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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force										Date: February 2019		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0606018F / NC3 Integration							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	12.382	19.312	25.917	0.000	25.917	26.404	26.973	27.464	0.000	Continuing	Continuing
674877: NC3 Integration, Assessment, and Improvement	-	12.382	19.312	25.917	0.000	25.917	26.404	26.973	27.464	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

Nuclear Deterrence Operations (NDO) is an Air Force Core Function. Within this core function, Nuclear Command and Control (NC2) is the exercise of authority and direction by the President, as Commander in Chief, through established command lines, over nuclear weapon operations of military forces. The President's authority and direction are exercised through the Nuclear Command and Control System (NCCS). The NCCS is the designated combination of flexible and enduring elements including facilities, equipment, communications, procedures, personnel, and the structure in which these elements are integrated, all of which are essential for planning, directing, and controlling nuclear weapon operations. These functions are accomplished through the NC3 system of systems.

The NC3 system of systems provides connectivity from the President or Secretary of Defense through the National Military Command System (NMCS) to nuclear execution forces worldwide. To enhance NC3 mission success, the AF formalized AF NC3 elements as a specified AF Weapon System (WS), AN/USQ-225. Activities funded in this Program integrate legacy systems, ongoing NC3 programs, and future capabilities for the overall AF NC3 WS.

The AF Nuclear Weapon Center NC3 Integration Directorate (AFNWC/NC) will ensure current, new, and future NC3 capabilities are fully integrated as part of the Air Force's overall effort to sustain, modernize, and recapitalize the nuclear enterprise. AFNWC/NC will be responsible for integrating NC3 materiel management across Air Force Materiel Command (AFMC) to include authority and responsibility for weapon system architecture, weapon system configuration management, weapon system state-of-health reporting, risk management, supply chain management, overall integration, system test, verification, and certification. AFNWC/NC is responsible for defining, building, and sustaining current and future AF NC3 WS system of systems configuration baselines, and marshaling necessary Supporting Centers in AFMC and other units/agencies in the Air Force and the Department of Defense (DoD) to support and/or accomplish these tasks. AFNWC/NC will collaborate with AFMC Supporting Centers to champion the full spectrum of doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy (DOTMLPF-P) efforts, in support of Air Force Global Strike Command as the Lead Command championing NDO requirements for all Combatant Commands.

This program funds activities for integrating AF NC3 WS materiel, authority, and responsibility for the AF NC3 WS architecture, modeling, simulation, configuration management, risk management, weapon system state-of-health reporting, supply chain supportability and risk management, and overall AF NC3 WS integration, development, system test, verification, fielding, and certification.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver nuclear weapon support capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

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As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is \$14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.								
This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.								
B. Program Change Summary (\$ in Millions)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total		
Previous President's Budget		12.636	26.112	25.917	0.000	25.917		
Current President's Budget		12.382	19.312	25.917	0.000	25.917		
Total Adjustments		-0.254	-6.800	0.000	0.000	0.000		
• Congressional General Reductions		0.000	0.000					
• Congressional Directed Reductions		0.000	-6.800					
• Congressional Rescissions		0.000	0.000					
• Congressional Adds		0.000	0.000					
• Congressional Directed Transfers		0.000	0.000					
• Reprogrammings		0.000	0.000					
• SBIR/STTR Transfer		-0.254	0.000					
• Other Adjustments		0.000	0.000	0.000	0.000	0.000		
Change Summary Explanation FY18 \$0.254M SBIR reduction FY19 \$6.8M Congressional Mark due to unjustified growth in direct mission support.								
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: NC3 Integration, Assessment, and Improvement				12.382	19.312	25.917	0.000	25.917
Description: To include but not limited to: Modeling and simulation of the AF NC3 WS current and future capabilities, conducting capability gap analysis, and establishing NC3 capability recapitalization and modernization plans. Developing and conducting the AF NC3 WS test and certification program as well as expanding existing High Frequency (HF) and other frequency testbeds utilizing a phased approach. Conducting NC3 system component verification. Implementing and employing program and material management controls for the AF NC3 WS including configuration management, risk management, supply chain supportability and risk management, maintenance data collection and reporting capabilities and AF NC3 WS health monitoring								

**UNCLASSIFIED**

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
solutions, issue tracking and resolution, assessments and analysis, and governance. Providing data-driven system of system solutions, and shaping NC3 component program acquisition strategies for AF NC3 WS sustainment and performance capability improvements. Initiating and implementing new capability programs/ systems and changes to existing programs to align with AF NC3 WS requirements, test and certification, and future capabilities.						
<b>FY 2019 Plans:</b> AF NC3 weapon system integration efforts including, but not limited to: - Continue to implement test and evaluation certification program for AF NC3 WS - Expand existing communication spectrum and cyber assessment test bed utilizing a phased approach - Continue to perform NC3 physics, communication and networking analysis - Continue to develop and evolve technical framework of the AF NC3 WS to meet mission threats of 2030 and beyond - Continue to conduct WS analysis, develop WS capability model, plan WS updates, and implement WS updates - Continue to evaluate options for system-of-system performance improvements within constraints of AF NC3 WS strategic vision and roadmap - Continue to analyze, model, and prototype emerging NC3 technologies - Continue to develop and implement AF NC3 WS program and materiel management control processes including risk management, configuration management, supply chain management, maintenance data collection and reporting and AF NC3 WS health assessment application, integrated scheduling, budgeting and cost controls, etc. - Continue to conduct AF NC3 WS health assessments, reporting, and issue resolution - Continue to map out the AF NC3 WS supply chain and develop supply chain monitoring capability, supply chain supportability and supply chain risk management - Continue to develop layered architecture to measure and report capability impacts - Continue to develop and coordinate OPCD to support weapon system configuration element specs, test and evaluation, and assessment of weapon capabilities and limitations - Establish authoritative intelligence community analysis for high-altitude electromagnetic pulse (HEMP) - Improve integration and interoperability of the AF NC3 WS - Continue to conduct WS risk, issue, and opportunity analysis, and mitigation/corrective action/pursuit plan development						
<b>FY 2020 Base Plans:</b>						

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
NC3 weapon system integration efforts including, but not limited to: - Continue to implement test and evaluation certification program for NC3 WS - Expand existing communication spectrum and cyber assessment test bed utilizing a phased approach - Continue to perform NC3 physics, communication and networking analysis - Continue to develop and evolve technical framework of the NC3 WS to meet mission threats of 2030 and beyond - Continue to conduct WS analysis, develop WS capability model, plan WS updates, and implement WS updates - Continue to evaluate options for system-of-system performance improvements within constraints of NC3 WS strategic vision and roadmap - Continue to analyze, model, and prototype emerging NC3 technologies - Continue to develop and implement AF NC3 WS program and materiel management control processes including risk management, configuration management, supply chain management, maintenance data collection and reporting and NC3 WS health assessment application, integrated scheduling, budgeting and cost controls, etc. - Continue to conduct NC3 WS health assessments, reporting, and issue resolution - Continue to map out the NC3 WS supply chain and develop supply chain monitoring capability, supply chain supportability and supply chain risk management - Continue to develop layered architecture to measure and report capability impacts - Continue to develop and coordinate Operational Performance Criteria Document (OPCD) to support weapon system configuration element specs, test and evaluation, and assessment of weapon capabilities and limitations - Establish authoritative intelligence community analysis for high-altitude electromagnetic pulse (HEMP) - Improve integration and interoperability of the NC3 WS - Continue to conduct WS risk, issue, and opportunity analysis, and mitigation/corrective action/pursuit plan development  FY 2020 OCO Plans: N/A  FY 2019 to FY 2020 Increase/Decrease Statement: FY19 to FY20 funding increased due continued ramp-up for full requirements.						
Accomplishments/Planned Programs Subtotals		12.382	19.312	25.917	0.000	25.917
D. Other Program Funding Summary (\$ in Millions)						
N/A						

**UNCLASSIFIED**

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<b>D. Other Program Funding Summary (\$ in Millions)</b>		
<b>Remarks</b>		
<b>E. Acquisition Strategy</b> The NC3 Integration acquisition strategy applies WS acquisition lifecycle principles across the system of systems AF NC3 WS. Key elements include configuration management, supply chain supportability and risk management, maintenance data collection and reporting, risk management, integration, test, verification, and certification, as well as modeling, simulation, gap analysis, and architecture development for capabilities in sustainment, development, and for future capabilities. To conduct these essential activities a combination of competitively awarded contracts, classified contracts, as well as sole source contracts, will be used to augment AF organic capabilities with technical skill sets from Federally Funded Research and Development Centers (FFRDCs), research laboratories, University Affiliated Research Centers (UARCs), and industry Advisory and Assistance Services (A&AS) providers.		
<b>F. Performance Metrics</b> Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force												Date: February 2019			
Appropriation/Budget Activity 3600 / 7						R-1 Program Element (Number/Name) PE 0606018F / NC3 Integration				Project (Number/Name) 674877 / NC3 Integration, Assessment, and Improvement					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
DMS FFRDC/UARC/A&AS	Various	Various : Various	-	11.083	Oct 2017	13.952	Nov 2018	19.959	Oct 2019	-		19.959	Continuing	Continuing	-
DMS Supply Chain Risk Management	MIPR	NSWC : Crane, IN	-	-		1.200	Jan 2019	1.400	Jan 2020	-		1.400	Continuing	Continuing	-
Subtotal			-	11.083		15.152		21.359		-		21.359	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Integration Studies /Test Support	Various	Various : Various	-	0.025	Jul 2018	-		0.222	Oct 2019	-		0.222	Continuing	Continuing	-
Subtotal			-	0.025		-		0.222		-		0.222	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
PMA (Eng/Acq Spt/Travel/Supplies)	Various	Various : Various	-	1.274	Oct 2017	4.160	Oct 2018	4.336	Oct 2019	-		4.336	Continuing	Continuing	-
Subtotal			-	1.274		4.160		4.336		-		4.336	Continuing	Continuing	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	12.382		19.312		25.917		-		25.917	Continuing	Continuing	N/A
Remarks Increase in FY19 Management Services due to Direct Cite Authority for civilian positions. \$1.8M in FY19, \$1.9M in FY20, and escalated in future years.															

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2020 Air Force			<b>Date:</b> February 2019		
<b>Appropriation/Budget Activity</b> 3600 / 7		<b>R-1 Program Element (Number/Name)</b> PE 0606018F / NC3 Integration			<b>Project (Number/Name)</b> 674877 / NC3 Integration, Assessment, and Improvement

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
<b>NC3 WS Integration</b>																												
AF NC3 WS Test and Certification Program																												
NC3 Health Assessment and Analysis																												
Enhance Target Architecture through Development of NC3 Technologies																												
Implement AF NC3 WS Program and Materiel Management Control Process																												
AF NC3 WS Risk Management Program, Monthly Working Group, and Quarterly Board																												
AF NC3 Maintenance Data Reporting																												
NC3 Supply Chain Risk Analysis																												
NC3 Supply Chain Normalization and Supply Health Reporting																												
AF NC3 WS NC3 Configuration Boards Biannually																												
AF Nuclear Weapon System Enterprise Review Biannually																												
AF NC3 WS Review Biannually																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2020 Air Force		<b>Date:</b> February 2019
<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0606018F / <i>NC3 Integration</i>	<b>Project (Number/Name)</b> 674877 / <i>NC3 Integration, Assessment, and Improvement</i>

**Schedule Details**

<b>Events by Sub Project</b>	<b>Start</b>		<b>End</b>	
	<b>Quarter</b>	<b>Year</b>	<b>Quarter</b>	<b>Year</b>
<b><i>NC3 WS Integration</i></b>				
AF NC3 WS Test and Certification Program	1	2018	4	2024
NC3 Health Assessment and Analysis	1	2018	4	2024
Enhance Target Architecture through Development of NC3 Technologies	1	2018	4	2024
Implement AF NC3 WS Program and Materiel Management Control Process	1	2018	4	2024
AF NC3 WS Risk Management Program, Monthly Working Group, and Quarterly Board	1	2018	4	2024
AF NC3 Maintenance Data Reporting	1	2018	4	2024
NC3 Supply Chain Risk Analysis	1	2018	4	2024
NC3 Supply Chain Normalization and Supply Health Reporting	1	2018	4	2024
AF NC3 WS NC3 Configuration Boards Biannually	1	2018	4	2024
AF Nuclear Weapon System Enterprise Review Biannually	1	2018	4	2024
AF NC3 WS Review Biannually	1	2018	4	2024