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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 I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0305205N I (U)UAS Integration and Interoperability
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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	41.831	36.509	-	36.509	20.473	17.410	11.060	11.318	Continuing	Continuing
3379: <i>Common Control System</i>	0.000	0.000	41.831	36.509	-	36.509	20.473	17.410	11.060	11.318	Continuing	Continuing

Note

The Common Control System (CCS) was budgeted in PE 0604404N: Unman Carrier Launch A/B Surv & Strike (UCLASS) Sys prior to FY16. UCLASS restructured into Carrier Based Aerial Refueling System (CBARS) program, PE 0605414N, PU 3278 in January 2016 for FY17. CCS Increment I development began 3Q2013.

A. Mission Description and Budget Item Justification

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

This program will define, develop and deliver CCS capability that enables the flexibility for Ground Control Systems (GCS) that could be ship, shore, airborne, or expeditionary based to operate multiple and dissimilar Naval (UxSs). CCS includes a common framework, user interface, and common components that will also be integrated and tested with legacy platform components. CCS is being developed with an open and modular business model with robust cybersecurity implementation and will be provided as Government Furnished Equipment (GFE) to UxS Contractors as required. The CCS acquisition approach is to provide increasing UxS capability through incremental development for UxS platforms as follows:

Increment I will provide unmanned vehicle control functionality for launch & recovery, maneuvering & stationing, situational awareness, and health & performance status with a common Vehicle Management (VM) capability using legacy platform Mission Management/Mission Planning (MM/MP) capabilities hosted on legacy platform hardware. UxS platforms for initial CCS transition include CBARS, Triton (MQ-4), and Fire Scout (MQ-8). Efforts will include exploring opportunities for other UxS platforms from across all domains to benefit from CCS invested developments.

Increment II will maintain and update, as necessary, the core VM baseline and add common MM/MP capabilities hosted on legacy platform hardware.

Increment III aligns Common Control software and hardware for the Naval UxS control segment.

CCS is a ship/shore/airborne/expeditionary based common control segment that provides VM and MM/MP capabilities for Naval Group 2 through 5 Unmanned Aerial Vehicles (UAVs) and other domain UxS's. The CCS will provide open software architecture, based on the OSD Unmanned Control Segment (UCS) architecture, that is agile and scalable to evolving Service requirements and is supportive of safety/airworthiness certification and cybersecurity certification and accreditation.

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The CCS PU funds two Speed-to-the-Fleet capability initiatives in FY17: 1) Full Motion Video (FMV) for Geo-intelligence Unified Naval Streaming System (GUNSS) and 2) Moving Target Indicator (MTI) for Broad Area Maritime Surveillance - Demonstrator (BAMS-D).

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

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	41.831	40.847	-	40.847
Current President's Budget	0.000	41.831	36.509	-	36.509
Total Adjustments	0.000	0.000	-4.338	-	-4.338
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	1.710	-	1.710
• Rate/Misc Adjustments	0.000	0.000	-6.048	-	-6.048

Change Summary Explanation

Decrease in UAS Integration and Interoperability by \$1.523M as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

The restructure of the UCLASS program in FY17 into Carrier Based Aerial Refueling System (CBARS) predicated the need for the change in the Common Control System (CCS) budget language and acquisition strategy. The new CCS strategy is realigned from increments based on platforms to a capabilities-based strategy.

R-2 & R-2A Mission Description: Increment I and II definitions explained in greater detail with regards to vehicle management, mission management, and mission planning.

Overall strategy change from Increments structured by Platform to Increments based on Capability Areas

CCS Increment strategy realigned to provide:

Increment 1: Vehicle Management (VM), formerly UAVC2

Increment 2: Mission Management(MM) and Mission Planning (MP)

Increment 3: Common Control Segment

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R-4 Schedule and Schedule details changed to align with new strategy and new increment definitions.

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy										Date: February 2016		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0305205N / (U)UAS Integration and Interoperability				Project (Number/Name) 3379 / Common Control System			
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
3379: <i>Common Control System</i>	0.000	0.000	41.831	36.509	-	36.509	20.473	17.410	11.060	11.318	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

The Common Control System was budgeted in PE 0604404N: Unman Carrier Launch A/B Surv & Strike (UCLASS) Sys prior to FY16. The Common Control System (CCS) was budgeted in PE 0604404N: Unman Carrier Launch A/B Surv & Strike (UCLASS) Sys prior to FY16. UCLASS restructured into Carrier Based Aerial Refueling System (CBARS) program, PE 0605414N, PU 3278 in January 2016 for FY17.

A. Mission Description and Budget Item Justification

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

This program will define, develop and deliver CCS capability that enables the flexibility for Ground Control Systems (GCS) that could be ship, shore, airborne, or expeditionary based to operate multiple and dissimilar Naval (UxSs). CCS includes a common framework, user interface, and common components that will also be integrated and tested with legacy platform components. CCS is being developed with an open and modular business model with robust cybersecurity implementation and will be provided as Government Furnished Equipment (GFE) to UxS Contractors as required. In alignment with the newly established Office of the Chief of Naval Operations Directorate for Unmanned Warfare Systems (OPNAV N99), the CCS acquisition approach is to provide increasing UxS capability through incremental development for UxS platforms as follows:

Increment I will provide unmanned vehicle control functionality for launch & recovery, maneuvering & stationing, situational awareness, and health & performance status with a common Vehicle Management (VM) capability using legacy platform Mission Management/Mission Planning (MM/MP) capabilities hosted on legacy platform hardware. UxS platforms for initial CCS transition include CBARS, Triton (MQ-4), and Fire Scout (MQ-8). Efforts will include exploring opportunities for other UxS platforms from across all domains to benefit from CCS invested developments.

Increment II will maintain and update, as necessary, the core VM baseline and add common MM/MP capabilities hosted on legacy platform hardware.

Increment III aligns Common Control software and hardware for the Naval UxS control segment.

CCS is a ship/shore/airborne/expeditionary based common control segment that provides VM and MM/MP capabilities for Naval Group 2 through 5 Unmanned Aerial Vehicles (UAVs) and other domain UxS's. The CCS will provide open software architecture, based on the OSD Unmanned Control Segment (UCS) architecture, that is agile and scalable to evolving Service requirements and is supportive of safety/airworthiness certification and cybersecurity certification and accreditation.

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305205N / (U)UAS Integration and Interoperability	Project (Number/Name) 3379 / Common Control System

The CCS PU funds two Speed-to-the-Fleet capability initiatives in FY17: 1) Full Motion Video (FMV) for Geo-intelligence Unified Naval Streaming System (GUNSS) and 2) Moving Target Indicator (MTI) for Broad Area Maritime Surveillance - Demonstrator (BAMS-D).

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

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

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Increment I	0.000	34.331	17.400	0.000	17.400
Articles:	-	-	-	-	-
Description: Common Control System (CCS) Increment I provides Unmanned Air System Vehicle Management (VM) with legacy platform Mission Management/Planning (MM/MP) capability hosted on legacy platform hardware required to support Unmanned System(s) (UxS) control system development, integration, and test. Initial target platforms include CBARS, Triton, and Fire Scout.					
FY 2015 Accomplishments: N/A					
FY 2016 Plans: FY16 plans include continuation of CCS Increment 1 Vehicle Management software development, integration and test. Effort will additionally ensure that maximum commonality and applicability is maintained for continued transition of other UxSs.					
FY 2017 Base Plans: Development of CCS VM capability will continue in FY17 and will include initial CCS VM build delivery to CBARS to support the CBARS development and will also include initial CCS VM engineering build releases to support risk reduction for Triton and Fire Scout VM transition. FY17 plans include requirements and architecture identification, definition, and analysis of surface, sub-surface, and ground UxS.					
FY 2017 OCO Plans: N/A					
Title: Increment II	0.000	7.500	19.109	0.000	19.109
Articles:	-	-	-	-	-

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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>Description: CCS Increment II will maintain and update as necessary the core Vehicle Management (VM) baseline and will add common Mission Management/Mission Planning (MM/MP) capability hosted on legacy platform hardware. CCS Increment II will be the initial MM/MP baseline for CBARS. Plans include ensuring that maximum commonality is maintained for transition to Triton, Fire Scout, and other UxS.</p> <p>FY 2015 Accomplishments: N/A</p> <p>FY 2016 Plans: FY16 plans include requirements identification, definition, analysis, UxS trade studies, and initiation of accelerated development of migration plans for Triton and Fire Scout UAS platforms.</p> <p>FY 2017 Base Plans: In FY17 CCS Increment II will, concurrently with Increment I development, refine requirements and architecture and accelerate software development for the MM/MP core components. FY17 activities include initial CCS Increment II software build development to support CBARS, the development of the GUNSS and the MTI Speed-to-the-Fleet capabilities initiatives, and continuation of trade studies and requirements development for Triton and Fire Scout.</p> <p>FY 2017 OCO Plans: N/A</p>					
Accomplishments/Planned Programs Subtotals	0.000	41.831	36.509	0.000	36.509

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

<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017 Base</u>	<u>FY 2017 OCO</u>	<u>FY 2017 Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• RD TEN/0604404N: <i>Unman Carrier Launch A/B Surv & Strk (UCLASS) Sys</i>	382.542	434.699	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1,077.510
• RD TEN/0605414N: <i>Carrier Based Aerial Refueling System (CBARS)</i>	0.000	0.000	89.000	-	89.000	349.000	544.000	646.000	532.000	Continuing	Continuing

Remarks

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D. Acquisition Strategy

PEO(U&W) issued an Acquisition Decision Memorandum (ADM) 5000 Ser PEO(U&W)/11-093 dated July 1, 2011 to establish the Common Control System (CCS) to achieve Unmanned Aircraft System (UAS) common control across Program Executive Office Unmanned Aviation and Weapon Systems (PEO(U&W)) UAS platforms to eliminate redundant efforts, encourage innovation, and improve cost control of unmanned aviation. In coordination with the ADM the program will define, develop and deliver a common control system to operate respective naval Unmanned Systems (UxSs). This will include a common framework, a common user interface, and common components that will be integrated and tested with unique components on emerging or legacy platforms. The CCS acquisition approach is to provide increasing UxS capability through incremental development for UxS platform as follows: Increment I will provide common Vehicle Management capability with Carrier Based Aerial Refueling System (CBARS), Triton, and Fire Scout as the initial transition platforms; Increment II will maintain and update as necessary the core VM baseline and adds Mission Management/Mission Planning capability; Increment III aligns Common Control software and hardware for the Naval UxS control segment. CCS was being developed initially for the UCLASS Acquisition Category (ACAT) 1D program and will be provided to the CBARS air vehicle prime as Government-Furnished Equipment (GFE) and also for transition into Triton and Firescout. CCS will leverage existing government-owned products as well as employ competitive procurement vehicles to support CBARS and will transition Triton, Firescout, and other Naval UxS across multiple domains.

E. Performance Metrics

CCS uses a Service-Oriented Architecture based on the OSD Unmanned Control Segment (UCS) architecture. The CCS Capability Development Document (CDD) will be developed in FY16-17 and will inform the Common Control requirements and Key Performance Parameters (KPPs). CCS will inherit common requirements of each supported UxS platform's CDD/CPD through the respective specification trees. CCS must therefore also support the KPPs, Measures of Suitability/Effectiveness, Concepts of Operations, etc., flowed down from each supported platform.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy **Date:** February 2016

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305205N / (U)UAS Integration and Interoperability	Project (Number/Name) 3379 / Common Control System
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Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Primary Software Development	C/CPFF	TBD : TBD	0.000	0.000		17.200	Apr 2016	5.660	Apr 2017	-		5.660	0.000	22.860	22.860
Primary Software Development	C/CPFF	Raytheon : Dulles, VA	0.000	0.000		5.750	Apr 2016	11.141	Dec 2016	-		11.141	0.000	16.891	16.891
Advanced Development	WR	NAWC-WD : China Lake, CA	0.000	0.000		2.800	Nov 2015	2.700	Nov 2016	-		2.700	0.000	5.500	-
Subtotal			0.000	0.000		25.750		19.501		-		19.501	0.000	45.251	-

Remarks
The FY16 Primary Software Development contract will be a competitive award in FY16 via an existing NAVAIR Multiple Award Contract (MAC) so the performing activity and location are currently TBD due to the competitive contracting strategy.

Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Systems Engineering	WR	NAWC-AD : Pax River, MD	0.000	0.000		6.473	Nov 2015	8.395	Nov 2016	-		8.395	Continuing	Continuing	Continuing
Lead Systems Engineering and Integration	WR	NAWC-WD : Pt Mugu, CA	0.000	0.000		5.800	Nov 2015	3.903	Nov 2016	-		3.903	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		12.273		12.298		-		12.298	-	-	-

Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DT&E	WR	NAWC-AD : Pax River, MD	0.000	0.000		1.180	Nov 2015	1.573	Nov 2016	-		1.573	Continuing	Continuing	Continuing
DT&E	WR	NAWC-WD : Pt Mugu, CA	0.000	0.000		1.585	Nov 2015	1.700	Nov 2016	-		1.700	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		2.765		3.273		-		3.273	-	-	-

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

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Common Control System				
Acquisition Milestones: Increment I Initial Vehicle Management (VM) Software Release	2	2017	2	2017
Acquisition Milestones: Increment II Initial Mission Management/Mission Planning (MM/MP) Software Release	3	2020	3	2020
System Development: Increment I VM Software Development	1	2016	4	2021
System Development: Increment I VM Software Integration and Test	1	2016	4	2021
System Development: Increment II MM/MP Requirements/Architecture Development	1	2016	2	2018
System Development: Increment II MM/MP Software Development	4	2017	4	2021
System Development: Increment II MM/MP Software Integration and Test	2	2019	4	2021

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