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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force **Date:** February 2020

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0606018F / <i>NC3 Integration</i>
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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	-	18.633	25.917	26.356	0.000	26.356	26.932	27.414	0.000	0.000	Continuing	Continuing
674877: <i>NC3 Integration, Assessment, and Improvement</i>	-	18.633	25.917	26.356	0.000	26.356	26.932	27.414	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Nuclear Command, Control, and Communications (NC3) is critical to our Nation's nuclear deterrence. 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 U.S. Strategic Command as the Enterprise Lead for NC3, the Under Secretary of Defense for Acquisition and Sustainment as the NC3 Enterprise Capability Portfolio Manager, and 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, digital engineering, 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 also supports modernization and integration activities associated with Joint All Domain Command and Control (JADC2) and Advanced Battle Management System (ABMS) initiatives.

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This program element may include necessary civilian pay expenses required to manage, execute, and deliver NC3 weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F or 0605833F.

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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	19.312	25.917	26.404	0.000	26.404
Current President's Budget	18.633	25.917	26.356	0.000	26.356
Total Adjustments	-0.679	0.000	-0.048	0.000	-0.048
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• 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	0.000	0.000			
• Other Adjustments	-0.679	0.000	-0.048	0.000	-0.048

Change Summary Explanation

No significant changes

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Title: NC3 Integration, Assessment, and Improvement	18.633	25.917	26.356
Description: To include but not limited to:			
- Modeling and simulation of the AF NC3 WS current and future capabilities			
- Conducting capability gap analysis			
- 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 solutions			
- Issue tracking and resolution, assessments and analysis, and governance			

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
<p>- Providing data-driven system of system solutions, and shaping NC3 component program acquisition strategies for AF NC3 WS sustainment and performance capability improvements</p> <p>- 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</p> <p>- Interfacing with JADC2 & ABMS leadership to ensure NC3 Modernization efforts are synchronized with larger AF modernization efforts & identifying risk areas where advanced tech demos may be required</p> <p>FY 2020 Plans: NC3 weapon system integration efforts including, but not limited to:</p> <ul style="list-style-type: none"> - Continue to implement test and evaluation certification program for NC3 WS - Continue to 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 - Continue to establish authoritative intelligence community analysis for high-altitude electromagnetic pulse (HEMP) - Continue to improve integration and interoperability of the NC3 WS - Continue to conduct WS risk, issue, and opportunity analysis, and mitigation/corrective action/pursuit plan development - Interfacing with JADC2 & ABMS leadership to ensure NC3 Modernization efforts are synchronized with larger AF modernization efforts & identifying risk areas where advanced tech demos may be required <p>FY 2021 Plans: NC3 weapon system integration efforts including, but not limited to:</p>				

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
<ul style="list-style-type: none"> - Continue to implement test and evaluation certification program for NC3 WS - Continue to 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 - Continue to establish authoritative intelligence community analysis for high-altitude electromagnetic pulse (HEMP) - Continue to improve integration and interoperability of the NC3 WS - Continue to conduct WS risk, issue, and opportunity analysis, and mitigation/corrective action/pursuit plan development <p>N/A</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Increase is due to inflation factor for continuing NC3 Integration.</p>				
Accomplishments/Planned Programs Subtotals		18.633	25.917	26.356
D. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
E. Acquisition Strategy				
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				

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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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force **Date:** February 2020

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0606018F / NC3 Integration	Project (Number/Name) 674877 / NC3 Integration, Assessment, and Improvement
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Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Product Development	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
DMS FFRDC/UARC/A&AS	Various	Various : Various	-	13.273	Nov 2018	19.959	Oct 2019	20.308	Oct 2020	-		20.308	Continuing	Continuing	-
DMS Supply Chain Risk Management	MIPR	NSWC : Crane, IN	-	1.200	Jan 2019	1.400	Jan 2020	1.400	Jan 2021	-		1.400	Continuing	Continuing	-
Subtotal			-	14.473		21.359		21.708		-		21.708	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Test and Evaluation	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
Integration Studies /Test Support	Various	Various : Various	-	-		0.222	Oct 2019	0.226	Oct 2020	-		0.226	Continuing	Continuing	-
Subtotal			-	-		0.222		0.226		-		0.226	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Management Services	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
PMA (Eng/Acq Spt/Travel/Supplies)	Various	Various : Various	-	4.160	Oct 2018	4.336	Oct 2019	4.422	Oct 2020	-		4.422	Continuing	Continuing	-
Subtotal			-	4.160		4.336		4.422		-		4.422	Continuing	Continuing	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		-	18.633	25.917	26.356	-	-	26.356	Continuing	Continuing	N/A

Remarks
FY21 Management Services includes Direct Cite Authority (DCA) for 12 civilian positions; \$1.94M.

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>NC3 WS Integration</i>				
AF NC3 WS Test and Certification Program	1	2019	4	2025
NC3 Health Assessment and Analysis	1	2019	4	2025
Enhance Target Architecture through Development of NC3 Technologies	1	2019	4	2025
Implement AF NC3 WS Program and Materiel Management Control Process	1	2019	4	2025
AF NC3 WS Risk Management Program, Monthly Working Group, and Quarterly Board	1	2019	4	2025
AF NC3 Maintenance Data Reporting	1	2019	4	2025
NC3 Supply Chain Risk Analysis	1	2019	4	2025
NC3 Supply Chain Normalization and Supply Health Reporting	1	2019	4	2025
AF NC3 WS NC3 Configuration Boards Biannually	1	2019	4	2025
AF Nuclear Weapon System Enterprise Review Biannually	1	2019	4	2025
NC3 Availability Improvement Program (NAIP)	1	2019	4	2025
AF NC3 WS Review Biannually	1	2019	4	2025