Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020	
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 SVS (CANES)*							
COST ($ in Millions)	**Prior Years**	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**Cost To Complete**	**Total Cost**
Total Program Element	227.060	23.322	22.873	29.684	-	29.684	29.115	29.595	25.120	25.626	Continuing	Continuing
0725: *Communication Automation*	0.000	0.000	0.821	7.000	-	7.000	5.944	5.962	1.010	1.033	Continuing	Continuing
9C87: *CANES Integration*	227.060	23.322	22.052	22.684	-	22.684	23.171	23.633	24.110	24.593	253.069	643.694
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** M417												

Note

1) To ensure resources are aligned to enable rapid capability delivery, funding has been realigned into PE 0303138N Project 0725 from PE 0204163N Project 0725 as part of RDTEN PE Consolidation starting in FY20.

2) To ensure enterprise Naval Aviation network solutions, funding for ADNS Advanced Networking Tactical System (ANTS) in FY21, FY22, and FY23 was realigned into PE 0303138N Project 0725 from PE 0605414N Project 3278.

There are no New Starts associated with the Program Element (PE) transfers listed above.

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

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy	Date: February 2020
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 SVS (CANES)*

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.

In FY 2021, CANES will continue development of Technical Insertion (TI) 4 hardware and software baseline requirements including Agile Core Services (ACS), E2C laboratory engineering efforts and implementation of a Development Operations development and testing environment. Perform Operational Testing in support of CANES submarine variant and perform Application Integration System Integration Testing to support TI 3 software development efforts.

Automated Digital Network System (ADNS) provides cyber hardened warfighting critical afloat to shore wide area networking. Capabilities include routing, switching, baseband, configuration and monitoring capabilities that interconnect fleet tactical and coalition partner enclaves worldwide. ADNS is the method by which Tactical Navy units transfer Internet Protocol (IP) data to Navy and Department of Defense communities on the Global Information Grid (GIG). ADNS is the gateway to tactical Wide Area Network (WAN) afloat for Internet Protocol network operations, supporting information dissemination and external connectivity. ADNS enables services and applications to interconnect to the Defense Information Systems Network (DISN) ashore via multiple Radio Frequency (RF) resources, to include emerging Assured Command and Control (C2) capabilities and pier connectivity.

In FY 2021, ADNS will perform technical analyses and engineering efforts associated with the implementation of new technology to enable rapid introduction of new products and technology, prevent obsolescence, and mitigate end of support issues. ADNS will perform the development and design of ADNS hardware and software in support of Advanced Networking Tactical System (ANTS) on Unmanned Carrier Aviation (UCA) platforms. ADNS will perform formal qualification test and flight test preparation of ANTS design on UCA platform.

Programs will implement digital system-of-systems engineering by using tools such as Model Based System Engineering (MBSE) and Digital Twins to create adaptable digital models to optimize system engineering from design, development and testing to operations and sustainment. Programs will use Development, Security and Operations (DevSecOps) processes for continuous development, integration, testing and deployment, along with common platform services such as Agile Core Services (ACS), for faster fielding of capability.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy					Date: February 2020
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 SVS (CANES)*		
B. Program Change Summary ($ in Millions)	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**
Previous President's Budget	23.697	22.873	23.333	-	23.333
Current President's Budget	23.322	22.873	29.684	-	29.684
Total Adjustments	-0.375	0.000	6.351	-	6.351
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.375	0.000			
• Program Adjustments	0.000	0.000	5.962	-	5.962
• Rate/Misc Adjustments	0.000	0.000	0.389	-	0.389

Change Summary Explanation

Project 0725, Communication Automation: The FY 2021 funding request was increased by $5.962 million due to realigning funds in support of Advanced Networking Tactical System (ANTS). All other adjustments are miscellaneous rate adjustments. Prior to FY21, Advanced Networking Tactical System (ANTS) funding resides in PE 0605414N, project 3278. Starting in FY21, the funding was realigned to PE 0303138N, project 0725 to ensure enterprise alignment of Naval Aviation network solutions.

Project 9C87, Consolidated Afloat Networks and Enterprise Services (CANES) Integration: Funding increase of $0.632 million from FY20 to FY21 accounts for increased complexity in the CANES technical baseline and additional cyber security design efforts.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303138N / *Consolidated Afloat Network ENT SVS (CANES)*	Project (Number/Name) 0725 / *Communication Automation*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
0725: *Communication Automation*	0.000	0.000	0.821	7.000	-	7.000	5.944	5.962	1.010	1.033	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Funding has been realigned into PE 0303138N from PE 0204163N Project 0725 as part of RDTEN PE Consolidation starting in FY20. Additionally, in FY21, FY22, and FY23, funding for Advanced Tactical Networks System (ANTS) has been realigned into PE 0303138N Project 0725 from PE 0605414N Project 3278. All budgeted efforts have been previously approved. There are no New Starts associated with these realignments.

A. Mission Description and Budget Item Justification

Automated Digital Network System (ADNS)provides cyber hardened warfighting critical afloat to shore wide area networking. Capabilities include routing, switching, baseband, configuration and monitoring capabilities that interconnect fleet tactical and coalition partner enclaves worldwide. ADNS utilizes off the shelf equipment and network protocols as specified by the Joint Technical Architecture. ADNS Increment (INC) III combines all Navy Tactical Voice, Secure Communications Interoperability Protocol (SCIP) Inter-Working Function, video, and data requirements into a converged IP data stream. ADNS INC III supports higher bandwidth satellites, providing up to 25 megabytes per second (Mbps) of throughput on Unit Level ships and up to 50 Mbps on Force Level ships. INC III architecture also incorporates an Internet Protocol (IP)v4/IPv6 dual stack and Cipher-Text (CT) security architecture to align to the Global Information Grid (GIG) in order to mesh Navy Tactical surface, subsurface, airborne platforms, and Aegis Ashore sites into single IP environments with gateway functions to coalition and joint networks, in addition to greater security utilizing the High Assurance Internet Protocol Encryptor (HAIPE) devices. ADNS will investigate emerging technologies to integrate with additional Department of Defense PEO (Program Executive Office) Command, Control, Communications, Computers & Intelligence (C4I) Programs to improve inter-strike group networking and extend the network to the tactical edge.

FY21 ADNS RDTEN will design and test ADNS hardware and software in support of Advanced Networking Tactical System (ANTS) on Unmanned Carrier Aviation (UCA) platforms to ensure enterprise alignment of Naval Aviation network solutions. ADNS will conduct ANTS Formal Qualification Test (FQT) and First Flight Test on UCA platform. ADNS RDTEN investment will continue to support Interface Design Development (IDD) and integration with network applications, development of Line-Of-Sight (LOS) link, Defense Information Systems Network (DISN) integration, and development of CT piers. ADNS development will include addressing network management, intra and inter domain routing, Quality of Service (QoS), and Concept of Operations discussions. ADNS will continue network-based Cyber Security technology and virtualization to increase performance of the Navy's ADNS routing and transport architecture.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Automated Digital Network System (ADNS)	0.000	0.821	7.000	0.000	7.000
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303138N / *Consolidated Afloat Network ENT SVS (CANES)*	**Project (Number/Name)** 0725 / *Communication Automation*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
FY 2020 Plans: Continue testing and interfacing with Navy Enterprise Network Management System (ENMS), Internet Protocol (IP)v6 transition, and integration of Super High Frequency (SHF). Continue the Interface Design Description (IDD) and integration with network applications, develop Line of Sight (LOS) link, Defense Information Systems Network (DISN) integration and development of Cipher-Text (CT) piers. Investigate and recommend platform network devices, network design support to include procurement, integration and testing of the Wide Area Networking (WAN). Continue network-based Cyber Security technology and virtualization of ADNS. Perform technical analyses and engineering efforts associated with implementation of new technology to enable rapid introduction of new products and technology, prevent obsolescence, and mitigate end of support issues. ***FY 2021 Base Plans:*** Design, develop, and test ADNS hardware and software solutions in support of Advanced Networking Tactical System (ANTS) on Unmanned Carrier Aviation (UCA) platforms to ensure enterprise alignment of Naval Aviation network solutions. Conduct ANTS Formal Qualification Test (FQT) and First Flight Test on UCA platform. Continue the IDD and integration with network applications, develop LOS link, DISN integration and development of CT piers. Investigate and recommend platform network devices, network design support to include procurement, integration and testing of the WAN. Continue network-based Cyber Security technology and virtualization of ADNS. Perform technical analyses and engineering efforts associated with implementation of new technology to enable rapid introduction of new products and technology, prevent obsolescence, and mitigate end of support issues. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase in funding from FY20 to FY21 of $5.962 million is due to the realignment of Advanced Network Tactical System (ANTS) from PE 0605414N, project 3278; funds are also aligned in FY22 and FY23. $0.217 million of the increase is miscellaneous rate adjustments. ANTS funding was realigned to PE 0303138N, project 0725 to ensure enterprise alignment of Naval Aviation network solutions. All budgeted efforts have been previously approved. There are no New Starts associated with these realignments.					
Accomplishments/Planned Programs Subtotals	0.000	0.821	7.000	0.000	7.000

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303138N / *Consolidated Afloat Network ENT SVS (CANES)*	**Project (Number/Name)** 0725 / *Communication Automation*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• OPN/3050: *Ship Communications Automation*	109.152	128.728	124.288	-	124.288	97.272	98.452	90.786	92.668	Continuing	Continuing
• RDTEN/0204163N/0725: *Communication Automation*	1.613	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	249.601

Remarks

OPN/3050 funding profile captures more than Automated Digital Networking System (ADNS) OPN budget control. BLI 3050 funds Command and Control Official Information eXchange (C2OIX), Shore Tactical Assured Command and Control (STACC), Operation Rolling Tide (ORT), Enterprise Pier Connectivity Architecture (EPCA), and ADNS programs.

RDTEN/0204163N/0725 funding profile captures more than ADNS RDTEN budget control. Prior to FY20, PU 0725 funds Battle Force Tactical Network (BFTN), Joint Aerial Layer Network - Maritime (JALN-M), and ADNS. ADNS funding has been realigned into PE 0303138N, PU 0725 as part of RDTEN PE Consolidation starting in FY20.

D. Acquisition Strategy

Automated Digital Network System (ADNS): Evolutionary acquisition approach with overlapping development and implementation phases for defined Increment (INC) I, II, and III baselines. INC I, II, and III will use competitively awarded contracts to implement changes consistent with acquisition initiatives. ADNS leverages Commercial-Off-The-Shelf (COTS) and Government Off-the-Shelf (GOTS) products while capitalizing on acquisition reform initiatives to achieve material savings in the logistics, installation, integration and training areas. Where feasible, differing types of advantageous contract vehicles will be used to provide flexibility, decrease contract administrative costs, and encourage acquisition streamlining through the use of COTS/GOTS products.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303138N / *Consolidated Afloat Network ENT SVS (CANES)*	Project (Number/Name) 0725 / *Communication Automation*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering-ADNS	WR	NIWC : PAC/LANT	0.000	0.000		0.493	Dec 2019	5.090	Dec 2020	-		5.090	Continuing	Continuing	Continuing
Systems Engineering-ADNS	WR	NUWC : Newport, RI	0.000	0.000		0.164	Oct 2019	0.177	Oct 2020	-		0.177	Continuing	Continuing	Continuing
Systems Engineering-ADNS-DC	C/CPFF	NUWC : Newport, RI	0.000	0.000		0.041	Mar 2020	0.044	Mar 2021	-		0.044	Continuing	Continuing	Continuing
Integration and Test-ADNS	C/CPFF	NIWC : PAC	0.000	0.000		0.041	Mar 2020	0.044	Mar 2021	-		0.044	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.739		5.355		-		5.355	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Certification Authority-ADNS	C/CPFF	BAH : San Diego, CA	0.000	0.000		0.082	Jan 2020	0.617	Jan 2021	-		0.617	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.082		0.617		-		0.617	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation-ADNS	WR	NIWC : PAC/LANT	0.000	0.000		0.000		0.500	Dec 2020	-		0.500	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		0.500		-		0.500	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	C/CPFF	STF : San Diego, CA	0.000	0.000		0.000		0.528	Dec 2020	-		0.528	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		0.528		-		0.528	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303138N / *Consolidated Afloat Network ENT SVS (CANES)*	Project (Number/Name) 0725 / *Communication Automation*	

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.821		7.000		-		7.000	Continuing	Continuing	N/A

Remarks

FY19 cost data is provided under PE 0204163N Project 0725. Prior to FY21, ADNS Airborne Advanced Networking Tactical System (ANTS) funding resides in PE 0605414N, project 3278. Starting in FY21, the funding was realigned to PE 0303138N, project 0725 to ensure enterprise alignment of Naval Aviation network solutions.

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303138N / *Consolidated Afloat Network ENT SVS (CANES)*	**Project (Number/Name)** 0725 / *Communication Automation*

EXHIBIT R-4, RDT&E Schedule Profile: PB 2021

DATE: December 2019

Appropriation/Budget Activity
1319 / 07

R-1 Program Element
PE 0303138N / CANES

PROJECT NUMBER AND NAME
0725 - Communication Automation - ADNS

ADNS

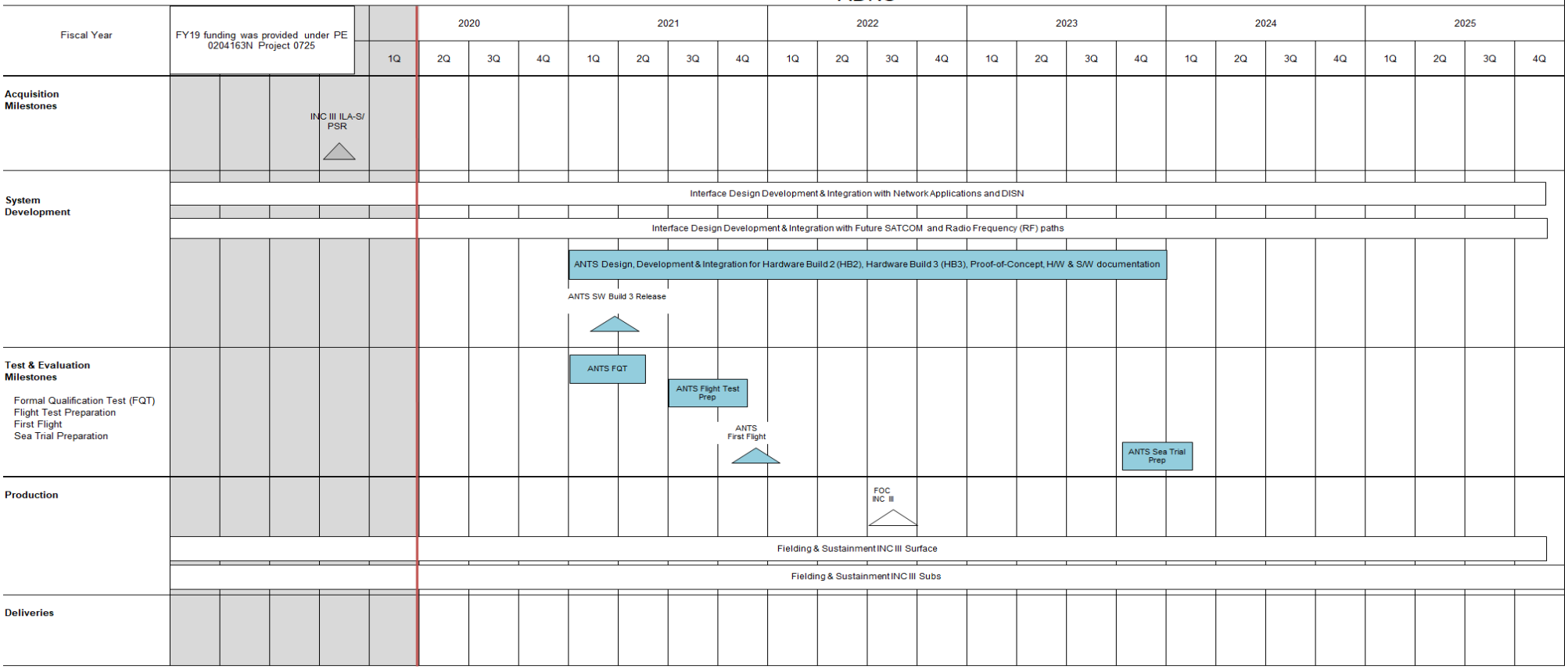


Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303138N / *Consolidated Afloat Network ENT SVS (CANES)*	**Project (Number/Name)** 0725 / *Communication Automation*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0725				
System Development: ADNS: Increment III_Interface Design Development and Integration with Network Applications and Defense Information Systems Network (DISN)	1	2019	4	2025
System Development: ADNS: Increment III_Interface Design Development and Integration with SATCOM and Radio Frequency (RF) paths	1	2019	4	2025
Production: ADNS: Increment III_Fielding and Sustainment INC III Surface	1	2019	4	2025
Production: ADNS: Increment III_Fielding and Sustainment INC III Submarines	1	2019	4	2025
Production: ADNS: Increment III_Full Operational Capability	3	2022	3	2022
System Development ADNS: ANTS Design, Development & Integration for Hardware Build 2 (HB2), Hardware Build 3 (HB3), Proof-of-Concept, H/W & S/W documentation	1	2021	4	2023
Test & Evaluation Milestones: ANTS SW Build 3 Release	2	2021	2	2021
Test & Evaluation Milestones: ANTS Formal Qualification Test (FQT)	1	2021	2	2021
Test & Evaluation Milestones: ANTS Flight Test Preparation	3	2021	4	2021
Test & Evaluation Milestones: ANTS Flight Test	4	2021	4	2021
Test & Evaluation Milestones: ANTS Sea Trial Preparation	4	2023	1	2024

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy										Date: February 2020		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0303138N / *Consolidated Afloat Network ENT SVS (CANES)*				Project (Number/Name) 9C87 / *CANES Integration*			
COST ($ in Millions)	**Prior Years**	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**Cost To Complete**	**Total Cost**
9C87: *CANES Integration*	227.060	23.322	22.052	22.684	-	22.684	23.171	23.633	24.110	24.593	253.069	643.694
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.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**
Title: CANES Integration	23.322	22.052	22.684	0.000	22.684
Articles:	-	-	-	-	-
FY 2020 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303138N / *Consolidated Afloat Network ENT SVS (CANES)*	**Project (Number/Name)** 9C87 / *CANES Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Start development of Technical Insertion (TI) 4 hardware and software baseline development including ACS, E2C laboratory engineering efforts and implementation of a Development Operations development and testing environment. Perform Operational Testing in support of CANES submarine variant and perform Application Integration System Integration Testing (SIT) to support completion of TI 3 software development efforts. Investigate and evaluate new technologies to improve network services capabilities and cyber security. ***FY 2021 Base Plans:*** Continue development of Technical Insertion (TI) 4 hardware and software baseline development including Agile Core Services (ACS) and Enterprise Engineering and Certification (E2C) laboratory engineering efforts. Perform systems engineering efforts to complete functional baselines and update technical data packages in support of TI 4. Perform Operational Testing (OT) in support of CANES submarine variant and perform Development Testing Assist (DTA) to support TI 4 and related software development efforts. Investigate and evaluate new technologies to improve network services capabilities and cyber security. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding increase of $0.6 million from FY20 to FY21 accounts for increased complexity in the CANES technical baseline and additional cyber security design efforts.					
Accomplishments/Planned Programs Subtotals	23.322	22.052	22.684	0.000	22.684

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• OPN/2915: *CANES*	404.891	409.571	389.585	-	389.585	430.142	403.953	398.159	410.347	2,366.429	7,076.098
• OPN/2925: *CANES Intell*	53.465	52.713	48.654	-	48.654	53.553	48.702	49.722	50.722	392.576	1,115.212

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

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303138N / *Consolidated Afloat Network ENT SVS (CANES)*	**Project (Number/Name)** 9C87 / *CANES Integration*

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-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303138N / *Consolidated Afloat Network ENT SVS (CANES)*	**Project (Number/Name)** 9C87 / *CANES Integration*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Product Development	Various	Various : Various	179.731	0.000		0.000		0.000		-		0.000	0.000	179.731	179.731
Primary Hardware Development	WR	NIWC : San Diego, CA and Charleston, SC	8.620	8.330	Nov 2018	7.844	Nov 2019	8.356	Nov 2020	-		8.356	63.100	96.250	100.000
Primary Software Development	WR	NIWC : San Diego, CA and Charleston, SC	7.804	9.721	Nov 2018	9.073	Nov 2019	9.084	Nov 2020	-		9.084	70.944	106.626	110.000
Systems Engineering	C/CPFF	Booz Allen Hamilton (BAH) : San Diego, CA	0.315	0.670	Dec 2018	0.627	Dec 2019	0.627	Dec 2020	-		0.627	4.890	7.129	8.000
Systems Engineering	WR	NIWC : San Diego, CA and Charleston, SC	4.481	2.750	Dec 2018	2.573	Dec 2019	2.670	Dec 2020	-		2.670	20.070	32.544	30.000
Systems Engineering	MIPR	US ARMY CECOM (MITRE) : San Diego, CA	0.827	0.790	Mar 2019	0.776	Mar 2020	0.770	Mar 2021	-		0.770	5.766	8.929	10.000
		Subtotal	201.778	22.261		20.893		21.507		-		21.507	164.770	431.209	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Support	Various	Various : Various	5.621	0.000		0.000		0.000		-		0.000	0.000	5.621	5.744
Studies & Design	WR	NIWC : San Diego, CA	0.150	0.430	Nov 2018	0.430	Nov 2019	0.463	Nov 2020	-		0.463	3.357	4.830	5.000
Certification Authority	C/CPFF	Booz Allen Hamilton (BAH) : San Diego,CA	0.863	0.421	Dec 2018	0.421	Dec 2019	0.421	Dec 2020	-		0.421	3.284	5.410	7.000
		Subtotal	6.634	0.851		0.851		0.884		-		0.884	6.641	15.861	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303138N / *Consolidated Afloat Network ENT SVS (CANES)*	**Project (Number/Name)** 9C87 / *CANES Integration*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Test & Evaluation	Various	Various : Various	6.187	0.000		0.000		0.000		-		0.000	0.000	6.187	6.649
Operational Test & Evaluation	MIPR	JITC : Fairfax, VA	0.167	0.150	Feb 2019	0.250	Feb 2020	0.235	Feb 2021	-		0.235	1.095	1.897	2.000
		Subtotal	6.354	0.150		0.250		0.235		-		0.235	1.095	8.084	N/A

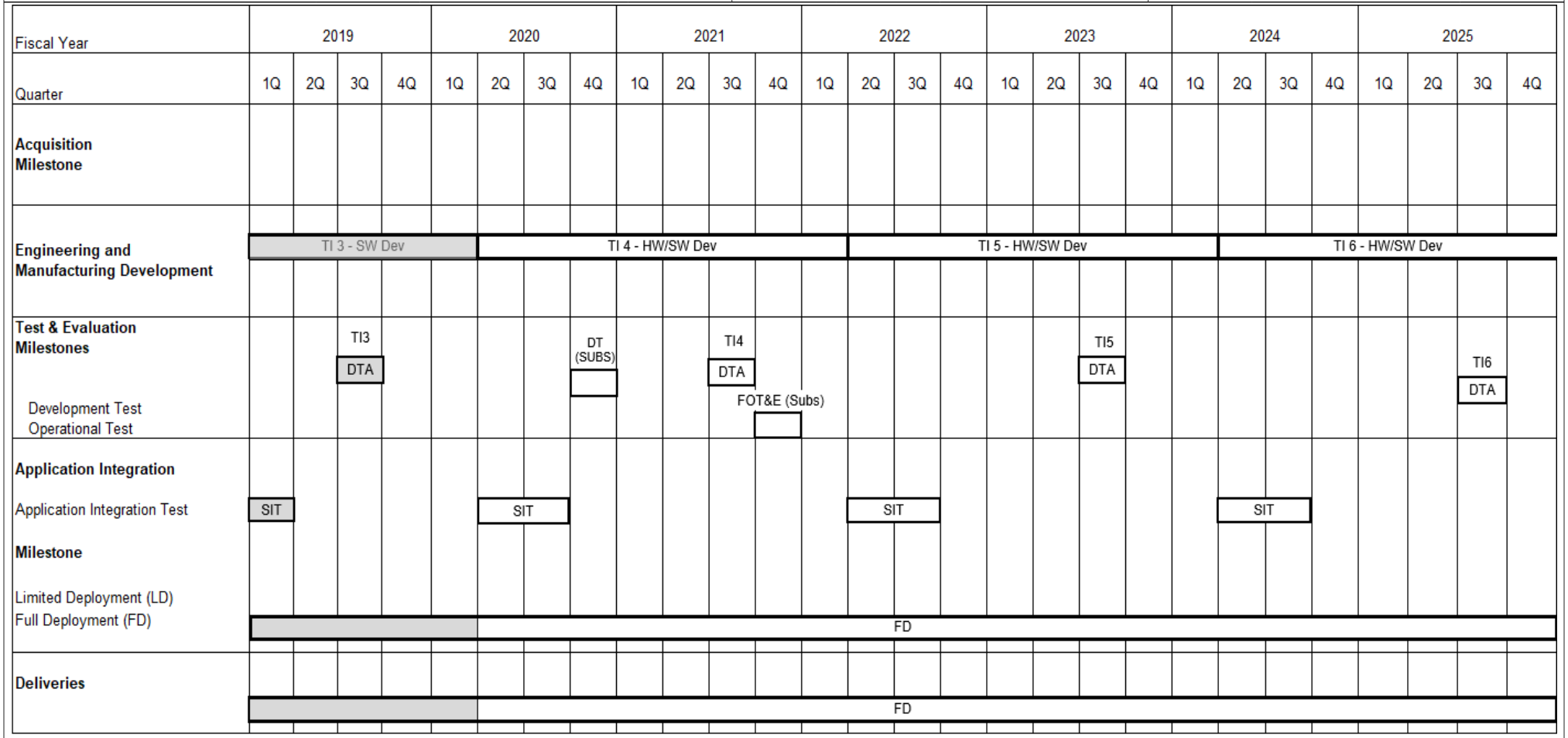
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Management Services	Various	Various : Various	12.239	0.000		0.000		0.000		-		0.000	0.000	12.239	12.239
Program Management	C/CPFF	STF : San Diego, CA	0.055	0.060	Dec 2018	0.058	Dec 2019	0.058	Dec 2020	-		0.058	0.438	0.669	1.000
		Subtotal	12.294	0.060		0.058		0.058		-		0.058	0.438	12.908	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	227.060	23.322		22.052		22.684		-		22.684	172.944	468.062	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		**Date:** February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303138N / *Consolidated Afloat Network ENT SVS (CANES)*	**Project (Number/Name)** 9C87 / *CANES Integration*



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 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303138N / *Consolidated Afloat Network ENT SVS (CANES)*	**Project (Number/Name)** 9C87 / *CANES Integration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Fiscal Year				
Engineering and Manufacturing Development: Platform: Engineering and Manufacturing Development - TI 3 SW Development	1	2019	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	1	2024
Engineering and Manufacturing Development: Platform: Engineering and Manufacturing Development - TI 6 Hardware (HW)/SW Development	2	2024	4	2025
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: Development Test Assist- TI 6	3	2025	3	2025
Test & Evaluation Milestone: Development Test: Developmental Test - Sub	4	2020	4	2020
Test & Evaluation Milestone: Operational Test: Operational Test - FOT&E Sub	4	2021	4	2021
Application Integration: Application Integration SIT 2	1	2019	1	2019
Application Integration: Application Integration SIT 3	2	2020	3	2020
Application Integration: Application Integration SIT 4	2	2022	3	2022
Application Integration: Application Integration SIT 5	2	2024	3	2024
Production Milestone: Production Milestone - Full Deployment (FD)	1	2019	4	2025
Deliveries: Deliveries - Full Deployment (FD)	1	2019	4	2025