Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy										Date: February 2018	

Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0303138N *I Consolidated Afloat Network Ent Services(CANES)*						

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	179.639	23.224	24.271	23.697	-	23.697	22.173	22.656	23.186	23.671	280.704	623.221
9C87: *CANES Integration*	179.639	23.224	24.271	23.697	-	23.697	22.173	22.656	23.186	23.671	280.704	623.221

Program MDAP/MAIS Code: Project MDAP/MAIS Code(s): M417

A. Mission Description and Budget Item Justification

Consolidated Afloat Networks and Enterprise Services (CANES) is the Navy's Program of Record (POR) to replace and modernize existing afloat networks with the necessary hardware, software and enterprise services infrastructure to enable information warfare from and within the tactical domain. CANES provides complete infrastructure inclusive of hardware, software, processing, storage and end user devices for the Unclassified, Coalition, Secret and Sensitive Compartmented Information (SCI) enclaves to a wide variety of Navy surface combatants, submarines and Maritime Operations Centers. CANES services include application hosting, data transport and storage, system management, cyber security, email, web, chat, collaboration, and voice and video services. CANES is based on the overarching concept of reducing the number of afloat networks and providing enhanced efficiency through a single engineering focus on integrated technical solutions. It allows for streamlined acquisition, contracting, test events, sustainment, and significant lifecycle efficiencies through consolidation of multiple configuration management baselines, logistics, and training efforts into a single unified support structure.

More than eighty (80) hosted applications and systems inclusive of Command and Control, Intelligence, Surveillance and Reconnaissance, Information Operations, Logistics and Business domains require the CANES infrastructure to operate in the tactical environment. Specific programs, such as Distributed Common Ground System - Navy (DCGS-N), Global Command and Control System - Maritime (GCCS-M), Naval Tactical Command Support System (NTCSS), and Undersea Warfare Decision Support System (USW-DSS), no longer provide their own independent network hardware and now depend on CANES to field, host, and sustain their capabilities. The CANES Application Integration program provides common software governance, testing, processes, and tools to application developers, and evaluates and confirms compatibility between CANES and the hosted applications prior to fielding. CANES also provides a set of capabilities called Agile Core Services (ACS) which brings common network services to allow hosted application developers to focus on the unique capabilities they provide.

CANES is funded and programmed to develop regular technical updates with an agile and robust hardware and software baseline development cycle necessary to pace rapidly evolving cyber security threats and meet emerging operational demands within the tactical domain. In order to deliver a mission effective, secure and affordable afloat network, CANES implements a Development Operations (DevOps) framework to improve its engineering processes and speed the deployment of new cyber security, application hosting and baseline updates. CANES requires that Automated Digital Network System (ADNS) field prior to or concurrently with CANES due to the architectural reliance between the two programs.

In FY 2019, CANES RDT&E investment will continue the development of the Technical Insertion (TI) 3 functional baselines including Enterprise Engineering and Certification (E2C) laboratory engineering efforts; perform systems engineering efforts to complete and update technical data packages; perform Development Testing in

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0303138N *I Consolidated Afloat Network Ent Services(CANES)*	

support of submarine functional baselines; and perform Development Testing Assist (DTA) for TI 3 software development. Additionally, new and emerging technologies will be evaluated for integration into future CANES TI baselines.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	23.541	24.271	22.410	-	22.410
Current President's Budget	23.224	24.271	23.697	-	23.697
Total Adjustments	-0.317	0.000	1.287	-	1.287
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.306	0.000			
• Program Adjustments	0.000	0.000	1.422	-	1.422
• Rate/Misc Adjustments	0.000	0.000	-0.135	-	-0.135
• Congressional General Reductions Adjustments	-0.011	-	-	-	-

Change Summary Explanation

The FY 2019 funding request was reduced by ($0.314) million to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.Technical: N/A

Funding: $1.5M added in FY2019 to develop CANES functional baseline for Aegis Ashore modernization efforts.

Schedule:
Development Testing (DT) for submarines will be in Q1FY19 due to submarine test platform operational commitments. FDD was achieved in 1QFY16.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy										Date: February 2018	

Appropriation/Budget Activity 1319 / 7				R-1 Program Element (Number/Name) PE 0303138N / Consolidated Afloat Network Ent Services(CANES)				Project (Number/Name) 9C87 / CANES Integration			

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
9C87: *CANES Integration*	179.639	23.224	24.271	23.697	-	23.697	22.173	22.656	23.186	23.671	280.704	623.221
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: M417

A. Mission Description and Budget Item Justification

Consolidated Afloat Networks and Enterprise Services (CANES) is the Navy's Program of Record (POR) to replace and modernize existing afloat networks with the necessary hardware, software and enterprise services infrastructure to enable information warfare from and within the tactical domain. CANES provides complete infrastructure inclusive of hardware, software, processing, storage and end user devices for the Unclassified, Coalition, Secret and Sensitive Compartmented Information (SCI) enclaves to a wide variety of Navy surface combatants, submarines and Maritime Operations Centers. CANES services include application hosting, data transport and storage, system management, cyber security, email, web, chat, collaboration, and voice and video services. CANES is based on the overarching concept of reducing the number of afloat networks and providing enhanced efficiency through a single engineering focus on integrated technical solutions. It allows for streamlined acquisition, contracting, test events, sustainment, and significant lifecycle efficiencies through consolidation of multiple configuration management baselines, logistics, and training efforts into a single unified support structure.

More than eighty (80) hosted applications and systems inclusive of Command and Control, Intelligence, Surveillance and Reconnaissance, Information Operations, Logistics and Business domains require the CANES infrastructure to operate in the tactical environment. Specific programs, such as Distributed Common Ground System - Navy (DCGS-N), Global Command and Control System - Maritime (GCCS-M), Naval Tactical Command Support System (NTCSS), and Undersea Warfare Decision Support System (USW-DSS), no longer provide their own independent network hardware and now depend on CANES to field, host, and sustain their capabilities. The CANES Application Integration program provides common software governance, testing, processes, and tools to application developers, and evaluates and confirms compatibility between CANES and the hosted applications prior to fielding. CANES also provides a set of capabilities called Agile Core Services (ACS) which brings common network services to allow hosted application developers to focus on the unique capabilities they provide.

CANES is funded and programmed to develop regular technical updates with an agile and robust hardware and software baseline development cycle necessary to pace rapidly evolving cyber security threats and meet emerging operational demands within the tactical domain. In order to deliver a mission effective, secure and affordable afloat network, CANES implements a Development Operations (DevOps) framework to improve its engineering processes and speed the deployment of new cyber security, application hosting and baseline updates. CANES requires that Automated Digital Network System (ADNS) field prior to or concurrently with CANES due to the architectural reliance between the two programs.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: CANES Integration	23.224	24.271	23.697	0.000	23.697
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy					Date: February 2018		
Appropriation/Budget Activity 1319 / 7				R-1 Program Element (Number/Name) PE 0303138N / Consolidated Afloat Network Ent Services(CANES)		Project (Number/Name) 9C87 / CANES Integration	

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Complete TI 2 hardware and software baseline development and initiate development of TI 3 software baseline including E2C laboratory engineering efforts. Perform systems engineering efforts for TI 3 to complete functional baselines and update technical data packages.					
FY 2019 Base Plans: Continue development of Technical Insertion (TI) 3 functional baseline including ACS; Enterprise Engineering and Certification (E2C) laboratory engineering efforts; and implementation of a Development Operations development and testing environment. Perform systems engineering efforts to complete functional baselines and update technical data packages in support of TI 3. Perform Development Testing in support of CANES submarine functional baseline and perform Development Testing Assist (DTA) for TI 3 software development.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Minor reduction of RDT&E funding from FY2018 to FY2019 attributed to previous increase to FY18 RDT&E budget for data cloud integration via Agile Core Services (ACS).					
Accomplishments/Planned Programs Subtotals	23.224	24.271	23.697	0.000	23.697

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/2915: CANES	207.730	322.754	423.027	-	423.027	428.315	394.533	441.888	414.738	2,881.395	6,677.715
• OPN/2925: CANES Intell	35.313	48.028	54.465	-	54.465	54.528	47.749	52.764	50.129	469.064	1,096.285

Remarks

D. Acquisition Strategy

CANES is an ACAT IAC Major Automated Information System (MAIS) program. The program office employed a multiple-phase, multiple-award down-select contract strategy to reduce program risks and maintain competition in both design development and limited production during contract performance. Milestone C was achieved in 1QFY13 and Full Deployment Decision (FDD) was achieved in 1QFY16. In 2QFY15, a separate full and open indefinite delivery indefinite quantity (IDIQ) multiple award contract (MAC) production contract was awarded to support future production. CANES is programmed to develop regular technical updates to its hardware and software baselines to ensure that no cyber security vulnerabilities exist due to hardware and software obsolescence.

Exhibit R-2A, **RDT&E Project Justification:** PB 2019 Navy		**Date:** February 2018
Appropriation/Budget Activity 1319 *I* 7	**R-1 Program Element (Number/Name)** PE 0303138N *I Consolidated Afloat Network Ent Services(CANES)*	**Project (Number/Name)** 9C87 *I CANES Integration*

E. Performance Metrics

Early RDT&E investment and sustainment of dual design contractors through the development phase reduced Total Ownership Cost (TOC) from Milestone B to Milestone C. Cost avoidance throughout the life of the program is based on 1) reducing the number of networks through the use of mature, certified, cross domain technologies; 2) reducing the infrastructure footprint and associated costs for hardware afloat; and 3) providing increased capability to meet current and projected war fighter requirements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy													Date: February 2018	
Appropriation/Budget Activity 1319 / 7						**R-1 Program Element (Number/Name)** PE 0303138N / Consolidated Afloat Network Ent Services(CANES)							**Project (Number/Name)** 9C87 / CANES Integration	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Prior Year Product Development	Various	Various : Various	158.657	0.000		0.000		0.000		-		0.000	0.000	158.657	162.000
Primary Hardware Development	WR	SSC : San Diego, CA and Charleston, SC	0.000	8.194	Nov 2016	9.220	Nov 2017	8.894	Nov 2018	-		8.894	133.274	159.582	160.000
Primary Software Development	WR	SSC : San Diego, CA and Charleston, SC	0.000	7.257	Nov 2016	9.721	Nov 2017	9.492	Nov 2018	-		9.492	140.516	166.986	169.000
Systems Engineering	C/CPFF	Booz Allen Hamilton (BAH) : San Diego, CA	0.000	0.315	Dec 2016	0.670	Dec 2017	0.654	Dec 2018	-		0.654	9.685	11.324	12.000
Systems Engineering	WR	SSC : San Diego, CA and Charleston, SC	0.000	4.481	Nov 2016	2.750	Dec 2017	2.685	Dec 2018	-		2.685	39.751	49.667	51.000
Systems Engineering	MIPR	US ARMY CECOM (MITRE) : San Diego, CA	0.000	0.827	Dec 2016	0.790	Nov 2017	0.776	Nov 2018	-		0.776	11.419	13.812	14.000
Subtotal			158.657	21.074		23.151		22.501		-		22.501	334.645	560.028	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Prior Year Support	Various	Various : Various	3.854	0.000		0.000		0.000		-		0.000	0.000	3.854	4.000
Studies & Design	WR	SSC : San Diego, CA	0.000	0.150	Jan 2017	0.460	Nov 2017	0.449	Nov 2018	-		0.449	6.649	7.708	8.500
Certification Authority	C/CPFF	NSMA : Washington, DC	0.000	0.377	Apr 2017	0.000		0.000		-		0.000	0.000	0.377	0.500
Certification Authority	C/CPFF	Booz Allen Hamilton (BAH) : San Diego,CA	0.000	0.863	Dec 2016	0.450	Dec 2017	0.439	Dec 2018	-		0.439	6.505	8.257	8.500
Subtotal			3.854	1.390		0.910		0.888		-		0.888	13.154	20.196	N/A

Exhibit R-3, **RDT&E Project Cost Analysis:** PB 2019 Navy		**Date:** February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303138N / Consolidated Afloat Network Ent Services(CANES)	**Project (Number/Name)** 9C87 / CANES Integration

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Test & Evaluation	Various	Various : Various	4.944	0.000		0.000		0.000		-		0.000	0.000	4.944	5.200
Operational Test & Evaluation	MIPR	JITC : Fairfax, VA	0.000	0.167	Feb 2017	0.150	Feb 2018	0.250	Feb 2019	-		0.250	2.168	2.735	3.100
Development Test & Evaluation	WR	SSC : San Diego, CA	0.000	0.165	Nov 2016	0.000		0.000		-		0.000	0.000	0.165	0.500
Development Test & Evaluation	MIPR	DTIC : Ft Belvoir, VA	0.000	0.373	Feb 2017	0.000		0.000		-		0.000	0.000	0.373	0.500
Subtotal			4.944	0.705		0.150		0.250		-		0.250	2.168	8.217	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Management Services	Various	Various : Various	12.184	0.000		0.000		0.000		-		0.000	0.000	12.184	12.500
Program Management	C/CPFF	STF : San Diego, CA	0.000	0.055	Jan 2017	0.060	Dec 2017	0.058	Dec 2018	-		0.058	0.867	1.040	1.500
Subtotal			12.184	0.055		0.060		0.058		-		0.058	0.867	13.224	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	179.639	23.224	24.271	23.697	-	23.697	350.834	601.665	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy | | **Date:** February 2018

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303138N / Consolidated Afloat Network Ent Services(CANES)	Project (Number/Name) 9C87 / CANES Integration

Exhibit R-4, RDT&E Schedule Profile: DON 2019 Navy | DATE: February 2018

APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-7	R-1 Program Element (Number/Name) PE 0303138N / Consolidated Afloat Network Ent Services (CANES)	Project (Number/Name) 9C87 / CANES Integration

Fiscal Year	2017				2018				2019				2020				2021				2022				2023			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Acquisition Milestones

Engineering and Manufacturing Development
- TI 2 - HW/SW Dev
- TI 3 - SW Dev
- TI 4 - HW/SW Dev
- TI 5 - SW Dev

Test & Evaluation Milestones
- TI2 DTA
- TI3 DTA
- TI4 DTA
- TI5 DTA

Developmental Test
- DT (Subs)

Operational Test
- FOT&E (Force Level)
- FOT&E (Subs)

Application Integration

Application Integration Test
- SIT
- SIT
- SIT

Milestones
- Limited Deployment (LD)
- Full Deployment (FD) — FD

Deliveries
- FD

TI: Technical Insertion; DT: Development Testing; DTA: Development Testing Assist; FOT&E: Force Level Follow-On Test and Evaluation; SIT: Software Integration Test; FD: Full Deployment

Exhibit R-4A, **RDT&E Schedule Details:** PB 2019 Navy		**Date:** February 2018
Appropriation/Budget Activity 1319 *I* 7	**R-1 Program Element (Number/Name)** PE 0303138N *I Consolidated Afloat Network Ent Services(CANES)*	**Project (Number/Name)** 9C87 *I CANES Integration*

Schedule Details

Events by Sub Project	Start		End	
	Quarter	**Year**	**Quarter**	**Year**
Fiscal Year				
Engineering and Manufacturing Development: Platform: Engineering and Manufacturing Development - TI 2 Hardware (HW)/SW Development	1	2017	1	2018
Engineering and Manufacturing Development: Platform: Engineering and Manufacturing Development - TI 3 SW Development	2	2018	1	2020
Engineering and Manufacturing Development: Platform: Engineering and Manufacturing Development - TI 4 HW/SW Development	2	2020	1	2022
Engineering and Manufacturing Development: Platform: Engineering and Manufacturing Development - TI 5 SW Development	2	2022	4	2023
Test & Evaluation Milestone: Development Test: Development Test Assist- TI 2	3	2017	3	2017
Test & Evaluation Milestone: Development Test: Development Test Assist- TI 3	3	2019	3	2019
Test & Evaluation Milestone: Development Test: Development Test Assist- TI 4	3	2021	3	2021
Test & Evaluation Milestone: Development Test: Development Test Assist- TI 5	3	2023	3	2023
Test & Evaluation Milestone: Development Test: Developmental Test - Sub	2	2019	2	2019
Test & Evaluation Milestone: Operational Test: Operational Test Force Level - Follow-on Operational Test & Evaluation (FOT&E)	1	2017	1	2018
Test & Evaluation Milestone: Operational Test: Operational Test - FOT&E Sub	3	2020	3	2020
Application Integration: Application Integration SIT 1	3	2017	4	2017
Application Integration: Application Integration SIT 2	3	2018	1	2019
Application Integration: Application Integration SIT 3	3	2020	4	2020
Production Milestone: Full Deployment: Production Milestone - Full Deployment (FD)	1	2017	4	2023
Deliveries: Deliveries - Full Deployment (FD)	1	2017	4	2023