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Thank you for participating,

A handwritten signature in black ink, appearing to read 'G. Hamilton'.

Gregory Hamilton  
President  
Aviation Week Network

Acknowledged, agreed, and submitted by

A handwritten signature in black ink, appearing to read 'Andrew Gallerani'.

Nominee’s Signature

7/11/24  
Date

Nominee’s Name (please print): Andrew Gallerani

Title (please print): LIDS Product Line Director

Company (please print): Raytheon

## NOMINATION FORM

Name of Program: LIDS / Coyote

Name of Program Leader: Andrew Gallerani

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Customer Approved

Date: 7/24/2024

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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.**

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## 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.]

Low slow small unmanned aircraft system Integrated Defeat System (LIDS) is a US Army Counter Unmanned Aircraft System (C-UAS) that includes Raytheon's Ku-band Radio Frequency System (KuRFS) radar and the Coyote effector and launcher. The KuRFS radar was originally designed for a Counter Rocket Artillery Mortar (C-RAM) mission. The radar was paired with the Coyote system and other components and deployed in 2020 as part of a Joint Urgent Operational Needs Statement (JUONS) for a C-UAS mission. Over the past year there has been significant growth in the demand and subsequent application of LIDS in multiple Outside the Continental United States (OCOUS) locations.

This increased demand resulted in numerous development, production and sustainment contract awards in 2023 with missile deliveries from these contracts immediately being shipped OCONUS to support ongoing operations. These contract awards were spread out during the year which resulted in gaps in production that needed to be mitigated to support the demand for LIDS components. The Raytheon LIDS team worked closely with key suppliers to accelerate Coyote effector deliveries by 6 months and to close a 3-month gap in production between contracts.

Another critical aspect of the LIDS program is rapid responsiveness to field and test observations. Raytheon (RTX) works closely with the US Army customer to identify creative solutions to resolve issues and keep pace with the ever-evolving UAS threat. As a result of this collaboration, production acceleration, and ongoing field service representative support there have been nearly 100 OCONUS successful intercepts in the past year and many of those successful engagements means a warfighter or group of individuals go home safely that day and can continue to protect US forces and allies in challenging OCONUS environments.

## 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 LIDS and its associated key Raytheon products, the Coyote effector, launcher and KuRFS radar provide significant value to Raytheon through their domestic contract execution. Those financial impacts will grow significantly in the near future as international bookings are secured. In 2023, the LIDS portfolio booked over \$470M in new contracts and annual sales are expected to increase significantly in the next five years due to the growing demand for C-UAS across the globe. In addition to Raytheon's financial and personnel growth, LIDS is also driving growth in the supply base that manufactures Coyote and KuRFS components. As LIDS contract requirements are driving sequential production builds at increased capacity, our suppliers are seeing a steady demand signal at increasing quantities which in turn results in additional financial value observed at all levels of the supply base.

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

The value of LIDS to the customer cannot be overstated. Coyote and KuRFS systems are actively deployed OCONUS today keeping our US warfighter and allies protected from UAS threats and in the past year there have been nearly 100 successful intercepts using LIDS. Every single one of these intercepts enables the warfighter to successfully continue their mission abroad while knowing that they are protected by the premier kinetic C-UAS system in the world. Raytheon deploys field support representatives (FSRs) to ensure equipment availability and performance. Those FSRs have been recognized numerous times by the US Army customer and for the support they receive from Raytheon and the effectiveness of LIDS. Additionally, the Raytheon LIDS team has shown tremendous customer responsiveness and quick turn capabilities to refine and improve hardware and/or software based on in-depth data analysis of real-World OCONUS activities, UAS threat evolution, and to ensure optimized integration into a broader, layered air and missile defense system.

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

In addition to the financial value proposition, the growth of the LIDS portfolio is driving a significant team size expansion with numerous exciting new roles that offer a pathway for career and personal

development for existing and new team members. Specifically, in 2023 the LIDS team grew by 48 full time equivalent (FTE) personnel which was spread across Engineering, Supply Chain, Operations, Quality, Finance, and Program Management. Expanding into 2024, the LIDS portfolio plans to add another 61 FTEs which is over 75% higher than the team size at the start of 2023. In order to execute this team size expansion, we reorganized internally and created a “Product Line” organizational structure. This Product Line structure views the entire contractual landscape for the LIDS portfolio versus being organized around a single specific contract. In doing so, we aggregate and synthesize tasking and demand at a higher level and develop macro strategies to meet the needs of our customers. As a result of this growth, we have been in a nearly continuous interview/hiring process to ensure we have the required personnel to keep up with the ever increasing demand forecast. As part of this hiring activity, the team has developed numerous onboarding packages to help new team members assimilate into the organization very quickly. We also perform a significant amount of peer or supervisor mentoring with new team members to ensure they integrate quickly and can support the tasking they are being hired to execute as efficiently and effectively as possible.

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

The LIDS product, as depicted in Figure 1, has a significant contribution to the greater good of society on a daily basis since its components were first fielded in 2013. As noted earlier, LIDS are actively deployed in OCONUS locations where they protect the US warfighter, allies, and critical resources from UAS threats. As a result of the proliferation of UAS capabilities across the globe Raytheon has worked tirelessly to increase the capacity of our LIDS production capabilities as well as reducing lead time so we can deploy these assets even faster. All of these efforts are aimed at making the world a safer place by intercepting aggressive threats or acting as a deterrent to our enemies such that they don’t even try and attack military bases and key assets with UAS’s.



*Figure 1: Fixed Site LIDS*

### 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 LIDS team leverages as many tools and systems as possible to accelerate contract award and subsequent hardware delivery to the warfighters. Some of these tools and systems are typical best practices for program management such as earned value and a disciplined recurring program communication cadence. In addition to standard program management processes, the team also leveraged internal RTX funding to enable procurement of radar and missile hardware in advance of a contract being awarded which resulted in numerous benefits to the customer.

These benefits included procuring parts at greater quantities than any individual contract. Increased quantity procurement enabled the LIDS team to gain price efficiencies on supplier purchase orders which was then passed on to the US Army customer. Additionally, utilizing internal funds allowed the LIDS team to place purchase orders ahead of contract awards which significantly reduced the lead time of the overall equipment deliverables. This lead time reduction enabled the mitigation of approximately 3-month gap in missile production between contracts that otherwise would have resulted in line shut down, startup costs, resource re-allocation, and delays to production.

The LIDS team, specifically in the Coyote missile product area, implemented daily critical chain reviews to identify and mitigate vendor issues that were driving cost and lead time. This daily critical chain methodology, along with the associated follow up activities, resulted in a 6-month acceleration of the start of Coyote missile deliveries (May 2024 accelerated to Nov 2023). Given the critical, ongoing need for these missiles to support OCONUS activities, this 6-month acceleration was extremely well received by the US Army customer and enabled inventory fulfillment to ensure no locations that required LIDS were without Coyote interceptors.

In addition to the financial and supply chain management tools, the LIDS team also has a regular and rigorous leadership engagement process for both highlights and areas of help needed. This regular leadership engagement approach ensures that the appropriate resources and prioritization is placed on resolving issues that are driving production schedule or field upgrade readiness. Additionally, this regular communication ensures that Raytheon's Land and Air Defense (LADS) Leadership Team (LT) has the latest information on program status, issues, and upcoming events. Given the intense focus on counter-UAS across the globe, the LADS LT has regular senior level customer engagements (planned and ad-hoc) and ensuring they are up to speed with the latest program area status enables effective customer engagements and rapid issue resolution. This approach has served as a very effective "roadblock removal" process.

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

The LIDS team is constantly striving to find ways to accelerate program execution and realize cost efficiencies. One innovative way to meet these objectives is to tailor internal processes to get the desired impact while maintaining compliance but not over-burdening the team with non-critical tasking. As such, the LIDS team has tailored our Integrated Product Development System (IPDS) processes, especially in

the areas of program startup and design reviews. This “right size” tailoring ensures the team is working on only the critical tasks in these phases of the program to enable flawless execution and to document any deferred non-essential tasks at this phase of the program.

Given the tremendous growth experienced on the LIDS program area in the past year, there was also a need to update the organizational structure and associated team member roles and responsibilities. The LIDS team assessed multiple other Raytheon program areas that had a similar portfolio of interdependent contracts to identify an organizational structure that would enable rapid program execution along with consistent communications and be scalable to handle the magnitude of contracts needing to be executed. The solution was to have Product Areas for the radar (KuRFS), the effector/launcher (Coyote) and for sustainment. These product areas then flow into the program teams based on contractual scope. Each contract has a single Program Manager that is outside of the product area teams and that person is responsible for overall contract execution and manages program funding specific to that contract. The Product Areas then aggregate that contract demand and ensure that the “portfolio” of demand is accounted for when making investment decisions and resource allocations.

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

The technology and knowledge base contained in the LIDS supply chain is a critical part of what makes Coyote and KuRFS such amazing products and supplier performance is a key enabler of executing contracts ahead of schedule. Coyote, in particular, is almost entirely comprised of non-Raytheon made hardware and even some of the overall software suite is developed externally. The seeker and rocket motor suppliers that make critical components are both experts in their field and they have also been supporting Coyote for many years so they understand the program history and real-World relevance. This overall product technology and capability roadmap, developed by our Research and Development organization, includes integration and alignment with key suppliers. This highly integrated product maturation process allows the Coyote supply base to better target their investment resources. Our suppliers are integrally woven into the LIDS team, the broader technology roadmap, and overall customer care abouts which enables quick identification and mitigation of root causes for any test or field issues so the program stays on, or ahead of, schedule.

An example of this quick response was observed in 2023 when there were performance anomalies found during testing at Raytheon. The Coyote team worked closely with the vendor to share data and analysis on a daily basis and, as a result, were able to identify root cause and put mitigation steps in place while maintaining the build schedule. This collaborative, highly integrated, and trusting supplier relationship enables program success on a regular basis.

Similarly, on the KuRFS side, a printed wiring board vendor was having issues yielding one of the most schedule-critical sub-tier components of the system on time. The KuRFS Engineering, Quality, and Supply Chain teams had numerous in-person and teleconference reviews with the vendor and the team was able to slightly relax the drawing requirements in a key area causing the supplier difficulty as well as mitigate cross-Raytheon Purchase Order (PO) prioritization conflicts. This resulted in a 200 day improvement in the Printed Wiring Board (PWB) delivery outlook for this part and brought the radar build outlook back in line with the customer desired program baseline.

More broadly, Raytheon uses its Supplier Rating System (SRS) to continuously rate each vendor based on their most recent contract performance. This data enables robust second source identification which in the case of Coyote Circuit Card Assemblies (CCAs) is resulting in lead time and cost reduction while also reducing sole-source related risk to program execution.



## 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.)

There are numerous areas of volatility, uncertainty, and complexity faced by the LIDS team. As observed in the Middle East and Europe, UAS threats are being used in increasingly novel and effective ways on the battlefield every day. They are also becoming much more widely available and capable in terms of speed, payload capacity, and evasive operational maneuverability.

As the LIDS team worked to restart radar production, reduce production lead times, and increase capacity there were numerous challenges within the supply base that had to be mitigated to ensure customer deliverable schedules could be met or exceeded. This mitigation needed to be executed in the face of dynamic US military budgeting priorities. There are also varying customer priorities that are evolving with the threat set that must be coalesced into a coherent contractual path forward to ensure as many desired capabilities can be provided as possible. Examples of these include but are not limited to dealing with obsolescence issues, delivery “no-fits”, procuring tooling and test equipment to enable capacity increases, and ensuring the real-world performance of the fielded systems was analyzed quickly and improvement opportunities identified to enable even more effective threat mitigation.

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

The most critical area of volatility and complexity that must be addressed to ensure program success is the ever evolving and expanding UAS threat set. In order to accomplish this, the LIDS team is continuously monitoring and reviewing OCONUS engagement information with our US Army customer and their Joint Analysis Team. This requires constant, real-time, information sharing and communication along with innovative and rapid solution development and fielding. This rapid fielding is enabled by a consistent and recurring test program that allows for accelerated cut in of system upgrades. These upgrades include both hardware and software changes that are robustly tested to ensure requirements compliance and threat mitigation effectiveness before being deployed to the field. Our FSRs work in close collaboration with the base commanders and military personnel to coordinate this upgrade fielding with our customer and end-users.





*Figure 2: Coyote Block 2 Missile Launch*

One methodology used to help address these challenges was to utilize an Agile approach to software development. Agile software development is an iterative and incremental approach that emphasizes the importance of delivering a working product quickly and frequently. It involves close collaboration between the development team and the customer. This Agile approach is a key enabler in getting critical product improvements to the User as quickly as possible.

Another challenge was to meet the increased demand for Coyote and KuRFS products. The LIDS supply base required expansion and support from Raytheon to mitigate obsolescence or lead time issues as they arose. The team used Critical Chain Management techniques to identify constraints in our procurement and build process and then worked closely with our suppliers to mitigate those issues. This is an interactive and evolving process that requires a keen understanding of potential alternative parts, areas of potential specification relief, and insight into second/third sources of supply. Raytheon uses its' Supplier Rating System (SRS) to continuously score and grade suppliers which enables quick turn second source identification. This SRS approach assesses lead times, capacity, capability, supplier risk, unit costs, and past performance to compile an aggregate rating to ensure Raytheon uses the best suppliers for each element of the program.

In addition to second and third sourcing techniques using the SRS system, the LIDS team works closely with our suppliers to understand any constraints (test equipment, special tooling, sub-suppliers, etc.) they are facing. This is done through regular, weekly engagements with key suppliers where their feedback is provided to our Engineering, Quality, and Operations teams so alternate parts can be identified that meet performance specifications. Additionally, the LIDS team uses this regular supplier feedback to identify areas of purchase order specification relief that could help address the constraint and still meet system performance requirements. A collateral benefit of this highly integrated approach with our supply base is that we provide them with a longer-term view of product demand forecasts which they, in turn, use to prioritize their own internal investments; a true “systems” view and approach to supplier management.

Another challenge was having some items on our product bill-of-material that had lead-times well outside our need dates. In many of these instances, we worked quickly and collaboratively with our engineers, supply chain, and suppliers to identify alternate parts to mitigate potential delivery risks. Specifically, on the Coyote missile, we worked closely with our CCA supplier who, at the time of the proposal, had by far the longest lead time and as such were driving the overall build schedule. By identifying alternate CCA components that still met the performance requirements, the supplier was able to accelerate their deliveries for multiple contracts which enabled a multi-month acceleration of missile deliveries that were critically needed for OCONUS operations while also closing a 3-month gap in production between two programs.

Another area of constraint in the supply base that needed to be mitigated was multiple, conflicting demands on the same supplier from different Raytheon programs. In this scenario, the LIDS team worked with the supplier to identify the other conflicting programs and then collaborated with those internal program managers to identify a solution and program-specific prioritized delivery schedule that supported the numerous contractual delivery requirements.

One more significant area of volatility and uncertainty involves US budgets and the allocation to and within the Department of Defense (DoD). Over the past few years, there have been numerous competing priorities within the US budgets and the amount provided to the DoD is then further distributed between the various military branches. In order to support our customer in the face of this dynamic budgeting environment, the LIDS team provided numerous Rough Order of Magnitude (ROM) cost estimates of varying production quantities and Non-Recurring Engineering (NRE) activities. These ROMs are then used by the government to support what-if budgetary assessments and allocations. Once budgets become firm and the Request for Proposal (RFP) is released, the LIDS team works to complete the associated proposal activity as soon as possible so that funds can be obligated and not re-allocated to other competing priorities.

The LIDS team addressed each of the challenging examples above by utilizing a disciplined set of program management processes. Examples of these include effective Management Reserve (MR) funding oversight, a robust Risk and Opportunity (R&O) management process, leveraging Earned Value (EV) tools to help identify any emerging program execution issues, and performing regular Estimates at Completion (EAC) activities to ensure our internal leadership and external customer has good visibility to program financial status. By having a continuous, detailed understanding of the overall program financial status the LIDS team was able to adapt to evolving customer requests and execute additional tasking to maximize the value the customer receives through contract execution.

Given the challenge and importance of product performance in the field, we worked with our life-cycle and logistics subject matter experts to analyze our product bills-of-material and utilize Failure Mode Effects and Criticality Analysis (FMECA) and part reliability predictions to develop a robust sparing strategy. This sparing methodology was partnered with our customer and resulted in timely ordering of critical spare parts being available to help improve field availability.

## **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 yesterday'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 table below shows a subset of the predictive metrics used to execute the portfolio of LIDS contracts. This table highlights some of the most critical and predictive metrics used by the LIDS team.

Metric Name	Description	Goal Value	Review Frequency	Review Forum
Drawing Burndown	Quantity of drawing releases to be completed each month	Drawing burndown needs to meet or exceed purchase order release plan	Weekly	Program Execution Reviews
Line of Balance	Forecasted inventory on hand for upcoming production builds	Greater than zero for all months where production builds occur	Weekly	Program Execution Reviews
OR	Measures system uptime in a deployed environment as compared to it's desired operational tempo	90% - 95%	Monthly	Program Execution Reviews
tCPI	Assessment of future productivity needed to meet the Estimate at Complete (EAC) cost	Less than .1 above or below ITD CPI	Quarterly	EAC Reviews
Story Points	Estimated effort to complete a software development task	Sprints should complete all planned story points	Sprint conclusion and monthly	Program Execution Reviews

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

Performance against each metric varies by program and becomes more relevant at different stages of the product development lifecycle. The true value of these predictive metrics is in the issues that are flagged and subsequently resolved as part of the program review cadence. In general Drawing Burndown, Line of Balance (LOB), and agile software Story Points all performed as expected as evidenced by the schedule acceleration noted throughout this paper.

Operational Readiness (OR) is a metric that the LIDS program is particularly proud of given high average value of that metric with over 1.8 million operational hours on some of our KuRFS radars. Given the criticality of the mission, the KuRFS radar was designed to be highly reliable in challenging environments (high heat, sandstorms, dust, etc.). That inherent reliability is then augmented with FSRs who are stationed near LIDS that can quickly isolate and repair a failure in the field using existing government owned spares.

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

Drawing burndown is a great example of using metrics to proactively drive behavior with the true goal of the metric to inform supply chain when they can plan to release Purchase Orders (POs). If everything is on track, POs are cut as planned and fit into our build schedule per Raytheon's Material Resource Planning (MRP) tool. If there is an unfavorable disconnect between drawing release outlook and the PO release need date, there are a few different mitigation approaches that Raytheon utilizes. Given our close working relationship with the suppliers we will send them a redlined or engineering released drawing package so the vendor can start to understand the requirements and their associated readiness and ability to make the part. Alternatively, Raytheon uses Letter Subcontracts (LSC) to get a supplier started early with material procurement while the final requirements or PO Terms and Conditions (T&Cs) are agreed to.

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LOB is another key predictive metric that was used regularly to accelerate Coyote builds and ensure KuRFS builds stayed on track. As POs are placed and the lead times get locked into our MRP tool, the system then projects inventory levels for each piece of the build and anything that goes negative then drives mitigation activities to bring that part back in line with the build schedule. Examples of unfavorable LOB metrics that were mitigated included seekers, rocket motors, and various radar subcomponents.

To-complete Cost Performance Index (tCPI) is used to predict EAC reasonableness, risk and opportunity. If tCPI is more than .1 above or below cumulative CPI it is an indicator that the cost projections may be too favorable or pessimistic which then triggers leadership and the team to discuss the associated details to ensure the EAC is as accurate and predictable as possible. Accurate EACs are important from a compliance perspective but also in working with our USG customer to provide them with the best information during execution to help them improve their own budget request accuracy as well. If the EAC shows that there may be funding remaining after all the existing contractual commitments are satisfied, there is an opportunity to support additional tasking and it is critical to have an accurate understanding of that financial picture when having discussions with the customer.

No single metric is adequate to use on the complex set of products and contracts that comprise the LIDS portfolio. During our program start-up for a specific contract, the LIDS Team assesses the work scope for each contract and then identifies the most relevant metrics to be used during the program execution. Then, again using our Product Line portfolio approach, we also identify additional metrics to be used to ensure we account for the broader aspects of a portfolio-based system with critical real-world fielding implications.