Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605414N *I (U) Unmanned Carrier Aviation (UCA)*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	75.863	222.208	718.942	-	718.942	705.972	690.368	680.097	550.469	Continuing	Continuing
3278: *MQ-25 Development*	0.000	75.863	222.208	683.915	-	683.915	679.707	688.659	678.342	550.469	Continuing	Continuing
3279: *UMCS*	0.000	0.000	0.000	35.027	-	35.027	26.265	1.709	1.755	0.000	0.000	64.756
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** P462												

Note

Elements of the MQ-25 program were previously funded under the Unmanned Carrier Launched Airborne Surveillance and Strike (UCLASS) System Program Element (PE) 0604404N, Project Unit (PU) 3278 and assigned to Budget Activity (BA) 05: System Development and Demonstrations (SDD). In January of 2016, PE 0605414N PU 3278 was established as the principal budget line for MQ-25. In January of 2018, PU 3279 was established for the Unmanned Carrier Aviation (UCA) Mission Control System (UMCS).

The President's Budget FY17 PE 0605414N PU 3278 submission was initially regarded as Carrier Based Aerial Refueling System (CBARS)/UCLASS Development. To better align with the mission and capability funded under PE 0605414N, it is now referred to as Unmanned Carrier Aviation (UCA)/MQ-25.

A. Mission Description and Budget Item Justification

The MQ-25 program rapidly develops an unmanned capability to embark on CVNs as part of the Carrier Air Wing (CVW) to conduct aerial refueling as a primary mission and provide Intelligence, Surveillance, Reconnaissance (ISR) capability as 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 for its primary missions. As the first carrier-based, group 5 Unmanned Aircraft System (UAS), MQ-25 will pioneer the integration of manned and unmanned operations, demonstrate mature complex sea-based Command, Control, Communications, Computers, and Intelligence (C4I) UAS technologies, and pave the way for future multifaceted multi-mission UAS to pace emerging threats.

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 Jun 11 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 to support the CSG. The JROC validated the Capability Development Document (CDD) for MQ-25 Carrier Based Unmanned Air System (CBUAS) on 21 July 2017. MQ-25 is expected to provide an Initial Operational Capability to the fleet in 2026.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605414N *I (U) Unmanned Carrier Aviation (UCA)*

The newly established ACAT III Unmanned Carrier Aviation (UCA) Mission Control System (UMCS). UMCS is comprised of the Control System & Connectivity (CS&C) and Carrier (CVN) Segments previously captured under the MQ-25 Development PU 3278.

The Unmanned Carrier Aviation (UCA) Mission Control System (UMCS) program consists of the MQ-25 control station, designated the MD-5, and modifications to the Command, Control, Communications, Computers, and Intelligence (C4I) systems and Carrier Vessel, Nuclear (CVN) infrastructure required for MQ-25 vehicle and mission control.

This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes some projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full-rate production decision.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	89.000	222.208	484.950	-	484.950
Current President's Budget	75.863	222.208	718.942	-	718.942
Total Adjustments	-13.137	0.000	233.992	-	233.992
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.536	0.000			
• Program Adjustments	0.000	0.000	240.294	-	240.294
• Rate/Misc Adjustments	-0.001	0.000	-6.302	-	-6.302
• Congressional General Reductions Adjustments	-0.022	-	-	-	-
• Congressional Directed Reductions Adjustments	-12.578	-	-	-	-

Change Summary Explanation

Technical: Not Applicable.

Schedule: Fixed Fleet Control Station Delivery and Hull, Mechanical, and Electrical (HME) Install 4/5 removed and will be procured out of OPN LI 4269 (UMCS-Unmanned Carrier Aviation (UCA) Mission Control System).

Engineering and Manufacturing Development (EMD) contract award delayed approximately six weeks due to a delay in the release of the final RFP.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605414N *I (U) Unmanned Carrier Aviation (UCA)*

Funding: Increase in FY2019 funding in the net amount of $233.9M provides required profile to meet Chief of Naval Operations (CNO) priority and Joint Requirements Oversight Council (JROC) validated IOC threshold date of FY2026 (contract award plus 8 years).

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*				Project (Number/Name) 3278 / *MQ-25 Development*			
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
3278: *MQ-25 Development*	0.000	75.863	222.208	683.915	-	683.915	679.707	688.659	678.342	550.469	Continuing	Continuing
Quantity of RDT&E Articles		-	-	2	-	2	2	-	-	-		

Project MDAP/MAIS Code: P462

A. Mission Description and Budget Item Justification

The MQ-25 program rapidly develops an unmanned capability to embark on CVNs as part of the Carrier Air Wing (CVW) to conduct aerial refueling as a primary mission and provide Intelligence, Surveillance, Reconnaissance (ISR) capability as 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 for its primary missions. As the first carrier-based, group 5 Unmanned Aircraft System (UAS), MQ-25 will pioneer the integration of manned and unmanned operations, demonstrate mature complex sea-based Command, Control, Communications, Computers, and Intelligence (C4I) UAS technologies, and pave the way for future multifaceted multi-mission UAS to pace emerging threats.

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 Jun 11 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 to support the CSG. The JROC validated the Capability Development Document (CDD) for MQ-25 Carrier Based Unmanned Air System (CBUAS) on 21 July 2017. MQ-25 is expected to provide an Initial Operational Capability to the fleet in 2026.

MQ-25 will be designed to conduct aerial refueling and ISR missions. MQ-25 will have the ability to refuel all carrier based fixed wing aircraft capable of aerial refueling and to pass sensor data to other aircraft, naval vessels, and ground forces. Sensor data will be transmitted at appropriate classification levels, to exploitation nodes afloat and ashore (e.g. Distributed Common Ground System - Navy). The MQ-25 system will be sustainable onboard an aircraft carrier, as well as ashore, and will be designed to minimize the logistics footprint of the current CVW.

MQ-25 will achieve these capabilities through the use of a carrier-suitable, semi-autonomous, Unmanned Air Segment; a Control System and Connectivity Segment; and a Carrier Segment. The Government will perform Lead Systems Integration (LSI), providing government-led system of systems integration for the MQ-25 Program. The LSI will coordinate across all segments and with external stakeholders to ensure program activities are synchronized. MQ-25 will interface with existing ship and land-based command and control systems, including ISR Tasking, Collection, Processing, Exploitation, and Dissemination systems.

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 accomplish these capabilities MQ-25 will transition (as

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3278 / *MQ-25 Development*

required) 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)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Air Segment Product Development	0.000	89.314	615.031	0.000	615.031
Articles:	-	-	-	-	-
Description: 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. A prime contractor (selected following a limited source competition) will deliver the Air System products. ***FY 2018 Plans:*** Complete MQ-25 source selection activities, conduct acquisition Milestone, and award Air System contract. Begin Air System contract activities. Continue Air Segment system integration and interface development activities. ***FY 2019 Base Plans:*** Continue Air System Engineering and Manufacturing Development contract activities. Continue Air Segment system integration and interface development activities. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Air Segment (AS) Primary Hardware and System Engineering increase from FY18 to FY19 due to a full year of execution for the FPIF Engineering & Manufacturing Development (EMD) contract and associated time critical materials for the development of the first two Air Vehicle Engineering Demonstration Models (EDMs) to meet first flight in FY2021.					
Title: Control System & Connectivity (CS&C) Segment Product Development	29.353	42.626	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: CS&C Segment Product Development is a Government-led effort which includes, but is not limited to, the hardware, software, and networks needed to establish interfaces and upgrades to existing ship and land-based command and control systems.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3278 / *MQ-25 Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: Perform Control System & Connectivity hardware/software development, integration and testing. Continue development and fabrication of Common Processing System/Common Display System-based control stations and hardware/software solutions required to enable data exchanges with shipboard and shore-based networks. Continue development and hardware hosting of open architecture mission systems software applications and integration with air vehicle command and control software. Continue integration among airborne, shipboard and terrestrial Automated Digital Network System hardware/software nodes. Continue integration and testing among control stations with shipboard and shore-based networks and data links. Conduct control station requirements verification/validation activities in Government integration lab facilities in order to meet program timelines required to support system-of-systems integration and flight test. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** MD-5 operational control stations and MQ-25 related carrier modification for hulls 4-5 removed and will be procured out of OPN LI 4269 (UMCS-Unmanned Carrier Aviation(UCA)Mission Control Station)					
Title: Carrier (CVN) Segment Product Development	17.612	31.139	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: CVN Segment Product Development is a Government-led effort which includes, but is not limited to, upgrades to existing CVN infrastructure to support accelerated delivery MQ-25 capabilities, unique modifications to the Joint Precision Approach Landing System (JPALS) and beyond the existing Program of Record (PoR), modifications to Aircraft Launch and Recovery Equipment (ALRE) to support specific MQ-25 capabilities, and integration with C4I systems. ***FY 2018 Plans:*** Begin developing software to support communication system integration with the MQ-25. Perform ship installations and upgrades to existing CVN infrastructure, especially critical CVN suitable technologies and mission essential equipment. Continue engineering efforts to develop and implement Ship Change Documents (SCDs), Ship Installation Drawings (SIDs), and Engineering Change Proposals (ECPs), and begin modifying					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3278 / *MQ-25 Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
CVNs for MQ-25 hardware and software during inflexible pier-side maintenance availability periods. Continue CVN ship integration activities and development/refinement of Concepts of Employment (CONEMPs) in accordance with NAVSEA, SPAWAR, PEO (CARRIERS), CNAF, and OPNAV processes. Continue to design and develop specific modifications to existing Program of Record (PoR) shipboard systems (i.e. Landing Systems, Information Distribution Systems and Aircraft Launch and Recovery Systems) needed to support the MQ-25 capability to include required hardware and software for shipboard test and integration activities. Continue development of Navy Modernization Program (NMP) supporting shipboard Configuration Management and Logistics. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding moved to UMCS (Unmanned Carrier Aviation (UCA) Mission Control System) Project Unit 3279					
Title: Lead Systems Integration (LSI) Product Development	14.498	32.991	38.664	0.000	38.664
Articles:	-	-	-	-	-
Description: Lead Systems Integration (LSI) tasks are 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. ***FY 2018 Plans:*** Complete MQ-25 concept refinement and Air System contract source selection activities. Continue Air Segment, Control System & Connectivity Segment, and Carrier Segment development, design, integration, interface and architecture refinement and modification activities. Continue fabrication and operation of system integration laboratories and test facilities in support of government-led development and test program activities, including implementation of open system architectures. ***FY 2019 Base Plans:*** Continue Air Segment, Control System & Connectivity Segment, and Carrier Integration Segment development, design, integration, interface, cyber security risk management framework, architecture refinement and					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3278 / *MQ-25 Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
modification activities. Continue fabrication and operation of the Systems Test and Integration Lab (STIL) and test facilities in support of government-led development and test program activities, including implementation of open system architectures. Connect to air system contractor system integration laboratories and begin combined contractor and government integration activities. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** LSI Funding increase from FY18 to FY19 due to increased integration and test activities associated with incorporating Air Vehicle design into MQ-25 system of systems architecture. Connect to air system contractor system integration laboratories and begin combined contractor and government integration activities.					
Title: Management	6.250	6.495	6.538	0.000	6.538
Articles:	-	-	-	-	-
Description: Efforts include program, engineering, test, and logistics management. ***FY 2018 Plans:*** Perform oversight, coordination, and management of MQ-25 acquisition, system interface and integration activities. Oversee contract activities, including source selection for the Air System contract. Conduct logistics management tasks. Maintain security and program office environments. ***FY 2019 Base Plans:*** Perform oversight, coordination, and management of MQ-25 acquisition, system interface and integration activities. Oversee contract activities, including execution of the Air System Engineering, Manufacturing and Development (EMD) contract. Conduct logistics management tasks. Maintain security and program office environments. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding increase from FY18 to FY19 due to increased development, integration and test activities associated with incorporating Air Vehicle design into MQ-25 system of systems architecture.					
Title: Test and Evaluation	5.606	14.092	21.563	0.000	21.563
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3278 / *MQ-25 Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: Continue to support development and implementation of test facilities, range, and lab test requirements. Support updates to the Test and Evaluation Master Plan (TEMP) development, support engineering events, and program management activities. Support developmental test for Control System & Connectivity and Carrier segments. Support Air Segment source selection activities. Support the accelerated stand-up of the Government Systems test & Integration Lab (STIL) in support of the FY2018 EMD contract award. ***FY 2019 Base Plans:*** Continue to support development and implementation of test facilities, range, and lab test requirements. Support updates to the Test and Evaluation Master Plan (TEMP), support engineering events, and program management activities. Support surrogate test activities for landing systems demonstrations. Support activities in Modeling and Simulation development to include validation and verification. Continue support of the Government Systems Test & Integration Lab (STIL) and continue stand up of the integrated test facilities in support of the Engineering & Manufacturing Development (EMD) contract, to include test facility installation, integration, and accreditation activities. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Test and Evaluation funding increase from FY18 to FY19 supports the procurement and outfitting of support equipment associated with the integrated test facilities.					
Title: Support	2.544	5.551	2.119	0.000	2.119
Articles:	-	-	-	-	-
Description: Efforts include studies, analyses, and training development support. ***FY 2018 Plans:*** Continue logistics supportability studies and analyses, modeling and simulation, and support of Manned Flight Simulation efforts. Increase development efforts of training tools for the Fleet, and development of manpower and training assessments, to support EMD contract award and timeline. ***FY 2019 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3278 / *MQ-25 Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue logistics supportability studies and analyses, modeling and simulation efforts. Continue development efforts of training tools for the Fleet, and development of manpower and training assessments, to support EMD contract award and timeline. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding is higher in FY18 then FY19 for the procurement of hardware to start the development of the prototype Mission System Trainer.					
Accomplishments/Planned Programs Subtotals	75.863	222.208	683.915	0.000	683.915

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 1205/0816376N: *UCLASS T&E Facility*	40.576	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	40.576
• 4269/0204112N: *UMCS-UNMAN CARRIER AVIATION (UCA) MISSION CNTRL STN*	0.000	0.000	42.009	-	42.009	44.708	58.159	67.817	111.462	Continuing	Continuing

Remarks

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) IC 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).

The MQ-25 system will enhance carrier (CVN) capability and versatility for the Joint Forces Commander through the integration of a persistent, sea-based, multi-mission aerial refueling and reconnaissance Unmanned Aircraft System (UAS) into the Carrier Air Wing (CVW). MQ-25 is comprised of three major architectural segments: an Air Segment (AS), a Control System & Connectivity (CS&C) Segment, and a CVN Segment. These 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.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3278 / *MQ-25 Development*

MQ-25 will use an evolutionary acquisition strategy to develop, fly, deploy, and evolve an Initial Operational Capability system for fleet integration. This MQ-25 acquisition strategy will support the development of the MQ-25 AS, supporting control and connectivity systems, and CVN modifications required for entry into Engineering & Manufacturing Development (EMD) in 2018 with an objective IOC of 2024 and a threshold IOC of 2026.

MQ-25 will pursue a fixed price incentive, firm target (FPIF) contract for the AS EMD contract.

E. Performance Metrics

Meet Navy operational requirements as defined in requirements documents.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3278 / *MQ-25 Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Air Segment - Primary Hardware Development	C/FPIF	TBD : TBD	0.000	0.000		80.483	Aug 2018	598.780	Oct 2018	-		598.780	Continuing	Continuing	Continuing
Air Segment - Systems Engineering	WR	NAWCAD : Patuxent River, MD	0.000	0.000		8.264	Nov 2017	15.673	Nov 2018	-		15.673	Continuing	Continuing	Continuing
Air Segment - Systems Engineering	WR	NAWCWD : China Lake, CA	0.000	0.000		0.324	Nov 2017	0.330	Nov 2018	-		0.330	Continuing	Continuing	Continuing
Air Segment - Systems Engineering	Various	Various : Various	0.000	0.000		0.243	Mar 2018	0.248	Mar 2019	-		0.248	Continuing	Continuing	Continuing
CS&C Segment	WR	NAWCAD : Patuxent River, MD	0.000	14.605	Nov 2016	7.409	Nov 2017	0.000		-		0.000	0.000	22.014	-
CS&C Segment	Various	Various : Various	0.000	4.696	Dec 2016	2.994	Dec 2017	0.000		-		0.000	0.000	7.690	-
CS&C Segment	Various	NSMA : Arlington, VA	0.000	0.655	Dec 2016	1.347	Dec 2017	0.000		-		0.000	0.000	2.002	-
CS&C Segment	WR	SPAWAR : San Diego, CA	0.000	6.180	Dec 2016	4.969	Dec 2017	0.000		-		0.000	0.000	11.149	-
CS&C Segment (Comms, Intel, Network)	Various	Various : Various	0.000	2.459	Dec 2016	6.070	Dec 2017	0.000		-		0.000	0.000	8.529	-
CS&C Segment (CPS/ CDS)	Various	Various : Various	0.000	1.200	Nov 2016	19.837	Mar 2018	0.000		-		0.000	0.000	21.037	-
Carrier Segment (Ship Integration)	Various	Various : Various	0.000	0.319	Dec 2016	0.580	Dec 2017	0.000		-		0.000	0.000	0.899	-
Carrier Segment (Ship Integration)	WR	NAWCAD : Patuxent River, MD	0.000	14.685	Dec 2016	24.686	Dec 2017	0.000		-		0.000	0.000	39.371	-
Carrier Segment (Ship Integration)	WR	NAWCAD : Lakehurst, NJ	0.000	1.386	Dec 2016	1.178	Dec 2017	0.000		-		0.000	0.000	2.564	-
Carrier Segment	SS/FFP	Rockwell Collins : Cedar Rapids, IA	0.000	0.000		2.882	Feb 2018	0.000		-		0.000	0.000	2.882	-
Carrier Segment	WR	SPAWAR : San Diego, CA	0.000	2.144	Dec 2016	1.813	Dec 2017	0.000		-		0.000	0.000	3.957	-
LSI - Advanced Development (Primary Hardware Development)	Various	NSMA : Arlington, VA	0.000	0.151	Dec 2016	0.183	Dec 2017	0.000		-		0.000	0.000	0.334	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3278 / *MQ-25 Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LSI - Advanced Development (Primary Hardware Development)	WR	NAWCAD : Patuxent River, MD	0.000	0.509	Dec 2016	0.189	Dec 2017	0.000		-		0.000	0.000	0.698	-
LSI - Advanced Development (Primary Hardware Development)	WR	NAWCWD : China Lake, CA	0.000	0.240	Nov 2016	0.000		0.000		-		0.000	0.000	0.240	-
LSI - Systems Engineering	Various	Various : Various	0.000	2.888	Dec 2016	2.046	Dec 2017	3.918	Dec 2018	-		3.918	Continuing	Continuing	Continuing
LSI - Systems Engineering	WR	NAWCAD : Patuxent River, MD	0.000	9.301	Dec 2016	28.038	Dec 2017	32.106	Dec 2018	-		32.106	Continuing	Continuing	Continuing
LSI - Systems Engineering	Various	SPAWAR : San Diego, CA	0.000	1.576	Nov 2016	2.535	Nov 2017	2.640	Nov 2018	-		2.640	Continuing	Continuing	Continuing
		Subtotal	0.000	62.994		196.070		653.695		-		653.695	Continuing	Continuing	N/A

Remarks

Control System and Connectivity (CS&C)
Navy Systems Management Activity (NSMA)
Common Display System (CDS)
Common Processing System (CPS)
Lead Systems Integration (LSI)
Engineering and Manufacturing Development (EMD)

Air Segment (AS) Primary Hardware and System Engineering increase from FY18 to FY19 due to a full year of execution for the FPIF Engineering & Manufacturing Development (EMD) contract and associated time critical materials for the development of the first two Air Vehicle Engineering Demonstration Models (EDMs) to meet first flight in FY2021. FPIF "Target Value of Contract" will be updated once base contract has been awarded AUG 2018.

Carrier Segment - Funding moved to UMCS (Unmanned Carrier Aviation (UCA) Mission Control System) Project Unit 3279.

LSI Funding increase from FY18 to FY19 due to increased integration and test activities associated with incorporating Air Vehicle design into MQ-25 system of systems architecture. Connect to air system contractor system integration laboratories and begin combined contractor and government integration activities.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3278 / *MQ-25 Development*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Manpower Studies & Analyses	Various	Various : Various	0.000	0.106	Jan 2017	0.113	Nov 2017	0.115	Nov 2018	-		0.115	Continuing	Continuing	Continuing
Training Development	Various	Various : Various	0.000	1.197	Dec 2016	5.438	Dec 2017	2.004	Dec 2018	-		2.004	Continuing	Continuing	Continuing
		Subtotal	0.000	1.303		5.551		2.119		-		2.119	Continuing	Continuing	N/A

Remarks

Support funding is higher in FY18 then FY19 for the procurement of hardware to start the development of the prototype Mission System Trainer.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	WR	NAWCAD : Patuxent River, MD	0.000	6.858	Dec 2016	14.079	Dec 2017	21.550	Dec 2018	-		21.550	Continuing	Continuing	Continuing
Test and Evaluation	Various	Various : Various	0.000	0.012	Jan 2017	0.013	Jan 2018	0.013	Jan 2019	-		0.013	Continuing	Continuing	Continuing
		Subtotal	0.000	6.870		14.092		21.563		-		21.563	Continuing	Continuing	N/A

Remarks

Test and Evaluation funding increase from FY18 to FY19 supports the procurement and outfitting of support equipment associated with the integrated test facilities.

Management Services ($ in Millions)

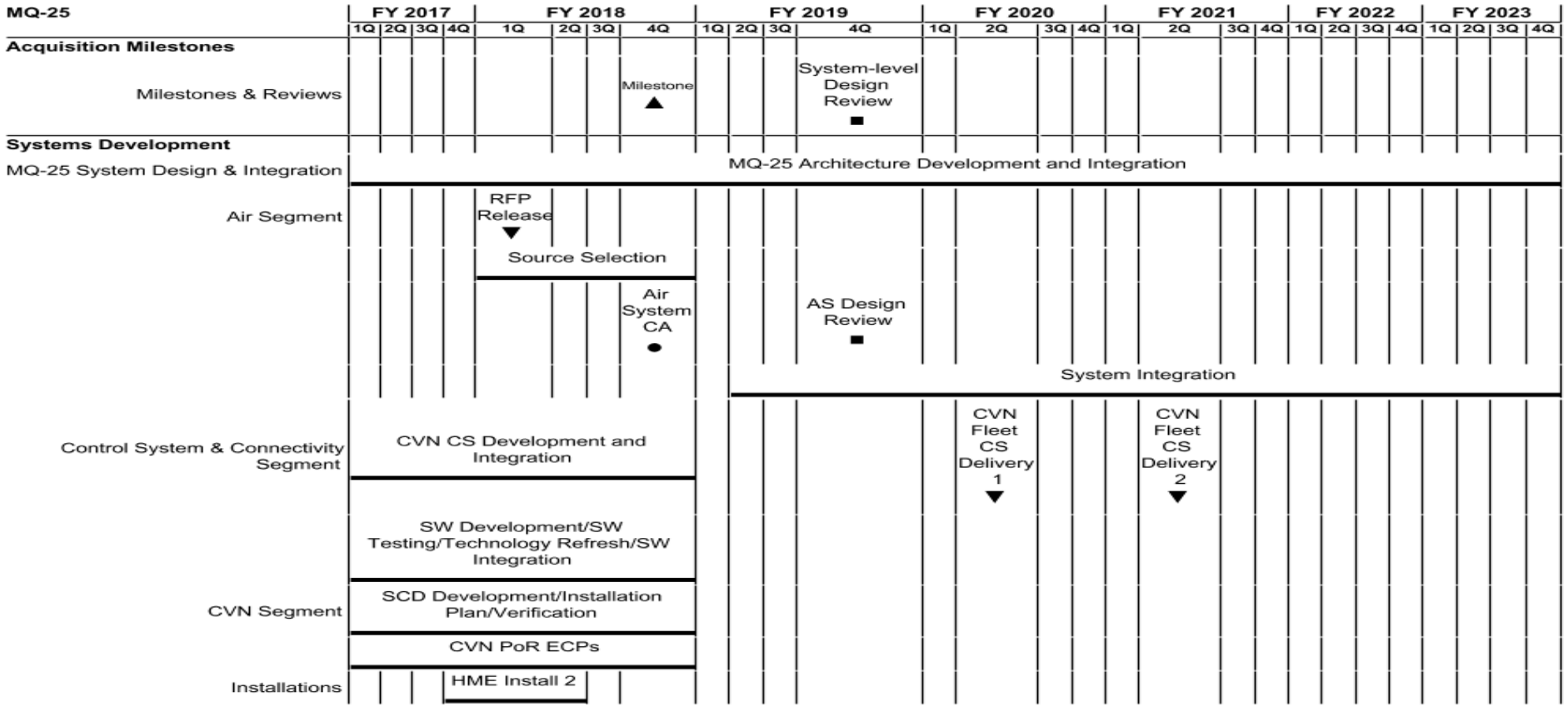
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management	Various	Various : Various	0.000	1.100	Dec 2016	1.769	Dec 2017	1.804	Dec 2018	-		1.804	Continuing	Continuing	Continuing
Management	WR	NAWCAD : Patuxent River, MD	0.000	3.542	Nov 2016	4.596	Nov 2017	4.601	Nov 2018	-		4.601	Continuing	Continuing	Continuing
Management	Various	NAVAIR : Patuxent River, MD	0.000	0.054	Oct 2016	0.130	Oct 2017	0.133	Oct 2018	-		0.133	Continuing	Continuing	Continuing
		Subtotal	0.000	4.696		6.495		6.538		-		6.538	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	Project (Number/Name) 3278 / *MQ-25 Development*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	75.863		222.208		683.915		-		683.915	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3278 / *MQ-25 Development*



2019PB - 0605414N - 3278

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3278 / *MQ-25 Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MQ-25				
Acquisition Milestones: Milestones & Reviews: Milestone	4	2018	4	2018
Acquisition Milestones: Milestones & Reviews: System-level Design Review	4	2019	4	2019
Systems Development: MQ-25 System Design & Integration: MQ-25 Architecture Development and Integration	1	2017	4	2023
Systems Development: Air Segment: RFP Release for Air System Contract Award	1	2018	1	2018
Systems Development: Air Segment: Source Selection Activities	1	2018	4	2018
Systems Development: Air Segment: Air System Contract Award	4	2018	4	2018
Systems Development: Air Segment: Air System Design Review	4	2019	4	2019
Systems Development: Air Segment: System Integration	2	2019	4	2023
Systems Development: Control System & Connectivity Segment: Carrier Vessel Nuclear (CVN) Control Station (CS) Development and Integration	1	2017	4	2018
Systems Development: Control System & Connectivity Segment: CVN Fleet CS Delivery 1	2	2020	2	2020
Systems Development: Control System & Connectivity Segment: CVN Fleet CS Delivery 2	2	2021	2	2021
Systems Development: Control System & Connectivity Segment: Software (SW) Development/SW Testing/Technology Refresh/SW Integration	1	2017	4	2018
Systems Development: CVN Segment: Ship Change Document (SCD) Development/ Installation Plan/Verification	1	2017	4	2018
Systems Development: CVN Segment: CVN Program of Record (PoR) Engineering Change Proposals (ECP)	1	2017	4	2018
Systems Development: Installations: Hull, Mechanical & Electrical (HME) Install 2	4	2017	2	2018

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	Project (Number/Name) 3279 / *UMCS*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3279: *UMCS*	0.000	0.000	0.000	35.027	-	35.027	26.265	1.709	1.755	0.000	0.000	64.756
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

The President's Budget FY19 created PU 3279 to help separate the funding between the MDAP P462 (MQ-25 Development) and the newly established ACAT III Unmanned Carrier Aviation (UCA) Mission Control System (UMCS). UMCS is comprised of the Control System & Connectivity (CS&C) and Carrier Vessel, Nuclear (CVN) Segments previously captured under the MQ-25 Development PU 3278. This change provides additional clarity into the CVN installations on the MQ-25 test ships.

A. Mission Description and Budget Item Justification

The Unmanned Carrier Aviation (UCA) Mission Control System (UMCS) program consists of the MQ-25 control station, designated the MD-5, and modifications to the Command, Control, Communications, Computers, and Intelligence (C4I) systems and Carrier Vessel, Nuclear (CVN) infrastructure required for MQ-25 vehicle and mission control.

The Control Station & Connectivity (CS&C) segment is responsible for the lifecycle of the MD-5 and integration with C4I systems and infrastructure.

The CVN segment is responsible for the installation and modification to the CVN infrastructure to support MQ-25 operations. Hardware modifications include configuration of the Unmanned Aviation Warfare Center (UAWC) which houses the MD-5 components, a Video Management System (VMS) and an Unmanned Aircraft System (UAS) Mission Commander (UMC) station, and procurement and installation of an ARC-210 Radio Control System required for MQ-25 command and control (C2). Software modifications required for MQ-25 include changes to the Joint Precision Approach Landing System (JPALS) and the Aircraft Launch and Recovery Equipment (ALRE) systems.

CVN installations are regulated by NAVSEASYSCOM processes/guidelines which identify strict deadlines for documentation, drawings, and material availability due dates to support carrier modifications and due to the extent of the hardware modification, by the CVN availability schedule which identifies significant maintenance periods (revised at least twice per year) which could, in turn, drive changes to the CVN segment installation schedule.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Unmanned Carrier Aviation (UCA) Mission Control System	0.000	0.000	35.027	0.000	35.027
Articles:	-	-	-	-	-
Description: CVN Segment Product Development is a Government-led effort which includes, but is not limited to, upgrades to existing CVN infrastructure to support accelerated delivery of MQ-25 capabilities, unique					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3279 / *UMCS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
modifications to the Joint Precision Approach Landing System (JPALS) and the Aircraft Launch and Recovery Equipment (ALRE) to support specific MQ-25 capabilities, and integration with C4I systems. ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** Complete the software development modification of one (1) transmit waveform for MQ-25 line of sight (LOS) communications and enable the internet protocol (IP) port for both variants of the Generation 5 (Gen 5) ARC-210 radio. Begin development to enable the IP port on the Gen 6 ARC-210 radio. Perform system integration and laboratory testing on the ARC-210 radios. Complete the development of two engineering change proposals (ECPs) with Joint Precision Approach Landing System (JPALS). Complete hardware procurements, finish Ship Installation Drawings (SIDs), prepare and stage material, and begin the installation of four Ship Change Documents (SCDs) on one (1) CVN. Conduct environmental, shock, and vibration testing on the Video Management System and perform antenna location and frequency analysis for two (2) CVNs. Begin developing the interface requirements and associated documentation required to support the Equipment SCD and start developing the Equipment SIDs in support of a late FY20 installation. Update all SCD packages based on installation redlines, technology refresh, obsolescence, and engineering changes. Continue development efforts on Aircraft Launch and Recovery Equipment (ALRE) systems which will interface with JPALS to issue commands to the MQ-25A, and display status messages to the Landing Signal Officer (LSO) in order to recover the MQ-25A. These systems will be required for installation on the two (2) test ships in FY21 and FY22. Continue engineering efforts to develop and implement SCDs, SIDs, and ECPs. Continue CVN and Carrier Air Wing (CVW) integration activities and development/refinement of Concepts of Employment (CONEMPs) in accordance with NAVSEA, SPAWAR, PEO (CARRIERS), CNAF, and OPNAV processes. Continue development of Navy Modernization Program (NMP) supporting shipboard Configuration Management and Logistics. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Previously funded from Project 3278 - Carrier (CVN) Segment Product Development and Control System & Connectivity (CS&C) Segment Product Development.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	35.027	0.000	35.027

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3279 / *UMCS*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The CS&C and CVN segments will be organically managed by the Government LSI and will modify existing systems via the affected system's Engineering Change Proposal and configuration management processes. These integration tasks include successful demonstration of integration with the CVN landing system, integration of control system, and integration with the Tasking, Collecting, Processing, Exploitation, Dissemination interfaces to include successful transmission of mission system data. The Government will develop and award contracts as required to support program activities, including a contract for the Air System. The Government's acquisition strategy was approved in July 2017.

E. Performance Metrics

Meet Navy operational requirements as defined in requirements documents.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3279 / *UMCS*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UMCS (Ship Integration)	Various	Various : Various	0.000	0.000		0.000		0.592	Dec 2018	-		0.592	0.580	1.172	Continuing
UMCS (Ship Integration)	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		24.282	Dec 2018	-		24.282	17.281	41.563	Continuing
UMCS (Ship Integration)	WR	NAWCAD : Lakehurst, NJ	0.000	0.000		0.000		4.162	Dec 2018	-		4.162	3.306	7.468	Continuing
UMCS	SS/FFP	Rockwell Collins : Cedar Rapids, IA	0.000	0.000		0.000		3.792	Nov 2018	-		3.792	6.557	10.349	Continuing
UMCS	C/BA	SPAWAR : San Diego, CA	0.000	0.000		0.000		2.199	Dec 2018	-		2.199	2.005	4.204	Continuing
		Subtotal	0.000	0.000		0.000		35.027		-		35.027	29.729	64.756	N/A

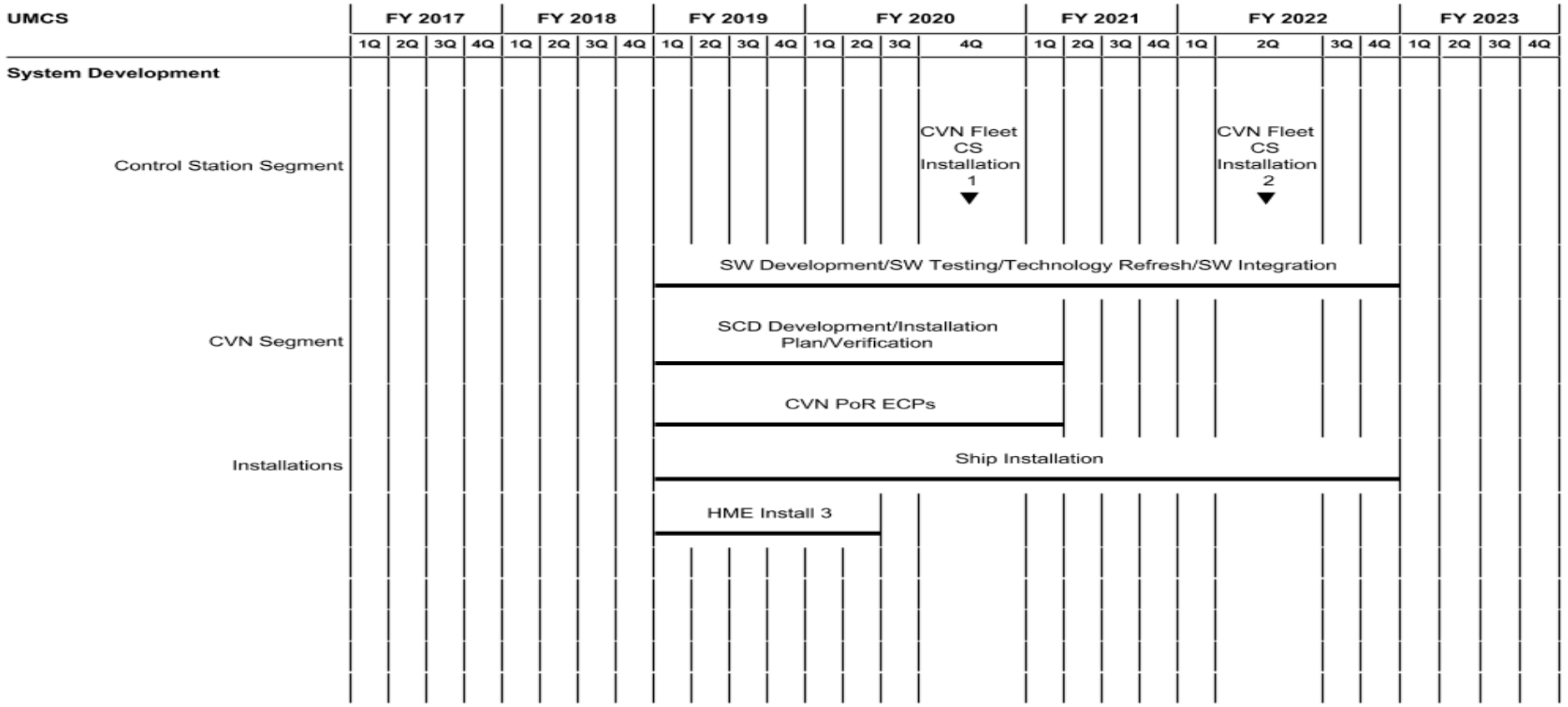
Remarks

UMCS - SS/FFP Rockwell Collins "Target Value of Contract" will be updated once base contract has been awarded in Feb 2018.

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		35.027		-		35.027	29.729	64.756	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3279 / *UMCS*



2019PB - 0605414N - 3279 CS delivery and HM&E schedules are predicated on ship availability. CVN Fleet CS Deliveries and HM&E installations updated to better align with ship availability schedules.

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3279 / *UMCS*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
UMCS				
System Development: Control Station Segment: CVN Fleet CS Installation 1	4	2020	4	2020
System Development: Control Station Segment: CVN Fleet CS Installation 2	2	2022	2	2022
System Development: Control Station Segment: Software (SW) Development/SW Testing/Technology Refresh/SW Integration	1	2019	4	2022
System Development: CVN Segment: Ship Change Document (SCD) Development/ Installation Plan/Verification	1	2019	1	2021
System Development: CVN Segment: CVN Program of Record (PoR) Engineering Change Proposals (ECP)	1	2019	1	2021
System Development: Installations: Ship Installation	1	2019	4	2022
System Development: Installations: Hull, Mechanical & Electrical (HME) Install 3	1	2019	2	2020