AVIATION WEEK
PROGRAM EXCELLENCE AWARDS

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Thank you for participating,

Gregory Hamilton
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Acknowledged, agreed, and submitted by

___ Lynn Boldt _____ 6/26/2025_____
Nominee's Signature Date

Nominee's Name (please print): Lynn Boldt _____

Title (please print): Director, Program Management _____

Company (please print): Raytheon_____

NOMINATION FORM

Name of Program: Silent Knight Radar Production

Name of Program Leader: Lynn Boldt

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☒ Customer Approved

- Date: 6/26/2025
- Customer Contact (name/title/organization/phone): LTC Seth Green / Silent Knight Program Manager / US Special Operations Command / seth.m.green.mil@socom.mil

☐ Supplier Approved (if named in this nomination form)

- Date:
- Supplier Contact (name/title/organization/phone):

PLEASE REFER TO PROGRAM EXCELLENCE DIRECTIONS AS YOU COMPLETE THIS FORM.

SECTION 1: EXECUTIVE SUMMARY

Make the Case for Excellence

Value: 10 points

Use 12 pt. Times Roman typeface.

What is the vision for this program/project? What unique characteristics and properties qualify this program for consideration?

[LIMIT YOUR NARRATIVE TO THIS PAGE.]

The Silent Knight Radar (SKR) is an advanced Terrain Following / Terrain Avoidance (TF/TA) radar system developed by Raytheon for use on multiple U.S. Special Operations Command (USSOCOM) fixed-wing and rotary-wing platforms. SKR enables safe high-speed low-altitude navigation over challenging terrain types during night or day operations and adverse weather conditions, allowing aircrews to covertly execute missions in hostile environments. It is actively deployed in unidentified Outside the Continental United States (OCONUS) locations and is in daily use supporting Special Operations Forces (SOF) missions.

The SKR program has collaborated closely with the USSOCOM acquisition office to execute consecutive multi-year production awards, resulting in significant cost reductions for USSOCOM by bundling material procurements and ensuring continuous factory flow. Throughout the execution of these programs, the Raytheon team has worked relentlessly to support the USSOCOM aircraft modification schedule despite facing multiple material availability challenges from critical suppliers.

The success of the SKR program is founded on the partnership between Raytheon and USSOCOM, ensuring transparency and urgency in supporting Warfighter needs. These supplier-oriented initiatives and successes are attributed to trust and strong leadership, disciplined processes, and unique, creative approaches to managing suppliers and partners.

Silent Knight Radar

DIRECTIONS

- **Do not exceed 10 pages in responding to the following four descriptions**.
    - Allocate these 10 pages as you deem appropriate, but it is important that you respond to all four sections.

- DO NOT REMOVE THE GUIDANCE PROVIDED FOR EACH SECTION.

- Use 12 pt. Times Roman typeface throughout.

- Include graphics and photos if appropriate; do not change margins.

SECTION 2: VALUE CREATION

Value: 15 points

Please respond to the following prompt:

➢ **Clearly define the value of this program/project for the corporation; quantify appropriately**

The SKR portfolio provides significant value to Raytheon and its associated supply base through contract execution spanning the full product lifecycle. After completing design, development, and Low Rate Initial Production (LRIP), the initial SKR Multi-Year I production contract was awarded in December 2020 with a contract value of $235 million. This was followed by a Multi-Year II contract awarded in December 2023 with a contract value of $323 million. Together, these multi-year contracts total $558 million and provide nine years of continuous production efforts at Raytheon and its supply base.

The fielding of SKR led to award in 2024 of a 6-year $293M Indefinitte Delivery / Indefinite Quantity (IDIQ) contract. This contract provides life cycle sustainment services, research and development of additional capabilities, quick reaction initiatives, and the ability for USSOCOM to procure spare parts. The success of the SKR program has enabled Raytheon to continue building trust with the SOF community, positioning Raytheon as a value proposition supplier partner for future warfighter needs and a leader in Terrain Following Radars.

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

The value SKR provides to the USSOCOM customer and warfighters cannot be overstated. SKR is actively deployed Outside the Continental United States (OCONUS) for daily use, enabling the execution of SOF missions at night, in adverse weather conditions, and across challenging terrain to covertly infiltrate and exfiltrate hostile environments with a reduced risk of detection. The SKR enhances pilot situational awareness by providing navigation support, ground mapping, and weather information.

The SKR is a software-defined radar designed for use on multiple USSOCOM platforms by leveraging common interfaces, enabling SOF aircrews to share knowledge. The ability to deploy additional capabilities and enhancements without hardware modifications supports the "Speed of SOF" construct. Commonality across platforms allows USSOCOM to reduce initial acquisition and life cycle sustainment costs by leveraging economies of scale.

Additionally, the USSOCOM SKR program manager was recognized by the Defense Acquisition University in 2024 for their efforts in negotiating the Multi-Year II and IDIQ contracts, which yielded over $60 million in savings for the U.S. government on one of USSOCOM's largest programs.

- **Clearly define the value of this program/project to members of your team; quantify if possible**

Raytheon, along with its suppliers, partners, and customers, all share immense pride in supporting the warfighter and are dedicated to the success of the Silent Knight Radar (SKR). A significant portion of the SKR workforce comprises veterans who understand the value of the product they produce and its importance to national security interests. As a result, many employees voluntarily work extra hours, including weekends, without leadership's request, to ensure that critical deadlines are met. This dedication underscores the team's commitment to delivering high-quality solutions that support the mission and safety of Special Operations Forces.

With most team members having several years of tenure, the SKR program has allowed team members to grow and gain knowledge in various aspects of a complex hardware and software program. The SKR program offers many challenging opportunities to promote career growth and to gain a breadth of knowledge, featuring everything from power supplies, transmitters, and converters to more advanced RF technologies and waveforms. Successful performance within the SKR program has also led to the promotion of program leaders into new positions, while successfully leaving behind a "Support the Mission first" culture that employees are eager to be a part of. This culture fosters dedication, continuous learning, and a strong sense of purpose among the team members, contributing to the overall success and resilience of the program.

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

The SKR system contributes to national security in several key ways by enabling SOF to operate effectively and covertly. It enhances their ability to infiltrate and execute missions in challenging environments by providing low-altitude navigation capabilities, operational flexibility in adverse weather and darkness, reduced risk of detection through advanced radar technologies, and enhanced safety with terrain-following and terrain-avoidance features.

SKR installed on CV-22

Additionally, the SKR program is supported by 13 critical suppliers and their sub-tier supply chains, supporting countless jobs and providing opportunities for building networks within the defense supply base. This collaboration facilitates knowledge transfer and the sharing of best practices, further improving SKR product performance and driving operating efficiencies. This integrated approach not only strengthens the supply chain but also enhances the overall capability and reliability of the SKR system, contributing to its success and effectiveness in supporting national security missions.

SECTION 3: ORGANIZATIONAL BEST PRACTICES AND TEAM LEADERSHIP

Value: 35 points

Use 12 pt. Times Roman typeface

Please respond to the following prompts:

- ***15 points:*** **Describe the innovative tools and systems used by your team, how they contributed to performance and why**

The SKR program is focused on supplier quality and delivery schedules. To reduce escapes and improve quality, the SKR program uses a variety of tools and systems.

The program implements a monthly Failure Review Board (FRB) conducted jointly by Raytheon and USSOCOM to assess each of the failures witnessed during production. This review allows Raytheon to quickly identify problem parts, trends, and possible test procedure misalignments, with the goal of implementing corrective actions at the supplier level. For example, Raytheon identified that a supplier part had a tendency to fail environmental stress screening at higher temperatures due to a slight misinterpretation of the specification. By partnering with the supplier, the SKR program team resolved this issue, ensuring the procedure tested across the full required temperature range. The FRB also identifies wasted tests, which are tests that do not add value to the end product but increase the delivery cycle time. By analyzing collected test results, the FRB can determine the validity of these tests and optimize test procedures. For more complex issues, the SKR program utilizes the Raytheon Failure Analysis Lab, which has advanced diagnostic tools like X-ray, CT-Scan, Electron Microscopes, and Thermal analysis tools. This lab has supported supplier design or process improvements for issues such as severe corrosion, burnt capacitors, liquid leak test failures, and improper solder wicking to mitigate tin whiskers.

The SKR program also leverages several program-specific tools that help develop knowledge. These tools include the Dynamic Function Model Tool (DFM), which helps the factory isolate faults to a particular set of parts, and a proprietary tool that isolates faults to a particular subassembly and displays debugging information to determine the nature of the failure.

Additionally, the SKR team secured internal investment funds to continue procurements from critical suppliers between the Multi-Year I and Multi-Year II contracts. This proactive approach secured material pricing ahead of inflation increases, with savings passed directly to USSOCOM. It also averted an approximate 8-month production line gap, resulting in lower Multi-Year II costs and schedules by avoiding supplier startup costs and loss of learning by factory operators. This also reduced program support Level-Of-Effort costs and shortened delivery lead time.

- ***10 points:*** **Define the unique practices and process you used to develop, lead and manage people?**

The SKR program is driven by team members' performance and their buy-in to the SKR culture of respect, trust, empowerment, and accountability. This culture is cemented by a deep appreciation and pride for the mission, as team members understand that their activities directly impact whether SOF warfighters return home safely. When new team members join, they receive a detailed briefing on the product, customer, and warfighter mission set to immediately establish the required sense of urgency. Program activities carry this culture and the expectation that everyone can count on each other to care for and complete tasks effectively, with the principle of "quality means doing it right when no one is

looking" – Henry Ford – being a cornerstone. The team fosters a close-knit environment where members have the freedom to share ideas and ask for help.

Effective and constant communication is essential to ensure all team members are aware of the general program status and focused on near-term priorities in support of SKR deliveries. This is increasingly important given the geographically dispersed nature of the SKR program team, with the factory located in Forest, MS, Program Engineering in McKinney, TX, and Program Management Office personnel located at both sites and remote locations. Several recurring events form the basis of program execution cadence and customer engagements, including:

- Daily Tiered Accountability factory meetings
- Daily production status meetings between the factory and program office to address barriers and actions
- Weekly internal program-level cross-functional Program Performance Reviews (PPRs)
- Weekly Joint Raytheon/USSOCOM program status meetings
- Monthly Program Management Reviews (PMRs) with Raytheon Senior Leadership
- Quarterly Joint Raytheon/USSOCOM PMRs

Additionally, more junior team members are given opportunities to brief at the monthly and quarterly PMRs to grow their public speaking skills and provide exposure to Leadership and the Customer, supporting their career advancement. This structured communication and engagement strategy ensures that all team members stay aligned and focused on delivering high-quality results for the SKR program.

➢ ***10 points:*** **How did you leverage skills and technologies of your suppliers?**

The success of the SKR program is heavily influenced by the domain knowledge, expertise, quality performance, and delivery schedules of the 13 critical suppliers, as SKR is primarily comprised of non-Raytheon made hardware. This necessitates Raytheon to take a very active role in partnering with the supply base to develop a deep technical understanding of the suppliers' products, business practices, and production capabilities, followed by ongoing production support for analyzing test procedures, failure trends, and proactively working with suppliers to develop integrated schedules and recovery plans when needed.

One practice executed on the SKR program was to conduct Process Failure Mode Effect Analysis (PFMEA) assessments with each critical supplier after the conclusion of Multi-Year I deliveries and before the supplier initiates Multi-Year II. This ensures a tactical pause to review lessons learned and incorporate corrective actions. This approach allows the program to address any issues identified during the first phase of production, ensuring improvements are made and potential problems are mitigated before moving forward with the next phase, thereby enhancing overall product quality and reliability.

When critical suppliers fall behind schedule, identify risks that will affect future performance, or simply ask for help, the SKR program will deploy Tiger Teams to the supplier to provide focused support. The Tiger Team construct is adapted to the particular need and can vary in duration, with instances continuing with one critical supplier until all deliveries are completed. This proactive and collaborative approach helps maintain the high standards and timely delivery required for the SKR program's success.

SECTION 4: DEALING WITH PROGRAM COMPLEXITY

(VOLATILITY, UNCERTAINTY, COMPLEXITY, AMBIGUITY, or VUCA)

Value: 25 points
Use 12 pt. Times Roman typeface

Please respond to the following prompts:

- ***10 points:*** **Describe UNIQUE areas of VUCA faced by your program and why. (Please avoid the issues surrounding Covid-19 pandemic, which was faced by all programs.)**

Given that the SKR program is primarily comprised of non-Raytheon made hardware, the program team has faced many areas of volatility, uncertainty, complexity, and ambiguity induced by the supply base. These areas include workmanship issues, single point failures, unpredictable and complex failures, and force majeure events.

A common issue observed from suppliers is workmanship issues, which can be attributed to factors such as factory staffing turnover, inadequate training, and poor process controls. Unfortunately, many of these issues present themselves during Raytheon's final acceptance testing, causing immediate delivery schedule impacts. For instance, the SKR team had to overcome a single point failure for environmental stress screening chambers at a critical supplier. A systemic lack of periodic maintenance performed on vibration tables and thermal chambers by this supplier required the SKR team to adapt by conducting the testing at another Raytheon site to maintain the schedule.

In addition to more predictable or mitigable issues, the geographically dispersed supply base and Raytheon program team have made SKR more susceptible to impacts from force majeure events such as fires, floods, and hurricanes. These events cannot always be predicted, controlled, or prevented. However, Raytheon has engaged with critical suppliers to mitigate long-term disruptions, such as supporting business case development for investments in power generators to allow critical equipment to continue operating during power outages, moving work from one supplier location to another, or rescheduling activities to avoid needed shutdowns.

The most extreme example of VUCA experienced by the SKR program was receiving notice from a critical supplier that one of their technicians, in an attempt to implement a novel cost and schedule savings initiative, had destroyed six months' worth of circuit card assembly inventory. In developing recovery plans from that event, the same supplier also notified the SKR team that a sub-tier supplier was now experiencing below 20% yield for a custom module, requiring intense parallel recovery efforts at both suppliers.

This multifaceted approach to addressing and mitigating supply chain risks underscores the importance of proactive management, flexibility, and strong partnerships with suppliers to ensure the continued success and resilience of the SKR program.

- ***15 points:*** **Explain how your team responded to these challenges. What changes did you make, what were the results?**

When presented with supplier problems, the SKR team attacks the problem both tactically and strategically. In the instance of the supplier technician destroying inventory, the SKR team immediately provided Subject Matter Experts (SME) resources to determine if the destroyed inventory was salvageable and supported the authoring of repair procedures. They also developed detailed inchstone production recovery schedules, assessed material positions, and offered Raytheon's influence to commodity-level suppliers or available Raytheon inventories. Despite the loss of an estimated six months

of inventory, the SKR team and supplier partnership and relentless drive only resulted in a one-month slip to prior SKR forecasted delivery schedules.

Similarly, when presented with the exceptionally low production rates from the supplier's sub-tier, the SKR team again immediately provided SME resources to drive root cause and corrective actions. This included utilizing Raytheon's Failure Analysis Lab to complete x-ray and CT scans of the mechanical assembly, as well as chemical analysis and application processing of bonding materials used to hermetically seal the module. As a result of the compounding schedule impacts from the destroyed inventory and low yield, the SKR team leveraged their strong partnership with the USSOCOM program office and invited the USSOCOM uniformed Program Manager to accompany the SKR team to the sub-tier supplier. This provided in-person voice-of-the-Customer feedback to the sub-tier's executive leadership team and a meet-and-greet with the factory technicians responsible for implementing the corrective actions. The extended partnership and dedicated efforts between the SKR team, supplier, sub-tier, and USSOCOM mitigated a potential 4-6 month production impact to just one month.

In each of these instances, as well as other supplier quality and performance issues, Raytheon Supplier Quality Managers issued a Supplier Corrective Action Report (SCAR) to the supplier to receive a formal documented root cause and corrective action plan to prevent a repeat of the specific event and extrapolate those lessons learned to other similar activities at the supplier. Furthermore, the SKR team distills and shares the results of Supplier SCAR results with other SKR suppliers to promote sharing lessons learned to avoid related quality issues. This proactive and collaborative approach ensures continuous improvement and maintains high standards across the supply chain.

Due to ongoing performance issues with the supplier referenced in the examples above, the SKR team had already initiated plans for a second source to support the Multi-Year II program schedule and long-term sustainment efforts. The SKR team presented a business case to Raytheon leadership requesting internal investment funds to place a purchase order with the candidate second source for their efforts to complete a Critical Design Review (CDR) of a more modern and producible design.

The business case analysis leveraged thoughtful schedule depictions of the incumbent supplier's performance for completing remaining Multi-Year I deliveries and a partial Multi-Year II order, including their published capacity expansion and recovery schedules and discounts based on observed performance, versus the candidate second source's development, low-rate initial-production, and full-rate production schedule estimates with the most likely risks and opportunities for both suppliers performing in parallel. The SKR program team also identified multiple decision points to articulate varying return on investment scenarios and successfully secured the requested internal investment funds.

In partnership with USSOCOM, the SKR team conducted weekly status reviews with the candidate second source, as well as monthly in-person technical interchange meetings and the CDR event. This led to the SKR team ordering all remaining Multi-Year II demand with the second source. Since the decision to transition to the second source was made before the incumbent supplier completed all deliveries, the SKR program manager personally called the President of the incumbent supplier to inform them of the decision. They leveraged the existing relationship to ensure the incumbent supplier would continue recovery efforts in support of contractual commitments and the warfighters' needs. At the time of this writing, the collective performance of the incumbent and second source has validated that the SKR program team made the right decision.

SECTION 5: METRICS

Value: 15 points

Use 12 pt. Times Roman typeface

Please respond to the following prompts, where predictive metrics indicate items that provide a view of how yestrday's actions and today's actions will affect the future timeline, cost or other requirement.

Provide charts/graphs that illustrate performance to these metrics:

- **What are your predictive metrics?**

The SKR program uses several predictive metrics that are both backward and forward-looking. Historical data is used for trend analysis and is critical to the ability to be proactive in correcting future execution in a timely manner. The following metrics are a critical part of the SKR program's success:

On Time Delivery Metric (OTD) - On-time delivery, or OTD, measures the top-line program performance against contractual delivery requirements. This key performance indicator shows whether an organization is meeting its goals for promised delivery times and is critical for both measuring performance and maintaining customer satisfaction.

Line of Balance Metric – The Line of Balance is a scheduling tool that visualizes the progress of activities against planned deadlines. This method identifies discrepancies between actual and planned production rates, enabling timely interventions to prevent delays.

Hours Per Unit (HPU) - Hours per unit is a measure of productivity that indicates the amount of time required to produce a single unit of output. This metric is commonly used in manufacturing and production environments to assess efficiency and identify areas for improvement. By understanding the hours per unit, businesses can optimize their processes, reduce labor costs, and increase overall productivity.

First Pass Yield Metric - First Pass Yield measures the efficiency of a manufacturing process by assessing how many products meet quality standards on the first attempt. High FPY indicates a well-optimized process with minimal rework and waste, leading to lower production costs. Improving FPY involves identifying and addressing root causes of defects to enhance overall process efficiency.

Aged Work in Process (WIP) - This metric tracks the amount of time spent in each of the in-progress states, which varies based on the complexity of the task. Understanding how long each task stays in progress can help identify issues, improve flow, and estimate team capacity. Recognizing tasks that are taking longer than expected can trigger needed investigations and analysis.

- **How did you perform against these metrics?**

The SKR program performance varied against each individual metric, noting the true value of these predictive metrics was to drive team conversation and detailed action planning when reviewed as part of PPRs or PMRs.

- **OTD**: Driven by numerous supplier performance challenges, the SKR program team successfully implemented supplier engagement initiatives to recover schedules and avoid impacts on the USSOCOM aircraft modification schedule.

- **Line of Balance**: Performance by each supplier varied and resulted in the SKR program team prioritizing resources appropriately to address discrepancies and ensure timely interventions.
- **HPUs**: The Raytheon factories have thus far met or exceeded expectations on touch labor, allowing program resources to focus on supply chain corrective actions and maintaining overall productivity.
- **First Pass Yield**: Similar to Line of Balance, each supplier's quality performance varied. Trend line data from First Pass Yield metrics were used to implement corrective actions and improve process efficiency.
- **Aged WIP**: Like First Pass Yield, aged WIP metrics were key indicators that helped prioritize resources to investigate and address supplier quality issues.

In summary, while the SKR program performance varied across these metrics, the proactive use of predictive metrics facilitated effective team conversations and detailed action planning. This approach enabled the program to address challenges and maintain alignment with overall goals, ensuring continued success in delivering to USSOCOM.

➢ **How do your predictive metrics drive action toward program excellence? Please provide examples.**

Predictive metrics drive action toward program excellence by providing early indicators of issues and opportunities for improvement. These metrics enable the program team to proactively address problems, optimize processes, and ensure high-quality performance. Here are three examples of how predictive metrics have driven action within the SKR program:

1. **Supplier Performance Leading to Second Source**: Multiple data points from On-Time Delivery (OTD), Line of Balance, and First Pass Yield drove the team to evaluate a second source during the transition from Multi-Year I to Multi-Year II. Changing suppliers in the middle of production is a very risky challenge; however, the extrapolated data points from these critical metrics indicated that while the incumbent supplier could achieve recovery projections, their ability to sustain their forecasted delivery schedule was unlikely. The collective metric set was critical in forming the business case to secure internal investment to fund a candidate's initial design efforts before making a final determination on the full order of material for the Multi-Year II contract.

2. **First Pass Yield Decrease**: When first pass radar yields decrease, it prompts the team to evaluate the problem. For instance, there was a recent case where a batch of 10 transmitters failed at the radar level. The SKR program team took action by further evaluating some of the problem units and working with the supplier to determine that an incorrect capacitor was installed on this particular batch. The problem was then corrected at the supplier, and the first pass yields were restored. This proactive approach ensured that the quality issue was addressed promptly, minimizing impact on the overall production schedule and maintaining high-quality standards.

3. **Evaluation of Test Metrics**: The SKR program also employed test metrics to streamline processes. By evaluating data from 100 radars, the team determined that they were over-testing the vibration. Originally, the SKR test plan had designed two levels of vibration testing. However, it was identified that one of the vibration tests never resulted in a failure. As a result, the testing was streamlined to remove that unnecessary test. This optimization reduced unnecessary testing time and costs while maintaining the integrity and reliability of the radars.

In summary, predictive metrics such as OTD, Line of Balance, First Pass Yield, and test metrics provide valuable insights that drive the SKR program team to take targeted actions. These actions help in correcting issues, optimizing processes, and ensuring consistent delivery of high-quality products, thereby contributing to program excellence.