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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0206335M *I Common Aviation Command and Control Sys (CAC2S)*							
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	57.367	4.311	12.869	14.865	-	14.865	9.950	2.651	1.203	1.190	Continuing	Continuing
3373: *Common Aviation Command and Control System (CAC2S)*	57.367	4.311	9.324	14.865	-	14.865	9.950	2.651	1.203	1.190	Continuing	Continuing
9999: *Congressional Adds*	0.000	0.000	3.545	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.545
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** MN36												

A. Mission Description and Budget Item Justification

Common Aviation Command and Control System (CAC2S) is a Commandant of the Marine Corps (CMC) Force Design (FD) program which provides the Aviation Combat Element (ACE) with the necessary hardware, software, equipment, and facilities to effectively command, control, and coordinate aviation operations. CAC2S accomplishes the missions with a family of systems to support the Marine Air Ground Task Force (MAGTF), Naval forces, Joint Services, and Coalition Forces. CAC2S integrates the functions of aviation command and control (C2) into an interoperable system that supports the core competencies of all Marine Corps warfighting concepts. CAC2S, in conjunction with the Marine Air Command and Control System (MACCS) organic sensors, AN/TPS-80 Ground/Air Task Oriented Radar (G/ATOR), and the weapon system Composite Tracking Network (CTN) provides enhanced air control, improved situational awareness, sensor integration, full Tactical Data Link integration, airspace and battle planning and command functionality, as well as sensor netting integration (CTN). CAC2S, with these organic MACCS programs, support the tenets of Expeditionary Maneuver Warfare and foster joint interoperability. CAC2S Increment I replaced legacy aviation command and control systems in the following Marine aviation agencies: Direct Air Support Center (DASC), Tactical Air Command Center (TACC), Tactical Air Operations Center (TAOC), and Marine Air Traffic Control (MATC). In line with Force Design, CAC2S is to begin the development and prototyping of the Small Form Factor (SFF) variant in FY 2022. The SFF is a CAC2S variant required to meet the needs of Expeditionary Advance Base Operations and Force Design. The SFF variant will possess the same Tactical System, Data Link, and interface capabilities as the CAC2S Increment 1 system with the added benefits of being rapidly deployable, emitting at a lower signature, and reduced size and weight. The SFF's versatility will be a key enabling capability to support the task organization of the Marine Littoral Regiments (MLRs) as it meets the needs of US Marine Corps Expeditionary Advance Base Operations.

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0206335M *I Common Aviation Command and Control Sys (CAC2S)*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	4.406	9.324	0.000	-	0.000
Current President's Budget	4.311	12.869	14.865	-	14.865
Total Adjustments	-0.095	3.545	14.865	-	14.865
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	3.545			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.095	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	-	-	14.865	-	14.865

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: 9999: *Congressional Adds*		
Congressional Add: *Common Aviation Command & Control System Naval Integrated Fire Control*	0.000	3.545
Congressional Add Subtotals for Project: 9999	0.000	3.545
Congressional Add Totals for all Projects	0.000	3.545

Change Summary Explanation

The increase of $1.996M from FY 2022 to FY 2023 is attributed to the start in development and integration of Naval Integrated Fire Control (NIFC) and the Automatic Dependent Surveillance - Broadcast (ADS-B) system. In addition, the increase will support the research of CAC2S Force Design Technology Enhancements.

The FY 2023 funding request was adjusted by $0.772M to account for the availability of prior year execution balances.

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 / 7	R-1 Program Element (Number/Name) PE 0206335M / *Common Aviation Command and Control Sys (CAC2S)*	Project (Number/Name) 3373 / *Common Aviation Command and Control System (CAC2S)*	

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
3373: *Common Aviation Command and Control System (CAC2S)*	57.367	4.311	9.324	14.865	-	14.865	9.950	2.651	1.203	1.190	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: MN36

A. Mission Description and Budget Item Justification

Common Aviation Command and Control System (CAC2S) is a Commandant of the Marine Corps (CMC) Force Design (FD) program, which provides the Aviation Combat Element (ACE) with the necessary hardware, software, equipment, and facilities to effectively command, control, and coordinate aviation operations. CAC2S accomplishes the missions with a family of systems to support the Marine Air Ground Task Force (MAGTF), Naval forces, Joint Services, and Coalition Forces. CAC2S integrates the functions of aviation command and control (C2) into an interoperable system that supports the core competencies of all Marine Corps warfighting concepts. CAC2S, in conjunction with the Marine Air Command and Control System (MACCS) organic sensors, AN/TPS-80 Ground/Air Task Oriented Radar (G/ATOR), and the weapon system Composite Tracking Network (CTN) provides enhanced air control, improved situational awareness, sensor integration, full Tactical Data Link integration, airspace and battle planning and command functionality, as well as sensor netting integration (CTN). CAC2S, with these organic MACCS programs, support the tenets of Expeditionary Maneuver Warfare and foster joint interoperability. CAC2S Increment I replaced legacy aviation command and control systems in the following Marine aviation agencies: Direct Air Support Center (DASC), Tactical Air Command Center (TACC), Tactical Air Operations Center (TAOC), and Marine Air Traffic Control (MATC). CAC2S is the C2 system that enables the distribution of G/ATOR sensors and is critical to developing Naval and Marine integrated fire control methods. CAC2S sensor date correlation and distribution via the Composite Tracking Network (CTN) enables Marine Air Ground Task Force sensor data to be shared with Naval forces to inform the Joint targeting and decision-making process. In line with Force Design, CAC2S is to begin the development and prototyping of the Small Form Factor (SFF) variant in FY 2022. The SFF is a CAC2S variant required to meet the needs of Expeditionary Advance Base Operations and Force Design. The SFF variant will possess the same Tactical System, Data Link, and interface capabilities as the CAC2S Increment 1 system with the added benefits of being rapidly deployable, emitting at a lower signature, and reduced size and weight. In addition, the SFF's versatility will be a key enabling capability to support the task organization of the Marine Littoral Regiments (MLRs) as it meets the needs of US Marine Corps Expeditionary Advance Base Operations (EABO).

This increase of $5.541M from FY 2022 to FY 2023 is to support the development and integration of Naval Integrated Fire Control (NIFC) and the Automatic Dependent Surveillance - Broadcast (ADS-B) system. In addition, CAC2S will begin to research Force Design Technology Enhancements to investigate and identify new capabilities to support future CAC2S anticipated roles within EABO and LOCE CONOPS.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Product Development	0.000	4.800	10.358	0.000	10.358
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 3373 / *Common Aviation Command and Control System (CAC2S)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
FY 2022 Plans: - To initiate the AN/TSQ-297 Air Command & Control (AC2S) Small Form Factor (SFF) variant configuration development, and testing. This is an approved FD requirement which is to be developed and produced to the meet critical shortfalls of forward deployed small, scalable, survivable aviation C2 nodes capable of performing control of aircraft and missiles necessary for integration and defeat of dynamic targets performed by MAGTF, naval, joint, and national technical enabling capabilities. ***FY 2023 Base Plans:*** - To begin the development and integration Naval Integrated Fire Control (NIFC). - To begin research of new capabilities derived from Force Design and EABO, and conducts analysis on the technical approaches needed. - To continue the development, testing, and integration of the AN/TSQ-297 Air Command & Control (AC2S) Small Form Factor (SFF) variant. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The $5.558M increase is to start the development and integration of Naval Integrated Fire Control (NIFC) and the Automatic Dependent Surveillance - Broadcast (ADS-B) system. In addition, the increase will support the research of CAC2S Force Design Technology Enhancements.					
Title: Support	1.299	2.015	1.932	0.000	1.932
Articles:	-	-	-	-	-
FY 2022 Plans: - To continue yearly Cyber Compliance Tests required with each of the CAC2S quarterly software releases and conduct the Annual Security Review testing to support the maintenance of the CAC2S ATO/ATC. - To support integration development for new military-grade commercial-off-the-shelf (COTS) information technology (IT) hardware and software in support the technology refresh of the AN/TSQ-297 Air Command & Control Systems. This technical refresh is required to replace all obsolete hardware and software with new military-grade commercial-off-the-shelf (COTS) information technology (IT) configuration items every 5 years to maintain operational performance of the product baseline, and remain aligned with industry standard and service enterprise computing environment directives.					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 3373 / *Common Aviation Command and Control System (CAC2S)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
- To begin the development required to integrate Multifunctional Information Distribution System Joint Tactical Radio Systems (MIDS JTRS) for the AN/TSQ-297 AC2S Link-16 modernization. This is a Deputy SECDEF mandated system upgrade which enhances operational effectiveness without consuming more space, weight or power. ***FY 2023 Base Plans:*** - To continue yearly Cyber Compliance Tests required with each of the CAC2S quarterly software releases and conduct the Annual Security Review testing to support the maintenance of the CAC2S ATO/ATC. - To complete interface testing for new military-grade COTS IT hardware and software for the technology refresh of the AN/TSQ-297 Air Command & Control Systems. - To continue the development required to integrate Multifunctional Information Distribution System Joint Tactical Radio Systems (MIDS JTRS) for the AN/TSQ-297 AC2S Link-16 modernization. This is a Deputy SECDEF mandated system upgrade which enhances operational effectiveness without consuming more space, weight or power. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The $0.083M decrease is due to a reduction of interface testing support for the technology refresh of the AN/TSQ-297 Air Command & Control System.					
Title: Test and Evaluation	2.412	1.827	1.875	0.000	1.875
Articles:	-	-	-	-	-
FY 2022 Plans: - To Continue required integration and interface testing of upgraded hardware components and software enhancements. - To continue testing to support system software capability enhancements for capability improvement and to maintain system ATO and ATC. - To initiate interface testing for new military-grade COTS IT hardware and software for the technology refresh of the AN/TSQ-297 Air Command & Control Systems. The technology refresh is required to replace all obsolete hardware and software with new military-grade commercial-off-the-shelf (COTS) information technology (IT) configuration items every 5 years to maintain operational performance of the product baseline, and remain aligned with industry standard and service enterprise computing environment directives					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 3373 / *Common Aviation Command and Control System (CAC2S)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
- To complete Field User Evaluation (FUE) tests for AC2S Air Traffic Control integration/interface development and AN/MRQ-13 Communications System (CS) radio and crypto modernization. The CS upgrade is to replace obsolete voice/data communications components with modernized equipment that is more reliable, readily supportable and cyber-secure, enabling integration with CAC2S networks and interoperability with joint forces. ***FY 2023 Base Plans:*** - To Continue required integration and interface testing of upgraded hardware components and software enhancements. - To continue testing to support system software capability enhancements for capability improvement and to maintain system ATO and ATC. - To complete interface testing for new military-grade COTS IT hardware and software for the technology refresh of the AN/TSQ-297 Air Command & Control Systems. - To begin the development and integration testing for the Automatic Dependent Surveillance - Broadcast (ADS-B) system capability. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The funding increase of $0.048M from FY 2022 to FY 2023 is due to the start of integration and developmental testing for the Automatic Dependent Surveillance - Broadcast (ADS-B) system.					
Title: Management Services	0.600	0.682	0.700	0.000	0.700
Articles:	-	-	-	-	-
FY 2022 Plans: - To fund continued support from vendor MITRE to monitor CAC2S integration efforts with the MACS sensors, G/ATOR, CTN/CEC, and GBAD development. MITRE continue its development of prototype radar and track data injection tools to facilitate contractor integration and Government laboratory testing of CAC2S. ***FY 2023 Base Plans:*** - To fund continued support from vendor MITRE to monitor CAC2S integration efforts with the MACS sensors, G/ATOR, CTN/CEC, and GBAD development. MITRE continue its development of prototype radar and track data injection tools to facilitate contractor integration and Government laboratory testing of CAC2S. ***FY 2023 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 3373 / *Common Aviation Command and Control System (CAC2S)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** $0.018M increase from FY 2022 to FY 2023 is to account for economic adjusted increase annually for MITRE development tools to support government laboratory testing.					
Accomplishments/Planned Programs Subtotals	4.311	9.324	14.865	0.000	14.865

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
• PMC/4644: *Common Aviation Command And Control System (CAC2S)*	35.057	18.247	30.292	-	30.292	34.627	11.391	5.998	6.064	0.000	334.741

Remarks

RDT&E prior to FY 2015 was in PE 0206313M Marine Corps Comms Systems, Project 2273 Air Operations Command & Control (C2) Systems.

PMC funding for FY 2015 and beyond was in BLI 4644 Common Aviation Command and Control System (CAC2S). Prior to FY 2015 PMC funding is listed in BLI 4640 Air Operations C2 Systems, Common Aviation Command and Control Systems (CAC2S).

D. Acquisition Strategy

CAC2S employs an evolutionary acquisition strategy utilizing an incremental and phased approach for development and fielding of the CAC2S. The Capability Production Document (CPD) identifies two increments to achieve the full requirements of CAC2S. The current acquisition strategy addresses Increment I of the CAC2S development process and focuses on the requirements that will modernize the assault and air support, air defense and control, and Aviation Combat Element (ACE) battle management capabilities of the Marine Air Command and Control System (MACCS). Increment I of the CAC2S has been accomplished through a two phased approach. Phase 1 addressed the requirements to establish the baseline CAC2S capabilities for the MACCS and improved Air Command and Control (AC2) performance and effectiveness. Phase 2 addresses the requirements for remaining ACE Battle Management Command & Control (BMC2) requirements. Nine (9) Phase 2 Limited Deployment Unit systems were procured in FY 2015 and FY 2016 and fielded in FY 2017. The Full Deployment Unit (FDU) production contract was awarded 24 August 2017 and a total of forty one (41) systems were procured and fielded over three years (FY 2018-FY 2020).

CAC2S completed the procurement of components and is currently continuing the fielding the technology refresh of its AN/MRQ-13 Communications Subsystem (CS) for Radio and Crypto Modernization. The CS upgrade replaces 2006-era, obsolete voice/data communications components with modernized equipment that is more reliable, readily supportable and cyber-secure, enabling integration with CAC2S networks and interoperability with joint forces.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 3373 / *Common Aviation Command and Control System (CAC2S)*

In FY 2023, CAC2S will continue the development and testing of a small form factor (SFF) variant prototype of the AN/TSQ-297 Air Command & Control System. This is an approved FD initiative from the Capabilities Development Directorate (CDD) which is to take into account lessons learned from the Marine Corps Warfighting Laboratory (MCWL) Rapid Capabilities Office (RCO) initiatives with 15th Marine Expeditionary Unit (MEU) and war gaming exercises per CMC guidance, in support the USMC Expeditionary Advanced Base Operations (EABO) concept, which is an amphibious forward operating unit that will secure, sustain, and maintain warfighters and their weapons systems on a more amorphous and difficult-to-target forward-basing infrastructure. This system variant is to be developed and produced to the meet critical shortfalls of forward deployed small, scalable, survivable aviation C2 nodes capable of performing control of aircraft and missiles necessary for integration and defeat of dynamic targets performed by MAGTF, naval, joint, and national technical enabling capabilities like the current fielded AN/TSQ-297. The SFF variant will be fielded to the Marine Littoral Regiments (MLRs).

The Technology refresh of the AN/TSQ-297 Air Command & Control Systems and integration of the Multifunctional Information Distribution System Joint Tactical Radio Systems (MIDS JTRS) also continues in FY 2023. The technology refresh is required to replace all obsolete hardware and software with new military-grade commercial-off-the-shelf (COTS) information technology (IT) configuration items every 5 years to maintain operational performance and remain aligned with industry standard and service enterprise computing environment directives. The MIDS JTRS upgrade is a mandated requirement in accordance with the Deputy Secretary of Defense memorandum for record (MFR) 25 October 2019 to support the modernization of Link 16 across all Services. MIDS JTRS is a four-channel radio. It runs the Link 16 waveform and up to three additional communication protocols, including the Airborne Networking Waveform (ANW). The system enhances operational effectiveness without consuming more space, weight or power.

CAC2S will develop and integrate Naval Integrated Fire Control (NIFC). This initiative allows CAC2S to be a key enabler in the Joint Fight in executing the Kill Web across the MAGTF and Joint Services linking sensors and weapons in providing fire control solutions from information from multiple sensors. IFC capabilities complement and support sea-based sensor and weapon system extend the Sea Shield's engagement capabilities to provide early warning and engagement of airborne threats to the MAGTF and Naval Forces.

CAC2S will acquire the Automatic Dependent Surveillance - Broadcast (ADS-B) system (ADS-B) receiver and related peripheral equipment to integrate ADS-B data into CAC2S. CAC2S will be able to leverage information provided by the ADS-B to produce a complete air picture to support commanders in the decision making process. ADS-B ground stations are small and adaptable and will allow CAC2S to reach farther than conventional radar to gather information needed to maintain situational awareness on the battlefield. With the Marine Corps transitioning to Expeditionary Advanced Base Operations (EABO) the ability to utilize ADS-B will also help enhance system survivability by utilizing a passive capability, vice active radar, to provide vital aircraft information and quickly conduct combat identification.

CAC2S will investigate Force Design Technology Enhancements. It will research new capabilities derived from Force Design and EABO, and conduct analysis on the technical approaches needed to align efforts and prepare for future initiatives. All efforts directly support CAC2S's anticipated roles within EABO and Littoral Operations in a Contested Environment (LOCE) Concept of Operations (CONOPS), and provide the ability to conduct sea control and sea denial operations both from sea and from key maritime terrain. Analysis is necessary to inform priorities and FD initiatives.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 3373 / *Common Aviation Command and Control System (CAC2S)*

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
AC2S SFF Development	C/BA	NSWC Crane : Crane, IN	0.000	0.000		4.800	Nov 2021	3.140	Nov 2022	-		3.140	0.000	7.940	-
NIFC Development	C/BA	NSWC Crane : Crane, IN	0.000	0.000		0.000		2.229	Nov 2022	-		2.229	0.000	2.229	-
Force Design Technology Enhancements	C/BA	NSWC Crane : Crane, IN	0.000	0.000		0.000		4.050	Feb 2023	-		4.050	0.000	4.050	-
		Subtotal	0.000	0.000		4.800		9.419		-		9.419	0.000	14.219	N/A

Remarks

The funding increase of $4.619M from FY 2022 to FY 2023 is due to the development and integration of Naval Integrated Fire Control (NIFC) and CAC2S research for Force Design Technology Enhancements.

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
Travel	Various	Travel : TBD	0.359	0.050	Oct 2020	0.075	Oct 2021	0.095	Oct 2022	-		0.095	Continuing	Continuing	Continuing
Engineering Support	WR	NSWC DD : Dahlgren, VA	2.676	0.085	Nov 2020	0.000		0.000		-		0.000	0.000	2.761	-
Acquisition Support	WR	NSWC CD : Crane, IN	1.313	0.350	Nov 2020	0.796	Nov 2021	1.238	Nov 2022	-		1.238	0.000	3.697	-
Software Support	C/FFP	Raytheon Solipsys : Fulton, MD	0.450	0.631	May 2021	0.746	May 2022	0.249	May 2023	-		0.249	0.000	2.076	-
Software Support	C/FFP	Ternion : Huntsville, AL	0.161	0.183	May 2021	0.198	May 2022	0.000		-		0.000	0.000	0.542	-
Software Support	C/FFP	Ultra : San Diego, CA	0.298	0.000		0.200	Jun 2022	0.350	Jun 2023	-		0.350	0.000	0.848	-
Prior Years Cumulative Funding	Various	Various : Various	4.121	0.000		0.000		0.000		-		0.000	0.000	4.121	-
		Subtotal	9.378	1.299		2.015		1.932		-		1.932	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206335M / *Common Aviation Command and Control Sys (CAC2S)*	Project (Number/Name) 3373 / *Common Aviation Command and Control System (CAC2S)*	

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

Remarks

The funding decrease of $0.083M from FY 2022 to FY 2023 is due to a reduction of interface testing support for the technology refresh of the AN/TSQ-297 Air Command & Control System.

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
Testing and Evaluation	WR	NSWC CD : Crane, IN	11.025	1.512	Nov 2020	1.477	Nov 2021	1.626	Nov 2022	-		1.626	7.445	23.085	-
Testing and Evaluation	WR	NSWC DD : Dahlgren, VA	5.691	0.000		0.000		0.000		-		0.000	0.000	5.691	-
Testing and Evaluation	WR	NSWC Corona : Corona, CA	0.518	0.900	Nov 2020	0.145	Nov 2021	1.113	Nov 2022	-		1.113	0.000	2.676	-
Testing and Evaluation	C/BA	JITC : Ft. Huachuca, NM	0.166	0.000		0.205	Jan 2022	0.075	Jan 2023	-		0.075	0.000	0.446	-
Prior Years Cumulative Funding	Various	Various : Various	22.795	0.000		0.000		0.000		-		0.000	0.000	22.795	-
		Subtotal	40.195	2.412		1.827		2.814		-		2.814	7.445	54.693	N/A

Remarks

The funding increase of $0.987M from FY 2022 to FY 2023 is due to the start of integration and developmental testing for the Automatic Dependent Surveillance - Broadcast (ADS-B) system.

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
T&E Mgmt Support	C/FFP	GID : Fredericksburg, VA	0.266	0.000		0.000		0.000		-		0.000	0.000	0.266	-
Sensor Management	C/FFP	MITRE : Bedford, MA	4.796	0.600	Sep 2021	0.682	Sep 2022	0.700	Sep 2023	-		0.700	2.958	9.736	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 3373 / *Common Aviation Command and Control System (CAC2S)*

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
Prior Years Cumulative Funding	Various	Various : Various	2.732	0.000		0.000		0.000		-		0.000	0.000	2.732	19,096.227
		Subtotal	7.794	0.600		0.682		0.700		-		0.700	2.958	12.734	N/A

Remarks

The funding increase of $0.018M from FY 2022 to FY 2023 is due to the inclusion of MITRE development tools to support government laboratory testing.

	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	57.367	4.311		9.324		14.865		-		14.865	Continuing	Continuing	N/A

Remarks

The funding $5.541M increase from FY 2022 to FY 2023 primarily to support the development and integration of Naval Integrated Fire Control (NIFC) and the Automatic Dependent Surveillance - Broadcast (ADS-B) system and research efforts for Force Design Technology Enhancements to identify new capabilities to support future CAC2S anticipated roles within EABO and LOCE CONOPS.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 3373 / *Common Aviation Command and Control System (CAC2S)*

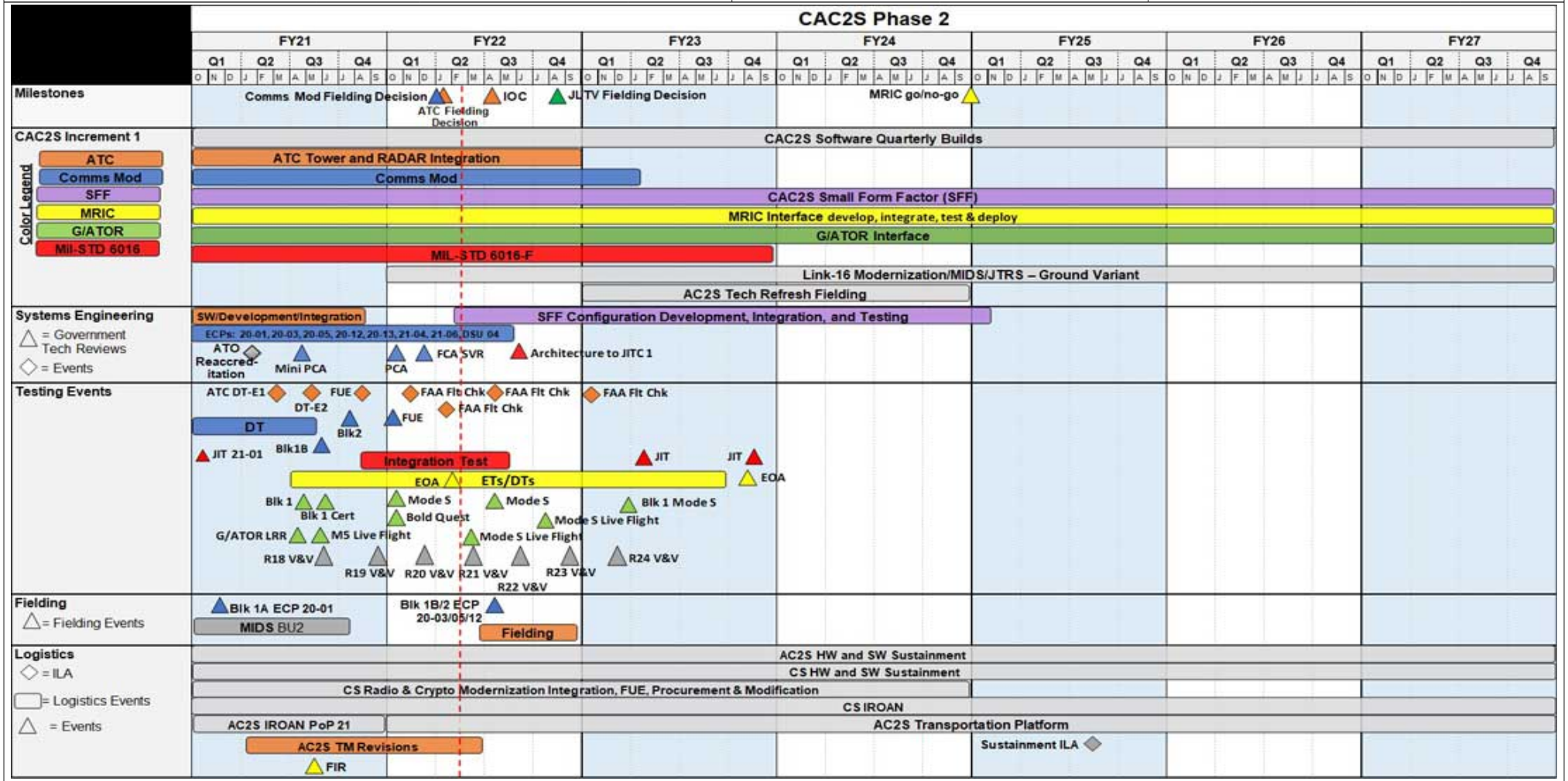

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 3373 / *Common Aviation Command and Control System (CAC2S)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3373				
Milestones: MRQ-13 Communications System Modernization fielding decision	2	2022	2	2022
Milestones: AN/TSQ-297 AC2S FRP/FDU FOC Threshold	2	2022	2	2022
Milestones: IOC	3	2022	3	2022
Milestones: JLTV Fielding Decision	4	2022	4	2022
CAC2S Increment 1: Quarterly SW Releases	1	2021	4	2027
CAC2S Increment 1: Air Traffic Control (ATC) Integration	1	2021	4	2022
CAC2S Increment 1: AN/MRQ-13 CS tech refresh	1	2021	2	2023
CAC2S Increment 1: CAC2S Small Form Factor	1	2021	4	2027
CAC2S Increment 1: MRIC Interface develop, integration, and test	1	2021	4	2027
CAC2S Increment 1: G/ATOR Interface	1	2021	4	2027
CAC2S Increment 1: MIL-STD 6016-F	1	2021	4	2023
CAC2S Increment 1: Link-16 Modernization (MID-JTRS)	1	2022	4	2027
CAC2S Increment 1: AC2S Tech Refresh fielding	1	2023	4	2024
CAC2S Increment 1: ADS-B Interface	1	2023	4	2026
Systems Engineering: Small Form Factor Development, Integration, and Testing	2	2022	1	2025
Systems Engineering: AN/MRQ-13 CS ECPs	1	2021	3	2022
Testing Events: Air Traffic Control (ATC) FAA Flight Checks	1	2022	1	2023
Testing Events: AN/MRQ-13 CS FUE	1	2022	1	2022
Testing Events: MIL-STD 6016-F Integration Test	4	2021	3	2022
Testing Events: MRIC Interface development testing	3	2021	3	2023
Testing Events: G/ATOR Interface Mode S Testing	3	2021	2	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 3373 / *Common Aviation Command and Control System (CAC2S)*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Testing Events: Link-16 Modernization V&Vs	3	2021	1	2023
Full Deployment Unit (FDU) Assets: AN/MRQ-13 CS IROAN	1	2021	4	2021
Full Deployment Unit (FDU) Assets: AC2S IROAN	2	2021	4	2021
Full Deployment Unit (FDU) Assets: AC2S Technology Refresh	2	2021	4	2024
Fielding: Multifunctional Information Distribution System (MIDS) Block Upgrade 2	3	2022	3	2022
Fielding: CAC2S ATC integration fielding	2	2022	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206335M / *Common Aviation Command and Control Sys (CAC2S)*	Project (Number/Name) 9999 / *Congressional Adds*	

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
9999: *Congressional Adds*	0.000	0.000	3.545	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.545
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Common Aviation Command and Control System (CAC2S) is a Commandant of the Marine Corps (CMC) Force Design (FD) program, which provides the Aviation Combat Element (ACE) with the necessary hardware, software, equipment, and facilities to effectively command, control, and coordinate aviation operations. CAC2S accomplishes the missions with a family of systems to support the Marine Air Ground Task Force (MAGTF), Naval forces, Joint Services, and Coalition Forces. CAC2S integrates the functions of aviation command and control (C2) into an interoperable system that supports the core competencies of all Marine Corps warfighting concepts. CAC2S, in conjunction with the Marine Air Command and Control System (MACCS) organic sensors, AN/TPS-80 Ground/Air Task Oriented Radar (G/ATOR), and the weapon system Composite Tracking Network (CTN) provides enhanced air control, improved situational awareness, sensor integration, full Tactical Data Link integration, airspace and battle planning and command functionality, as well as sensor netting integration (CTN). CAC2S, with these organic MACCS programs, support the tenets of Expeditionary Maneuver Warfare and foster joint interoperability. CAC2S Increment I replaced legacy aviation command and control systems in the following Marine aviation agencies: Direct Air Support Center (DASC), Tactical Air Command Center (TACC), Tactical Air Operations Center (TAOC), and Marine Air Traffic Control (MATC). CAC2S is the C2 system that enables the distribution of G/ATOR sensors and is critical to developing Naval and Marine integrated fire control methods. CAC2S sensor date correlation and distribution via the Composite Tracking Network (CTN) enables Marine Air Ground Task Force sensor data to be shared with Naval forces to inform the Joint targeting and decision-making process. In line with Force Design, CAC2S is to begin the development and prototyping of the Small Form Factor (SFF) variant in FY 2022. The SFF is a CAC2S variant required to meet the needs of Expeditionary Advance Base Operations and Force Design. The SFF variant will possess the same Tactical System, Data Link, and interface capabilities as the CAC2S Increment 1 system with the added benefits of being rapidly deployable, emitting at a lower signature, and reduced size and weight. In addition, the SFF's versatility will be a key enabling capability to support the task organization of the Marine Littoral Regiments (MLRs) as it meets the needs of US Marine Corps Expeditionary Advance Base Operations (EABO).

The decrease of $3.545M from FY 2022 to FY 2023 is due to Congressional add funding provided to support the development and integration of Naval Integrated Fire Control (NIFC) in FY 2022.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022
Congressional Add: Common Aviation Command & Control System Naval Integrated Fire Control	0.000	3.545
FY 2021 Accomplishments: N/A		
FY 2022 Plans: - To begin the development and integration of Naval Integrated Fire Control (NIFC).		
Congressional Adds Subtotals	0.000	3.545

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 9999 / *Congressional Adds*

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
• PMC/4644: *Common Aviation Command And Control System (CAC2S)*	35.057	18.247	30.292	-	30.292	34.627	11.391	5.998	6.064	0.000	334.741

Remarks

PMC funding for FY 2015 and beyond was in BLI 4644 Common Aviation Command and Control System (CAC2S). Prior to FY 2015 PMC funding is listed in BLI 4640 Air Operations C2 Systems, Common Aviation Command and Control Systems (CAC2S).

D. Acquisition Strategy

CAC2S employs an evolutionary acquisition strategy utilizing an incremental and phased approach for development and fielding of the CAC2S. The Capability Production Document (CPD) identifies two increments to achieve the full requirements of CAC2S. The current acquisition strategy addresses Increment I of the CAC2S development process and focuses on the requirements that will modernize the assault and air support, air defense and control, and Aviation Combat Element (ACE) battle management capabilities of the Marine Air Command and Control System (MACCS). Increment I of the CAC2S has been accomplished through a two phased approach. Phase 1 addressed the requirements to establish the baseline CAC2S capabilities for the MACCS and improved Air Command and Control (AC2) performance and effectiveness. Phase 2 addresses the requirements for remaining ACE Battle Management Command & Control (BMC2) requirements. Nine (9) Phase 2 Limited Deployment Unit systems were procured in FY 2015 and FY 2016 and fielded in FY 2017. The Full Deployment Unit (FDU) production contract was awarded 24 August 2017 and a total of forty one (41) systems were procured and fielded over three years (FY 2018-FY 2020).

CAC2S completed the procurement of components and is currently continuing the fielding the technology refresh of its AN/MRQ-13 Communications Subsystem (CS) for Radio and Crypto Modernization. The CS upgrade replaces 2006-era, obsolete voice/data communications components with modernized equipment that is more reliable, readily supportable and cyber-secure, enabling integration with CAC2S networks and interoperability with joint forces.

In FY 2022, CAC2S received a Congressional Add to begin the development and integration of Naval Integrated Fire Control (NIFC). This initiative will allow CAC2S to be a key enabler in the Joint Fight in executing the Kill Web across the MAGTF and Joint Services linking sensors and weapons in providing fire control solutions from information from multiple sensors. IFC capabilities complement and support sea-based sensor and weapon system extend the Sea Shield's engagement capabilities to provide early warning and engagement of airborne threats to the MAGTF and Naval Forces.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 9999 / *Congressional Adds*

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
NIFC Development	C/FFP	Raytheon Solipsys : Fulton, MD	0.000	0.000		1.745	Jul 2022	0.000		-		0.000	0.000	1.745	-
NIFC Development	C/BA	NSWC Crane : Crane, IN	0.000	0.000		1.800	Jun 2022	0.000		-		0.000	0.000	1.800	-
		Subtotal	0.000	0.000		3.545		0.000		-		0.000	0.000	3.545	N/A

Remarks

The net decrease of $3.545M from FY 2022 to FY 2023 is due to Congressional add funding provided to support the development and integration of Naval Integrated Fire Control (NIFC) in FY22.

	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	0.000	0.000		3.545		0.000		-		0.000	0.000	3.545	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 9999 / *Congressional Adds*

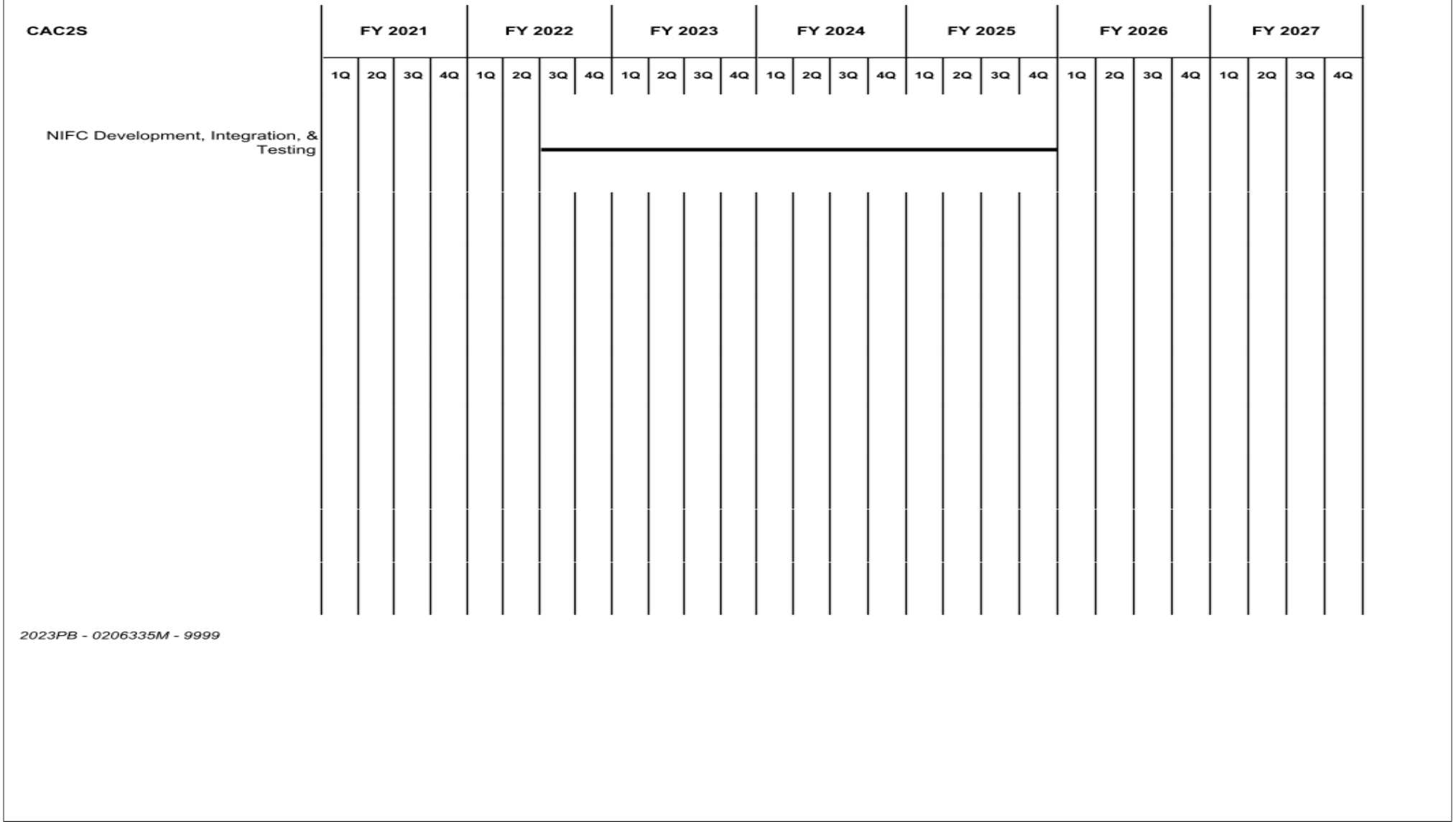

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CAC2S				
NIFC Development, Integration, & Testing: CAC2S Naval Integrated Fire Control Development, Integration, & Testing	3	2022	4	2025