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Thank you for participating,

[signature: Gregory Hamilton]

Gregory Hamilton
President
Aviation Week Network

Acknowledged, agreed, and submitted by

[signature: Kent E Bussinger]

_____   _25 June 2020_____
Nominee's Signature   Date

Nominee's Name (please print**): Kent E Bussinger _____

Title (please print): NISSC Program Director _____

Company (please print): Raytheon Technologies Corporation _____

NOMINATION FORM

Name of Program: North American Aerospace Defense Command (NORAD) Cheyenne Mountain Complex (NCMC) – Integrated Tactical Warning/Attack Assessment (NCMC – ITW/AA) and Space Support Contract (NISSC) _____

Name of Program Leader: Kent E Bussinger _____

Phone Number: 719-622-2256_____

Email: kent.bussinger@raytheon.com _____

Postal Address: 1330 Inverness Dr., Suite 330 Colorado Springs, CO 80910_____

_____

☒ Customer Approved - NISSC/NORAD Program Office review completed (June 10, 2020)

- o   Date: _____

- o   Contact (name/title/organization/phone): Jason Harmon, Contracting Officer, Contracts, 719-291-9426 _

☐ Supplier Approved (if named in this nomination form)

- o   Date: _____

- o   Contact (name/title/organization/phone): _____

CATEGORY ENTERED

Refer to definitions in the document "2020 Program Excellence Directions." You must choose one category that most accurately reflects the work described in this application. **The Evaluation Team reserves the right to move this program to a different category if your program better fits a different category.**

Check one

☐ Special Projects

☒ OEM/Prime Contractor Sustainment

☐ OEM/Prime Contractor Systems Design and Development

☐ Supplier System Design and Development

☐ OEM/Prime Contractor Production

☐ Supplier System Production

☐ Supplier System Sustainment

Point Distribution

Executive Summary: Make the Case for Excellence (15 pts)		
Metrics **10 pts** Predictive Metrics (10)	**Program Volatility/ Uncertainty/Complexity/ Ambiguity** **25 pts** Describe overall VUCA (10) Cite examples of team response (15)	**Organizational Best Practices & Team Leadership** **40 pts** Innovative Tools and Systems (15) Unique Innovative Processes for People Development/Knowledge Transfer (15) Unique Practice es for Customer Engagement (10)
Value Creation (10 pts)		

Abstract

In 150 words or less, why is this program excellent in terms of execution?

Program excellence for the NORAD Cheyenne Mountain Complex Integrated Tactical Warning/Attack Assessment and Space Support Contract, or NISSC, is due to two fundamental factors:

First, the program is classified as NO-FAIL, requiring full operation 24 hours a day, 7 days a week. Raytheon Intelligence & Space, or RI&S, has maintained the mission systems' A_o *above* the required, classified key performance parameters. It ensures continued Mission Availability – ensuring the system hardware and software is available for all military operators at all times.

Second, RI&S meets the Air Force's demand for agile acquisition by executing every enhancement and sustainment action with innovation and speed. We put critical systems in the hands of airmen faster. NISSC must be agile and capable of meeting current and future missile warning and defense mission needs. RI&S' response has been described by Air Force leaders as the polar opposite of the traditional, slower execution processes.

Purpose

Provide a 150-word description of the purpose of this program, spelling out all acronyms and correct acronyms

The NISSC program provides operations, maintenance and sustainment of covered systems to support two primary missions: North American air and missile warning and space situational awareness. The program supports worldwide warning and surveillance systems that sense and report threats to command centers located at the White House and at 24 Sussex, the Canadian Prime Minister's residence in support of warning.

Combatant Commanders rely on the system to assess and respond to any potential threat to North America or to space-based assets. The system must provide accurate and expedient information at all times, since responses to threats need to be timely and appropriate, and can range from deploying aircraft to antiballistic missiles to nuclear weapon deployment.

Additionally, the program detects, tracks and identifies objects in Earth's orbit in support of the Space Situational Awareness mission's command and control capabilities, and provides space catalog maintenance, space event processing and laser firing determination.

Executive Summary: Make the Case for Excellence *(Value: 15 pts)*

What is the vision for this program/project? What unique characteristics and properties qualify this program for consideration? (12 pt. Times New Roman)

The national security importance of the NISSC program – which requires accurate, timely and unambiguous information to quickly identify and track threats – drives RI&S' vision to execute at the highest level. Mission availability is of vital importance for these national systems and the role they play in our nation's command authority and their responsibility to protect the boundaries and people of North America from adversaries' bad intentions.

To achieve the level of excellence needed for this program, we focus on two characteristics: continuous system monitoring and development and delivery of new capabilities – both in close collaboration with the U.S. Air Force and the System Program Office.

Our system administrators sit side-by-side with operators at military locations, monitoring the system 24/7. During maintenance and regular operations, our teams constantly evaluate system performance and look for any problems that need to be addressed. From indications of performance degradation to errors that flag pending system problems, this 24/7 monitoring and improvement process ensures that the system is always available to be used.

When developing new capabilities or enhancing existing ones, the level of design and integration that goes into each enhancement is extremely detailed. We achieve this by working closely with the customer during the development process, providing demos of new features and soliciting feedback early and often.

We also maintain program excellence by investing in top engineering talent, systems, processes and tools in support of the U.S. Air Force and NORAD mission. Additionally, we leverage our expertise in operations sustainment and modernization solutions – which include sensor and software systems, radars, command and control, and range-engineering services – to bring innovative options to the warfighter.

The NISSC Program is unique in that it is the only government contract tasked with supporting and sustaining the mission systems that identify and warn against attacks to North America. In support of that mission, the RI&S team focuses on providing reliable and cost effective solutions.

The RI&S NISSC team not only ensures exceptional Mission Operations, we play a crucial role in modifying the mission systems to account for emerging threats. Our subject matter experts know the architecture, design, and implementation of the mission systems – the majority of our Engineering team has over 10 years of experience maintaining and improving our nation's early warning systems. We have continuously demonstrated our ability to respond to mission needs, as exemplified by our Delivery Order responses to a Joint Emergent Operational Need, or JEON, for space battle management/command and control. This mission system enhancement laid the ground work for our nation's ability to identify, track, and warn against our adversaries' newest missile threats to North America.

The Air Force Life Cycle Management Center System Program Office and RI&S see these Delivery Orders as needing an aggressive schedule with little room for error. As noted in an email to NISSC Program Leadership from the SPO Project Manager for the JEON, RI&S' ability to remain flexible, while delivering such an important and high-visibility capability on such a short timeline was nothing but outstanding. The SPO Project Manager further stated that Raytheon Intelligence & Space completed their testing milestone 45 days earlier than required, thereby making this capability available to the warfighter early for operational assessment with the other users of this capability.

The legacy space systems provide centralized command and control, space situational awareness, earth satellite vehicle surveillance, space object identification, and operations support for North America. Space mission command and control. This is accomplished via systems and applications that provide data, processing, and analysis through the Space Defense Operations Center system, Space Deconfliction system, and Single Integrated Space Picture system. The systems provide space catalog maintenance, space event processing, laser firing determination, and space order of battle.

In support of the ITW/AA mission, the legacy space mission, and the NISSC-covered systems' technical baseline, the RI&S NISSC team has exceeded classified Key Performance Parameter requirements, ensuring continuous Mission Operational Availability and system performance. This guarantees the timely, accurate, unambiguous and continuous strategic warning for the United States and our allies.

(Do not exceed 10 pages in responding to the following four descriptions; allocate those 10 pages as you deem appropriate, but it is important that you respond to all four sections.)

VALUE CREATION *(Value: 10 pts)*
Please respond to the following prompts:
➢ **Clearly define the value of this program/project for the corporation beyond profit and revenue**

The biggest added value of the NISSC program to Raytheon Intelligence & Space is in people capital. As a flagship program in RI&S' Multi-Domain Battle Management portfolio, NISSC engineers and managers take tremendous pride in working for the program. This commitment to the program was in evidence recently during the COVID-19 pandemic, where RI&S staff isolated themselves with the NORAD/NORTHCOM military crews to ensure they could continue to support the crews' mission operations safely. Our team's dedication and mission focus have been lauded by our customers use when talking about our execution on the program.

Ensuring that our engineers and managers have this level of commitment is at the heart of our company's mission-driven values. That is why we work to reinforce these values by providing many opportunities for development, career growth and advancement across the engineering and functional support disciplines. In this way, we can ensure that our engineers get the domain mission training that we require of them, so if they have to fix software deficiencies or add new capabilities, they understand the mission domain it is used on. We also look for opportunities to bring new engineers onto the program with basic knowledge of their respective functions by providing advanced training, along with mentoring and opportunities in leadership roles.

Our company believes strongly in supporting the communities where we live and work. Since winning this program contract in the fall of 2015 and bringing a major Raytheon Intelligence & Space presence to Colorado Springs, Colorado, we have increased our community involvement and engagement. Employees are encouraged to volunteer and donate to causes important to them, and where possible, the company matches those contributions.

An example of our commitment to the community is our support of the Boys and Girls Club of the Pikes Peak Region since 2016. Our support has included the creation of a Science, Technology, Engineering and Mathematics Center of Innovation, sponsoring and judging the Youth of the Year celebrations, tutoring, and support to the Fill the Pack backpack drives. RI&S also sponsored an Apollo 11 50th anniversary celebration at the Space Foundation Discover Center in Colorado Springs, which included a variety of STEM-related activities for all ages. And RI&S has provided sponsorships and support to the United States Air Force Academy's athletic programs.

➢ **Clearly define the value of this program/project to your customer**

By sustaining and enhancing the program's existing warning systems, RI&S is enabling the Air Force to continue their mission without having to re-develop entire new systems to face new and evolving threats. Costs to develop new systems continue to increase, and it can take years to achieve operational acceptance of these systems. Sustainment and enhancement, a key component of the NISSC contract, is necessary to keep pace with changing requirements in today's battlespace.

The national security importance of these mission systems cannot be overlooked. The ITW/AA mission system provides the President of the United States, The Prime Minister of Canada, and senior decision-makers with an accurate, timely and unambiguous data set of possible threats to North America. NORAD provides our nation's leaders the information they need to respond in a timely manner to threats that range from missile launches to the possible use of nuclear weapons. In doing so, the program is a critical component to our continued safety and national security.

Additionally, the Space Situational Awareness mission system provides critical detection, tracking and identification of all artificial objects in Earth's orbit. It enables manned and unmanned space mission execution to proceed with the minimum amount of risk related to the loss of human life and loss of multi-million dollar assets through unintended object interference.

Evolving threat and time to need drive many of the mission system enhancements performed on the program. As an example, NISSC is providing a modern Internet Protocol network infrastructure to replace legacy, point-to-point Time Division Multiplexing communications in the CCIC2S communications subsystem and deploying that solution globally. TDM technologies are rapidly being phased out by vendors. Answering that technology refresh requirement, the program is modernizing the communications layers of our mission systems with a modern communciations infrastructure, not only increasing the system reliability and availability, but also providing cost benefit to our customer through lower sustainment costs and operating costs.

Additionally, RI&S updated the decades-old hardware on the Space Defense Operations Center, or SPADOC mission system, to improve its performance and decrease obsolesce risk. The new system, SPADOC Emulation Analysis Risk Reduction, known as SPEARR, is designed to provide a more sustainable system that requires less maintenance. The new hardware provides the same functionality as the predecessor SPADOC system, making it easy to learn and operate. SPEARR also significantly reduced the footprint and power consumption needed to operate the system by eliminating the need for ten racks of equipment to host SPADOC down to one rack to host SPEARR.

RI&S also modernized the aging platform of the SPADOC Graphical Read Display user terminals to a Linux operating system, and hosted the new code on modern, thin-client hardware. During the effort, NISSC team subject matter experts were able to port the code and demonstrate that the GRD functionality can successfully be migrated to a new hardware platform, again enhancing sustainability and reducing obsolescence risk.

➢ **Clearly define the value of this program/project to members of your team**

Our teams value being part of a program that provides safety to our families, communities, our country and our allies. Our employees are passionate about the NORAD mission to defend the North American continent and realize the importance of their work in helping military operators. We see this reflected in the loyalty of our workforce – team members have remained with the program despite a change in prime-contractors at the start of the NISSC program. More than 50 percent of the staff at the start of NISSC transferred from the previous contract. Many team members have been involved with the program mission domains for more than 20 years.

➢ **Clearly define the contribution of this program/project to the greater good (society, security, etc.)**

The NISSC program is at the forefront of national security, protecting all citizens and our allies. It's a program that serves a noble purpose – managing and sustaining critical components of NORAD, which must continuously scan the North American skies for inbound missiles and unidentified aircraft. NORAD provides the strategic front line missile warning information needed to provide accurate and detailed information to decision makers. The system is capable of detecting launches and quickly providing the threat picture to our leaders, giving them the time required to determine how to respond to threats. The more time our decision-makers have, the better their ability to respond with appropriate actions and countermeasures.

The NISSC Delivery Order and Sustainment activities are tasked with ensuring the mission evolves in the continued defense of our nation. This way, as new threats emerge, the public can be protected through the development of new capabilities and enhancements. As an example of these new capabilities, the program delivered processing capabilities that provide high-accuracy reports in the event of a nuclear detonation.

METRICS *(Value: 10 pts)*
Please respond to the following prompt:
➢ **How do your predictive metrics drive action toward program excellence?**
(12 pt. Times Roman)

Taking advantage of the NISSC Programs focus on obsolescence management, the System Program Office, or SPO, requested a forecast analysis for system requirements through 2026, extending the previous analysis through 2021. Through the analysis, Raytheon Intelligence & Space identified an increased number of High Part Support Risk hardware components. This provided the SPO with the ability to proactively plan and mitigate obsolescence issues, reducing risk of critical mission failure.

RI&S was also successful in moving beyond data accuracy to providing actionable analysis. The company continues to mature obsolescence analysis by integrating Reliability, Availability, and Maintainability Data into program discussions and Logistics Product Data Summary analysis to determine bad actors and watch items. By collaborating with the customer, RI&S is able to prioritize high-risk components to elevate mission critical items and focus on resolving those issues first.

An extended Dell support agreement, aligned with the projected SPEARR fielding effort, successfully mitigated risks related to the DMX-4 storage unit supportability. Leveraging the SPEARR DO to prioritize SPADOC High Part Support Risk components, RI&S identified 130 of 181 SPADOC Line Replaceable Units as Low Part Support Risk, with sufficient spares to support through 2026. Of the remaining 51, 39 have become overcome by events by the implementation of the SPEARR Fielding DO, leaving only 12 High Part Support Risk components for the RI&S team to develop mitigation plans for the SPO.

The company provided a unique, holistic approach to the integration of the NISSC-covered systems. We used NISSC-customized tooling to address dependencies across different efforts, asset management and scheduling for deconfliction, and branching strategies between technical artifacts and code baselines. These tools provide visualizations into forward-thinking, limited-risk approaches of deployments to the mission systems.

For the NISSC Agile projects, each scrum team has developed a velocity check that is available from project dashboards and that is used real-time as part of the technical interchange meetings and sprint and increment demos. Velocity indicates the number of story points a team is able to complete during an iteration or sprint. This metric is used to mitigate risk and track the work-in-progress and expectations. The velocity is used to determine if additional teams or resources are needed, and if work items need to be re-prioritized in the backlog.

DEALING WITH PROGRAM CHALLENGES (VOLATILITY, UNCERTAINTY, COMPLEXITY, AMBIGUITY, OR VUCA) *(Value: 25 pts)*
Please respond to the following prompts:
➢ *10 pts:* **Describe overall VUCA faced by your project/program.**
➢ *15 pts:* **Cite specific example(s) and how your team responded.**
(12 pt. Times Roman)

The NISSC program is incredibly complex, requiring constant monitoring, improving and upgrading in the face of technological advancements and the developments of new threats. This leads to challenges that the team must address to ensure the mission availability of the system.

One particular challenge stemmed from bringing commercial cyber security and cyber hardening practices to the NISSC program and receiving Authority to Operate, or ATO, for those program systems. ATO is the official Air Force certification of a system appropriateness, and is typically granted after a lengthy assessment process at major milestone release events. This was a very challenging transition, as the program worked to replace old processes and establish a new set artifacts supporing Risk Management Framework, or RMF, guidelines.

To solve this challenge, the NISSC team adopted an Agile and Kanban methodology, which helped reduce the time to develop required cyber artifacts. And working closely with the government, RI&S used the methodology to provide continuous evaluation and process improvement to increase the understanding of the current cyber posture and potential needs of the mission systems. At the end, the NISSC team was able to deliver 189 RMF CDRLs and 23 packages, resulting in 16 mission systems achieving ATOs, of which 13 have been multi-year ATOs. RI&S significantly improved the program's RMF quality, as cited by the NORAD-USNORTHCOM Security Control Assessor. RI&S created, vetted and received approval for the RMF common control baseline using a "yardstick" for assessing the quality and thoroughness of RMF artifacts. All seven RMF packages under Air Force Space Command AO purview were awarded extended ATOs, including five systems that were awarded unprecedented two-year ATOs.

Staying ahead of modern threats, creates an uncertain environment in which new capabilities need to be developed to deal with those threats – while still maintaining mission availability. In an effort to expand and accelerate sustainment and modernization efforts, RI&S consistently integrates content from several efforts into the least amount of releases for each mission system. This helps to greatly reduce the disruption on operations, as well as providing critical mission capabilities as quickly as possible.

There is a certain degree of volatility to such complex systems. So when issues do arise in the mission systems, RI&S has established processes to isolate the issue and to take actions that ensure that the mission objectives continue to be met. In just under four years, the team has responded to 57 Emergency/Urgent

Depot Level Maintenance requests and Engineering and Technical Assistance Requests, meeting the contractually-mandated response time for all requests and ensuring mission availability.

During the ID16 DO, a significant issue was discovered during a technical interchange meeting, exposing a required fix. In a matter of two weeks, RI&S quickly worked with SPO, users, and off-program stakeholders to isolate and identify the problem, and to develop and deliver a solution. RI&S had previously established an internal risk for what eventually became the issue, and used Management Reserve to address the risk.

Uncertainty plagues the future of any long-standing program. The NISSC team is working to address the 5-digit catalog number limitation on satellites – a result of an ever-increasing number of satellites being placed in orbit, in addition to the large amount of smaller objects that need tracking. The team designed an alpha-numeric solution, known as Alpha 5 to address this. The Legacy Space systems will now have the flexibility to use the current 5-digit catalog number and the new Alpha 5. This enhancement will be deployed well-ahead of the operational need for this capability.

Another complex challenge arose when the new USSTRATCOM facility on Offutt Air Force Base experienced delays in site availability, resulting in multiple installation date changes. The RI&S team's baselined schedule adjusted to these challenges, formulating innovative storage solutions and executing all pre-ship activities ahead of schedule.

ORGANIZATIONAL BEST PRACTICES AND TEAM LEADERSHIP *(Value: 40 pts)*
Please respond to the following prompts:
➢ *15 pts:* **In executing the program, what unique and innovative practices, tools and systems frame your program and help you achieve program excellence**?

As mentioned above, the program needed to address vital cyber security and hardening gaps to bring the mission systems in line with modern requirements. RI&S partnered with the SPO and leveraged mature commercial practices to accelerate the development and implementation of new cyber security capabilities.

Every member of the RI&S operations team is trained to perform vital tasks – 24 hours, 7 days a week, 365 days a year – that include hardware maintenance, preventive maintenance inspections, qualification training administrator tasks, mission testing and facility support requirements. The team can perform many of these tasks both remotely or on-site, whether at the Test Development Facility, 21st base communications and service support at Cheyenne Mountain Air Force Station, or at Joint Space Operations Center support at Vandenberg AFB. This is unique because regardless of where our Mission Assurance Center staff are deployed, they're trained with a core set of skills that allows flexibility in placing our staff. If we have need for additional staff at Offutt Air Force Base due to illness or personal reasons, our team members regularly assigned to CMAFS can travel to and support the needs at OAFB.

➢ *15 pts:* **What unique and innovative processes and practices are you using to develop people and transfer knowledge and how do you know they are working?**

The SW20 DO uses multiple, cross-functional, agile teams that can flow backlogged work items to other teams. One of the goals of these cross-functional teams is to provide the customer with people who are deep in knowledge in one area, as well as having the cross discipline knowledge needed to work in other aspects of the program.

NISSC leadership also established Subject Matter Expert training to engineers across the program, focusing on CCIC2S and Legacy Space systems. Newcomer engineers receive an orientation, including an overview

of the NISSC organizational and contractual structure, the mission overview, and ongoing delivery orders. NISSC personnel have also attended multiple external training classes such as Systems Engineering Technical Development Program and Raytheon Certified Architect Program; and have attended multiple IBM conferences. Over the years, individuals in the program have wholeheartedly embraced this and other opportunities for self-development – a testament to their success.

> ➤ *10 pts:* **What unique practices are you using to engage customers and how do you know?**

Consistent customer engagement is at the heart of achieving program excellence. In the case of Delivery Orders for new capabilities, our teams engage with customer throughout development, providing demos of completed features and soliciting feedback from the customer early and often. Our teams also engage with the customer on retrospective events that focus on facilitating an environment of continuous improvement. We have seen the success of these engagements through the multiple user Technical Interchange Meetings, held early in the design process. They demonstrated and discussed technical changes, including architecture, network, algorithms and GUI changes to ensure early buy-in and concurrence from the customer and the user community. Ultimately, the success of the process is reflected in our team's ability to meet key performance parameters and the positive customer feedback.

After development, our team holds training events to give operators the chance to see and use the system modifications before deployment. This provides operators with ample time to understand upcoming changes and to communicate any procedural updates that may be required once the release is fielded.

Collaborative meetings between contractors and teams are not unique by themselves. And certainly, our teams engage in weekly and quarterly program tag-ups, where topics like contracts, financials, engineering, operations, sustainment and logistics are discussed. But our teams have also set up a number joint boards to manage the technical direction of the program. Some examples include a Joint Engineering Review Board, an Obsolescence Working Group and a Cybersecurity Working Group. This style of engagement allows us to identify and adjust our scope of work and enable us, in many cases, to learn of solicitation requirements that might not meet the intent and need of end-users. We can then, early in the development process of a new capability, quickly identify and adjust contract requirements to meet the actual needs of the end-user.

RI&S provides a Contractor Performance Assessment Report self assessment for each option year of the NISSC program. This report is meant to solicit feedback from the SPO, assessing Quality, Schedule, Cost Control, Management, and Small Business and Regulatory Controls. Performance rankings for RI&S have improved year-over-year since the first option, going from two "exceptional" ratings to five, and from one "very good" rating to five.