Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy											Date: March 2019	
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 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	75.863	194.176	518.942	671.258	-	671.258	277.674	233.761	219.331	136.568	Continuing	Continuing
3278: *MQ-25 Development*	75.863	194.176	483.915	598.968	-	598.968	218.981	191.099	189.966	119.885	Continuing	Continuing
3279: *UMCS*	0.000	0.000	35.027	72.290	-	72.290	58.693	42.662	29.365	16.683	Continuing	Continuing
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** P462												

Note

The prime contractor has declared a Loss Contract and thereby invoked Federal Acquisition Regulation clause 32.503-6. Per the 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 and will prevent the program from meeting expenditure benchmarks in the near years.

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).

A. Mission Description and Budget Item Justification

The MQ-25 program 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, 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 CVW. The JROC validated the Capability Development Document for MQ-25 Carrier Based Unmanned Air System on 21 July 2017. After contract award in 2018, an opportunity to accelerate Initial Operational Capability (IOC) to 2024 was recognized, and the Navy decided to make the investments required to capture that opportunity by increasing the number of test carrier installs to four and funding System Demonstration Test Article (SDTA) production to start in FY20.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy	Date: March 2019
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 Unmanned Carrier Aviation (UCA) Mission Control System (UMCS) program consists of the MQ-25 control station, designated the MD-5, and modifications to the C4I systems and CVN infrastructure required for MQ-25 vehicle and mission control.

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 full-rate production decision.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	222.208	718.942	705.972	-	705.972
Current President's Budget	194.176	518.942	671.258	-	671.258
Total Adjustments	-28.032	-200.000	-34.714	-	-34.714
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-200.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.311	0.000			
• SBIR/STTR Transfer	-4.731	0.000			
• Program Adjustments	0.000	0.000	-31.495	-	-31.495
• Rate/Misc Adjustments	0.000	0.000	-3.219	-	-3.219
• Congressional Directed Reductions Adjustments	-22.990	-	-	-	-

Change Summary Explanation

The FY 2020 funding request was reduced by $26.320 million to account for the availability of prior year execution balances.

The FY 2020 funding request was reduced due to MQ-25 contract savings.

Technical: Increase in test carriers from two to four in order to ensure sufficient underway testing to achieve the accelerated Initial Operational Capability (IOC) for the MQ-25 in FY24.

Schedule: IOC accelerated to 2024.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy											Date: March 2019	
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 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
3278: *MQ-25 Development*	75.863	194.176	483.915	598.968	-	598.968	218.981	191.099	189.966	119.885	Continuing	Continuing
Quantity of RDT&E Articles		-	4	3	-	3	-	-	-	-		
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. After contract award in 2018, an opportunity to accelerate Initial Operational Capability (IOC) to 2024 was recognized, and the Navy decided to make the investments required to capture that opportunity by increasing the number of test carrier installs to four and funding System Demonstration Test Article (SDTA) production to start in FY20.

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 and the UCA Mission Control System (UMCS) that provides CVN infrastructure modifications and hardware to support MQ-25 operations aboard all NIMITZ class carriers (except CVN 68), all delivered and planned FORD class carriers, and operational shore sites. The Government will perform Lead Systems Integration (LSI), providing government-led system of systems integration for the MQ-25 Program. The program 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.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
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*

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 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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Air Segment Product Development	87.882	387.251	484.728	0.000	484.728
Articles:	-	4	3	-	3
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. ***FY 2019 Plans:*** Continue to perform Air System Engineering and Manufacturing Development contract activities. Continue Air Segment system integration and interface development activities and complete System Design Review. Begin design and fabrication of Air Vehicle subsystem and begin assembly of Air Vehicles. ***FY 2020 Base Plans:*** Continue to perform Air Segment system integration and interface development activities. Continue design and fabrication of Air Vehicle subsystem and begin assembly of Air Vehicles. Complete three (3) Hardware in the Loop labs and one (1) Ironbird to stand up government and contractor System Integration Labs. Complete software qualifications, begin contractor testing, conduct Test Readiness Review, and complete test preparations for first flight in FY21. Exercise option for System Demonstration Test Articles (SDTA). Continue EMD Studies and Analysis. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase in FY 2020 due to procuring SDTA aircraft, conducting engineering analysis to support System Design Review, and initiating assembly of four Engineering Development Models (EDM) vehicles.					
Title: Control System & Connectivity (CS&C) Segment Product Development	29.116	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
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. For FY19 and beyond, this effort is captured under PU 3279. ***FY 2019 Plans:*** N/A ***FY 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:*** N/A					
Title: Carrier (CVN) Segment Product Development ***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) 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. For FY19 and beyond, this effort is captured under PU 3279. ***FY 2019 Plans:*** N/A ***FY 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:*** N/A	24.348 -	0.000 -	0.000 -	0.000 -	0.000 -
Title: Lead Systems Integration (LSI) Product Development ***Articles:*** ***Description:*** 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,	29.692 -	48.264 -	54.648 -	0.000 -	54.648 -

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
science and technology investments, roadmap refinement, and coordination of all MQ-25 capabilities across system segments and stakeholders. ***FY 2019 Plans:*** Continue to perform Air Segment and UCA Mission Control System (UMCS) development, design, integration, interface, cyber security risk management framework, architecture refinement and 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. Conduct and support flight test activities at contractor facilities. Conduct and support laboratory tests in support of EMD aircraft systems. ***FY 2020 Base Plans:*** Continue to perform Air Segment and UMCS development, design, and integration. Continue Cyber Security efforts to achieve Authority to Operate (ATO) certifications for the System Test Integration Lab (STIL), the Lab Revitalization Program (LRP), and test facilities. Continue operation of the STIL in support of government led hardware & software development and test activities. Procure LRP infrastructure communications and telemetry hardware to support test activities. Continue government and contractor STIL integration activities in support of software verification and validation. Conduct and support flight test activities at contractor facilities. Conduct and support laboratory tests in support of EMD aircraft systems. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** LSI Funding increase from FY19 to FY20 due to increased integration and test activities associated with incorporating Air Vehicle design into MQ-25 system of systems architecture. Additionally, the funding supports the connection to air system contractor system integration laboratories and continue combined contractor and government integration activities. FY20 funding supports the procurement of LRP infrastructure communications and telemetry hardware to support test activities.					
Title: Management	6.495	6.538	6.630	0.000	6.630
Articles:	-	-	-	-	-
Description: Efforts include program, engineering, test, and logistics management.					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY 2019 Plans: Continue 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 2020 Base Plans:*** Continue 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 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** No significant change from FY 2019 to FY 2020					
Title: Test and Evaluation	14.092	38.743	49.403	0.000	49.403
Articles:	-	-	-	-	-
Description: Provide Government Integrated testing and evaluation, Performance Based Specifications (PBS) compliance verification, support equipment evaluations/assessments, instrumentation development/support, and Integrated Test support. ***FY 2019 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 2020 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
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, procurement of support equipment and accreditation activities. Provide government engineering to support contractor testing in preparation of first flight in FY21. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Test and Evaluation funding increase from FY19 to FY20 supports the procurement and outfitting of mission and support equipment associated with the integrated test facilities and additional government engineering to support contractor testing in preparation of first flight in FY21.					
Title: Support	2.551	3.119	3.559	0.000	3.559
Articles:	-	-	-	-	-
Description: Efforts include studies, analyses, and training development support. ***FY 2019 Plans:*** Continue to perform 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 2020 Base Plans:*** Continue to perform 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 and timeline. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Increase from FY19 to FY20 due to prototype Mission System Trainer development at the Systems Integration Lab.					
Accomplishments/Planned Programs Subtotals	194.176	483.915	598.968	0.000	598.968

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 4269/0204112N: *UMCS-UNMAN CARRIER AVIATION (UCA) MISSION CNTRL STN*	0.000	18.019	32.668	-	32.668	60.431	67.000	72.948	83.329	Continuing	Continuing
• 0449/0305205N: *MQ-25*	0.000	0.000	0.000	-	0.000	0.000	53.435	725.904	680.718	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) 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).

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 an Air Segment (AS) and the UCA Mission Control System (UMCS). 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 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.

MQ-25 awarded a fixed price incentive, firm target (FPIF) contract for the AS EMD contract to Boeing in Aug 2018.

E. Performance Metrics

Meet Navy operational requirements as defined in requirements documents.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy		Date: March 2019
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 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Air Segment - Primary Hardware Development	C/FPIF	Boeing : St. Louis, MO	0.000	82.893	Aug 2018	347.000	Oct 2018	375.400	Oct 2019	-		375.400	0.000	805.293	805.300
Air Segment - Primary Hardware SDTA	C/FPIF	Boeing : St. Louis, MO	0.000	0.000		0.000		63.500	Oct 2019	-		63.500	21.200	84.700	84.700
Air Segment - Primary Hardware ESA	C/CPIF	Boeing : St. Louis, MO	0.000	0.000		20.000	Oct 2018	20.000	Oct 2019	-		20.000	40.000	80.000	80.000
Air Segment - Systems Engineering	WR	NAWCAD : Patuxent River, MD	0.000	4.422	Nov 2017	17.673	Nov 2018	23.238	Nov 2019	-		23.238	Continuing	Continuing	Continuing
Air Segment - Systems Engineering	WR	NAWCWD : China Lake, CA	0.000	0.324	Nov 2017	1.330	Nov 2018	1.337	Nov 2019	-		1.337	Continuing	Continuing	Continuing
Air Segment - Systems Engineering	Various	Various : Various	0.000	0.243	Mar 2018	1.248	Mar 2019	1.253	Nov 2019	-		1.253	Continuing	Continuing	Continuing
CS&C Segment	WR	NAWCAD : Patuxent River, MD	14.605	9.052	Jan 2018	0.000		0.000		-		0.000	0.000	23.657	-
CS&C Segment	Various	Various : Various	4.696	4.649	Dec 2017	0.000		0.000		-		0.000	0.000	9.345	-
CS&C Segment	Various	NSMA : Arlington, VA	0.655	0.388	Mar 2018	0.000		0.000		-		0.000	0.000	1.043	-
CS&C Segment	WR	SPAWAR : San Diego, CA	6.180	4.282	Dec 2017	0.000		0.000		-		0.000	0.000	10.462	-
CS&C Segment (Comms, Intel, Network)	Various	Various : Various	2.459	4.049	Jan 2018	0.000		0.000		-		0.000	0.000	6.508	-
CS&C Segment (CPS/ CDS)	Various	Various : Various	1.200	6.696	Jan 2018	0.000		0.000		-		0.000	0.000	7.896	-
Carrier Segment (Ship Integration)	Various	Various : Various	0.319	0.648	Jan 2018	0.000		0.000		-		0.000	0.000	0.967	-
Carrier Segment (Ship Integration)	WR	NAWCAD : Patuxent River, MD	14.685	17.740	Jan 2018	0.000		0.000		-		0.000	0.000	32.425	-
Carrier Segment (Ship Integration)	WR	NAWCAD : Lakehurst, NJ	1.386	2.177	Dec 2017	0.000		0.000		-		0.000	0.000	3.563	-
Carrier Segment	SS/FFP	Rockwell Collins : Cedar Rapids, IA	0.000	1.970	Feb 2018	0.000		0.000		-		0.000	0.000	1.970	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
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 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Carrier Segment	WR	SPAWAR : San Diego, CA	2.144	1.813	Dec 2017	0.000		0.000		-		0.000	0.000	3.957	-
LSI - Advanced Development (Primary Hardware Development)	Various	NSMA : Arlington, VA	0.151	0.183	Dec 2017	0.000		0.000		-		0.000	0.000	0.334	-
LSI - Advanced Development (Primary Hardware Development)	WR	NAWCAD : Patuxent River, MD	0.509	0.189	Dec 2017	0.000		0.000		-		0.000	0.000	0.698	-
LSI - Advanced Development (Primary Hardware Development)	WR	NAWCWD : China Lake, CA	0.240	0.000		0.000		0.000		-		0.000	0.000	0.240	-
LSI - Systems Engineering	Various	Various : Various	2.888	2.046	Dec 2017	5.918	Dec 2018	5.548	Nov 2019	-		5.548	Continuing	Continuing	Continuing
LSI - Systems Engineering	WR	NAWCAD : Patuxent River, MD	9.301	20.577	Dec 2017	34.666	Dec 2018	41.391	Nov 2019	-		41.391	Continuing	Continuing	Continuing
LSI - Systems Engineering	Various	SPAWAR : San Diego, CA	1.576	2.535	Nov 2017	3.640	Nov 2018	3.510	Nov 2019	-		3.510	Continuing	Continuing	Continuing
LSI - Integrated Digital Environment	SS/FFP	NAWCAD : Lakehurst, NJ	0.000	4.162	May 2018	4.040	Mar 2019	4.199	Mar 2020	-		4.199	0.000	12.401	-
		Subtotal	62.994	171.038		435.515		539.376		-		539.376	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)
Integrated Digital Environment (IDE)

Air Segment - Increase due to procuring SDTA aircraft, conducting engineering analysis to support System Design Review, and initiating assembly of four EDM vehicles.

LSI-Systems Engineering - Funding increase from FY19 to FY20 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 continue combined contractor and government integration activities. Procure LRP infrastructure communications and telemetry hardware to support test activities.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy		Date: March 2019
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 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Manpower Studies & Analyses	Various	Various : Various	0.106	0.113	Nov 2017	0.115	Nov 2018	0.156	Nov 2019	-		0.156	Continuing	Continuing	Continuing
Training Development	Various	Various : Various	1.197	2.438	Dec 2017	3.004	Dec 2018	3.403	Nov 2019	-		3.403	Continuing	Continuing	Continuing
		Subtotal	1.303	2.551		3.119		3.559		-		3.559	Continuing	Continuing	N/A

Remarks

Training Development increase from FY19 to FY20 due to prototype Mission System Trainer development at the Systems Integration Lab.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	WR	NAWCAD : Patuxent River, MD	6.858	14.079	Dec 2017	35.730	Dec 2018	46.390	Nov 2019	-		46.390	Continuing	Continuing	Continuing
Test and Evaluation	Various	Various : Various	0.012	0.013	Jan 2018	3.013	Jan 2019	3.013	Jan 2020	-		3.013	Continuing	Continuing	Continuing
		Subtotal	6.870	14.092		38.743		49.403		-		49.403	Continuing	Continuing	N/A

Remarks

Test and Evaluation funding increase from FY19 to FY20 supports the procurement and outfitting of support equipment associated with the integrated test facilities and additional government engineering to support contractor testing in preparation of first flight in FY21.

Management Services ($ in Millions)

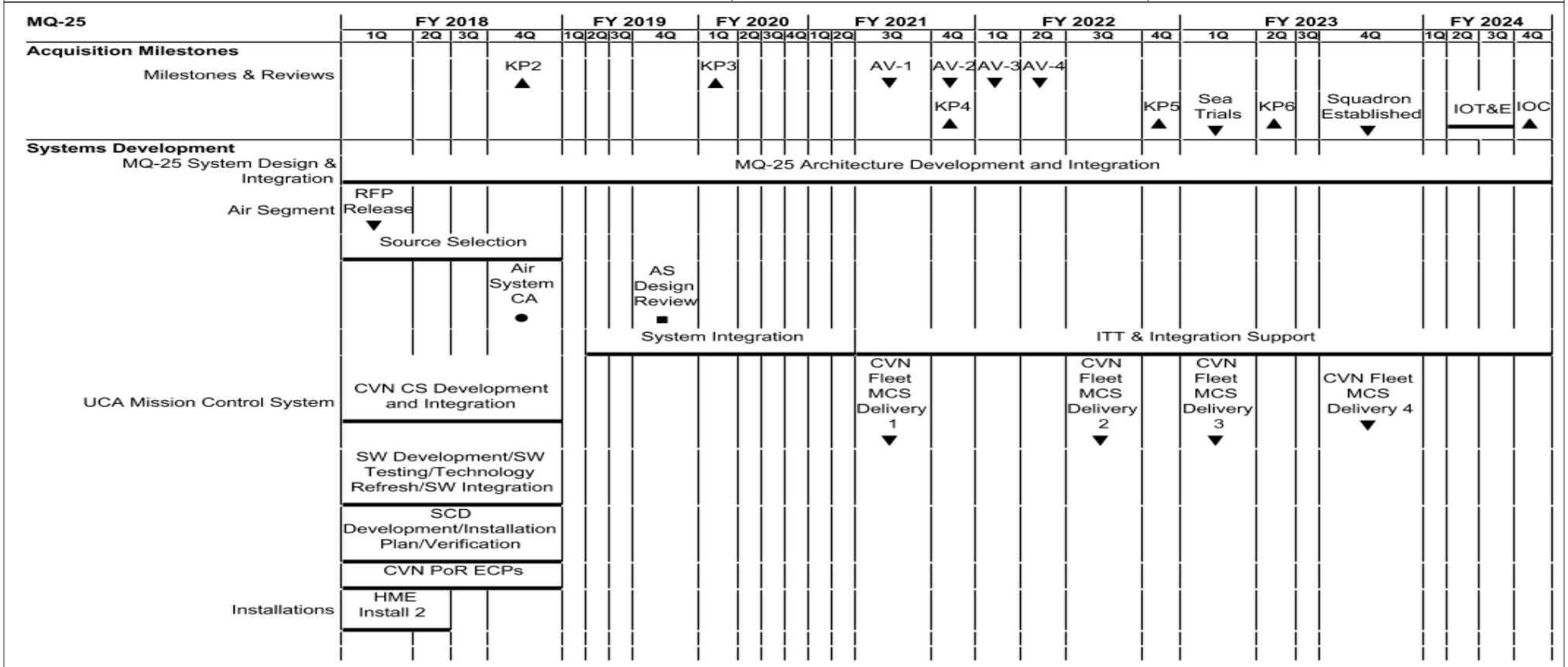
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management	Various	Various : Various	1.100	1.769	Dec 2017	1.804	Dec 2018	1.804	Nov 2019	-		1.804	Continuing	Continuing	Continuing
Management	WR	NAWCAD : Patuxent River, MD	3.542	4.596	Nov 2017	4.601	Nov 2018	4.693	Nov 2019	-		4.693	Continuing	Continuing	Continuing
Management	Various	NAVAIR : Patuxent River, MD	0.054	0.130	Oct 2017	0.133	Oct 2018	0.133	Oct 2019	-		0.133	Continuing	Continuing	Continuing
		Subtotal	4.696	6.495		6.538		6.630		-		6.630	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
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 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	75.863	194.176		483.915		598.968		-		598.968	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
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*



2020PB - 0605414N - 3278

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
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: KP2 EMD Contract Award	4	2018	4	2018
Acquisition Milestones: Milestones & Reviews: KP3 System Design Review	1	2020	1	2020
Acquisition Milestones: Milestones & Reviews: Air Vehicle Delivery 1	3	2021	3	2021
Acquisition Milestones: Milestones & Reviews: Air Vehicle Delivery 2	4	2021	4	2021
Acquisition Milestones: Milestones & Reviews: Air Vehicle Delivery 3	1	2022	1	2022
Acquisition Milestones: Milestones & Reviews: Air Vehicle Delivery 4	2	2022	2	2022
Acquisition Milestones: Milestones & Reviews: KP4 First Flight	4	2021	4	2021
Acquisition Milestones: Milestones & Reviews: KP5 Land Trap	4	2022	4	2022
Acquisition Milestones: Milestones & Reviews: Initial Sea Trials	1	2023	1	2023
Acquisition Milestones: Milestones & Reviews: KP6 LRIP CA	2	2023	2	2023
Acquisition Milestones: Milestones & Reviews: Milestone Squadron Established	4	2023	4	2023
Acquisition Milestones: Milestones & Reviews: Inital Operational Test and Evaluation	2	2024	3	2024
Acquisition Milestones: Milestones & Reviews: KP7 Initial Operational Capability	4	2024	4	2024
Systems Development: MQ-25 System Design & Integration: MQ-25 Architecture Development and Integration	1	2018	4	2024
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: Air System & Software Integration	2	2019	2	2021
Systems Development: Air Segment: ITT & Integration Support	3	2021	4	2024

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
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*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Systems Development: UCA Mission Control System: Carrier Vessel Nuclear (CVN) Mission Control Station (MCS) Development and Integration	1	2018	4	2018
Systems Development: UCA Mission Control System: CVN Fleet MCS Installation 1	3	2021	3	2021
Systems Development: UCA Mission Control System: CVN Fleet MCS Installation 2	3	2022	3	2022
Systems Development: UCA Mission Control System: CVN Fleet MCS Installation 3	1	2023	1	2023
Systems Development: UCA Mission Control System: CVN Fleet MCS Installation 4	4	2023	4	2023
Systems Development: UCA Mission Control System: Software (SW) Development/ SW Testing/Technology Refresh/SW Integration	1	2018	4	2018
Systems Development: UCA Mission Control System: Ship Change Document (SCD) Development/Installation Plan/Verification	1	2018	4	2018
Systems Development: UCA Mission Control System: CVN Program of Record (PoR) Engineering Change Proposals (ECP)	1	2018	4	2018
Systems Development: Installations: Hull, Mechanical & Electrical (HME) Install 2	1	2018	2	2018

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
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COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
3279: *UMCS*	0.000	0.000	35.027	72.290	-	72.290	58.693	42.662	29.365	16.683	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-25. The UMCS program includes what was previously identified as the Control System & Connectivity (CS&C) and Carrier Vessel, Nuclear (CVN) Segments previously captured under the MQ-25 Development PU 3278.

UMCS builds the following hardware: Mission Control Station (MCS), the Video Management System (VidMS), the ARC-210 Radio Communication System (RCS), and the Mobile User Objective System (MUOS) RCS (MRCS). The MCS has a ship and shore variant designated the MD-5A and MD-5B, respectively. The MD-5 consists of the following subsystems: Common Display System (CDS), Common Processing System (CPS), Network Processing Group (NPG), Integrated Communication System (ICS), and the Stingray Operating Software Suite (SOSS). MD-5A and B use the same common components with slight differences in the ICS, SOSS, and networking equipment. The VidMS provides MQ-25 operators the required video situational awareness of the unmanned carrier environment. The ARC-210 RCS provides narrow band Line of Sight (LOS) command and control (C2) transmissions with the MQ-25 while the MRCS provides narrow band Beyond Line of Sight (BLOS) C2 transmissions with the MQ-25 using the MUOS satellite system.

UMCS integrates with the MQ-25 air system, local networks, voice networks, C2 networks, tactical networks, intelligence systems, and launch and recovery systems.

UMCS performs CVN infrastructure modifications and installs the hardware mentioned above in support of MQ-25 operations aboard all NIMITZ class carriers (except CVN 68), all delivered and planned FORD class carriers, and the operational shore sites. All CVN installation and integration activities are planned and executed using the Ship Change Document (SCD) process. Installation and integration activities at the operational shore site are planned and executed via a method similar to the SCD process tailored to shore facilities.

CVN installations are regulated by Naval Sea Systems Command (NAVSEA) processes/guidelines that delineate strict schedules and deadlines for documentation, drawings, and hardware availability to support carrier modifications and by the CVN availability schedule (revised at least twice per year) which identifies pre-planned maintenance periods for all NIMITZ and FORD Class CVNs. Changes to the NAVSEA owned CVN availability schedule could, in turn, drive changes to the UMCS installation schedule.

The CVN modification and hardware installation process can be divided into four phases. Phase 1 is characterized by the development of technical data packages (TDPs), general and specific CVN hull number guidance documents, and the SCDs to be installed and begin approximately three years, or more, before the start of the CVN maintenance period. Phase 2 is characterized by the performance of a hull specific Ship Check, development of the SIDs for a specific CVN installation, and the purchase of the MD-5 subsystems, the VidMS, and the LOS/BLOS subsystems and begins two years before the start of the CVN maintenance period. Phase 3 is characterized by the approval of the SIDs, development of installation schedules, completion of cybersecurity/logistics documentation, and the integration and testing of

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
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the MD-5 and associated subsystems and begins approximately one year prior to the start of the CVN maintenance period. Phase 4 is characterized by the modification of the CVN infrastructure, installation of the MD-5 and associated subsystems, and completion of the system operational verification testing (SOVT) and begins as early as the beginning of the CVN maintenance period with the duration dependent the maintenance period and the number of SCDs being installed. Due to the size and complexity of UMCS modifications required to prepare the CVN, a scheduled maintenance period of at least six months is required.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Unmanned Carrier Aviation (UCA) Mission Control System	0.000	35.027	72.290	0.000	72.290
Articles:	-	-	-	-	-

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-25 capabilities, and integration with C4I systems.

FY 2019 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. Continue 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 multiple Ship Change Documents (SCDs) on two (2) CVNs. Procure the MD-5A Control Station for one (1) CVN and begin procurement of subsystems for one (1) CVN. Develop and integrate the various software components of the SOSS (Stingray Operating Software Suite) and deliver two software configurations to the MQ-25A contractor. Conduct environmental, shock, and vibration testing on the Video Management System and other Unmanned Carrier Aviation (UCA) Mission Control System (UMCS) sub-systems. Perform antenna location and frequency analysis for two (2) CVNs. Begin developing the interface requirements, drawings, and associated technical documentation required to support the creation of the Equipment and Mobile User Objective System (MUOS) SCDs in support of an FY20/21 installation. Prepare for and conduct integration testing with operationally representative communication and network systems, including C4I, to assess UMCS performance and enable CVN installation. Update all SCDs and Technical Data Packages (TDPs) based on installation redlines, technology refresh, obsolescence, and engineering changes. Conduct integration testing to assess UMCS performance with operationally representative communication and network systems. Continue development efforts on Aircraft Launch and Recovery Equipment (ALRE) systems which will interface with JPALS to

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
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 three (3) 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 2020 Base Plans: Continue MQ-25 unique ARC-210 GEN 6 software modifications and complete GEN 5 radio certification. Continue developing installation guidance documentation, Ship Change Documents (SCDs), and Ship Installation Drawings (SIDs) for the four (4) test ships. Complete the installation of multiple SCDs on one CVN while continuing installation of multiple SCDs on another CVN. Complete planning, SIDs development, and material procurement to support one CVN installation. Continue designing the Mobile User Objective System (MUOS) Radio Communication System (MRCS) and begin developing the technical data package, guidance documents, and SCD for future CVN installations. Update all SCDs and technical data based on installation redlines, technology refresh, obsolescence, and engineering changes. Procure and integrate components of the MD-5 Control Station for the labs and at least two CVNs. Continue the development and integration of UMCS software components and deliver one formal configuration to the MQ-25 contractor. Develop MQ-25 unique engineering changes to the SPAWAR C4I systems. Prepare for and conduct integration testing with operationally representative communication and network systems, including C4I, to assess UMCS performance and enable CVN installation. Continue development of two engineering change proposals (ECPs) with Joint Precision Approach Landing System (JPALS). Continue developing Aircraft Launch and Recovery Equipment (ALRE) modifications to provide Situational Awareness data for MQ-25 operators aboard the CVN and to integrate with JPALS and display MQ-25 status messages to safely recover the MQ-25. Installation of the ALRE modifications will be required on the four test ships from FY20 through FY23. 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 2020 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase in funding from FY19 to FY20 due to the increase in test carriers from two to four in order to provide sufficient at-sea testing to achieve the accelerated Initial Operational Capability (IOC) for the MQ-25 in FY24 and to continue development of the UMCS software, which includes two major builds and integration of software from the MQ-25 contractor.					
Accomplishments/Planned Programs Subtotals	0.000	35.027	72.290	0.000	72.290

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The UMCS Program will act as a 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. 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 2020 Navy		Date: March 2019
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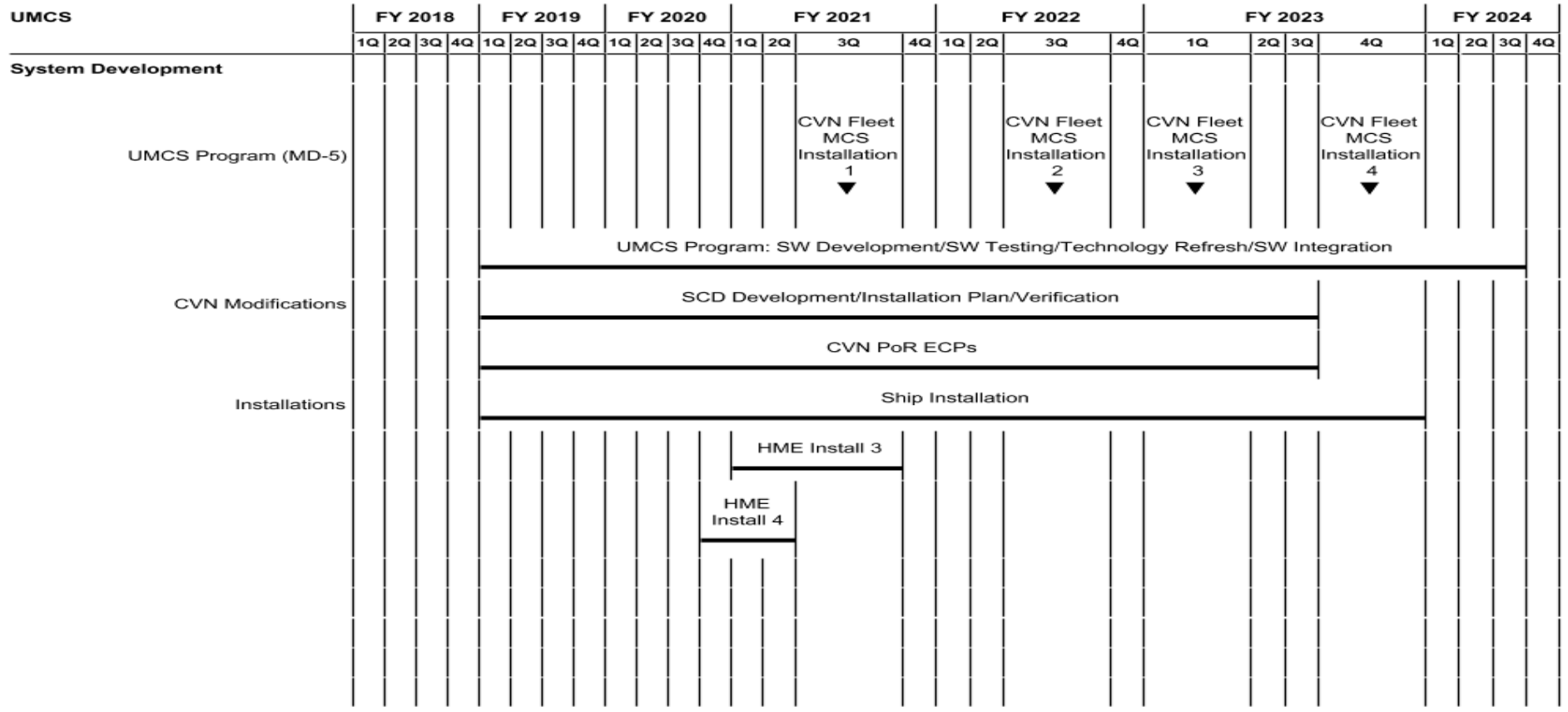
Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UMCS (Ship Integration)	Various	Various : Various	0.000	0.000		0.592	Dec 2018	24.050	Nov 2019	-		24.050	Continuing	Continuing	Continuing
UMCS (Ship Integration)	WR	NAWCAD : Patuxent River, MD	0.000	0.000		24.282	Dec 2018	40.370	Nov 2019	-		40.370	Continuing	Continuing	Continuing
UMCS (Ship Integration)	WR	NAWCAD : Lakehurst, NJ	0.000	0.000		4.162	Dec 2018	4.990	Nov 2019	-		4.990	Continuing	Continuing	Continuing
UMCS	SS/FFP	Rockwell Collins : Cedar Rapids, IA	0.000	0.000		3.792	Nov 2018	0.820	Nov 2019	-		0.820	0.000	4.612	8.725
UMCS	C/BA	SPAWAR : San Diego, CA	0.000	0.000		2.199	Dec 2018	2.060	Nov 2019	-		2.060	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		35.027		72.290		-		72.290	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		35.027		72.290		-		72.290	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3279 / *UMCS*



2020PB - 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 2020 Navy		Date: March 2019
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Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
UMCS				
System Development: UMCS Program (MD-5): CVN Fleet MCS Installation 1	3	2021	3	2021
System Development: UMCS Program (MD-5): CVN Fleet MCS Installation 2	3	2022	3	2022
System Development: UMCS Program (MD-5): CVN Fleet MCS Installation 3	1	2023	1	2023
System Development: UMCS Program (MD-5): CVN Fleet MCS Installation 4	4	2023	4	2023
System Development: UMCS Program (MD-5): UMCS Program: Software (SW) Development/SW Testing/Technology Refresh/SW Integration	1	2019	3	2024
System Development: CVN Modifications: Ship Change Document (SCD) Development/Installation Plan/Verification	1	2019	3	2023
System Development: CVN Modifications: CVN Program of Record (PoR) Engineering Change Proposals (ECP)	1	2019	3	2023
System Development: Installations: Ship Installation	1	2019	4	2023
System Development: Installations: Hull, Mechanical & Electrical (HME) Install 3	1	2021	3	2021
System Development: Installations: Hull, Mechanical & Electrical (HME) Install 4	4	2020	2	2021