AVIATION WEEK
PROGRAM EXCELLENCE AWARDS

(This section must be signed)

Individuals **outside your company**, including the companies listed above and other third parties, potentially including your competitors and others in your industry, may receive and/or review award submissions. All information submitted should address the program's management, leadership, and processes in a manner that you are comfortable sharing with third parties freely and without restriction, and may not include any classified or proprietary information or materials. Do not include any materials marked Confidential or Proprietary or bearing any similar legend. All responses and other submissions, whether in whole or in part ("Submissions"), shall be deemed not to be confidential, proprietary, and/or nonpublic information of any sort for any purpose.

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Thank you for participating,

Gregory Hamilton
President
Aviation Week Network

Acknowledged, agreed, and submitted by

Michal J Mills
_____ 6/27/2025_____
Nominee's Signature Date

Nominee's Name (please print): Michael J. Mills (Mike) _____

Title (please print): LTAMDS/GhostEye Executive Director _____

Company (please print): Raytheon _____

NOMINATION FORM

Name of Program: Lower Tier Air and Missile Defense Sensor (LTAMDS) Urgent Material Release (UMR)

Name of Program Leader: Michael J. Mills (Mike)

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☒ Customer Approved

- Date: 6/27/2025
- Customer Contact (name/title/organization/phone): COL Jonathan A. Bodenhamer / Project Manager / Search, Track, Acquire, Radiate, Eliminate (STARE) / 256-955-3240

☐ 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?

In conjunction with the U.S. Army, Raytheon took the Lower Tier Air and Missile Defense Sensor (LTAMDS) transformational capability from the initial Urgent Material Release (UMR) prototype contract award to production in under five years. This timeline is unparalleled for a Department of Defense (DoD) development program of this scale and importance. LTAMDS offers capability to counter advanced, evolving threats—terminal ballistic missiles, terminal hypersonic glide vehicles, cruise missiles, and unmanned aircraft systems. The radar provides 360º full-volume coverage and utilizes the latest Active Electronically Scanned Array (AESA) technology.

This team experienced early execution challenges resulting from the program's aggressive timeline, but they persevered. The first radar went to White Sands Missile Range (WSMR) in February 2022 to begin integration and testing but experienced several system performance challenges. In response, the team created an innovative, capability-based integration and test program focusing first on demonstrating primary (front) array performance and control of the Patriot Advanced Capability 3 (PAC-3) missile, then extending that performance across all three arrays and including the PAC-2 missile. By the end of 2024, LTAMDS achieved dozens of search/track and ground tests, more than 1,000 hours of live radiation, and seven missile flight tests (Figure 1) demonstrating extraordinary sensor performance.

This program falls under the OEM System Design and Development category because it is the first LTAMDS contract in what we anticipate will be several decades of service. The Patriot® air and missile defense system just celebrated 60 years and is used by 19 nations. LTAMDS represents the next generation of Patriot and is expected to follow a similar trajectory. Raytheon was awarded the LTAMDS UMR contract in October 2019 to design, deliver, and test six prototype radars. We completed all of these objectives by the end of 2024 and signed year one of the production contract in July 2024 to produce eight sensors. In February 2025, the Army granted Milestone C, which advances LTAMDS into the Initial Operational Test and Evaluation phase and establishes it as an official Army program of record.

- *The U.S. Army's extensive WSMR test program was key to demonstrating LTAMDS' maturity.*

Major U.S. Army LTAMDS Test Events at WSMR

- Nov '23: Intercepts Cruise Missile (CM) with PAC-3
- Dec '23: Intercepts Tactical Ballistic Missile (TBM) with PAC-3
- Mar '24: Intercepts long range CM with PAC-3
- Nov '24: Intercepts black dagger TBM with PAC-3
- Dec '24: Operational Assessment (OA), intercepts CM with PAC-3
- Dec '24: OA back-to-back intercept of TBM with PAC-3
- Feb '25: Intercepts CM with PAC-2 at WSMR

Figure 1: LTAMDS UMR Radar (left) and PAC-2 Missile Launch (right) at WSMR

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**

Raytheon's combat-proven Patriot® air and missile defense systems has been the global leader for lower tier integrated air and missile defense capability for more than 60 years. As a franchise program and world leading capability, Raytheon has delivered more than 250 fire units to 19 partner nations comprised of one sensor, one command and control (C2) unit and multiple launchers with missiles. Critical to the success of Patriot is its technologically advanced sensing capability that has been continually improved to enable the system to provide threat overmatch.

LTAMDS provides a quantum leap in sensing capability and is the clear future of air and missile defense sensing for the U.S. Army and allied nations. As a U.S. Army program of record, the LTAMDS fielding strategy is a block replacement for 16 U.S. Patriot battalions' current AN/MPQ-65 (Configuration 3+) radar consisting of 94 sensors over a 12-year period and having a contract value of greater than $13B across the life of the program.

International interest is robust, as 13 international countries have already formally expressed interest in LTAMDS to the U.S. government. In the near-term, international demand for LTAMDS indicates greater than 20 sensors, which grows to more than 80 sensors as the market matures. This international demand has a market value exceeding $27B. In 2023, Poland signed a Letter of Acceptance to become the first international LTAMDS customer.

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

LTAMDS (Figure 2) can counter complex 360-degree attacks comprising a diverse set of threats and in extremely large numbers. This includes low-cost drones mixed with high-speed cruise missiles and ballistic missiles, as well as hostile aircraft launching long-range strike weapons.

- *LTAMDS can counter complex 360-degree attacks.*

Figure 2: LTAMDS UMR Radar at Pelham, NH Test Site

Current operational requirements, coupled with modernization, continue to place significant stress on the U.S. Air and Missile Defense (AMD) forces. Core findings from a U.S. Army analysis on the health of the AMD force (Air Defense Artillery – Health of Force Assessment, 15 April 2021) was that excessive operational tempo and lower deploy-to-dwell rates (amount of time at home station versus on deployment), places these units at high risk, resulting in a loss of trust by AMD soldiers and families. After careful analysis and evaluation, LTAMDS became the centerpiece of the response by addressing system operational readiness rates and defense capability.

LTAMDS was designed to ensure sustainment requirements were met or exceeded. The intent is to provide a significant increase in mean time between failure, coupled with an improvement in mean time to repair. This provides the U.S. Army an opportunity to curtail the logistical footprint needed to sustain AMD forces, thus reducing the stress on those forces.

The ability of a system to deter, defend, and/or defeat adversarial AMD threats directly impacts the system and personnel deployment requirements. For instance, for current AMD forces to conduct 360° lower-tier AMD, it requires the emplacement of multiple weapon systems. In turn, each of these systems must be manned with personnel and provided with the associated logistics and sustainment support. This presents the AMD forces an operational challenge which LTAMDS addresses. LTAMDS provides a greatly increased battlespace versus current lower-tier AMD radars as well as the capability to conduct 360°AMD with a single sensor. This combination of revolutionary sensing capabilities enables the U.S. Army to reduce the number of weapon systems and associated personnel needed to provide more protection to its critical assets.

Lastly, Foreign Military Sales (FMS) of LTAMDS empowers U.S. partners and allies to build organic capacity, better defend their own sovereign territory and be more effective in U.S. global coalition AMD operations. This paradigm shift results in a decrease in the demand for U.S. AMD forces to provide this defense, ultimately reducing the stress on the forces at large, and aligns with U.S. State Department goals. Noted above is the strong ratio of FMS-to-Domestic LTAMDS acquisitions. This ratio, along with the sheer volume of global radar acquisitions, provides significant FMS lift and economies of scale to the U.S. Armed Forces and the U.S. taxpayer, meaning that the U.S. can acquire LTAMDS at a lower price than it could without FMS bundling.

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

Innovation, adaptability and commitment have been the lynchpin for the success of the LTAMDS team since its inception. The team has implemented this skill set to achieve prototype to production in less than five years. Through the design and production of six rapid protype units in unprecedented time, the LTAMDS team was able to adapt and innovate to overcome seemingly insurmountable obstacles,

including significantly reduced schedules, in parallel design and material procurement, and a highly aggressive test program.

Establishing the design and production process from the ground up provided both challenges and unique opportunities for growth across the team. Establishing an incremental capability development approach enabled the team to align their efforts to customer needs and then build upon those as the product and processes matured. This approach resulted in the completion of system level testing and multiple successful flight tests, each of which gave the team a real sense of pride because a missile intercept is a true visual representation of their hard work producing results. The team remained focused on the need to rapidly deploy this technology to the warfighter and worked collaboratively with the U.S. Army customer community to achieve enhanced performance relative to existing deployed systems.

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

The demand for AMD capabilities has grown exponentially over the last 20 years, as both state and non-state actors have taken to the world stage with significant advancements in threat capabilities and complexities. For instance, in September 2019, Saudi Arabia's oil industry was targeted in a coordinated attack of unmanned aerial systems and tactical ballistic missiles that crippled the Abqaiq oil processing facility and the Khurais oil field. The attack resulted in a temporary disruption of 5.7 million barrels per day of oil production, representing over half of Saudi Arabia's output and 5% of global supply. The attack had a significant impact on global oil markets, causing a spike in prices.

As another example, in April 2024, Iran launched its first direct attack on Israel and its allies utilizing excessive numbers of loitering munitions, cruise missiles, and ballistic missiles in what Iran termed "Operation True Promise". Later that year, in October, Iran launched another large-scale missile attack on Israel, which was largely intercepted by Israeli defenses with assistance from allies.

The United States and its allies rely on a credible capability to deter (and where necessary – defeat) continued aggressions. LTAMDS will add to the combat credibility of the AMD forces by providing a significantly extended surveillance volume and fire control across a 360° battlespace; enabling the U.S. and its allies to stay ahead of these evolving threats and increase the global security and stability posture.

Perhaps the greatest opportunity to capitalize on the unparalleled capability provided by LTAMDS is its critical role in the near future. Although conceived and designed well before the Golden Dome program, the DoD, the U.S. Army, Raytheon, its partners and suppliers designed, developed and built what could be the sensor to protect the homeland and make Golden Dome a success. Furthermore, based on the success of the UMR program, LTAMDS is being issued for transformation in contact in the 4th quarter of Fiscal Year 2025, significantly ahead of plan, to demonstrate its capability in real world conflicts. And based on Patriot's proven utility in the Ukrainian conflict, LTAMDS will be a key differentiator in future conflicts of this nature.

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 UMR contract required the team to simultaneously execute a complex development and test program as well as concurrently produce six LTAMDS Radar Prototype Units (RPUs) (Figure 3) in an accelerated timeline. Due to the overlapping nature, the team had to be creative with fast-tracking capability release on tactical hardware. Prior to the contract award, Raytheon had built a capital asset for the pre-award competition phase known as "Radar 0." The team resurged and upgraded this asset to be specifically dedicated to reducing development risk. One of the major technical concerns on the program was system stability and soldier usability. Soldier usability was of particular importance as one of the culminating test events was a missile flight test executed by the U.S. Army.

Radar 0 was solely devoted to maturation of system initialization including array control and specific soldier usability functions. Isolating the thread allowed for dedicated time to methodically define concept of operations, as well as diagnose issues by piloting network configuration changes and vendor patches

- *LTAMDS achieved Milestone C to proceed to production and deployment due to testing success.*

Figure 3: Notional LTAMDS UMR Radar with PAC-2 Missiles

prior to tactical deployment to both fast-track learning and decrease radar downtime on the test program. Usability made exceptional progress on soldier tasking by more than doubling the level of automation from the first new equipment training class to the next event six months later. Radar 0 was also used as an asset for field service representatives to dry run their curriculum prior to soldier engagement.

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

Quick and clear communication was a theme throughout the execution of this contract. Internally, Raytheon implemented a weekly Roadblocks Review meeting with the business president and his cross functional leadership, enabling direct communication and feedback with the program execution team. The team brought any challenges directly to leadership for quick and efficient adjudication. These meetings were extremely effective as action was taken quickly on numerous topics including accelerating staffing, increasing capital funding and tailoring process to ensure continued progress in a critical chain focused approach.

Externally, the team proactively established a communication cadence with U.S. Army leadership and developed meaningful metrics to measure success. This enabled them to pivot direction as needed, partnering on adjustments such as shifting test events, adding radar assets, and augmenting integration blocks at White Sands Missile Range (WSMR). After the initial failed WSMR test, they briefed the Assistant Secretary of the Army for Acquisitions, Logistics, and Technology (ASA (ALT)) deputy at the Pentagon regularly on accomplishments, challenges, and resolutions. The continuous connection and transparency helped gain confidence and trust that LTAMDS could achieve Milestone C required capability.

Beyond communication, training the larger team was a primary focus on our LTAMDS UMR leadership team. One of the major staffing challenges was deploying experienced engineers over the extended duration of the test program executed at WMSR in New Mexico because the team was largely based out of Massachusetts and New Hampshire. To address this risk, we created a radar operator, analyst and integrator pipeline with a 45-day duration, where new and inexperienced members would train at the LTAMDS facility in Pelham, New Hampshire during first shift. As they built their knowledge and experience, they were moved to second shift at the same facility as a competency test where they operated with little to no guidance. Once passing this, they were sent out to WSMR for a duration ranging from two weeks to three months. Upon return they were assigned to Pelham to support pipeline training. This rotation not only allowed for experienced bench strength and higher confidence in the test team but also inserted a feedback loop where the returning members could bring back lessons learned for the upcoming waves. The program worked so well that it continues (at a lesser scale) through today.

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

Overall, we utilized a thoughtful, strategic process to choosing suppliers who could not only deliver product, but work with us in a non-traditional, dynamic environment. We minimized quality notes for faster procurement, bought non-military standard parts to expedite prototype builds and get to testing faster, and held multiple supplier days to ensure they understood the long-term business opportunity and were incentivized to invest their own capital. If the schedule was pushed out, we would hold reverse planning exercises to get back in the box.

Our backend processing supplier leveraged existing designs to build off of and modify their products to meet our technical specifications. This enabled highly complex product delivery from 2022 to 2024 to

support the UMR radar delivery schedule. In the design phase, our power system supplier was able to double their voltage to address the changing requirements of the system and enable on time delivery.

Our maintainer monitoring module supplier, who builds ruggedized laptop systems for radar operators, worked collaboratively with us on parallel design, procurement and build of the kits. This included multiple iterations of design changes for urgent needs in our factory, and shipping partial kits as needed to support test and integration in Andover. They then shipped the balance once the full kit designs were released, procured, and built.

Multiple suppliers, for items such as cables and power distribution units, expedited their builds due to designs being released throughout the radar build phase. Since we had to design and build in parallel due to the schedule, we placed purchase orders for parts as soon as they were released and then worked with our suppliers to expedite partial builds to support the first radars. In the later phases of the program, as we were finishing builds, suppliers came through with extra parts needed when material on the floor was scrapped, like gap pads, due to there being no builds directly behind UMR.

Suppliers worked collaboratively with supply chain and engineering on design changes needed to make parts manufacturable and meet specifications. Examples include our slat brazement design, the radiating element design, the RF beamformer design and build to specification, cable suppliers on about 200 unique cables, and several updates needed on the pump to support the cooling system. Finally, suppliers came to Raytheon to assist in trouble shooting issues and repairing parts, addressing hardware, software and firmware issues in real time.

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.)**

The LTAMDS program faced incredibly unique challenges in the development of this new AESA radar -- technology that had never been demonstrated or delivered as complete radars at the unprecedented pace outlined in the UMR other transaction authority contract. LTAMDS is designed to combat the world's evolving threats, provide the advanced capabilities of 360-degree surveillance, increase threat detection ranges, and allow soldiers the ability to "stay in an extended fight" with increased reliability. The first primary (front) array was completed at the end of 2021, just two years after the 2019 UMR contract award. The first LTAMDS radar was delivered in early 2022 for testing at WSMR.

Although the first radar completed factory acceptance and both near and far field range testing, the performance results at WSMR in 2022 fell short of expectations. The complexity of the new technology and rapid speed of integrating both hardware and software were driving uncertain results. This required a strong partnership between Raytheon and the U.S. government to partner on agile contracting methods, such as the use of Pre-Planned Product Improvement contracts and incremental funding to achieve the objectives that delivered LTAMDS as a DoD Program of Record. Although the middle tier acquisition process with UMR intended to be a 'new' approach to accelerate capability maturation and delivery to the warfighters, another significant challenge was balancing the right level of management of such a critical program to enable success at the speed of relevance.

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

- *LTAMDS uses a system of systems approach, working with the PAC-2 and PAC-3 missiles and IBCS command and control.*

Figure 4: PAC-2 Missile Launch

To address the radar's technical performance issues, the program brought on new engineering leadership with extensive execution experience, strong technical leadership and communication skills, and the ability to rebuild customer relationships. The engineering team restructured Contract Test Events (CTE) to implement a phased, capability-based integration and test program, where the first stroke concentrated on primary array capability and the PAC-3 missiles, and the second iteration extended to 360-degree operations and included the PAC-2 missile (Figure 4). They regrouped more than 200 multi-disciplined engineers across geographically diverse sites into focused mission thread teams, assigned leads, developed the technical backlog to align with customer priorities, and implemented an agile tool set, Jira, to track progress and highlight blockers. Each thread lead owned a critical capability, such as tactical ballistic missile threat engagement or electronic protection. In the simplest sense, the thread leads were empowered to lead their teams to break down the requirements in a design–test–fix–test–approve Agile approach. The Agile process engaged a tightly knit team of systems engineers (requirements), software engineers (coding), and integration / test teammates working closely to deliver software updates for resolution of capability issues seen in the field. They hosted daily deep dives with the customer on the Software Trouble Report (STR) backlog to prioritize all defects in 2022 and 2023 after the initial failed WSMR testing. As a direct result of this effort, in three months the active Radar Frequency operation time improved by approximately 50 times.

Early LTAMDS issues in hardware design and workmanship were discovered in the 2022 prototypes and a direct result of the volatility of managing design, integration, and prototype builds in parallel. Although lessons learned from "similar to" designs were utilized, the early build processes were all new and issues were exposed in the rough terrain of WSMR. These issues were addressed through Raytheon's Customer Oriented Results and Excellence (CORE) or Lean / Six Sigma processes where tools such as Fault Tree analyses quickly isolated the root cause of problems and corrective actions including Lean Poka Yoke were used to error-proof designs for future builds. These early prototype learnings would be critical for application in transition to production and low-rate initial production contracts.

The complexities of the LTAMDS program were unique and immense at many programmatic levels. Beyond the complexities of the newest radar technology, program success depended heavily on steadfast leadership and collaboration of teammates that were both competitors and partners. Lockheed Martin provided the PAC-3 missiles, Northrop Grumman led the IBCS Command and Control, and Raytheon provided the LTAMDS radar and PAC-2 missiles. While both Lockheed Martin and Northrop Grumman

competed with Raytheon on the LTAMDS UMR contract in 2019, all three key companies had to work together effectively as a successful System of Systems. In the early phases, the three major defense contractors were assembled together, but lacked a clear lead for the System of Systems, highlighting another complexity challenge of the LTAMDS program. In collaboration with PEO Missiles & Space, the LTAMDS program uniquely demonstrated that business competitors could share in the same vision of success and the purpose to deliver a powerful new capability to the warfighter and allied nations for a safer world. This was accomplished through commitment at the business president levels of all three companies alongside their customers.

Upon completion, the restructured contractor test and government test (developmental test and operational assessment) achieved ground-breaking results:

- Seven successful missile flight tests
    - Includes successful Operational Assessment tests where soldiers operated LTAMDS and demonstrated for a first-time back-to-back missile flight tests that successfully engaged two different complex threats.
- Over 30 Search/Track (S/T) or Ground-to-Ground/Air events (G-G/A)
- Over 2,000 hours of WSMR radiation time
- Initial / preliminary mobility and environmental hardware qualification
- Development and DD-250 of six radars

On February 24, 2025, the Army System Acquisition Review Council (ASARC) review of detailed reports on the capabilities and limitations of the system under test resulted in LTAMDS achieving Milestone C. Despite the challenges, LTAMDS was still able to meet the Milestone C date and proceed into the production and deployment phase.

In many ways the tremendous technical and programmatic successes in development culminates in what is demonstrated and proven on the test field. The LTAMDS program's strong performance was recognized by the Chief of Staff of the Army who then directed LTAMDS to execute to the Army's Transformation in Contact approach by issuing two LTAMDS sensors into the field by the 4th quarter of Fiscal Year 2025 to accelerate soldier learning and feedback. Finally, among the program's many firsts and accomplishments, LTAMDS achieved the critical Milestone C with the approval of the acquisition decision memorandum on April 17, 2025.

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 team monitored predictive metrics throughout UMR development and production. During development, integration progress was tracked at bi-weekly internal reviews where Software, Systems, and Integration & Test metrics provided early indication of test event readiness. These predictive metrics highlighted productivity roadblocks and enabled accurate forecasting of capability deployment via software builds. The 2023 to 2024 test schedule fully utilized each radar built during UMR, and new

- *Production Cost of Rework and Scrap metrics enabled issue resolution and continuous improvement.*

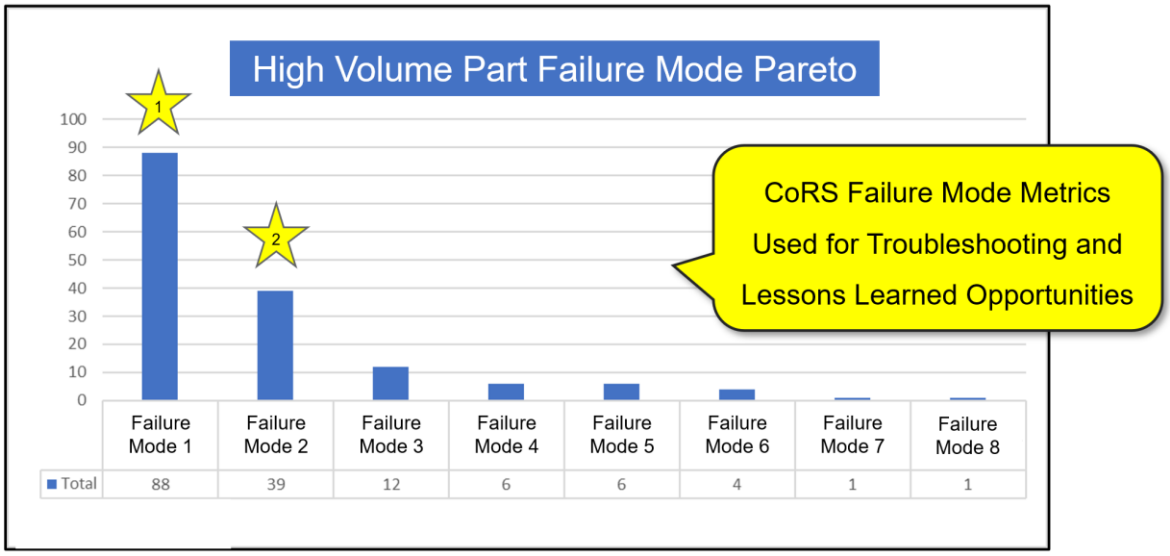

Figure 5: Failure Mode Analysis

software builds were routinely deployed to meet capabilities for each progressive stage of test: contractor verification testing, system qualification, developmental test and evaluation, culminating with seven missile flight tests. Below are the integration cross-functional metrics monitored by the team:

- **Software Troubleshoot Reports** (**STR**) – Software development / issue resolution tracking
- **Systems Investigation Reports** (**IR-SYS**) – System requirements issue tracking
- Integration & Test (I&T) **Knowledge Points** (**KP**) – Overall capability integration burndown

During production, a **Cost of Rework and Scrap (CoRS)** cadence was established by the quality team to track high volume line replaceable unit percent completes, yields, and fault monitoring (failure mode analysis, Figure 5). This data continues to enable real-time analysis and troubleshooting of parts through production and provides opportunities for continuous improvement. The CoRS cadence remains an integral part of production as the team moves into LRIP.

Throughout development and production, **Schedule Risk Assessments** (SRAs) were also conducted regularly. SRAs are Monte Carlo simulations run on program schedule data and provide quantified insights on potential schedule risks.

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

Monitoring integration metrics provided the program thread leads data to help inform requirement prioritization and test event planning with their STARE customer counterparts. Agreement was reached on less critical requirements which were moved into a backlog annex for future development. This iterative approach with U.S. Government partners was informed by the tracking of IR, STR, & KP predictive metrics (Figure 6). Through close partnering with STARE on requirements and capability progress, the team effectively mitigated testing roadblocks and ultimately met the residual operating capability by the end of UMR.

Tracking production and CoRS quality metrics, along with mitigiation of schedule risks informed by SRA data helped the team complete production of six radars on time and in support of test events across the country.

- *Knowledge Point burndown enabled Raytheon & USG partnering on performance expetations.*

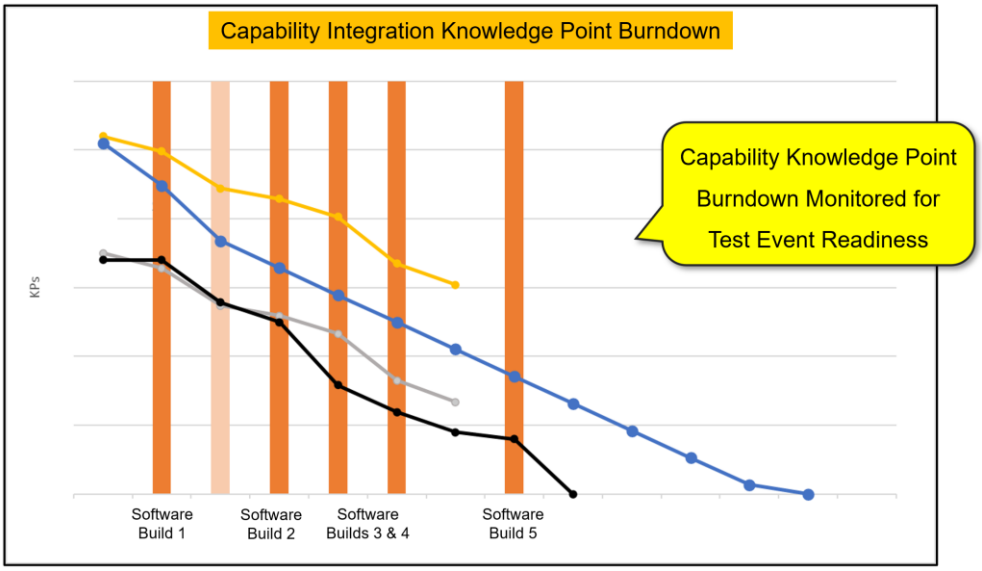

Figure 6: Capability Integration Knowledge Point Burndown

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

Example 1 - Monitoring integration metrics improved predictability during challenging test phase
During 2024, the program progressed into the second phase of CTE where novel, 360-degree sensing capabilities were integrated into the LTAMDS radar (using both the primary and secondary arrays in tandem). Leading up to this test phase, the Software and Systems productivity metrics stablized at <45hrs/STR (software) and <80hrs/IR (systems engineering). This consistent productivity helped the integration & test team reliably forecast KP capability burndown leading up to software build drops. Integrating the 360-degree sensing capabilities during CTE was crucial for ultimately achieving the residual operating capabilities on UMR.

Example 2 – SRA results used to quantify and reduce schedule risk on radars 7 & 8
During production of radars 7 & 8, SRA analyses were regularly refreshed to identify tasks driving the program critical path. During a particularly challenging stretch of high volume Line Replaceable Unit (LRU) production, SRA results were showing a potential schedule risk on the program of 4+ months. With further analysis, the team identified specific production LRUs on the critical path to target for schedule mitigation activities. In collaboration with Raytheon continuous improvement framework – CORE (similar to Lean Six Sigma), production value streams held workshops to streamline the builds and remove roadblocks. As a result of this planning, the 4-month schedule risk was mitigated down to an overall impact of about 1-month.

Example 3 – CoRS lessons learned data used to identify potential opportunities for cost reduction
An additional benefit of the CoRS data recorded during production of radars one through eight is the tracking of lessons learned. These lessons learned are currently being harvested for potential cost reduction opportunties on upcoming programs. Examples of these lessons learned include specific manufacturing improvments (e.g. additional fixturing, design improvements, etc.) along with potential factories to target for design for manufacturing and assembly improvement workshops.