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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2023 Air Force **Date:** April 2022

<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 7: Operational Systems Development</i>	<b>R-1 Program Element (Number/Name)</b> PE 0606018F / <i>NC3 Integration</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	30.521	26.532	23.559	0.000	23.559	24.910	24.920	24.930	24.977	Continuing	Continuing
674877: <i>NC3 Integration, Assessment, and Improvement</i>	-	30.521	26.532	23.559	0.000	23.559	24.910	24.920	24.930	24.977	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 Air Force (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 (AFGSC) 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 model-based systems engineering (modeling, simulation and visualization) of the NC3 WS, digital engineering, configuration management, change 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 AFGSC's Force Development Concept vignette analyses, 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 weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, 0606398F. In FY2021 1.600M was expended for civilian pay expenses in this program element, in FY2022 1.950M is forecasted for civilian pay expenses in this program element.

The FY23 funding request was reduced by 4.229M to account for the availability of prior year execution balances.

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>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>
Previous President's Budget	26.308	26.532	0.000	0.000	0.000
Current President's Budget	30.521	26.532	23.559	0.000	23.559
Total Adjustments	4.213	0.000	23.559	0.000	23.559
• 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	4.782	0.000			
• SBIR/STTR Transfer	-0.569	0.000			
• Other Adjustments	0.000	0.000	23.559	0.000	23.559

**Change Summary Explanation**

FY21 Below Threshold Reprogramming Minuteman III to NC3 Integration 4.782M

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>
<b>Title:</b> NC3 Integration, Assessment, and Improvement	30.521	26.532	23.559
<b>Description:</b> Efforts include, but are not limited to: - Modeling, simulation, and visualization of the AF NC3 WS current and future capabilities - Conducting capability gap and trade-space analyses			

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>
<ul style="list-style-type: none"> <li>- Establishing NC3 capability recapitalization and modernization plans</li> <li>- 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</li> <li>- Conducting NC3 system component verification</li> <li>- Implementing and employing program and material management controls for the AF NC3 WS including configuration management, change management, risk management, supply chain supportability and risk management, maintenance data collection and reporting capabilities and AF NC3 WS health monitoring solutions</li> <li>- Issue tracking and resolution, assessments and analysis, and governance</li> <li>- Providing data-driven system of system solutions, and shaping NC3 component program acquisition strategies for AF NC3 WS sustainment and performance capability improvements</li> <li>- 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</li> <li>- Interfacing with JADC2 &amp; ABMS leadership to ensure NC3 modernization efforts are synchronized with larger AF modernization efforts and identifying risk areas where advanced tech demonstrations may be required</li> </ul> <p><b>FY 2022 Plans:</b> NC3 weapon system integration efforts including, but not limited to:</p> <ul style="list-style-type: none"> <li>- Continue to implement test and evaluation certification program for NC3 WS</li> <li>- Continue to expand existing communication spectrum and cyber assessment test bed utilizing a phased approach</li> <li>- Continue to perform NC3 physics, communication and networking analysis</li> <li>- Continue to develop and evolve technical framework of the NC3 WS to meet mission threats of 2030 and beyond</li> <li>- Continue to conduct WS analysis, develop WS capability model, plan WS updates, and implement WS updates</li> <li>- Continue to evaluate options for system-of-system performance improvements within constraints of NC3 WS strategic vision and roadmap</li> <li>- Continue to analyze, model, simulate, visualize and prototype emerging NC3 technologies</li> <li>- Continue to develop and implement AF NC3 WS program and materiel management control processes including risk management, configuration management, change management, supply chain management, maintenance data collection and reporting and NC3 WS health assessment application, integrated scheduling, change management, budgeting and cost controls, etc.</li> <li>- Continue to conduct NC3 WS health assessments, reporting, and issue resolution</li> <li>- Continue to map out the NC3 WS supply chain and develop supply chain monitoring capability, supply chain supportability, and supply chain risk management</li> <li>- Continue to develop digital models to measure and report capability impacts</li> </ul>			

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<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 7: Operational Systems Development</i>	<b>R-1 Program Element (Number/Name)</b> PE 0606018F / <i>NC3 Integration</i>
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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>
<ul style="list-style-type: none"> <li>- 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</li> <li>- Continue to establish authoritative intelligence community analysis for high-altitude electromagnetic pulse (HEMP)</li> <li>- Continue to improve integration and interoperability of the NC3 WS</li> <li>- Continue to conduct WS risk, issue, and opportunity analysis, and mitigation/corrective action/pursuit plan development</li> </ul> <p><b>FY 2023 Plans:</b> NC3 weapon system integration efforts including, but not limited to:</p> <ul style="list-style-type: none"> <li>- Continue to implement test and evaluation certification program for NC3 WS</li> <li>- Continue to expand existing communication spectrum and cyber assessment test bed utilizing a phased approach</li> <li>- Continue to perform NC3 physics, communication and networking analysis</li> <li>- Continue to develop and evolve technical framework of the NC3 WS to meet mission threats of 2030 and beyond</li> <li>- Continue to conduct WS analysis, develop WS capability model, plan WS updates, and implement WS updates</li> <li>- Continue to evaluate options for system-of-system performance improvements within constraints of NC3 WS strategic vision and roadmap</li> <li>- Continue to analyze, model, simulate, visualize and prototype emerging NC3 technologies</li> <li>- Continue to develop and implement AF NC3 WS program and materiel management control processes including risk management, configuration management, change management, supply chain management, maintenance data collection and reporting and NC3 WS health assessment application, integrated scheduling, change management, and budgeting and cost controls, etc.</li> <li>- Continue to conduct NC3 WS health assessments, reporting, and issue resolution</li> <li>- Continue to map out the NC3 WS supply chain and develop supply chain monitoring capability, supply chain supportability, and supply chain risk management</li> <li>- Continue to develop digital models to measure and report capability impacts</li> <li>- 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</li> <li>- Continue to establish authoritative intelligence community analysis for high-altitude electromagnetic pulse (HEMP)</li> <li>- Continue to improve integration and interoperability of the NC3 WS</li> <li>- Continue to conduct WS risk, issue, and opportunity analysis, and mitigation/corrective action/pursuit plan development</li> </ul> <p><b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> The FY23 funding request was reduced to account for the availability of prior year execution balances.</p>			
<b>Accomplishments/Planned Programs Subtotals</b>	30.521	26.532	23.559

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<b>D. Other Program Funding Summary (\$ in Millions)</b> N/A		
<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, change management, supply chain supportability and risk management, maintenance data collection and reporting, risk management, integration, test, verification, and certification, as well as modeling, simulation, visualization, gap and trade-space analyses for capabilities in sustainment, development, and for future capabilities. To conduct these essential activities a combination of competitively awarded contracts, classified contracts, and/or 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 2023 Air Force** **Date:** April 2022

<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
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<b>Product Development (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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			
DMS FFRDC/UARC/A&AS	Various	Various : Various	-	27.845	Oct 2020	23.997	Oct 2021	20.876	Oct 2022	-		20.876	Continuing	Continuing	-
<b>Subtotal</b>			-	27.845		23.997		20.876		-		20.876	Continuing	Continuing	N/A

<b>Test and Evaluation (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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			
Integration Studies /Test Support	Various	Various : Various	-	0.021	Oct 2020	0.023	Oct 2021	0.045	Oct 2022	-		0.045	Continuing	Continuing	-
<b>Subtotal</b>			-	0.021		0.023		0.045		-		0.045	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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			
PMA (Eng/Acq Spt/Travel/Supplies)	Various	Various : Various	-	2.655	Oct 2020	2.512	Oct 2021	2.638	Oct 2022	-		2.638	Continuing	Continuing	-
<b>Subtotal</b>			-	2.655		2.512		2.638		-		2.638	Continuing	Continuing	N/A

			Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>			-	30.521	26.532	23.559	-	23.559	Continuing	Continuing	N/A

**Remarks**

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<b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2023 Air Force</b>		<b>Date: April 2022</b>
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FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
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 Implementation and 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 Bi-monthly	
Implement NC3 Enterprise Comm Tech Analysis Repository	
NC3 Capability Improvement Program (NCIP) Biannually	
AF NC3 WS Review Biannually	

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2023 Air Force		<b>Date:</b> April 2022
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>NC3 WS Integration</i></b>				
AF NC3 WS Test and Certification Program	1	2021	4	2027
NC3 Health Assessment and Analysis	1	2021	4	2027
Enhance Implementation and Target Architecture through Development of NC3 Technologies	1	2021	4	2027
Implement AF NC3 WS Program and Materiel Management Control Process	1	2021	4	2027
AF NC3 WS Risk Management Program, Monthly Working Group, and Quarterly Board	1	2021	4	2027
AF NC3 Maintenance Data Reporting	1	2021	4	2027
NC3 Supply Chain Risk Analysis	1	2021	4	2027
NC3 Supply Chain Normalization and Supply Health Reporting	1	2021	4	2027
AF NC3 WS NC3 Configuration Boards Bi-monthly	1	2021	4	2027
Implement NC3 Enterprise Comm Tech Analysis Repository	1	2021	4	2027
NC3 Capability Improvement Program (NCIP) Biannually	1	2021	4	2027
AF NC3 WS Review Biannually	1	2021	4	2027