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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0305205N / <i>UAS Integration & Interoperability</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	207.766	4.842	15.396	16.409	-	16.409	7.387	6.472	6.544	6.674	Continuing	Continuing
1993: <i>Architecture and Capabilities for Autonomy in the Naval Enterprise (ARCANE)</i>	0.000	0.000	0.000	16.409	-	16.409	7.387	6.472	6.544	6.674	Continuing	Continuing
3379: <i>Common Control System</i>	207.766	4.842	15.396	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	228.004

A. Mission Description and Budget Item Justification

Unmanned Aircraft Systems (UAS) Integration and Interoperability funding supports the development of solutions for Command and Control (C2) and interoperability of UAS platforms across the Naval Aviation Enterprise (NAE).

Project 3379: All Common Control System (CCS) efforts for Autonomy and Executive Control of multiple unmanned aircraft previously funded under PU 3379 have been transferred to PU 1993 - "Architect and Cap for Autonomy in the Naval Enterprise (ARCANE). This budget profile supports executive control of multiple unmanned aircraft through the development of an autonomy architecture for Naval Aviation platforms. This is an extension of the line of effort established by Common Control System (CCS) (Project 3379), expanding into autonomy and capabilities aligned with the National Defense Strategy. New PU established for clarity.

Project 1993: ARchitecture and Capabilities for Autonomy in the Naval Enterprise (ARCANE) budget profile supports executive control of multiple unmanned aircraft through the development of an autonomy architecture for Naval Aviation platforms. This is an extension of the line of effort established by Common Control System (CCS) (Project 3379), expanding into autonomy and capabilities aligned with the National Defense Strategy. New PU established for clarity.

The CCS program was redirected in FY21 to focus on autonomy, executive control, artificial intelligence, and machine learning for Unmanned Systems (UxS) systems. This direction was consistent with decisions to implement existing solutions for UAS control, while continuing to advance development in valid requirements captured in the CCS requirements document. Under this new direction the program is operating under the name ARCANE.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate funding in the current or subsequent fiscal year.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0305205N / <i>UAS Integration & Interoperability</i>
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B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	5.000	18.373	12.396	-	12.396
Current President's Budget	4.842	15.396	16.409	-	16.409
Total Adjustments	-0.158	-2.977	4.013	-	4.013
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-2.977			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.158	0.000			
• Program Adjustments	0.000	0.000	4.000	-	4.000
• Rate/Misc Adjustments	0.000	0.000	0.013	-	0.013

Change Summary Explanation

Project schedule changes from FY23 submission for Project 3379 reflect redirection toward ARCANE and transfer of autonomy and executive control efforts to Project 1993. This is an extension of the line of effort established by Common Control System (CCS) (Project 3379), expanding into autonomy and capabilities aligned with the National Defense Strategy. New PU established for clarity.

FY24 funding increase enables development activities after program redirection toward autonomy. The increase provides funding for development of autonomy architecture, autonomous behaviors, and tools to enable future autonomy development for the NAE.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0305205N / UAS Integration & Interoperability				Project (Number/Name) 1993 / Architecture and Capabilities for Autonomy in the Naval Enterprise (ARCANE)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
1993: <i>Architecture and Capabilities for Autonomy in the Naval Enterprise (ARCANE)</i>	0.000	0.000	0.000	16.409	-	16.409	7.387	6.472	6.544	6.674	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

ARchitecture and Capabilities for Autonomy in the Naval Enterprise (ARCANE) budget profile supports executive control of multiple unmanned aircraft through the development of an autonomy architecture for Naval Aviation platforms. This is an extension of the line of effort established by CCS (Project 3379), expanding into autonomy and capabilities aligned with the National Defense Strategy. New PU established for clarity.

The CCS program was redirected in FY21 to focus on autonomy, executive control, artificial intelligence, and machine learning for Unmanned Systems (UxS) systems. This direction was consistent with decisions to implement existing solutions for UAS control, while continuing to advance development in valid requirements captured in the CCS requirements document. Under this new direction the program is operating under the name ARCANE.

As part of this transition in focus, the ARCANE program is moving forward under the DoD Adaptive Acquisition Framework Software Acquisition Pathway. This pathway will allow the program to be more responsive to the autonomy needs of Naval Aviation platforms and allow for more efficient delivery of incremental capability. ARCANE has requested entry into the Planning Phase of the Software Acquisition Pathway, and is routing for DA approval. A draft acquisition strategy has been developed and will continue to be refined throughout the Planning Phase.

The ARCANE program will be a provider of autonomous capability solutions for Naval Aviation systems in order to provide interoperability between unmanned and autonomous Naval Aviation platforms, achieving integrated warfighting capability. ARCANE will consist of a common autonomy architecture framework; a process to enable Naval Aviation platforms to identify, achieve, and sustain autonomy needs; and a repository of autonomous behaviors developed for all ARCANE implementations across the Naval Aviation Enterprise (NAE). ARCANE will establish the autonomy enterprise architecture that supports the high-end fight and reduces impact on platform and OEM schedule / business arrangements. Autonomous capabilities will reduce cognitive decision-making workload and required operator actions to maximize warfighting impact in future "great power competition." The Software Acquisition Pathway will provide for the growth of autonomy-enabled capabilities at software pace, not traditional acquisition pace.

Concurrent with enterprise-level work on standards and architectures, the ARCANE program will transition the autonomy elements of the AVATAR Manned-Unmanned Teaming (MUM-T) program, fielding an initial MUM-T capability. The foundational autonomy elements of the MUM-T capability will also serve as the starting point for additional autonomy solutions for the NAE. Establishment of the initial MUM-T warfighting capability will be dependent on partner program integration, within that partner's resourcing approach and acquisition strategy.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305205N / UAS Integration & Interoperability	Project (Number/Name) 1993 / Architecture and Capabilities for Autonomy in the Naval Enterprise (ARCANE)
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The ARCANE Acquisition Strategy is in revision in accordance with the redirection in the program to focus on autonomy, executive control, artificial intelligence, and machine learning for UxS systems and continuing to reduce barriers to integration of Government-owned software services.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: ARCANE Phase 1	0.000	0.000	16.409	0.000	16.409
Articles:	-	-	-	-	-
FY 2023 Plans: N/A					
FY 2024 Base Plans: FY24 efforts will pursue common autonomy architecture framework for Naval Aviation. This framework will be largely based upon the Strategic Capabilities Office (SCO) AVATAR program, which transfers the autonomy-related technology portions of the AVATAR program to ARCANE by the end of FY23. FY24 will include engineering efforts to increase the technical maturity of the autonomy architecture toward production readiness, enhance cybersecurity, and validate that system safety and airworthiness are satisfactory. Efforts to establish an autonomy test, evaluation, verification, and validation environment will also be included.					
FY 2024 OCO Plans: N/A					
FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding enables development activities after program redirection toward autonomy. The increase provides funding for development of autonomy architecture, autonomous behaviors, and related tools for the NAE.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	16.409	0.000	16.409

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• OPN/4604: ARCANE .	0.000	0.000	1.612	-	1.612	5.613	5.618	5.728	5.848	Continuing	Continuing

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305205N / UAS Integration & Interoperability	Project (Number/Name) 1993 / Architecture and Capabilities for Autonomy in the Naval Enterprise (ARCANE)

D. Acquisition Strategy

The ARCANE program will move forward under the DoD Adaptive Acquisition Framework Software Acquisition Pathway (DoDI 5000.87). This pathway will allow the program to be more responsive to the autonomy needs of Naval Aviation platforms and allow for efficient delivery of incremental capability.

The program engineering efforts will build onward from the autonomy architectures initiated by the SCO AVATAR program. This foundation will allow the program to start from a point of higher technological maturity to achieve more rapid technology insertion, rather than designing a new autonomy architecture framework. The original SCO effort included competitive contracting under an Other Transactions Authority (OTA) which resulted in three vendors participating in Phase 1 of AVATAR. Two of the three vendors are still participating in Phase 3 of the AVATAR program, and elements from all three original vendors will be leveraged by ARCANE to establish the best possible enterprise architecture for autonomy.

ARCANE will use a combination of government and industry software development and support activities to develop and sustain both the autonomy architecture framework and autonomous behaviors. This will include establishing and maintaining a dedicated government software activity, as well as using relevant contract authorities to quickly allocate scope to industry. Channels for both industry and government organic development will enable ARCANE to provide timely response to operational needs, allowing for addition of new autonomous behaviors and modification of existing behaviors at the speed of relevance. This "capability to create capability" will be critical to countering evolving threats in order to maximize the effectiveness of autonomous systems and the lethality of the units they support in "great power competition."

The funding model for the program is as follows:

- ARCANE funding will establish the autonomy enterprise architecture.
- Once established, the enterprise architecture will require continued funding to support Continuous Integration / Continuous Development (CI/CD). This will include cybersecurity "threat-pacing", correction of software defects, resolution of software obsolescence issues, architecture and pipeline maintenance and upgrades, modification of existing autonomous behaviors, and continued behavior development to "pace the threat."
- When partner programs identify unique autonomy capability needs, these product-specific behaviors will be developed in accordance with the target program's resourcing, requirements, and acquisition approaches.

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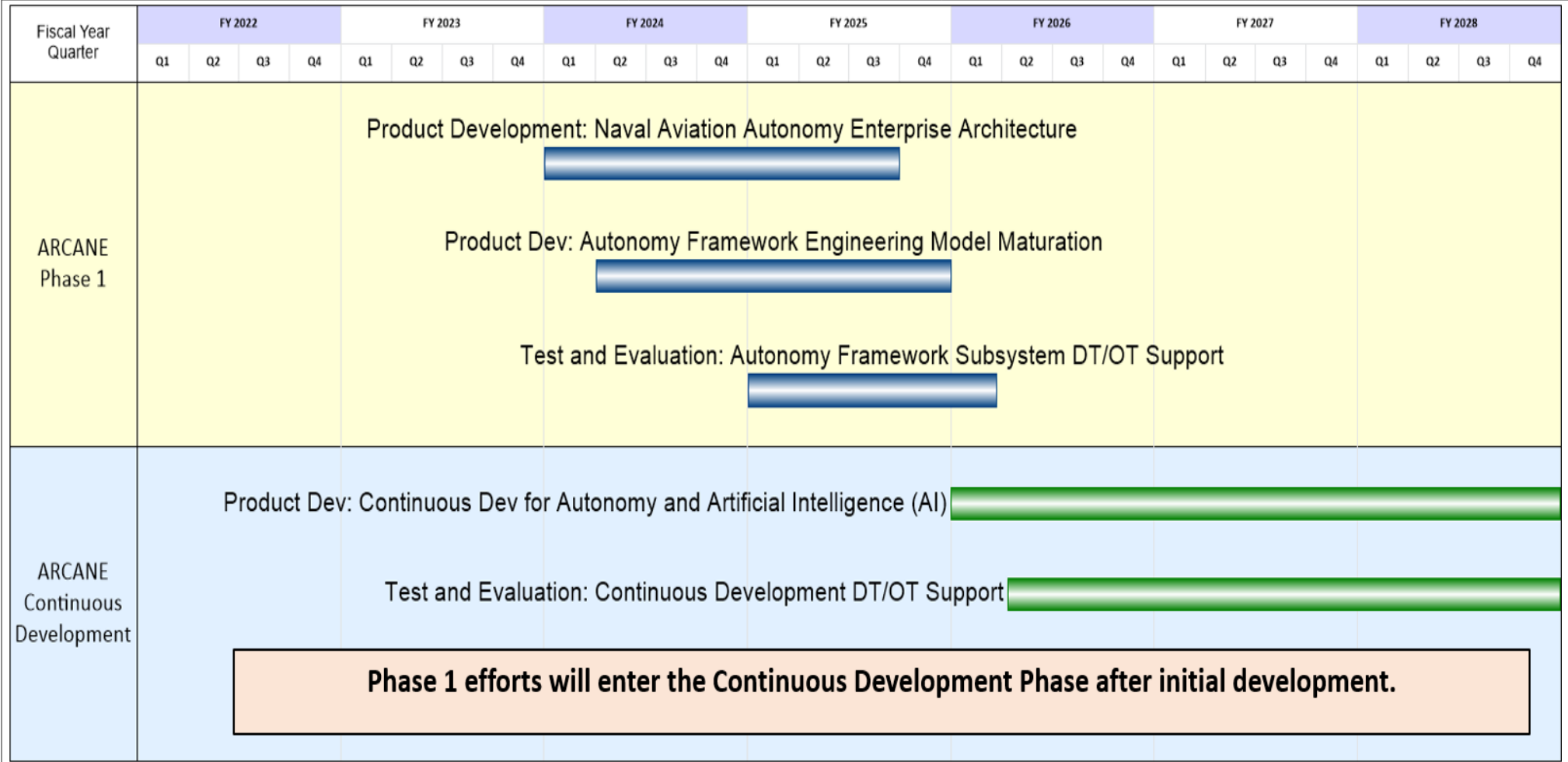
Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023		
Appropriation/Budget Activity 1319 / 7				R-1 Program Element (Number/Name) PE 0305205N / UAS Integration & Interoperability				Project (Number/Name) 1993 / Architecture and Capabilities for Autonomy in the Naval Enterprise (ARCANE)						

Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Advanced Development	WR	NAWC-WD : China Lake, CA	0.000	0.000		0.000		1.180	Nov 2023	-		1.180	Continuing	Continuing	Continuing
Software Cyber Modeling	C/CPFF	JHU APL : Baltimore, MD	0.000	0.000		0.000		0.555	Nov 2023	-		0.555	Continuing	Continuing	Continuing
Architecture Development	Various	Various : Various	0.000	0.000		0.000		0.605	Mar 2024	-		0.605	Continuing	Continuing	Continuing
SSA - Software Integration	WR	NIWC : San Diego, CA	0.000	0.000		0.000		2.000	Nov 2023	-		2.000	Continuing	Continuing	Continuing
Autonomy Development	TBD	TBD : TBD	0.000	0.000		0.000		3.500	Nov 2023	-		3.500	0.000	3.500	-
Autonomy Engineering and Lab Development	TBD	TBD : TBD	0.000	0.000		0.000		1.000	Nov 2023	-		1.000	0.000	1.000	-
Subtotal			0.000	0.000		0.000		8.840		-		8.840	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWC-AD : Pax River, MD	0.000	0.000		0.000		1.798	Nov 2023	-		1.798	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWC-TSD : Orlando, FL	0.000	0.000		0.000		0.100	Nov 2023	-		0.100	Continuing	Continuing	Continuing
Systems Engineering Technical Agent	C/CPFF	DCS Corporation : Alexandria, VA	0.000	0.000		0.000		2.550	Nov 2023	-		2.550	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	PSE : San Diego, CA	0.000	0.000		0.000		0.700	Nov 2023	-		0.700	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	TBD : TBD	0.000	0.000		0.000		0.995	Nov 2023	-		0.995	Continuing	Continuing	Continuing
Software Support Services	C/CPFF	TBD : TBD	0.000	0.000		0.000		0.426	Nov 2023	-		0.426	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		6.569		-		6.569	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy															Date: March 2023				
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Snapshot Date: 6/16/2022

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305205N / UAS Integration & Interoperability	Project (Number/Name) 1993 / Architecture and Capabilities for Autonomy in the Naval Enterprise (ARCANE)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 1993				
Product Development: ARCANE Phase 1: Naval Aviation Autonomy Enterprise Architecture Development	1	2024	3	2025
Product Development: ARCANE Phase 1: Autonomy Framework Engineering Development Model Maturation	2	2024	3	2025
Product Development: Continuous Development for Autonomy and AI	1	2026	4	2028
Test and Evaluation: ARCANE Phase 1: Autonomy Framework Subsystem DT/OT Support	1	2025	1	2026
Test and Evaluation: Continuous Development DT/OT Support	3	2026	4	2028

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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3379: Common Control System	207.766	4.842	15.396	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	228.004
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

CCS budget profile supported MQ-8 Fire Scout and follow on UxS platforms. All Common Control System (CCS) efforts for Autonomy and Executive Control of multiple unmanned aircraft have been transferred to PU 1993 - "Architect and Cap for Autonomy in the Naval Enterprise (ARCANE) budget profile supports executive control of multiple unmanned aircraft through the development of an autonomy architecture for Naval Aviation platforms. This is an extension of the line of effort established by Common Control System (CCS) (Project 3379), expanding into autonomy and capabilities aligned with the National Defense Strategy. New PU established for clarity.

The primary mission of CCS is to provide common control across the Navy's UxSs portfolio to add scalable and adaptable warfighting capability, implement robust cybersecurity attributes, leverage existing government owned products, eliminate redundant software development efforts, consolidate product support, encourage innovation thru competition, improve cost control and enable rapid integration of UxS capabilities across Aviation, Surface, Sub-Surface, and Ground domains.

CCS is a ship/shore/airborne/expeditionary based common control system that provides Vehicle Management (VM) /MM/MP capabilities for Naval Group 1 through 5 Unmanned Air Vehicles (UAVs) as well as other domain UxSs. VM is the software that allows the operator to control the UxS. MM/MP is the software that allows the operator to create mission plans and control the UxS's sensors and payloads. CCS software is based on the Society of Automotive Engineers (SAE) Unmanned Control Segment (UCS) architecture which is a service oriented open architecture that is modular and scalable to meet evolving Service requirements and is also supportive of safety/airworthiness certification and cybersecurity certification.

The CCS requirements are documented in an approved and validated Information Systems Initial Capabilities Document (IS-ICD) and in approved Requirement Definition Packages (RDP). This program defines, develops, and delivers CCS capabilities that enables the flexibility for Ground Control Systems (GCS) that could be ship, shore, airborne, or expeditionary based to operate multiple and dissimilar Naval UxSs. CCS includes a common framework, user interface, and common components that will also be integrated and tested with legacy platform components. CCS is being developed with an open and modular business model with robust cybersecurity implementation and will be provided as Government Furnished Equipment (GFE) to UxS contractors as required. The CCS acquisition approach provides increasing capability through incremental development for UxS platforms as follows: Increment I delivered initial unmanned vehicle management (VM) functionality for MQ-25 Stingray in FY 2018 and MQ-8 Fire Scout in FY 2019. Increment I development activities completed in FY 2019. Increment II builds upon CCS Increment I software delivery, adding discrete common MM/MP capabilities as well as maturing VM capabilities.

These MM/MP capabilities include route planning, sensor and payload control, and data processing and dissemination. CCS Increment II software will be hosted on legacy platform hardware. Increment II adds robust cybersecurity controls, key systems safety attributes and core program infrastructure, to include a system integration lab and software support activity (SSA), which provides monthly cybersecurity patches and Correction of Deficiencies. Additional efforts include developing and executing plans for integration of common CCS VM services already developed under this program into other UxS cross-domain platforms' control stations to reduce

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy	Date: March 2023
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department-level Total Ownership Costs for unmanned Ground Control Systems. The CCS Acquisition Strategy was revised in FY21 to align with the UxS Campaign Plan to focus on executive control, automation, artificial intelligence and machine learning for UxS systems.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Title: Increment II</p> <p align="right">Articles:</p> <p>Description: CCS Increment II develops common MM/MP capabilities and updates and matures VM capabilities, integrating these capabilities into the core CCS software baseline delivered under Increment I in support of Naval UxSs. CCS Increment II is the future common control system software that provides maximum commonality for affordable transition to MQ-8 Fire Scout, and other UxS to reduce enterprise Total Ownership Cost for UxS Ground Control Systems. Increment II also incorporates cyber security measures, key systems safety attributes, and core program infrastructure to include system integration lab and software support activities (SSA).</p> <p>FY 2023 Plans: The SSA will continue to provide integrated software baselines to supported UxS platforms, correct identified deficiencies, ensure cyber security compliance, and support engineering/test/evaluation activities. Development efforts support the CNO's Unmanned Campaign Plan, including key focus areas related to Model-Based Systems Engineering, interoperability throughout the Navy and DoD, autonomy, artificial intelligence /machine learning, manned-unmanned teaming, cyber defense and continuing to reduce barriers to integration of Government owned software services. This includes incremental deliveries of both the Integrated Cyber Model (ICM) to detect/address cyber attacks during mission execution and the CCS Common Presentation Layer, the prerequisite for control of multiple dissimilar UxS vehicles from a single control station. Begin integration efforts with Unmanned Maritime Autonomy Architecture (UMAA) in FY23 while integration and test support for other CCS platforms continue. Starting in FY23, funding will support an increased focus on Autonomy development. Autonomy development includes: collaboration with Industry and other Government agencies regarding technology maturation and transition; Capability Test, Evaluation, Validation, and Verification (TEVV); and Capability Monitoring & Sustainment. As part of autonomy development, the program will begin transition activities for the autonomy elements of the AVATAR MUM-T program, in coordination with other partner programs, with the ultimate goal of fielding an operational MUM-T capability.</p> <p>FY 2024 Base Plans: N/A</p> <p>FY 2024 OCO Plans:</p>	4.842	15.396	0.000	0.000	0.000
	-	-	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A					
<i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> CCS efforts relating to autonomy and executive control of multiple unmanned aircraft have been transferred to Project 1993. Funding for Project 3379 reduced to zero based on cessation of further development on legacy CCS.					
Accomplishments/Planned Programs Subtotals	4.842	15.396	0.000	0.000	0.000

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• OPN/4250: Common Control System	1.470	1.610	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.558

Remarks

D. Acquisition Strategy
 Program Executive Office Unmanned Aviation and Weapon Systems (PEO(U&W)) issued an Acquisition Decision Memorandum (ADM) 5000 Ser PEO(U&W)/11-093 dated July 1, 2011 to establish the Common Control System (CCS) to achieve Unmanned Aircraft System (UAS) common control across PEO(U&W) UAS platforms to eliminate redundant efforts, encourage innovation and improve cost control of unmanned aviation.

As directed by the ADM the program will define, develop and deliver a common control system to be integrated into platform ground control systems that operate respective naval Unmanned Systems (UxS)s. This will include a common framework, a common user interface and common components that will be integrated and tested with unique components on emerging or legacy platforms. The CCS acquisition approach provides increasing UxS capability through incremental development for UxS platforms as follows: Increment I provided common Vehicle Management (VM) capability to MQ-25 Stingray and MQ-8 Fire Scout which can also support other UxSs.

Increment II develops common MM/MP capabilities and updates and matures VM capabilities, integrating these capabilities into the core CCS software baseline delivered under Increment I in support of Naval UxSs. CCS was provided to the MQ-25 Stingray air vehicle prime as Government-Furnished Equipment (GFE) in FY 2018 and was also provided for transition to MQ-8 Fire Scout starting in FY 2019.

CCS is available to additional follow-on UxS platforms to further reduce enterprise Total Ownership Cost for Ground Control Systems. CCS leverages existing government-owned products and will employ competitive procurement vehicles.

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<p>ASN (RDA) designated CCS Increment II as an ACAT II program on December 1, 2017. PEO(U&W) issued ADM 5000 Ser PEO(U&W)/18-119 dated September 11, 2018 approving the CCS Increment II Acquisition Strategy. PEO(U&W) issued ADM 5000 Ser PEO(U&W)/18-157 dated October 5, 2018 approving the CCS acquisition documentation tailoring and entry criteria for Increment II Milestone B. OPNAV N9 letter designating CCS as the Navy's Unmanned Systems' (UxS) Control Station software signed 31 JAN 19. CCS IS-ICD signed by OPNAV N9 on 01 MAR 19 and validated by JROC on 23 JUL 19. Requirements Definition Package (RDP) for CCS Unmanned Aircraft System (UAS) VM was signed by OPNAV N98 on 07 MAR 19. RDP for CCS UAS MM/MP signed by OPNAV N98 on 07 MAR 19. A Key Performance Parameter for all future Navy Unmanned Systems to use CCS was approved by OPNAV N9 08 JAN 2020. RDP for CCS interoperability signed by OPNAV N98 on 23 JUL 20. CCS was reaffirmed as the Navy's Modular Open Systems Architecture (MOSA) control software solution for all Navy Unmanned Systems (UxS), DEC 2020. OPNAV N9 further highlighted their commitment to CCS as defined in the UxS Campaign Plan on 17 MAR 21.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity				R-1 Program Element (Number/Name)					Project (Number/Name)						
1319 / 7				PE 0305205N / UAS Integration & Interoperability					3379 / Common Control System						
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Primary Software Development (Increment I)	C/CPFF	Raytheon : Dulles, VA	44.177	0.000		0.000		0.000		-		0.000	0.000	44.177	44.228
Primary Software Development - Software Services (Increment II)	C/CPFF	TBD : TBD	0.000	0.000	Jul 2022	2.023	Jan 2023	0.000		-		0.000	0.000	2.023	Continuing
Primary Software Development - Software Services (Increment II)	C/CPFF	Northrop Grumman : Rancho Bernardo, CA	13.034	0.000		0.000		0.000		-		0.000	0.000	13.034	Continuing
Primary Software Development - Software Services (Increment II)	C/CPFF	Raytheon : Dulles, VA	2.364	0.000		0.000		0.000		-		0.000	0.000	2.364	2.364
Advanced Development	WR	NAWC-WD : China Lake, CA	8.574	0.240	Nov 2021	0.245	Nov 2022	0.000		-		0.000	0.000	9.059	8.339
Software Cyber Modeling	C/CPFF	JHU APL : Baltimore, MD	4.949	0.000	Jul 2022	0.551	Jul 2023	0.000		-		0.000	0.000	5.500	Continuing
Architecture Development	C/CPFF	SEI : Hanscom, MA	1.355	0.000		0.000		0.000		-		0.000	0.000	1.355	1.355
Architecture Development	C/CPFF	NRL : Washington, DC	2.330	0.000		0.000		0.000		-		0.000	0.000	2.330	2.330
Architecture Development	Various	Various : Various	4.733	0.100	Mar 2022	0.102	Mar 2023	0.000		-		0.000	0.000	4.935	3.605
SSA - Software Integration	C/CPFF	Raytheon : Dulles, VA	17.057	0.000		0.000		0.000		-		0.000	0.000	17.057	Continuing
SSA - Software Integration	C/CPFF	NIWC : San Diego, CA	6.590	0.676	Nov 2021	4.312	Nov 2022	0.000		-		0.000	0.000	11.578	Continuing
MQ-25 MIPR NSMA	TBD	NSMA : Washington, DC	48.000	0.000		0.000		0.000		-		0.000	0.000	48.000	-
Autonomy Development	TBD	TBD : TBD	0.000	0.000		2.732	Nov 2022	0.000		-		0.000	0.000	2.732	-
Subtotal			153.163	1.016		9.965		0.000		-		0.000	0.000	164.144	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305205N / UAS Integration & Interoperability	Project (Number/Name) 3379 / Common Control System
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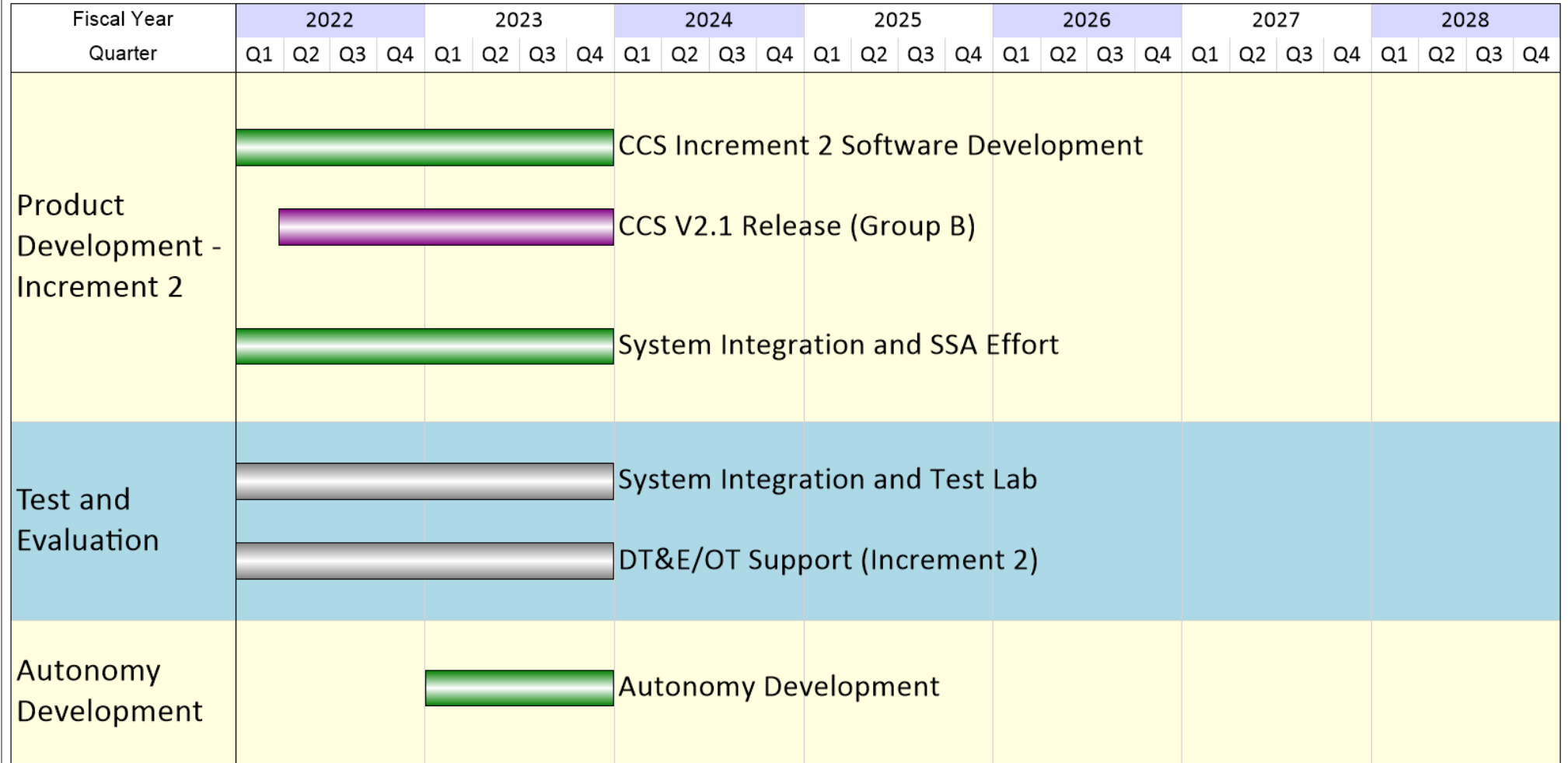
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Systems Engineering	WR	NAWC-AD : Pax River, MD	22.031	1.045	Nov 2021	1.516	Nov 2022	0.000		-		0.000	0.000	24.592	Continuing
Lead Systems Engineering and Integration	WR	NAWC-WD : Pt Mugu, CA	2.995	0.000		0.000		0.000		-		0.000	0.000	2.995	2.995
Systems Engineering	C/CPFF	Engility : Pax River, MD	0.756	0.000		0.000		0.000		-		0.000	0.000	0.756	0.756
Systems Engineering Integration Test	C/CPFF	Booz Allen : Pax River, MD	3.064	0.000		0.000		0.000		-		0.000	0.000	3.064	Continuing
Systems Engineering Study	C/CPFF	CNA : Alexandria, VA	0.800	0.000		0.000		0.000		-		0.000	0.000	0.800	0.800
Systems Engineering	Various	Various : Various	1.666	0.000		0.000		0.000		-		0.000	0.000	1.666	2.026
Systems Engineering Technical Agent	C/CPFF	DCS Corporation : Alexandria, VA	10.176	0.000		0.000		0.000		-		0.000	0.000	10.176	10.176
Systems Engineering Technical Agent Follow On	C/CPFF	DCS Corporation : Alexandria, VA	2.300	1.735	Nov 2021	2.850	Nov 2022	0.000		-		0.000	0.000	6.885	Continuing
Systems Engineering	C/CPFF	PSE : San Diego, CA	1.750	0.375	Nov 2021	0.382	Nov 2022	0.000		-		0.000	0.000	2.507	-
Subtotal			45.538	3.155		4.748		0.000		-		0.000	0.000	53.441	N/A

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Developmental Test & Evaluation (DT&E)	WR	NAWC-AD : Pax River, MD	2.545	0.190	Nov 2021	0.193	Nov 2022	0.000		-		0.000	0.000	2.928	Continuing
Developmental Test & Evaluation (DT&E)	WR	NAWC-WD : Pt Mugu, CA	0.730	0.000		0.000		0.000		-		0.000	0.000	0.730	0.730
Developmental Test & Evaluation (DT&E)	C/CPFF	BAE : Rancho Bernardo, CA	2.549	0.000		0.000		0.000		-		0.000	0.000	2.549	2.549
Subtotal			5.824	0.190		0.193		0.000		-		0.000	0.000	6.207	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305205N / UAS Integration & Interoperability	Project (Number/Name) 3379 / Common Control System
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DON24 Legacy CCS June 2022

Snapshot Date: 6/16/2022

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305205N / UAS Integration & Interoperability	Project (Number/Name) 3379 / Common Control System

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Common Control System				
Product Development: Increment II: CCS Program Software Integration/SSA Follow-on Efforts	1	2022	4	2023
Product Development: Increment II: CCS Increment II Software Development	1	2022	4	2023
Test and Evaluation: DT&E/OT Support (Increment II)	1	2022	4	2023
Test and Evaluation: System Integration and Test Laboratory	1	2022	4	2023
Autonomy Development: Autonomy Development	1	2023	4	2023