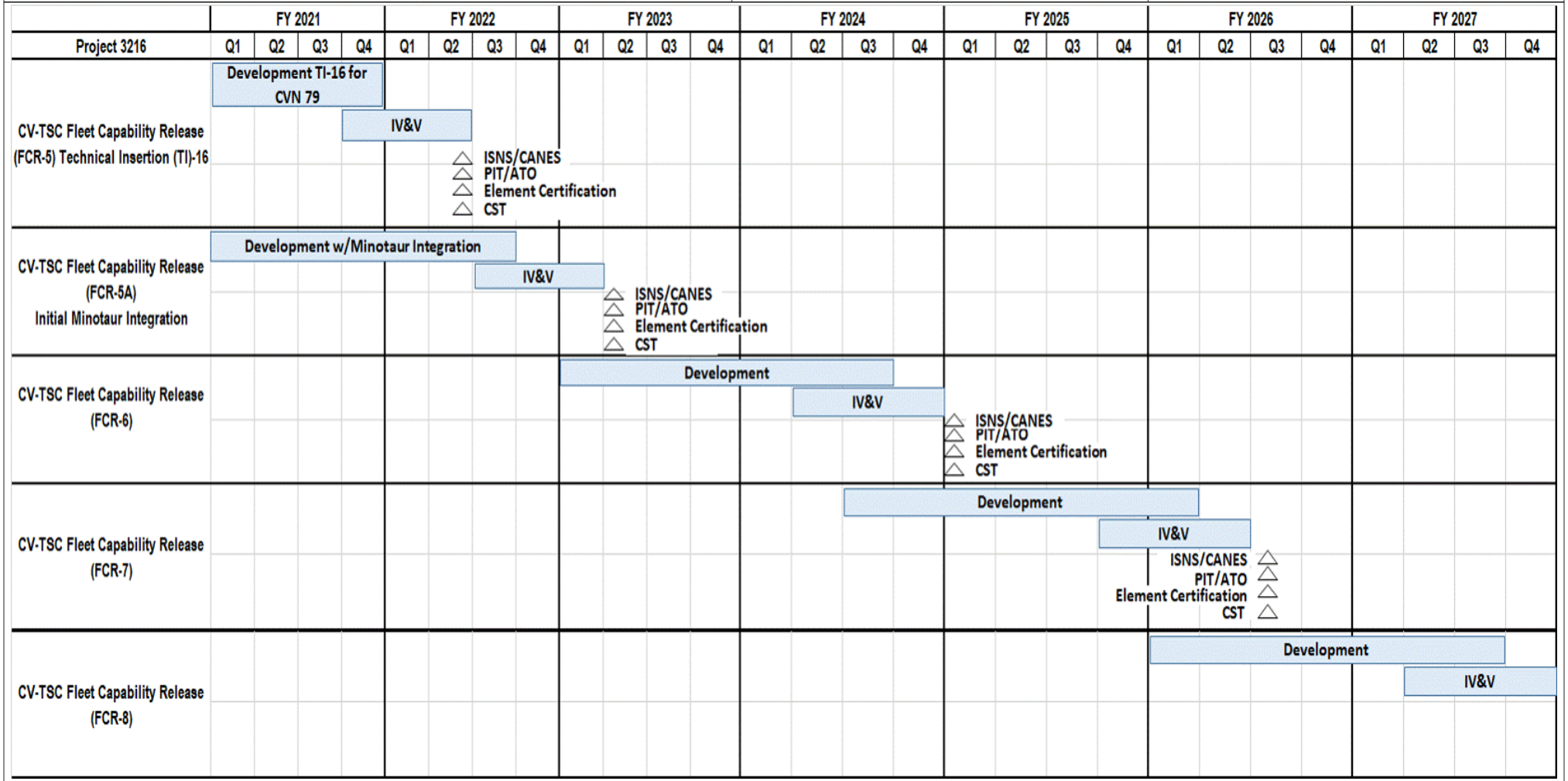

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 3216 / *Tactical Support Center-Integration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CV-TSC FCR-5 (TI-16 for CVN-79)				
CV-TSC FCR-5 Development	1	2021	4	2021
CV-TSC FCR-5 IV&V	4	2021	2	2022
CV-TSC FCR-5 ISNS / CANES Certification	2	2022	2	2022
CV-TSC FCR-5 PIT/ATO	2	2022	2	2022
CV-TSC FCR-5 Element Certification	2	2022	2	2022
CV-TSC FCR-5 CST	2	2022	2	2022
CV-TSC FCR-5A (Initial Minotaur Integration)				
CV-TSC FCR-5A Development	1	2021	3	2022
CV-TSC FCR-5A IV&V	3	2022	1	2023
CV-TSC FCR-5A ISNS / CANES Certification	2	2023	2	2023
CV-TSC FCR-5A PIT/ATO	2	2023	2	2023
CV-TSC FCR-5A Element Certification	2	2023	2	2023
CV-TSC FCR-5A CST	2	2023	2	2023
CV-TSC FCR-6				
CV-TSC FCR-6 Development	1	2023	3	2024
CV-TSC FCR-6 IV&V	2	2024	4	2024
CV-TSC FCR-6 ISNS / CANES Certification	1	2025	1	2025
CV-TSC FCR-6 PIT/ATO	1	2025	1	2025
CV-TSC FCR-6 Element Certification	1	2025	1	2025
CV-TSC FCR-6 CST	1	2025	1	2025
CV-TSC FCR-7				

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
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 FCR-7 Development	3	2024	1	2026
CV-TSC FCR-7 IV&V	4	2025	2	2026
CV-TSC FCR-7 ISNS / CANES Certification	3	2026	3	2026
CV-TSC FCR-7 PIT/ATO	3	2026	3	2026
CV-TSC FCR-7 Element Certification	3	2026	3	2026
CV-TSC FCR-7 CST	3	2026	3	2026
CV-TSC FCR-8				
CV-TSC FCR-8 Development	1	2026	3	2027
CV-TSC FCR-8 IV&V	2	2027	4	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy			Date: April 2022
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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
4005: *In-Service Carrier Systems Development*	28.883	1.171	1.178	3.048	-	3.048	3.169	3.034	2.948	2.783	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The In-Service Carrier Systems Demonstration and Validation Program develops new technology and enhancements for 11 nuclear powered Aircraft Carriers with nearly 300 systems onboard each vessel. These systems are a combination of historical and new initiatives that deliver an affordable, robust, operator-friendly automated control environment. In order to deter threats and properly integrate all of the systems, the Demonstration and Validation Program segments the testing and upgrades into four areas: system architecture, requirements/specification development, technology selection, cyber-security engineering and integration, and software development. The Demonstration and Validation Program also focuses on the Total Ownership Costs of each system and any equipment obsolescence issues. Initial technologies include the Uninterruptible Power Supply (UPS) Replacements, the Integrated Condition Assessment System (ICAS), the On-Machine I/O development for Low Pressure Air Plants (LPAP) and LPAP Air End Re-design. 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 (WELPS), Legacy Steering Interface (LSI) upgrades, Passive Countermeasures System (PCMS) alternate measurement capability, additive manufacturing efforts, and Weapons Elevators Programmable Logic Controller (PLC) redesign.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: In-Service Carrier Systems Development	1.171	1.178	3.048	0.000	3.048
Articles:	-	-	-	-	-
FY 2022 Plans: Fiscal Year 2022 plans support Aircraft Carrier technologies to include the Structural Assessment Tool, Weapons Elevator Tech Refresh for CVN 71-75 hulls currently in availability, and the CVN 78 Joint Strike Fighter Platform integration. Modifications, upgrades, and development of systems and software will be ongoing in support of In-Service Aircraft Carrier Modernization and Total Ownership Cost reduction initiatives to address equipment obsolescence issues.					
FY 2023 Base Plans: Fiscal Year 2023 plans include continued support to Aircraft Carrier technologies, with emphasis on Additive Manufacturing and the Weapon Elevator Programmable Logic Controller (PLC) Re-design. Modifications, upgrades, and development of systems and software will be ongoing in support of In-Service Aircraft Carrier Modernization and Total Ownership Cost reduction initiatives to address equipment obsolescence. Fiscal Year 2023 also encompasses CYBER Security requirements to include the implementation of the Defense-in-Depth					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Functional Implementation Architecture (DFIA), the CYBERSAFE program, and risk assessment, development, and testing of the Identify Protect Detect Respond and Recover strategy. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The FY 2022 ($1.178M) to FY 2023 ($3.048M) program increase ($1.870M) reflects new CYBER Security requirements onboard all Aircraft Carriers in compliance with the Navy's strategy to Identify-Protect-Detect-Respond-Recover. The additional funding addresses significant gaps to provide the ongoing research, testing, and integration of tools to protect software and hardware from malicious cyber attacks in accordance with CNO Directive 5239.4.					
Accomplishments/Planned Programs Subtotals	1.171	1.178	3.048	0.000	3.048

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). Deliver affordable operational upgrades onboard each platform through comparative initiatives and analysis without sacrificing schedule, performance, or requirements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy			Date: April 2022
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 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ship Integration	WR	NSWC : Philadelphia	4.327	0.464	Nov 2020	0.456	Nov 2021	0.308	Nov 2022	-		0.308	0.000	5.555	-
Ship Integration	WR	NSWC : Dahlgren	0.197	0.000		0.000		0.000		-		0.000	0.000	0.197	-
Ship Integration	WR	NSWC : Carderock	0.475	0.000		0.000		0.000		-		0.000	0.000	0.475	-
Ship Integration	WR	DOE : KCNSC	0.000	0.000		0.000		0.600	Nov 2022	-		0.600	0.000	0.600	-
		Subtotal	4.999	0.464		0.456		0.908		-		0.908	0.000	6.827	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	WR	NSWC : Philadelphia	8.486	0.100	Nov 2020	0.100	Nov 2021	0.525	Nov 2022	-		0.525	0.000	9.211	-
Program Management Support	WR	NSWC : Philadelphia	3.577	0.100	Nov 2020	0.100	Nov 2021	0.200	Nov 2022	-		0.200	0.000	3.977	-
Training Development	WR	NSWC : Philadelphia	1.515	0.100	Nov 2020	0.100	Nov 2021	0.200	Nov 2022	-		0.200	0.000	1.915	-
Integrated Logistics Support	WR	NSWC : Philadelphia	1.889	0.100	Nov 2020	0.100	Nov 2021	0.200	Nov 2022	-		0.200	0.000	2.289	-
Software Development	WR	NSWC : Dahlgren	0.308	0.000		0.000		0.000		-		0.000	0.000	0.308	-
Program Management Support	WR	NSWC : Dahlgren	0.317	0.000		0.000		0.000		-		0.000	0.000	0.317	-
Program Management Support	WR	NSWC : Carderock	0.250	0.007	Nov 2020	0.026	Nov 2021	0.265	Nov 2022	-		0.265	0.000	0.548	-
		Subtotal	16.342	0.407		0.426		1.390		-		1.390	0.000	18.565	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NIWC : Atlantic	0.214	0.000		0.000		0.000		-		0.000	0.000	0.214	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy		Date: April 2022
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 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NSWC : Carderock	0.225	0.000		0.000		0.000		-		0.000	0.000	0.225	-
Developmental Test & Evaluation	WR	NSWC : Philadelphia	6.834	0.300	Nov 2020	0.296	Nov 2021	0.750	Nov 2022	-		0.750	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	NSWC : Dahlgren	0.261	0.000		0.000		0.000		-		0.000	0.000	0.261	-
		Subtotal	7.534	0.300		0.296		0.750		-		0.750	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 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 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	28.883	1.171		1.178		3.048		-		3.048	Continuing	Continuing	N/A

Remarks

Ship Integration, Test and Evaluation, and Software Development increases reflect the investment into Cyber Security Survivability Wholeness.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy		Date: April 2022
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

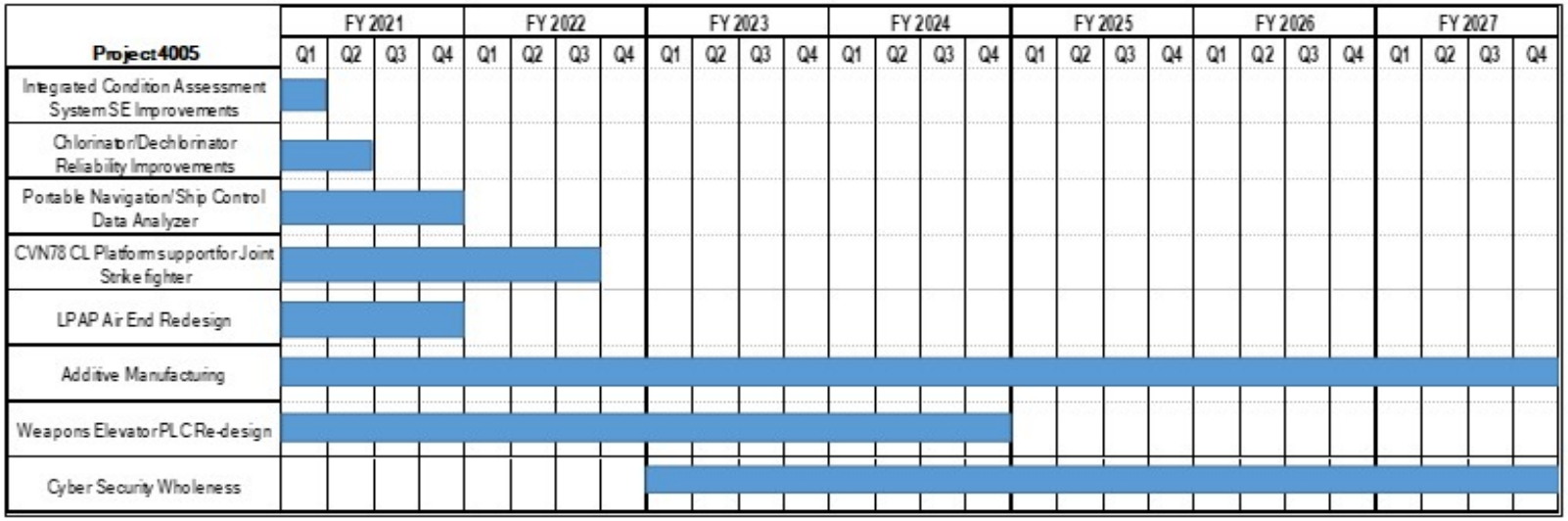

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 4005 / *In-Service Carrier Systems Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 4005				
Integrated Condition Assessment System SE Improvements: Integrated Condition Assessment System SE Improvements	1	2021	1	2021
Chlorinator/Dechlorinator Reliability Improvements: Chlorinator/Dechlorinator Reliability Improvements	1	2021	2	2021
Portable Navigation/Ship Control Data Analyzer: Portable Navigation/Ship Control Data Analyzer	1	2021	4	2021
CVN78 CL Platform support for Joint Strike Fighter: CVN78 CL Platform support for Joint Strike fighter	1	2021	3	2022
LPAP Air End Redesign: LPAP Air End Redesign	1	2021	4	2021
Additive Manufacturing: Additive Manufacturing	1	2021	4	2027
Weapons Elevator PLC Redesign: Weapons Elevator PLC Redesign	1	2021	4	2024
CYBER Security Wholeness: Cyber Security Wholeness	1	2023	4	2027