

**UNCLASSIFIED**

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

<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 5: System Development &amp; Demonstration (SDD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0605414N / <i>Unmanned Carrier Aviation (UCA)</i>
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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	1,402.107	252.435	261.992	265.646	-	265.646	207.039	148.471	144.189	146.245	Continuing	Continuing
3278: <i>MQ-25 Air System (AS)</i>	1,287.811	201.864	215.428	238.643	-	238.643	186.057	134.029	126.984	128.866	Continuing	Continuing
3279: <i>Unmanned Carrier Aviation Mission Control System</i>	114.296	50.571	46.564	27.003	-	27.003	20.982	14.442	17.205	17.379	Continuing	Continuing

**Program MDAP/MAIS Code:**  
**Project MDAP/MAIS Code(s):** P462

**Note**

PE 0605414N Unmanned Carrier Aviation (UCA) is comprised of two separated programs:  
 PU 3278 MQ-25 Development is directly related to the MQ-25 Air System (AS) development ACAT I Program.  
 PU 3279 UMCS is directly related to the Unmanned Carrier Aviation Mission Control System (UMCS) ACAT II program. UMCS develops the control station and integrates it with the MQ-25 AS along with multiple networks and systems both afloat and on shore.

MQ-25 PU 3278 execution is dependent upon the success of UMCS PU 3279 execution. This submission for PU 3278 has been coordinated with UMCS PU 3279.

The prime contractor for MQ-25 development declared a loss on the MQ-25 contract in Oct 2018 and thereby invoked Federal Acquisition Regulation clause 32.503-6(g). Per the loss contract clause, a loss ratio factor must be applied to all progress payments to protect the government by ensuring the amount of unliquidated progress payments does not exceed the fair value of undelivered work. The reduced progress payments will prevent the program from meeting expenditure benchmarks in the near years.

Prior to FY21, PMA-268 had been developing a government-furnished Ground Control Station (GCS) known as MD-5 as part of its UMCS program, the system-of-systems required for command and control of the MQ-25A air vehicle and payload. In September 2020, Navy leadership directed the MQ-25 program to transition to an already mature, industry-developed GCS solution that supports Joint All Domain Command and Control (JADC2) interoperability and multi-level security requirements. The modified hardware will streamline software development, readily support multiple classification levels, and position the MQ-25 for interoperability with other DoD systems. With the decision to switch to an industry developed GCS, work associated with integrating the new GCS into the MQ-25 air-vehicle and payload was put on contract with Boeing (integration) in December 2020 and Lockheed Martin (via NSMA) in April 2021.

**A. Mission Description and Budget Item Justification**

The MQ-25 program, PU 3278, rapidly develops an unmanned capability to embark on Carrier Vessel, Nuclear (CVN) as part of the Carrier Air Wing (CVW) to conduct aerial refueling as a primary mission and provide Intelligence, Surveillance, and Reconnaissance (ISR) capability for a secondary mission. MQ-25 extends CVW mission effectiveness range, partially mitigates the current Carrier Strike Group (CSG) organic ISR shortfall and fills the future CVW-tanker gap, mitigating Strike Fighter shortfall and preserving F/A-18E/F Fatigue Life Expenditure for its primary missions. As the first carrier-based, Group 5 Unmanned Aircraft System (UAS), MQ-25 will pioneer

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<p>the integration of manned and unmanned operations, utilize mature, complex sea-based Command, Control, Communications, Computers, and Intelligence (C4I) technologies, and pave the way for future multi-faceted, multi-mission UASs to pace emerging threats.</p> <p>The MQ-25 system will enhance CVN capability and versatility for the Joint Forces Commander through the integration of a persistent, sea-based, multi-mission aerial refueling and ISR UAS into the CVW. MQ-25 is comprised of an Air System which will integrate with the UMCS program. These architectural segments will be managed by the PMA-268 Government Lead Systems Integrator (LSI) that provides system-of-systems integration and is also responsible for managing enterprise-level UCA architecture and associated interfaces. MQ-25 Development includes development and test of the air vehicle to include software, peculiar support equipment, training systems and other logistics elements.</p> <p>In FY 2023, the first three Engineering Development Models (EDMs) and two System Demonstration Test Articles (SDTAs) will deliver and begin ground and flight testing. Production of the static test article will complete and perform all static testing analysis in support of IUF, boarding rate, catapult, and arrested landing loads. The fourth EDM will complete instrumentation installation and begin ground and flight testing in FY24. The third SDTA and fatigue test article will complete production and be delivered in FY24 for testing. The program will continue to develop and integrate increased software capabilities into the A/C in support of carrier suitability and mission systems evaluation.</p> <p>The Unmanned Carrier Aviation (UCA) Mission Control System (UMCS) program, PU 3279, is the system-of-systems required for MQ-25 vehicle and payload control both shipboard and shore based. UMCS consists of all ground and ship based hardware, software, and networks associated with the planning and execution of flight operations and tactical missions. In addition to the Ground Control Station (GCS), consisting of Air Vehicle Operator (AVO) workstations and servers, the UMCS program builds hardware to support line of sight (LOS) communications, beyond line of sight (BLOS) satellite communications (SATCOM), and integration with ship/shore based systems. There are three GCS variants: MD-5C (CVN-based), MD-5D (Shore-based) and MD-5E (Embarkable system for use on CVNs that do not yet have permanent GCS systems installed). UMCS leverages existing Programs of Record (PoR) for network integration and LOS/BLOS communications and builds MQ-25 unique systems (e.g. an ARC-210 based LOS communication system and a Video Management System (VidMS) for AVO situational awareness). The GCS streamlines software development, supports multiple classification levels, and positions MQ-25A interoperability with other DoD systems. Hardware development and fabrication is one facet of the program. UMCS develops and integrates software and modifies several aircraft carrier spaces to install and integrate the GCS and communication systems, in support of MQ-25A test events and operations aboard select NIMITZ Class CVNs. The UMCS program modifies and integrates with existing, external Command, Control, Communication, Computers, and Intelligence (C4I) systems to provide network paths for AV and mission payload data using a variety of wideband and narrowband communication paths. UMCS accomplishes this by integrating the GCS and the MQ-25A AV with multiple networks and systems both at sea and on shore.</p> <p>In FY 2023, UMCS will complete GCS software development and develop Correction of Deficiency (CoD) builds to support MQ-25 test events. UMCS will complete assembly of the MD-5E, an Embarkable system, consisting of a subset of GCS hardware and test unique instrumentation into three CONEX boxes that will be integrated with existing ship communication and network systems. The temporary infrastructure for the MD-5E will be installed on two (2) aircraft carriers in support of FY23 and FY24 MQ-25 test events. UMCS will continue providing system engineering, program management, and development/integration/test for wideband and narrowband LOS and BLOS communication systems.</p>		

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<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 5: System Development &amp; Demonstration (SDD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0605414N / <i>Unmanned Carrier Aviation (UCA)</i>
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JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to a full-rate production decision.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>
Previous President's Budget	256.970	268.937	0.000	-	0.000
Current President's Budget	252.435	261.992	265.646	-	265.646
Total Adjustments	-4.535	-6.945	265.646	-	265.646
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-6.945			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-4.535	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	-	-	265.646	-	265.646

**Change Summary Explanation**

PU 3279 FY 2023 funding request was reduced by \$3.059 million to account for the availability of prior year execution balances.

Schedule:

PU 3278: R-4 schedule

- Acquisition Milestone Knowledge Points have shifted due to delays in the build of Engineering Development Model (EDM) Air Vehicles for test. Software development and integration of the Air Vehicles with the Ground Control Station is progressing slower than expected but is outpacing build of the Air Vehicles.
- Air Vehicle (AV) Deliveries - Multiple factors have resulted in delays to the delivery of EDM aircraft. The aircraft design was intentionally paused to optimize weight and strength; quality issues and Notice of Escapes have been identified during the build process and Root Cause Corrective actions to determine the path forward are in work. Some components have been appropriately driven back to the supplier for correction. Additionally, a redesign of the lightning protection solution is still being evaluated for implementation into the design. COVID has had an impact on the manufacture and delivery of parts from suppliers thus impacting the aircraft build timeline.

PU 3279: R-4 Schedule updated to reflect latest CVN availability which deletes CVN C MD-5E Temporary Installation in FY23.

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

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Navy										<b>Date:</b> April 2022		
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<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
3278: MQ-25 Air System (AS)	1,287.811	201.864	215.428	238.643	-	238.643	186.057	134.029	126.984	128.866	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
<b>Project MDAP/MAIS Code:</b> P462												

**A. Mission Description and Budget Item Justification**

The scope of the program includes, but is not limited to, system level requirements identification, allocation of requirements to segments and components, design, development, integration, fabrication, test, training, and support activities to provide the MQ-25 capabilities. To provide these capabilities, MQ-25 will transition technologies from other programs and adapt them into the carrier environment. MQ-25 will deliver the necessary air vehicles, command, control, connectivity, shipboard and land-based launch and recovery control systems, associated support systems, interfaces, and upgrades to other Navy systems (as required) to meet the required capabilities.

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

	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>
<b>Title:</b> Air Segment Product Development	76.621	85.945	100.418	0.000	100.418
<b>Articles:</b>	-	-	-	-	-
<b>Description:</b> Air Segment Product Development efforts include, but are not limited to, design, development, integration, fabrication, test and training to deliver a carrier-suitable, semi-autonomous, unmanned vehicle capable of aerial refueling (give) and persistent Intelligence, Surveillance, and Reconnaissance (ISR) operations.					
<b>FY 2022 Plans:</b> Continue Air Vehicle development, design, and integration. Continue production of EDMs and System Demonstration Test Articles (SDTAs) air vehicles. Continue development of technical publication source data. Continue ground / software lab testing. Begin software correction of deficiency efforts. Begin development of software and hardware to support post IOC additive capabilities to account for current threats identified post EMD contract award. Continue efforts to support post IOC such as advanced training tactics and techniques; obsolescence, sustainment and other studies related to operational employment learned since EMD contract award. Continue software integration efforts related to GCS.					
<b>FY 2023 Base Plans:</b> Continue Air Vehicle development, design, and integration. Complete production and begin delivery of EDM and SDTA air vehicles. Continue development of technical publication source data. Complete ground / software lab testing and begin flight test. Continue software correction of deficiency efforts. Continue development of software and hardware to support post IOC additive capabilities to account for current threats identified post EMD contract					

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<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>
award. Continue efforts to support post IOC such as advanced training tactics and techniques; obsolescence, sustainment and other studies related to operational employment learned since EMD contract award. Continue software integration efforts related to GCS.  <b>FY 2023 OCO Plans:</b> N/A  <b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> Increase from FY22 to FY23 is to support the work associated with integrating the industry developed GCS into the MQ-25 air-vehicle and payload.					
<b>Title:</b> Lead Systems Integration (LSI) Product Development  <b>Description:</b> Lead Systems Integration (LSI) is a Government-led effort including, but not limited to, advanced development, architecture development, interface definition, integration, system level test and evaluation, science and technology investments, roadmap refinement, and coordination of all MQ-25 capabilities across system segments and stakeholders.  <b>FY 2022 Plans:</b> Continue transition to GCS and software. Continue Air Segment and UMCS development, design, and integration with the GCS. Continue government led efforts that support science and technology investments and roadmap refinement. Continue Cyber Security efforts to achieve Authority to Operate (ATO) certifications for the System Test and Integration Lab (STIL), the Lab Revitalization Program (LRP), and test facilities. Continue operation of the STIL in support of government led hardware and software development and test activities. Begin STIL activities in support of correction of deficiencies. Continue government and contractor STIL integration activities in support of software verification and validation. Maintain connection between STIL and LRP to air system contractor labs. Conduct and support laboratory tests in support of EMD aircraft systems.  <b>FY 2023 Base Plans:</b> Continue integration of GCS and software. Continue Air Segment and UMCS development, design, and integration with the GCS. Continue government led efforts that support science and technology investments and roadmap refinement. Complete Cyber Security efforts to achieve Authority to Operate (ATO) certifications for the System Test and Integration Lab (STIL), the Lab Revitalization Program (LRP), and test facilities. Continue operation of the STIL in support of government led hardware and software development and test activities. Continue STIL activities in support of correction of deficiencies. Continue government and contractor STIL	58.457	62.772	68.382	0.000	68.382
<b>Articles:</b>	-	-	-	-	-

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<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>																							
integration activities in support of software verification and validation. Maintain connection between STIL and LRP to air system contractor labs. Continue to conduct and support ground and lab test activities at contractor facilities. Continue to conduct and support laboratory tests in support of EMD aircraft systems.																							
<b>FY 2023 OCO Plans:</b> N/A																							
<b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> Increase from FY22 to FY23 due to incorporation of spares for FOT&E.																							
<b>Title:</b> Management																							
<b>Articles:</b>																							
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 65%;"></th> <th style="width: 8%;">FY 2021</th> <th style="width: 8%;">FY 2022</th> <th style="width: 8%;">FY 2023 Base</th> <th style="width: 8%;">FY 2023 OCO</th> <th style="width: 8%;">FY 2023 Total</th> </tr> </thead> <tbody> <tr> <td></td> <td align="right">7.321</td> <td align="right">7.475</td> <td align="right">7.805</td> <td align="right">0.000</td> <td align="right">7.805</td> </tr> <tr> <td></td> <td align="right">-</td> <td align="right">-</td> <td align="right">-</td> <td align="right">-</td> <td align="right">-</td> </tr> </tbody> </table>							FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total		7.321	7.475	7.805	0.000	7.805		-	-	-	-	-
	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total																		
	7.321	7.475	7.805	0.000	7.805																		
	-	-	-	-	-																		
<b>Description:</b> Efforts include program, engineering, test, and logistics management to include travel.																							
<b>FY 2022 Plans:</b> Continue oversight, coordination, and management of MQ-25 acquisition, system interface and integration activities. Oversee contract activities, including execution of the EMD contract and travel and training. Conduct logistics management tasks. Maintain security and program office environments.																							
<b>FY 2023 Base Plans:</b> Continue oversight, coordination, and management of MQ-25 acquisition, system interface and integration activities. Oversee contract activities, to include execution of the EMD contract, travel and training. Conduct logistics management tasks. Maintain security and program office environments.																							
<b>FY 2023 OCO Plans:</b> N/A																							
<b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> Increase from FY22 to FY23 due to inflation.																							
<b>Title:</b> Test and Evaluation																							
<b>Articles:</b>																							
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	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total																		
	54.305	55.710	55.869	0.000	55.869																		
	-	-	-	-	-																		
<b>Description:</b> Description: Provide Government Integrated test and evaluation and Performance Based Specifications (PBS) compliance verification; support equipment evaluations and assessments, instrumentation development and support, and Integrated Test support.																							

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<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>
<p><b><i>FY 2022 Plans:</i></b> Continue to support development, implementation, and sustainment of test facilities, range, and lab test requirements. Support updates to the TEMP, support engineering events, and program management activities. Support activities in Modeling and Simulation development to include validation and verification. Continue support of the Government STIL and continue stand up of the integrated test facilities in support of the EMD contract, to include test facility installation, integration, procurement of support equipment, and accreditation activities. Provide government engineering to support contractor testing; and support the integration of the GCSs.</p> <p><b><i>FY 2023 Base Plans:</i></b> Continue to support development, implementation, and sustainment of test facilities, range, and lab test requirements. Support updates to the TEMP, support engineering events, and program management activities. Support activities in Modeling and Simulation development to include validation and verification. Continue support of the Government STIL and continue stand up of the integrated test facilities in support of the EMD contract, to include test facility installation, integration, procurement of support equipment, and accreditation activities. Provide government engineering to support contractor testing and ground/flight test of EDMs.</p> <p><b><i>FY 2023 OCO Plans:</i></b> N/A</p> <p><b><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i></b> Increase from FY22 to FY23 due to inflation.</p>					
<p><b><i>Title:</i></b> Support</p> <p align="right"><b><i>Articles:</i></b></p>	5.160	3.526	6.169	0.000	6.169
<p><b><i>Description:</i></b> Efforts include studies, analyses, and training development support.</p> <p><b><i>FY 2022 Plans:</i></b> Mature the Logistics Product Database, Technical publications, NATOPS publications, and continue to build a Product Lifecycle system to share air system data and resources in an efficient configuration managed environment. Finalize FY22 spares models with NAVSUP and FST in support of IOC. Continue development of logistics products associated with GCS.</p> <p><b><i>FY 2023 Base Plans:</i></b></p>	-	-	-	-	-

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<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>
Continue to mature the Logistics Product Database, Technical publications, NATOPS publications, and continue to build a Product Lifecycle system to share air system data and resources in an efficient configuration managed environment. Begin to train IOT&E and Squadron (VUQ-10) Fleet operators and maintainers and begin training NATEC services in support of post IOT&E activities ("train the trainer" events). Continue development of logistics products associated with GCS.  <b>FY 2023 OCO Plans:</b> N/A  <b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> Increase from FY22 to FY23 is to support the development of the Tactics, Techniques, and Procedures (TTPs) to inform Contractor courseware development and provide the basis of the Naval TTP document.					
<b>Accomplishments/Planned Programs Subtotals</b>	201.864	215.428	238.643	0.000	238.643

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• APN/0449C: MQ-25 <i>Unmanned Carrier Aviation, AP</i>	0.000	47.468	51.463	-	51.463	50.577	51.534	52.520	53.626	522.361	829.549
• APN/0605 J0449: <i>MQ-25 APN SPARES</i>	0.000	57.749	133.541	-	133.541	112.432	103.469	128.854	116.880	Continuing	Continuing
• APN/0449: MQ-25 <i>Unmanned Carrier Aviation, APN-4</i>	0.000	0.000	744.181	-	744.181	699.182	709.954	723.263	738.376	6,341.985	9,956.941

**Remarks**  
 APN 0449 is APN-4 regular supporting the manufacturing and production of MQ-25 Air Systems (AS) Low Rate Initial Production (LRIP) aircraft.  
 APN 0449C is advanced procurement for the MQ-25A AS to procure LRIP long-lead items.  
 APN 0605 spares supports the APN-4 efforts for sparing.

**D. Acquisition Strategy**  
 Based on the Government's acquisition strategy approved in April 2017, the MQ-25 program is an evolution from the previous Unmanned Carrier-Launched Airborne Surveillance and Strike (UCLASS) program and is an Acquisition Category (ACAT) IB program managed by Program Executive Office, Unmanned Aviation & Strike Weapons (PEO(U&W)), PMA-268 Unmanned Carrier Aviation (UCA) Program Office. Pursuant to 10 U.S.C. 2430(d)(1), the Milestone Decision Authority (MDA) is ASN(RDA).

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Navy		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605414N / <i>Unmanned Carrier Aviation (UCA)</i>	<b>Project (Number/Name)</b> 3278 / <i>MQ-25 Air System (AS)</i>

MQ-25 requirements are aligned with the Unmanned Carrier Launched Airborne Surveillance and Strike (UCLASS) Initial Capabilities Document (ICD) and the Next Generation Air Dominance (NGAD) Family of Systems (FoS) ICD, which highlight the need for carrier-based refueling and persistent ISR capabilities. The Joint Requirements Oversight Council (JROC) endorsed the UCLASS ICD in April 2011 and formally approved it on 9 June 2011 via Joint Requirements Oversight Council Memorandum (JROCM) 087-11. The NGAD FoS ICD was validated by the JROC on 18 August 2015 and formally approved by JROCM 087-15. The JROC's guidance delineated in the validated ICDs and subsequent JROCMs was to establish a requirement for a versatile platform that supports a myriad of organic Naval missions such as aerial refueling and ISR for the CVW. The JROC validated the Capability Development Document for MQ-25 Carrier Based Unmanned Air System on 21 July 2017. Through a highly competitive source selection, the EMD contract was awarded in August 2018, and moved the Initial Operational Capability (IOC) four years earlier to 2024. The Navy recognized investments were required to support the shorter schedule and received support to increase the number of test CVN installs from two to four and exercised an option for System Demonstration Test Article (SDTA) production to start in FY20. Due to the UMCS FY20 budget reduction (PU 3279) in PB20, modifications ceased on two of the four test CVNs which made it highly likely IOC would be delayed by at least 10 months. The shift to a mature, industry developed ground control station (GCS) mitigated some of this risk, by providing an embarkable GCS that can be used for testing on any JPALS-equipped CVN. The latest projection for MQ-25A IOC is Sep 2025 and the program continues to look for opportunities to mitigate additional schedule risk. A stable funding base for both MQ-25 (PU 3278) and UMCS (PU 3279) remains critical to successfully delivering MQ-25A on an aggressive timeline as the two programs are tightly linked.

MQ-25 is implementing an evolutionary acquisition strategy to develop, fly, deploy, and evolve the MQ-25 Air Vehicle for Initial Operational Capability and fleet integration. This MQ-25 acquisition strategy continues with entry into flight test, correction of deficiencies work, and stand up of logistics and training efforts in conjunction with continued CVN modifications required for a decision to proceed to IOT&E and IOC in FY2025.

MQ-25, as part of the evolutionary acquisition strategy, will begin to utilize a Corporate Basic Ordering Agreement (BOA) for engineering studies, development work to pace emerging threats and capabilities needed for operational environment, sustainment, and training efforts.

MQ-25 awarded a fixed price incentive, firm target (FPIF) contract for the AS EMD contract to Boeing in August 2018. As a result of ASN(RDA) and OPNAV N9 directing new requirements for the MQ-25 GCS, a contract was awarded to Boeing in December 2020 to fund integration of a newest, more capable GCS provided as GFE/GFI by PMA-268.

MQ-25 is dependent upon the UMCS program to provide CVN-based GCS systems that are integrated into CVN networks.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy													Date: April 2022			
Appropriation/Budget Activity 1319 / 5				R-1 Program Element (Number/Name) PE 0605414N / Unmanned Carrier Aviation (UCA)						Project (Number/Name) 3278 / MQ-25 Air System (AS)						
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	
Air Segment - Primary Hardware Development	C/FPIF	Boeing : St. Louis, MO	824.293	6.590	May 2021	27.330	Dec 2021	34.392	Dec 2022	-		34.392	128.081	1,020.686	1,020.700	
Air Segment - Primary Hardware SDTA	C/FPIF	Boeing : St. Louis, MO	63.500	21.200	Mar 2021	0.000		0.000		-		0.000	0.000	84.700	84.700	
Air Segment - Primary Hardware ESA	C/CPIF	Boeing : St. Louis, MO	15.572	1.000	Mar 2021	1.000	Mar 2022	0.000	Mar 2023	-		0.000	0.000	17.572	22.267	
Air Segment- Primary Hardware Development	C/CPIF	Boeing : St. Louis, MO	11.324	20.165	May 2021	24.945	May 2022	33.321	May 2023	-		33.321	25.278	115.033	115.033	
Air Segment - Systems Engineering	WR	NAWCAD : Patuxent River, MD	35.922	22.000	Nov 2020	30.030	Nov 2021	30.062	Nov 2022	-		30.062	Continuing	Continuing	Continuing	
Air Segment - Systems Engineering	WR	NAWCWD : China Lake, CA	2.991	1.360	Nov 2020	1.360	Nov 2021	1.362	Nov 2022	-		1.362	Continuing	Continuing	Continuing	
Air Segment - Systems Engineering	Various	Various : Various	2.744	1.280	Nov 2020	1.280	Nov 2021	1.281	Nov 2022	-		1.281	Continuing	Continuing	Continuing	
CS&C Segment	Various	Various : Various	58.911	0.000		0.000		0.000		-		0.000	0.000	58.911	-	
Carrier Segment (Ship Integration)	Various	Various : Various	42.882	0.000		0.000		0.000		-		0.000	0.000	42.882	-	
LSI - Advanced Development (Primary Hardware Development)	Various	Various : Various	1.272	0.000		0.000		0.000		-		0.000	0.000	1.272	-	
LSI - Systems Engineering	Various	Various : Various	16.400	5.410	Nov 2020	5.119	Nov 2021	5.636	Nov 2022	-		5.636	Continuing	Continuing	Continuing	
LSI - Systems Engineering	WR	NAWCAD : Patuxent River, MD	80.072	45.980	Nov 2020	54.153	Nov 2021	58.892	Nov 2022	-		58.892	Continuing	Continuing	Continuing	
LSI - Systems Engineering	Various	NAVWAR : San Diego, CA	11.261	3.638	Nov 2020	2.000	Nov 2021	2.202	Nov 2022	-		2.202	Continuing	Continuing	Continuing	
LSI - Integrated Digital Environment	SS/FFP	NAWCAD : Lakehurst, NJ	11.401	3.429	Mar 2021	1.500	Mar 2022	1.652	Mar 2023	-		1.652	Continuing	Continuing	Continuing	
Air Segment -Primary Hardware Development	WR	NSMA : Washington, DC	4.774	3.026	Apr 2021	0.000		0.000		-		0.000	0.000	7.800	7.800	
<b>Subtotal</b>			1,183.319	135.078		148.717		168.800		-		168.800	Continuing	Continuing	N/A	

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy** **Date:** April 2022

<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605414N / <i>Unmanned Carrier Aviation (UCA)</i>	<b>Project (Number/Name)</b> 3278 / <i>MQ-25 Air System (AS)</i>
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<b>Product Development (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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			

**Remarks**  
FY 23: Cost increases from FY22 to FY23 in the Product Development Category support the new GCS efforts and contracting strategies.

<b>Support (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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			
Manpower Studies & Analyses	Various	Various : Various	0.490	0.200	Nov 2020	0.200	Nov 2021	0.214	Nov 2022	-		0.214	Continuing	Continuing	Continuing
Training Development	Various	Various : Various	8.042	4.960	Nov 2020	3.326	Nov 2021	5.955	Nov 2022	-		5.955	Continuing	Continuing	Continuing
<b>Subtotal</b>			8.532	5.160		3.526		6.169		-		6.169	Continuing	Continuing	N/A

**Remarks**  
Increase from FY22 to FY23 is to support the development of the Tactics, Techniques, and Procedures (TTPs) to inform Contractor courseware development and provide the basis of the Naval TTP document.

<b>Test and Evaluation (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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			
Test and Evaluation	WR	NAWCAD : Patuxent River, MD	66.563	52.235	Nov 2020	53.976	Nov 2021	54.114	Nov 2022	-		54.114	Continuing	Continuing	Continuing
Test and Evaluation	Various	Various : Various	5.038	2.070	Nov 2020	1.734	Nov 2021	1.755	Nov 2022	-		1.755	Continuing	Continuing	Continuing
<b>Subtotal</b>			71.601	54.305		55.710		55.869		-		55.869	Continuing	Continuing	N/A

**Remarks**  
Increase from FY22 to FY23 due to inflation.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy** **Date:** April 2022

<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605414N / <i>Unmanned Carrier Aviation (UCA)</i>	<b>Project (Number/Name)</b> 3278 / <i>MQ-25 Air System (AS)</i>
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<b>Management Services (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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			
Management	Various	Various : Various	6.477	1.840	Nov 2020	1.840	Nov 2021	1.921	Nov 2022	-		1.921	Continuing	Continuing	Continuing
Management	WR	NAWCAD : Patuxent River, MD	17.432	5.346	Nov 2020	5.500	Nov 2021	5.744	Nov 2022	-		5.744	Continuing	Continuing	Continuing
Management	Various	NAVAIR : Patuxent River, MD	0.450	0.135	Oct 2020	0.135	Oct 2021	0.140	Oct 2022	-		0.140	Continuing	Continuing	Continuing
<b>Subtotal</b>			24.359	7.321		7.475		7.805		-		7.805	Continuing	Continuing	N/A

**Remarks**  
Increase from FY22 to FY23 due to inflation.

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	1,287.811	201.864	215.428	238.643	-	238.643	Continuing	Continuing	N/A

**Remarks**

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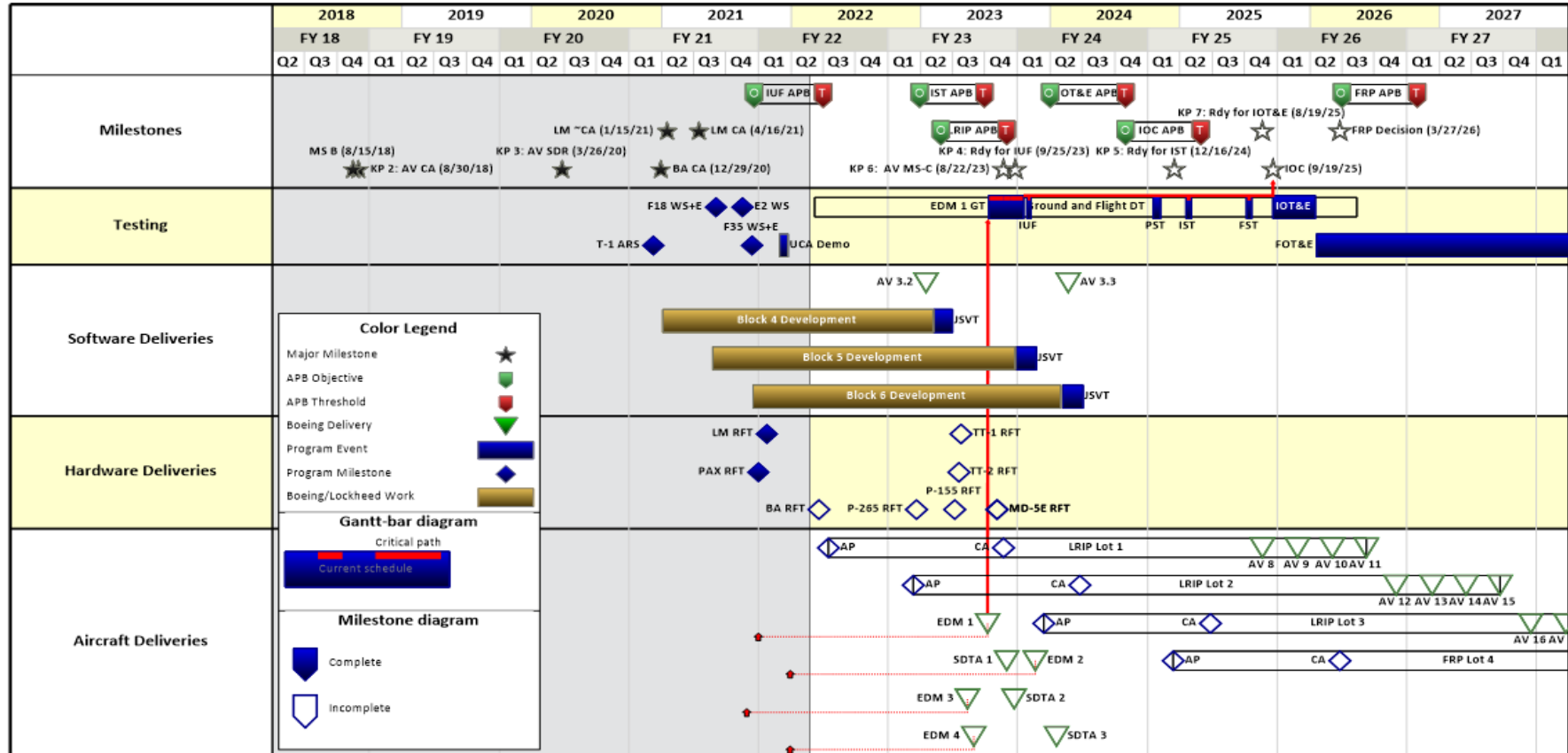
Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy

Date: April 2022

Appropriation/Budget Activity  
1319 / 5

R-1 Program Element (Number/Name)  
PE 0605414N / Unmanned Carrier Aviation  
(UCA)

Project (Number/Name)  
3278 / MQ-25 Air System (AS)



Note: This depiction of the program integrated master schedule is a resource for Government planning purposes only and shall not be construed as a modification to delivery or performance requirements set forth in the contract

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<b>Exhibit R-4A, RDT&amp;E Schedule Details: PB 2023 Navy</b>		<b>Date: April 2022</b>
<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605414N / <i>Unmanned Carrier Aviation (UCA)</i>	<b>Project (Number/Name)</b> 3278 / <i>MQ-25 Air System (AS)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>MQ-25</b>				
Acquisition Milestones: Milestones & Reviews: EDM Delivery 1	3	2023	3	2023
Acquisition Milestones: Milestones & Reviews: EDM Delivery 2	1	2024	1	2024
Acquisition Milestones: Milestones & Reviews: EDM Delivery 3	3	2023	3	2023
Acquisition Milestones: Milestones & Reviews: EDM Delivery 4	3	2023	3	2023
Acquisition Milestones: Milestones & Reviews: KP4 First Ready for IUF	4	2023	4	2023
Acquisition Milestones: Milestones & Reviews: KP5 Ready for IST	1	2025	1	2025
Acquisition Milestones: Milestones & Reviews: Initial Sea Trials	2	2025	2	2025
Acquisition Milestones: Milestones & Reviews: KP6 AV MS C	4	2023	4	2023
Acquisition Milestones: Milestones & Reviews: KP7 Ready for IOC	4	2025	4	2025
Acquisition Milestones: Milestones & Reviews: T-1 Hoist Aboard	1	2022	1	2022
Acquisition Milestones: Milestones & Reviews: Initial Operational Test and Evaluation	4	2025	2	2026
Acquisition Milestones: Milestones & Reviews: IOC	4	2025	4	2025
Acquisition Milestones: Milestones & Reviews: System Demonstration Test Article 1 Delivery	4	2023	4	2023
Acquisition Milestones: Milestones & Reviews: System Demonstration Test Article 2 Delivery	4	2023	4	2023
Acquisition Milestones: Milestones & Reviews: System Demonstration Test Article 3 Delivery	2	2024	2	2024
Acquisition Milestones: Milestones & Reviews: Follow on Test and Evaluation	2	2026	4	2027
Acquisition Milestones: Milestones & Reviews: FRP Decision	2	2026	2	2026
Systems Development: MQ-25 System Design & Integration: MQ-25 Architecture Development and Integration	2	2021	3	2023

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

<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605414N / <i>Unmanned Carrier Aviation (UCA)</i>	<b>Project (Number/Name)</b> 3278 / <i>MQ-25 Air System (AS)</i>
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<b>Events by Sub Project</b>	<b>Start</b>		<b>End</b>	
	<b>Quarter</b>	<b>Year</b>	<b>Quarter</b>	<b>Year</b>
Systems Development: MQ-25 System Design & Integration: Software Integration	2	2021	3	2024
Systems Development: Air Segment: ITT and Integration Support	2	2022	3	2026

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Navy										<b>Date:</b> April 2022		
<b>Appropriation/Budget Activity</b> 1319 / 5					<b>R-1 Program Element (Number/Name)</b> PE 0605414N / <i>Unmanned Carrier Aviation (UCA)</i>				<b>Project (Number/Name)</b> 3279 / <i>Unmanned Carrier Aviation Mission Control System</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
3279: <i>Unmanned Carrier Aviation Mission Control System</i>	114.296	50.571	46.564	27.003	-	27.003	20.982	14.442	17.205	17.379	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

The Unmanned Carrier Aviation (UCA) Mission Control System (UMCS) program builds, integrates, and installs control systems required to operate the MQ-25A. The UMCS program includes what was previously identified as the Control System & Connectivity (CS&C) and Carrier Vessel, Nuclear (CVN) Integration (CVNI) Segments previously captured under the MQ-25 Development PU 3278.

The Unmanned Carrier Aviation (UCA) Mission Control System (UMCS) program, PU 3279, is the system-of-systems required for MQ-25 vehicle and payload control both shipboard and shore based. UMCS consists of all ground and ship based hardware, software, and networks associated with the planning and execution of flight operations and tactical missions. In addition to Ground Control Station (GCS), consisting of Air Vehicle Operator (AVO) workstations and servers, the UMCS program builds hardware to support line of sight (LOS) communications, beyond line of sight (BLOS) satellite communications (SATCOM), and integration with ship/shore based systems. There are three variants of the GCS: MD-5C (CVN-based), MD-5D (Shore-based) and MD-5E (Embarkable system) for use on CVNs that do not yet have permanent GCS systems installed. UMCS leverages existing Programs of Record (PoR) for network integration and LOS/BLOS communications and builds MQ-25 unique systems (e.g. an ARC-210 based LOS communication system and a Video Management System (VidMS) for AVO situational awareness). The GCS streamlines software development, supports multiple classification levels, and positions MQ-25A interoperability with other DoD systems. Hardware development and fabrication is one facet of the program. UMCS develops and integrates software and modifies several aircraft carrier spaces to install and integrate the GCS and communication systems, in support of MQ-25A test events and operations aboard select NIMITZ Class CVNs. The UMCS program modifies and integrates with existing, external Command, Control, Communication, Computers, and Intelligence (C4I) systems to provide network paths for AV and mission payload data using a variety of wideband and narrowband communication paths. UMCS accomplishes this by integrating the GCS and the MQ-25A AV with multiple networks and systems both at sea and on shore.

UMCS builds the following hardware: MQ-25A GCS, Video Management System (VidMS), ARC-210 Radio Communication System (RCS), and Ashore Routing Communication System (ARCS). The GCS consists of the following components: air vehicle operator (AVO) workstations, server racks, network interface racks, integrated communication system (ICS), Data Transfer System (DTS), and software. The ship variant (MD-5C) will leverage the shore based system components but will have manufacturing differences to account for the harsher CVN environment. The VidMS provides situational awareness displays of the CVN environment. The ARC-210 and Digital Modular Radio (DMR) systems provide narrowband command and control (C2) communications between the GCS and the MQ-25A. An ICS 1/2 rack integrates the GCS with existing carrier communication systems. The ARCS provides an interface between the shore GCS sites and the Command, Control, Communication, Computers, and Intelligence (C4I) networks enabling wide-band LOS and BLOS communications with the MQ-25A. UMCS also leverages NAVWAR baseline systems on board the CVNs and at the MQ-25A shore sites.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Navy	<b>Date:</b> April 2022
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<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605414N / <i>Unmanned Carrier Aviation (UCA)</i>	<b>Project (Number/Name)</b> 3279 / <i>Unmanned Carrier Aviation Mission Control System</i>
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UMCS leads development, modification, engineering, and integration activities, to facilitate seamless voice, data, and C2 exchanges with the MQ-25A AV, local networks, voice networks, C2 networks, tactical networks, intelligence systems, and launch and recovery systems by collaborating with existing NAVWAR, NAVAIR and NAVSEA Programs of Record (PoRs).

CVN modification and installation is governed by the Naval Sea Systems Command (NAVSEA) Navy Modernization Process (NMP). This process defines the schedule for submitting documentation, drawings, and hardware to support CVN modifications. UMCS modifications must occur during pre-planned maintenance periods that are updated at least twice per year. Changes to these maintenance periods drive changes to the UMCS installation schedule. The NMP consists of multiple phases. Phase 1, approximately three years before the availability period, consists of developing the system design, technical data, installation guidance, and Ship Change Documents (SCDs). Phase 2, approximately two years before the maintenance period, consists of hull specific ship checks, drawing development and hardware procurement. Phase 3, one year before the maintenance period, consists of drawing approval, install schedule development, completion of cybersecurity and logistics documentation, and GCS integration testing. Phase 4 occurs during the maintenance period and consists of CVN infrastructure modification, hardware installation, and completion of ship-board integrated verification testing. CVN modifications and installations are based on the number of SCDs and the length of the planned maintenance period. Due to the size and complexity of the UMCS modifications, a minimum of two 6-month maintenance periods is required for a full installation.

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

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<b>Title:</b> Unmanned Carrier Aviation (UCA) Mission Control System	50.571	46.564	27.003	0.000	27.003
<b>Articles:</b>	-	-	-	-	-
<p><b>Description:</b> Description: The UMCS program is a Government-led effort which includes, but is not limited to, development, integration, installation, and testing of the UMCS hardware and software, upgrades to existing CVN infrastructure to support accelerated delivery of MQ-25 capabilities, unique modifications to the Joint Precision Approach Landing System (JPALS) and the Aircraft Launch and Recovery Equipment (ALRE) to support specific MQ-25A capabilities, and integration with C4I systems.</p> <p><b>FY 2022 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue GCS software development efforts and integration with MQ-25A AV software</li> <li>- Complete VidMS redesign and integration of the DTS-1 into the GCS baseline</li> <li>- Continue cybersecurity efforts to achieve Authority to Operate (ATO) certifications for the GCS, the VidMS, the ARC-210 RCS, and the ARC</li> <li>- Assemble and integrate one GCS and ancillary equipment for the LRP</li> <li>- Finalize ship, shore, and embarkable GCS design packages</li> <li>- Begin design and integration of the embarkable GCS; includes connectivity plan with existing CVN networks</li> <li>- Complete temporary CVN installation in support of T1 hoist aboard and JPALS surrogate testing</li> <li>- Begin guidance documentation for the temporary installation of the embarkable GCS on multiple CVNs</li> </ul>					

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Navy		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605414N / <i>Unmanned Carrier Aviation (UCA)</i>	<b>Project (Number/Name)</b> 3279 / <i>Unmanned Carrier Aviation Mission Control System</i>

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

	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>
<ul style="list-style-type: none"> <li>- Begin modifying multiple CVNs (up to 4) for installation of the GCS to support future MQ-25A testing</li> <li>- Continue developing interfaces between the embarkable GCS and ALRE systems and the ATC Picture</li> <li>Provide Non-Recurring Engineering (NRE), integration, installation, and test support for CVN C4I systems (e.g. Wideband Commercial and Military SATCOM, Narrowband Military SATCOM, Common Data Link Systems)</li> <li>- Provide NRE, integration, cybersecurity, and test support for ARCS for sustained end-to-end C4I communications from CVN to MQ-25A and to operational fixed control shore stations</li> <li>- Provide for NRE and integration of C4I systems at operational fixed control shore stations</li> <li>- Modify, integrate and test CVN and shore exploitation systems (e.g. DCGS-N and Classic Reach)</li> <li>- Provide C4I test support for PoR systems installed on CVN A and integrated with UMCS during at sea test events</li> </ul> <p><b>FY 2023 Base Plans:</b></p> <ul style="list-style-type: none"> <li>- Complete GCS software development and integration with MQ-25A AV software</li> <li>- Develop software Correction of Deficiency (CoD) builds based on lab, ground, and shore-based flight testing</li> <li>- Complete VidMS redesign due to End of Life (EOL) components and removal of the video wall and support station based on new GCS design</li> <li>- Complete development, qualification, and testing of the URC-300 radio</li> <li>- Complete development, qualification, and testing of the Unmanned Carrier Aviation (UCA) Transport System (UTS)</li> <li>- Correct ancillary system problems identified during Initial UMCS Flight (IUF)</li> <li>- Complete assembly, integration, and test of the MD-5E CVN Embarkable system</li> <li>- Finalize guidance packages and interface control documentation for the MD-5E CVN Embarkable system</li> <li>- Complete the planning and infrastructure installation for the MD-5E on CVNs A and D</li> <li>- Install the MD-5E Embarkable system on one of the four test carriers</li> <li>- Finalize interface design between the MD-5E and ancillary/communication/network systems</li> <li>- Develop Technical Data Packages for system level components</li> <li>- Maintain Cybersecurity certifications for the GCS, VidMS, ARC-210 RCS, ARCS, and other ancillary systems</li> <li>- Lab integration and test support for ARCS with the MD-5D GCS and C4I Networks</li> <li>- C4I Test &amp; Integration Support for Wideband Line of Sight (LOS) and Beyond LOS (BLOS) programs of record: Network Tactical Common Datalink (NTCDL) and Military/Commercial SATCOM</li> <li>- Provide for NRE and integration of C4I systems at operational fixed control shore stations</li> </ul> <p><b>FY 2023 OCO Plans:</b></p>					

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

<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605414N / <i>Unmanned Carrier Aviation (UCA)</i>	<b>Project (Number/Name)</b> 3279 / <i>Unmanned Carrier Aviation Mission Control System</i>
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<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>
N/A					
<b><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i></b> FY2022 to FY2023 decrease due to updated acquisition strategy with the new GCS, which reduces the RDTE CVN installs and is primarily for basic infrastructure to support the Embarkable GCS. Work also transitioning to OPN funded while MD-5C tasking ramps up.					
<b>Accomplishments/Planned Programs Subtotals</b>	50.571	46.564	27.003	0.000	27.003

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• OPN/4269: <i>UMCS- Unman Carrier Aviation (UCA) Mission Cntrl Stn</i>	40.070	86.584	136.647	-	136.647	153.477	130.250	199.489	191.792	Continuing	Continuing
• OPN/9020/J4269: <i>Spares for Unmanned Carrier Aviation (UCA)</i>	0.000	3.705	3.246	-	3.246	0.711	1.677	0.401	0.503	Continuing	Continuing

**Remarks**

The Unmanned Carrier Aviation (UCA) Mission Control System (UMCS) program builds, integrates, installs, and sustains GCSs required to operate the MQ-25A AV via CVNs or shore sites.

- RDTE will fund the redesign of the CVN infrastructure; design, assembly, and installation of an embarkable GCS to support testing; software development to support MQ-25A AV development and certification of new software for UMCS on Navy IT systems/platforms; product development modifying existing systems with new capabilities for integration with or utilization by UMCS.
- OPN will fund the modification of CVN infrastructure and installation of hardware on CVNs and operational shore sites; incorporation of UMCS into existing Post MS-C PoRs (i.e. NAVWAR - C4I, ADNS, SATCOM, Secure Shore Integration; NAVAIR - ALRE, JPALS); Tech Refresh which includes replacement of a portion of selected hardware components on a three year recurring schedule.

**D. Acquisition Strategy**

In February 2019, the UMCS program was designated an ACAT II program, a separate PoR from the MQ-25 Air System (AS) ACAT IB. However both PoRs, UMCS and MQ-25, are required to field a Unmanned Carrier Aviation (UCA) System capability. MQ-25 AS is dependent on UMCS to meet the program's 2025 IOC.

- Due to the close alignment of requirements with MQ-25 AS, interoperability, and parent documentation, the UMCS PoR will leverage MQ-25 PoR acquisition events and milestones as part of the acquisition strategy for oversight and approvals.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Navy		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605414N / <i>Unmanned Carrier Aviation (UCA)</i>	<b>Project (Number/Name)</b> 3279 / <i>Unmanned Carrier Aviation Mission Control System</i>
<p>- The MQ-25 UCA Program was designated a Maritime Accelerated Acquisition (MAA) Program by the CNO and the Assistant Secretary of the Navy for Research, Development, and Acquisition (ASN(RDA)). This designation expedites the acquisition and fielding of the MQ-25 system and directs all associated organizations to support the MQ-25 Program on a priority basis.</p> <p>- The UMCS government team is performing the role of the Lead Systems Integrator (LSI) for the Ground Control System (GCS).</p> <p>- In order to expedite fielding of UMCS per MAA policy and to align with the IOC requirements for the MQ-25 SoS, the program team has and will continue to leverage systems with high Technology Readiness Levels, largely consisting of Commercial and Government Off the Shelf systems (i.e. COTS and GOTS) to the greatest extent possible.</p> <p>The latest UMCS acquisition strategy was approved on 25 July 2019. The UMCS PoR will use an evolutionary acquisition approach to develop, integrate, test, deploy, and evolve the capabilities throughout the life of the system. The UMCS requires integration of multiple products with the primary developmental system being the software dominant GCS.</p> <p>Prior to FY21, PMA-268 had been developing a government-furnished Ground Control Station (GCS) known as MD-5A and MD-5B as part of its UMCS program, the system-of systems required for command and control of the MQ-25A Air Vehicle (AV) and payload. In September 2020, Navy leadership directed the MQ-25 program to transition to a mature, industry-developed GCS capable of Joint All Domain Command and Control (JADC2) interoperability and meeting multi-level security requirements. The new Lockheed Martin designed and built GCS will streamline software development, readily support multiple classification levels, and position the MQ-25 for interoperability with other DoD systems. With the decision to switch to an industry developed GCS, work associated with integrating the new GCS into the MQ-25A AV and payload was put on contract with Boeing (for integration) in December 2020 and Lockheed Martin (via NSMA) in April 2021.</p> <p>UMCS hardware procurements will accommodate CVN installation, testing, and deployment constraints as well as ship modification schedule constraints.</p> <p>- Because the UMCS is integrated and installed aboard CVNs, PMA-268 must follow the ship modernization process, which directs delivery dates for deliverables and installation milestones associated with a CVN maintenance availability period. The lead-time associated with this process drives the timeline to design, develop, and procure equipment ahead of the planned installation date.</p> <p>UMCS testing will occur in multiple stages, progressing from standalone testing with an AV simulator, to operating in conjunction with a hardware-in-the-loop air vehicle (hot bench), to shipboard evaluation of Unmanned Air Warfare Center (UAWC) installations. Each version of UMCS will be evaluated for system functionality and usability through a series of capabilities-based test events focused on the execution of mission tanking, recovery tanking, and Intelligence, Surveillance, and Reconnaissance missions. Additional testing to include mission planning, supportability, and reliability will be conducted during dedicated events when not captured concurrently with other tests.</p>		

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy** **Date:** April 2022

<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605414N / <i>Unmanned Carrier Aviation (UCA)</i>	<b>Project (Number/Name)</b> 3279 / <i>Unmanned Carrier Aviation Mission Control System</i>
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<b>Product Development (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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			
UMCS (Ship Integration)	Various	Various : Various	24.772	8.883	Nov 2020	7.338	Nov 2021	5.107	Nov 2022	-		5.107	Continuing	Continuing	Continuing
UMCS (Ship Integration)	WR	NAWCAD : Patuxent River, MD	60.181	32.747	Nov 2020	35.460	Nov 2021	19.846	Nov 2022	-		19.846	Continuing	Continuing	Continuing
UMCS (Ship Integration)	WR	NAWCAD : Lakehurst, NJ	6.611	3.199	Nov 2020	1.547	Nov 2021	0.000		-		0.000	4.031	15.388	-
UMCS - Primary Hardware/Software Development CS	WR	NSMA : Washington, DC	11.221	4.000	Apr 2021	0.000		0.000		-		0.000	0.000	15.221	-
UMCS	SS/FFP	Rockwell Collins : Cedar Rapids, IA	2.696	0.160	Nov 2020	0.000		0.000		-		0.000	0.000	2.856	2.242
UMCS	Various	NAVWAR : San Diego, CA	8.815	1.582	Nov 2020	2.219	Nov 2021	2.050	Nov 2022	-		2.050	6.589	21.255	-
<b>Subtotal</b>			114.296	50.571		46.564		27.003		-		27.003	Continuing	Continuing	N/A

**Remarks**  
 -UMCS Ship Integration reduced from FY2022 to FY 2023 due to decreased CVN installs related to updated acquisition strategy and to account for the availability of prior year execution balances.  
 -UMCS San Diego, CA decreases from FY 2022 to FY 2023 due to funding for NRE and testing for C4I systems at shore stations

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	114.296	50.571	46.564	27.003	-	27.003	Continuing	Continuing	N/A

**Remarks**

Appropriation/Budget Activity  
1319 / 5

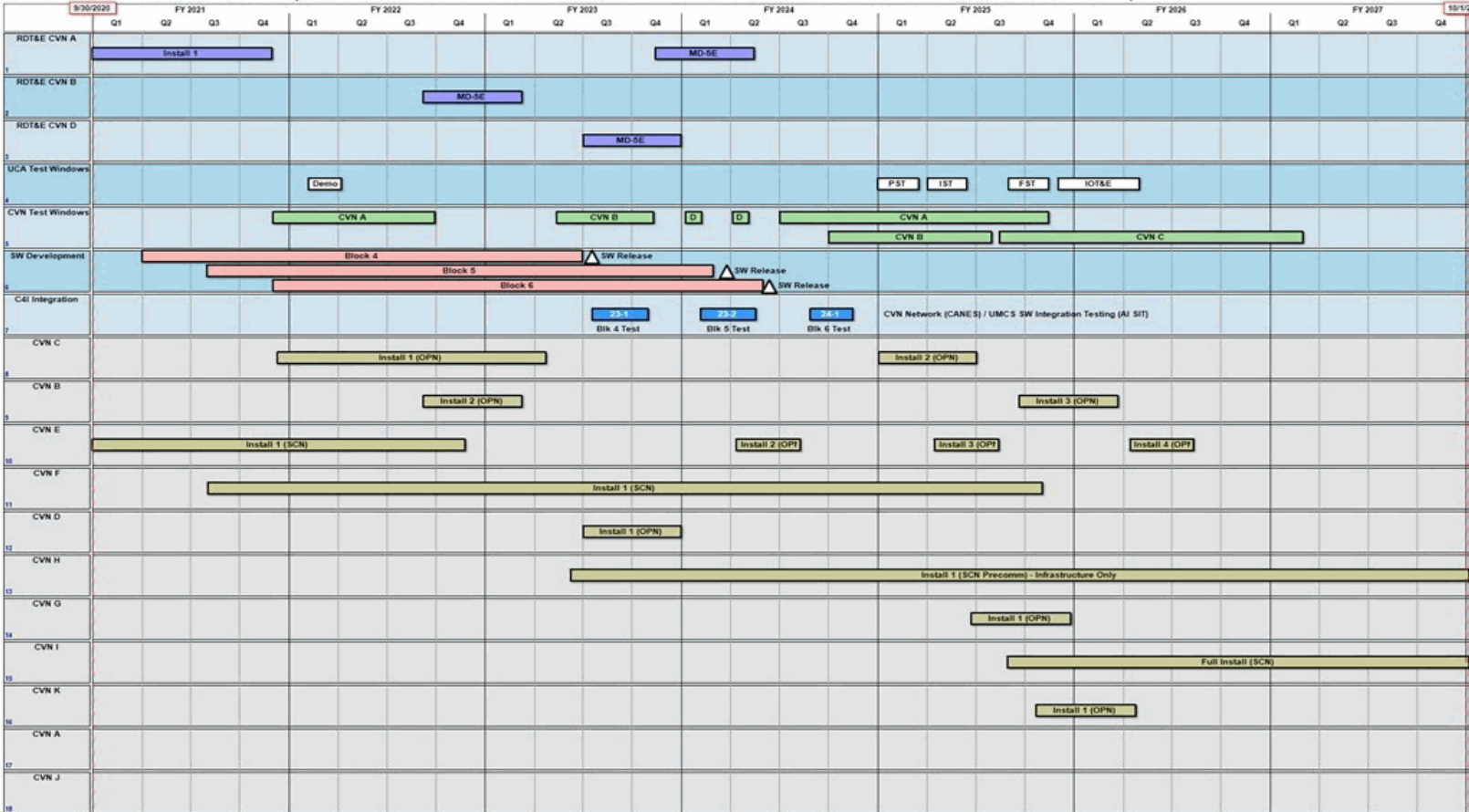
R-1 Program Element (Number/Name)  
PE 0605414N / Unmanned Carrier Aviation  
(UCA)

Project (Number/Name)  
3279 / Unmanned Carrier Aviation Mission  
Control System



# PMA 268 CVN AVAILABILITY TARGETS (NO HULL #S)

AS OF 3 MARCH 2022 (PMS 312 CVN AVAILABILITY SCHEDULE DATED 3 JANUARY 2022)



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<b>Exhibit R-4A, RDT&amp;E Schedule Details: PB 2023 Navy</b>		<b>Date: April 2022</b>
<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605414N / <i>Unmanned Carrier Aviation (UCA)</i>	<b>Project (Number/Name)</b> 3279 / <i>Unmanned Carrier Aviation Mission Control System</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>UMCS</b>				
System Development (RDTE Carriers): UMCS Program (MD-5): CVN A Installation	1	2021	4	2021
System Development (RDTE Carriers): UMCS Program (MD-5): CVN B MD-5E Temporary Installation	3	2022	1	2023
System Development (RDTE Carriers): UMCS Program (MD-5): CVN D MD-5E Temporary Installation	3	2023	1	2024
System Development (RDTE Carriers): UMCS Program (MD-5): CVN A MD-5E Temporary Installation	4	2023	2	2024
System Development (RDTE Carriers): UMCS Program (MD-5): UMCS Program: Software (SW) Development/SW Testing/Technology Refresh/SW Integration	2	2021	2	2024
System Development (RDTE Carriers): NAVWAR C4I Integration: AI SIT, ADNS	1	2023	4	2024
Carrier Modifications (OPN Carriers): CVN C Installation 1	4	2021	2	2023
Carrier Modifications (OPN Carriers): CVN C Installation 2	1	2025	3	2025
Carrier Modifications (OPN Carriers): CVN B Installation 2	3	2022	1	2023
Carrier Modifications (OPN Carriers): CVN B Installation 3	3	2025	1	2026
Carrier Modifications (OPN Carriers): CVN D Installation 1	3	2023	1	2024
Carrier Modifications (OPN Carriers): CVN D Installation 2	4	2025	1	2027
Carrier Modifications (OPN Carriers): CVN E Installation 2	2	2024	3	2024
Carrier Modifications (OPN Carriers): CVN E Installation 3	2	2025	3	2025
Carrier Modifications (OPN Carriers): CVN E Installation 4	2	2026	3	2026
Carrier Modifications (OPN Carriers): CVN A Installation 2	4	2023	2	2024
Carrier Modifications (OPN Carriers): CVN A Installation 3	4	2026	2	2027
Carrier Modifications (OPN Carriers): CVN G Installation 1	2	2025	4	2025

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2023 Navy			<b>Date:</b> April 2022	
<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605414N / <i>Unmanned Carrier Aviation (UCA)</i>	<b>Project (Number/Name)</b> 3279 / <i>Unmanned Carrier Aviation Mission Control System</i>		

<b>Events by Sub Project</b>	<b>Start</b>		<b>End</b>	
	<b>Quarter</b>	<b>Year</b>	<b>Quarter</b>	<b>Year</b>
Carrier Modifications (OPN Carriers): CVN K Installation 1	4	2025	2	2026