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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy **Date:** February 2016

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605414N / (U) <i>Carrier Based Aerial Refueling System (CBARS)</i>
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	0.000	89.000	-	89.000	349.000	544.000	646.000	532.000	Continuing	Continuing
3278: <i>UCLASS Development</i>	0.000	0.000	0.000	89.000	-	89.000	349.000	544.000	646.000	532.000	Continuing	Continuing

Note

Elements of the Carrier Based Aerial Refueling System (CBARS) 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 CBARS.

A. Mission Description and Budget Item Justification

The Carrier Based Aerial Refueling System (CBARS) program rapidly develops an unmanned capability to embark on CVN's as part of the Carrier Air Wing (CVW) to conduct aerial refueling and provide some Intelligence, Surveillance, Reconnaissance (ISR) capability. These efforts restore fighter aircraft back to the CVW to conduct combat missions vice refueling missions. Additionally, CBARS extends CVW mission effectiveness range, partially mitigates the current Carrier Strike Group (CSG) organic ISR shortfall, fills the future CVW-tanker gap, and preserves F/A-18E/F Fatigue Life Expectancy. As the first carrier-based, group 5 Unmanned Aircraft System (UAS), CBARS will pioneer the integration of manned and unmanned operations, demonstrate mature complex sea-based C4I UAS technologies, and pave the way for more multifaceted multi-mission UAS to pace emerging threats.

The CBARS requirements are aligned with the Unmanned Carrier Launched Airborne Surveillance and Strike (UCLASS) Initial Capabilities Document (ICD) which highlights the need for a persistent, carrier-based ISR and precision strike asset. 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 JROC's guidance delineated in the validated ICD and subsequent JROCMs was to establish a requirement for a versatile platform that supports a myriad of organic Naval missions such as aerial refueling, counter-terrorism, and ISR to support the CVW. CBARS is expected to provide an Initial Operational Capability to the fleet by the mid-2020s.

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 requirement prior to full-rate production decision.

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B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	89.000	-	89.000
Total Adjustments	0.000	0.000	89.000	-	89.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Rate/Misc Adjustments	0.000	0.000	89.000	-	89.000

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy										Date: February 2016		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0605414N / (U) Carrier Based Aerial Refueling System (CBARS)				Project (Number/Name) 3278 / UCLASS Development			
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3278: UCLASS Development	0.000	0.000	0.000	89.000	-	89.000	349.000	544.000	646.000	532.000	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Carrier Based Aerial Refueling System (CBARS) program rapidly develops an unmanned capability to embark on CVN's as part of the Carrier Air Wing (CVW) to conduct aerial refueling and provide some Intelligence, Surveillance, Reconnaissance (ISR) capability. These efforts restore fighter aircraft back to the CVW to conduct combat missions vice refueling missions. Additionally, CBARS extends CVW mission effectiveness range, partially mitigates the current Carrier Strike Group (CSG) organic ISR shortfall, fills the future CVW-tanker gap, and preserves F/A-18E/F Fatigue Life Expectancy. As the first carrier-based, group 5 Unmanned Aircraft System (UAS), CBARS will pioneer the integration of manned and unmanned operations, demonstrate mature complex sea-based C4I UAS technologies, and pave the way for more multifaceted multi-mission UAS to pace emerging threats.

The CBARS requirements are aligned with the Unmanned Carrier Launched Airborne Surveillance and Strike (UCLASS) Initial Capabilities Document (ICD) which highlights the need for a persistent, carrier-based ISR and precision strike asset. 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 JROC's guidance delineated in the validated ICD and subsequent JROCMs was to establish a requirement for a versatile platform that supports a myriad of organic Naval missions such as aerial refueling, counter-terrorism, and ISR to support the CVW. CBARS is expected to provide an Initial Operational Capability to the fleet by the mid-2020s.

CBARS will be designed to conduct automated aerial refueling and will have the ability to pass command and control information along with sensor data to other aircraft, naval vessels, and ground forces. Sensor data will be transmitted, in either raw or processed forms, at appropriate classification levels, to exploitation nodes afloat and ashore (e.g. Distributed Common Ground System - Navy). The CBARS system will be sustainable onboard an aircraft carrier, as well as ashore, and will be designed to minimize increases in the logistics footprint of the current CVW.

CBARS 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 CBARS Program. The LSI will coordinate across all segments and with external stakeholders to ensure program activities are synchronized. CBARS will interface with existing ship and land-based command and control systems, including ISR&T 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 Carrier Based Aerial Refueling System (CBARS) capabilities. To accomplish these capabilities CBARS will transition (as required) technologies from other programs and adapt them into the carrier environment. CBARS 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.

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605414N / (U) Carrier Based Aerial Refueling System (CBARS)	Project (Number/Name) 3278 / UCLASS Development

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

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<p>Title: Air Segment Product Development</p> <p align="right">Articles:</p> <p>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 with future precision strike. A prime contractor (selected following a limited source competition) will deliver the Air Segment products.</p> <p>FY 2015 Accomplishments: N/A</p> <p>FY 2016 Plans: N/A</p> <p>FY 2017 Base Plans: Release final Request for Proposal for the CBARS Air System contract and begin source selection activities. Continue Air Segment system integration and interface activities.</p> <p>FY 2017 OCO Plans: N/A</p>	0.000	0.000	12.578	0.000	12.578
<p align="right">Articles:</p> <p align="center">-</p>	-	-	-	-	-
<p>Title: Control System & Connectivity (CS&C) Segment Product Development</p> <p align="right">Articles:</p> <p>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.</p> <p>FY 2015 Accomplishments: N/A</p> <p>FY 2016 Plans: N/A</p> <p>FY 2017 Base Plans:</p>	0.000	0.000	29.375	0.000	29.375
<p align="right">Articles:</p> <p align="center">-</p>	-	-	-	-	-

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Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605414N / (U) Carrier Based Aerial Refueling System (CBARS)	Project (Number/Name) 3278 / UCLASS Development			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
Perform Control System & Connectivity hardware/software development and integration. Continue development and fabrication of Common Processing System/Common Display System based control stations, to include the test-transportable control station and test-ashore control station, in order to meet timelines required to support integration and flight test. Conduct control station requirements verification/validation activities in Government integration lab. Continue integration of Automated Digital Network System hardware/software components. Continue integration testing between control station with shipboard networks and data links.					
FY 2017 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 Carrier Based Aerial Refueling System capabilities.					
FY 2015 Accomplishments: N/A					
FY 2016 Plans: N/A					
FY 2017 Base Plans: Perform ship installation activities and upgrades to existing CVN infrastructure, especially critical CVN suitable technologies and mission essential equipment. Continue engineering efforts in support of implementing Ship Change Documents (SCDs) and Engineering Change Proposals (ECPs) to modify CVNs for CBARS hardware and software. Continue CVN ship integration activities and development of Concept of Employment. Conduct development of CBARS modifications to existing Program of Record shipboard systems (i.e. landing systems and Aircraft Launch and Recovery Systems) needed to support the CBARS capability to include required hardware for shipboard test and integration activities. Continue development of Navy Modernization Program (NMP) supporting shipboard Configuration Management and Logistics.					
FY 2017 OCO Plans: N/A					
Title: Lead Systems Integration (LSI) Product Development					
	0.000	0.000	18.294	0.000	18.294
	-	-	-	-	-
	0.000	0.000	14.131	0.000	14.131

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

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<p align="right">Articles:</p> <p>Description: The LSI task is a Government-led effort including, but not limited to, advanced development, architecture development, interface definition, integration, system level test and evaluation, science and technology investments, roadmap refinement, and coordination of all Carrier Based Aerial Refueling System (CBARS) capabilities across system segments and stakeholders.</p> <p>FY 2015 Accomplishments: N/A</p> <p>FY 2016 Plans: N/A</p> <p>FY 2017 Base Plans: Conduct CBARS efforts to implement an open systems architecture across all CBARS segments. Perform enterprise design and integration activities. Continue Air Segment, Control System & Connectivity Segment, and Carrier Segment interface activities. Continue fabrication and operation of system integration laboratories and test facilities in support of government-led program activities, including implementation of open system architectures.</p> <p>FY 2017 OCO Plans: N/A</p>	-	-	-	-	-
<p>Title: Management</p> <p align="right">Articles:</p> <p>Description: Efforts include program, engineering, test, and logistics management.</p> <p>FY 2015 Accomplishments: N/A</p> <p>FY 2016 Plans: N/A</p> <p>FY 2017 Base Plans:</p>	0.000 -	0.000 -	7.905 -	0.000 -	7.905 -

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Perform oversight, coordination, and management of Carrier Based Aerial Refueling System 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 2017 OCO Plans: N/A					
Title: Test and Evaluation FY 2015 Accomplishments: N/A FY 2016 Plans: N/A FY 2017 Base Plans: Support development and implementation of test facility, range, and lab test requirements. Support engineering events and program management activities. Conduct developmental test for Control System & Connectivity and Carrier segments. Support Air Segment Request for Proposal/source selection activities. FY 2017 OCO Plans: N/A	0.000	0.000	6.717	0.000	6.717
Articles:	-	-	-	-	-
Accomplishments/Planned Programs Subtotals	0.000	0.000	89.000	0.000	89.000

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

Remarks

D. Acquisition Strategy
The Government will perform Lead Systems Integration (LSI) across all Carrier Based Aerial Refueling System (CBARS) segments, including Air Segment, Control System & Connectivity (CS&C) Segment, and Carrier (CVN) Segment and external enterprise stakeholders. The CBARS Program will leverage existing Navy information dissemination and Department infrastructures, as the government-led system of systems integration is accomplished across all segments and external enterprise stakeholders. The Government will manage the system level architecture and interfaces, and foster efficient data exchanges and integration. Specifically, 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

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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 on 7 Jun 13. Acquisition and contracting strategies comply with current statutes, regulations, and instructions.

E. Performance Metrics

Meet Navy operational requirements as defined in requirements documents.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy												Date: February 2016			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
1319 / 5				PE 0605414N / (U) Carrier Based Aerial Refueling System (CBARS)				3278 / UCLASS Development							
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Air Segment - Systems Engineering	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		10.724	Nov 2016	-		10.724	Continuing	Continuing	Continuing
Air Segment - Systems Engineering	Various	Various : Various	0.000	0.000		0.000		1.854	Dec 2016	-		1.854	Continuing	Continuing	Continuing
CS&C Segment	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		7.228	Nov 2016	-		7.228	Continuing	Continuing	Continuing
CS&C Segment	Various	Various : Various	0.000	0.000		0.000		2.997	Dec 2016	-		2.997	Continuing	Continuing	Continuing
CS&C Segment	Various	NSMA : Arlington, VA	0.000	0.000		0.000		1.349	Dec 2016	-		1.349	Continuing	Continuing	Continuing
CS&C Segment	WR	SPAWAR : San Diego, CA	0.000	0.000		0.000		4.845	Dec 2016	-		4.845	Continuing	Continuing	Continuing
CS&C Segment (Comms, Intel, Network)	Various	Various : Various	0.000	0.000		0.000		6.076	Dec 2016	-		6.076	Continuing	Continuing	Continuing
CS&C Segment (CPS/ CDS)	TBD	TBD : TBD	0.000	0.000		0.000		6.880	Nov 2016	-		6.880	Continuing	Continuing	Continuing
CS&C Segment (Ship Integration)	Various	Various : Various	0.000	0.000		0.000		0.614	Dec 2016	-		0.614	Continuing	Continuing	Continuing
CS&C Segment (Ship Integration)	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		14.555	Dec 2016	-		14.555	Continuing	Continuing	Continuing
CS&C Segment (Ship Integration)	WR	NAWCAD : Lakehurst, NJ	0.000	0.000		0.000		1.230	Dec 2016	-		1.230	Continuing	Continuing	Continuing
Carrier Segment	WR	SPAWAR : San Diego, CA	0.000	0.000		0.000		1.895	Dec 2016	-		1.895	Continuing	Continuing	Continuing
LSI - Advanced Devleopment (Primary Hardware Development)	Various	Various : Various	0.000	0.000		0.000		0.826	Dec 2016	-		0.826	Continuing	Continuing	Continuing
LSI - Advanced Development (Primary Hardware Development)	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		0.924	Dec 2016	-		0.924	Continuing	Continuing	Continuing
LSI - Advanced Development (Primary Hardware Development)	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		0.565	Dec 2016	-		0.565	Continuing	Continuing	Continuing

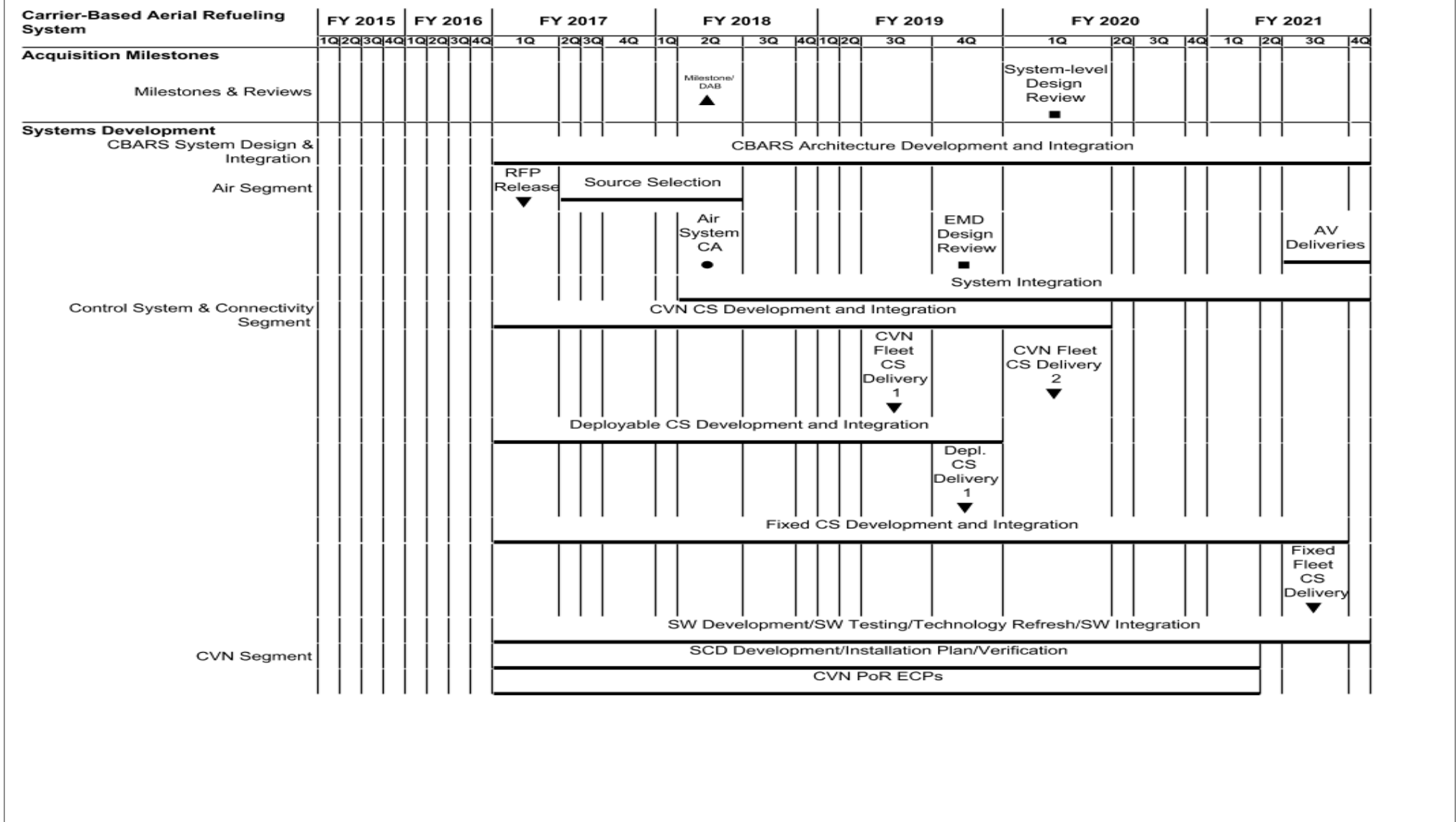
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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy												Date: February 2016			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
1319 / 5				PE 0605414N / (U) Carrier Based Aerial Refueling System (CBARS)				3278 / UCLASS Development							
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
LSI - Systems Engineering	Various	Various : Various	0.000	0.000		0.000		4.202	Dec 2016	-		4.202	Continuing	Continuing	Continuing
LSI - Systems Engineering	WR	NAWCAD : Patuxent River	0.000	0.000		0.000		7.614	Dec 2016	-		7.614	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		74.378		-		74.378	-	-	-
Remarks															
Control System and Connectivity (CS&C) Navy Systems Management Activity (NSMA) Common Display System (CDS) Common Processing System (CPS) Lead Systems Integration (LSI) Advanced Development (AD)															
Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Manpower Studies & Analyses	Various	Various : Various	0.000	0.000		0.000		0.188	Jan 2017	-		0.188	Continuing	Continuing	Continuing
Training Development	Various	Various : Various	0.000	0.000		0.000		1.275	Dec 2016	-		1.275	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		1.463		-		1.463	-	-	-
Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		5.243	Dec 2016	-		5.243	Continuing	Continuing	Continuing
Test and Evaluation	Various	Various : Various	0.000	0.000		0.000		0.011	Jan 2017	-		0.011	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		5.254		-		5.254	-	-	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy **Date:** February 2016

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605414N / (U) Carrier Based Aerial Refueling System (CBARS)	Project (Number/Name) 3278 / UCLASS Development
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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605414N / (U) Carrier Based Aerial Refueling System (CBARS)	Project (Number/Name) 3278 / UCLASS Development

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Carrier-Based Aerial Refueling System				
Acquisition Milestones: Milestones & Reviews: Milestone/Defense Acquisition Board (DAB)	2	2018	2	2018
Acquisition Milestones: Milestones & Reviews: System-level Design Review	1	2020	1	2020
Systems Development: CBARS System Design & Integration: CBARS Architecture Development and Integration	1	2017	4	2021
Systems Development: Air Segment: RFP Release for Air System Contract Award	1	2017	1	2017
Systems Development: Air Segment: Source Selection Activities	2	2017	2	2018
Systems Development: Air Segment: Air System Contract Award	2	2018	2	2018
Systems Development: Air Segment: EMD Design Review	4	2019	4	2019
Systems Development: Air Segment: Air Vehicle Deliveries	3	2021	4	2021
Systems Development: Air Segment: System Integration	2	2018	4	2021
Systems Development: Control System & Connectivity Segment: Carrier Vessel Nuclear (CVN) Control Station (CS) Development and Integration	1	2017	1	2020
Systems Development: Control System & Connectivity Segment: CVN Fleet CS Delivery 1	3	2019	3	2019
Systems Development: Control System & Connectivity Segment: CVN Fleet CS Delivery 2	1	2020	1	2020
Systems Development: Control System & Connectivity Segment: Deployable CS Development and Integration	1	2017	4	2019
Systems Development: Control System & Connectivity Segment: Deployable CS Delivery 1	4	2019	4	2019
Systems Development: Control System & Connectivity Segment: Fixed CS Development and Integration	1	2017	3	2021

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy **Date:** February 2016

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605414N / (U) Carrier Based Aerial Refueling System (CBARS)	Project (Number/Name) 3278 / UCLASS Development
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Systems Development: Control System & Connectivity Segment: Fixed Fleet CS Delivery	3	2021	3	2021
Systems Development: Control System & Connectivity Segment: Software (SW) Development/SW Testing/Technology Refresh/SW Integration	1	2017	4	2021
Systems Development: CVN Segment: Ship Change Document (SCD) Development/ Installation Plan/Verification	1	2017	1	2021
Systems Development: CVN Segment: CVN Program of Record (PoR) Engineering Change Proposals (ECP)	1	2017	1	2021
Systems Development: Installations: Ship Installation	1	2017	4	2021
Systems Development: Installations: Hull, Mechanical & Electrical (HME) Install 2	4	2017	4	2017
Systems Development: Installations: HME Install 3	3	2018	3	2018
Systems Development: Installations: HME Install 4	3	2020	3	2020
Systems Development: Installations: HME Install 5	1	2021	1	2021

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