AVIATION WEEK
PROGRAM EXCELLENCE AWARDS

(This section must be signed)

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Thank you for participating,

Gregory Hamilton
President
Aviation Week Network

Acknowledged, agreed, and submitted by

_____ 5/20/25
Nominee's Signature Date

Nominee's Name (please print): Joseph DiCesare _____

Title (please print): Sr. Director, Upper Tier Missile Defense _____

Company (please print): Raytheon

NOMINATION FORM

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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.

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 THAAD Radar Virtual Trainer (TRVT) Development Team set out with a bold vision: to revolutionize warfighter training through an innovative, adaptable, and cost-effective virtual solution. By harnessing advanced virtual reality (VR) technology, the team aimed to overcome the limitations of conventional hardware mock-ups and classroom-based methods, enabling immersive training that is both agile and scalable. Operating under strict budget and schedule constraints, TRVT achieved an 80% reduction in training costs while significantly enhancing training effectiveness and accessibility.

TRVT provides 3D immersive operational and maintenance software training modules, also known as Interactive Media Instructions (IMIs) via a simulated THAAD environment. It supports an integrated radar hardware and software training operation, maintenance, and remove/replace training for major components of the THAAD Radar system. The simulation is run on portable commercial off-the-shelf (COTS) computer workstations with touchscreens and Virtual Reality (VR) interfaces. TRVT also incorporates Integrated Electronic Technical Manuals (IETM) access, a Learning Management System (LMS), for real-time scoring and instructor tools for oversight and control – ensuring comprehensive and measurable training outcomes.

Through close collaboration with the USG acquisition customer and end-users, the TRVT team delivered a forward-looking sustainable solution that aligns with evolving mission needs and readiness goals. It provides the end-user with long-term cost-effectiveness and has received overwhelmingly positive feedback, positioning it as the new standard and model for future THAAD Radar training across the AN/TPY-2 community. TRVT exemplifies RTX's commitment to innovation, excellence in program management, and delivering superior training solutions for military applications.

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**

Previously, TPY-2 training relied on active/deployed radars or costly replica structures of Major End Items (MEIs), creating significant barriers for the customer and making Raytheon a less attractive training provider—despite having the subject matter expertise. Additionally, diverting MEIs from the production line for training purposes caused delays in delivering fielded radars, impacting operational readiness.

The development of the THAAD Radar Virtual Trainer (TRVT) fundamentally changed the training dynamic. This allowed production capacity to stay focused on fielded radars while positioning Raytheon as a cost-effective, technically advanced training provider.

TRVT leveraged existing investments by building on the same UNREAL Engine platform used in the Patriot Radar Virtual Trainer. This strategic reuse reduced development time and cost while enhancing training consistency across systems.

Results were measurable and strategic:

- Enhanced Raytheon's competitiveness as a training provider
- Strengthened relationships with the U.S. Government and other global users, several of whom are looking to adopt TRVT

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

When a Foreign Military Sales (FMS) partner required a training solution for their newly acquired THAAD radars, this team delivered a modern, mission-ready alternative that met tight schedule, cost, and operational constraints. Traditional hardware-based training assets and mock-ups were not viable due to their high cost, long lead times, and logistical complexity. In response, the team proposed and developed the THAAD Radar Virtual Trainer (TRVT)—a flexible, immersive, and cost-effective virtual reality (VR) training system.

Working closely with the U.S. Government acquisition team and end-users, the team conducted trade studies that considered technical performance, lifecycle cost, schedule, and user requirements. The result was a best-value solution that reduced training costs by 80% compared to traditional methods while meeting all mission-readiness objectives.

Key benefits to the customer:

- **Rapid Deployment:** TRVT met urgent training timelines that hardware-based solutions could not.
- **Significant Cost Savings:** Delivered at 20% of the cost of legacy training systems.
- **Mobility and Flexibility:** TRVT can be used in both classroom and field settings, adapting to the customer's training environment.
- **Mission-Focused Preparation:** Soldiers can rehearse procedures ahead of scheduled maintenance, improving efficiency and reducing downtime.
- **User Familiarity:** The VR-based system leverages technologies familiar to today's soldiers, improving engagement and training effectiveness.
- **Sustainability:** Built using RTX IRAD and COTS components, the system is designed for long-term affordability and supportability.

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

Value to the Program Team

1. Meaningful, Modern Work

For many team members—particularly early-career professionals and new graduates—TRVT was their first chance to work on a project that bridged the gap between modern consumer technology and military application.

- Engineers didn't just build code—they built something soldiers rely on to perform in high-stakes missions.
- Team members reported that working on TRVT was the first time they felt their personal tech interests were fully aligned with their professional work.

2. Career Development & Skill Growth

Team members gained hands-on experience with Unreal Engine, VR systems, and immersive instructional design—skills that are both in high demand and rare in defense.

- This has made participants more competitive for future roles within and outside of RTX.
- Several engineers were able to take on technical leadership roles early due to the fast-paced, innovative nature of the project.

3. High Morale and Retention

TRVT became a talent magnet within Raytheon. Engineers, instructional designers, and systems architects sought opportunities to join the project because it represented a break from traditional, legacy development work.

- Result: Increased job satisfaction and internal mobility, contributing to higher retention in technical roles often at risk of attrition.

4. Personal Pride and Visibility

The TRVT team had the rare opportunity to work on a visible, high-impact product that earned praise directly from end users—including soldiers, government customers, and senior RTX leadership.

- Many team members described this as a "career highlight" and a "project that reminded them why they became engineers."

Quantified Benefits to the Team & Program

- 30–40% reduction in development time through software reuse and agile practices led by empowered, cross-functional teams.
- The project directly supported RTX's strategic goals in engineering modernization, workforce development, and customer alignment.

TRVT didn't just deliver a modern training solution—it created a modern development experience. It empowered individuals to innovate, lead, and make a tangible difference in the field, reinforcing Raytheon's commitment to mission success and meaningful careers.

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

1. Preserving Operational Readiness and Global Security
By enabling soldiers to train without taking fielded radars offline, TRVT ensures that our critical missile defense systems remain fully operational and mission-ready at all times. This is vital for maintaining a strong defense posture and protecting civilians from evolving global threats. Training readiness without sacrificing system availability contributes directly to national and allied security - a benefit to all citizens who rely on these systems for protection.

2. Responsible Stewardship of Public Funds
TRVT provides a highly effective training capability at only 20% of the cost of traditional hardware-based methods. This not only makes advanced training more accessible - a win for service members, leadership, and every American taxpayer.

3. Enhancing Information Security
Traditional training on fielded radars can risk exposure of classified information to personnel without the appropriate clearance, due to mixed-access environments. TRVT eliminates this risk by using controlled, discipline-specific training modules that deliver only the information each user is cleared to receive. This protects sensitive technologies and operations, ensuring that national security secrets remain secure while still enabling high-quality training.

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 TRVT program embraced a forward-leaning digital strategy—merging Model-Based Systems Engineering (MBSE), Agile software development, and DevSecOps practices into a cohesive and traceable program management approach. This convergence of tools and systems enabled traditionally separate engineering and program management disciplines to align between planning, execution, and verification.

- **Azure Dev Ops (ADO) –** ADO served as the team's central platform for managing the entire software development lifecycle. Through ADO, we implemented Agile methodologies that supported:

  - Sprint and milestone planning
  - Daily task tracking and stand-ups
  - Incremental test execution
  - Real-time bug tracking and resolution

  ADO ensured visibility across a distributed team and helped maintain momentum during development, resulting in shorter feedback loops and better integration of user feedback. ADO

allowed program leaders to transition from static Gantt charts to living roadmaps—supporting proactive decision-making, efficient risk management, and clear communication across a distributed team of stakeholders.

- **Cameo Systems Modeler (MBSE) –** Cameo maintained a robust Model-Based Systems Engineering (MBSE) environment. It was leveraged beyond engineering and became a strategic program management tool. Cameo enabled:

  - Traceability of every capability, requirement, and test case back to customer outcomes
  - A shared reference model for hardware, software, and training content development
  - Data-driven decision-making across technical and programmatic domains - from high-level capabilities to end-user training procedures

  With Cameo, the TRVT team maintained a dynamic, single source of truth across the full lifecycle. It eliminated disconnects between planning and execution, reducing rework and accelerating approval cycles.

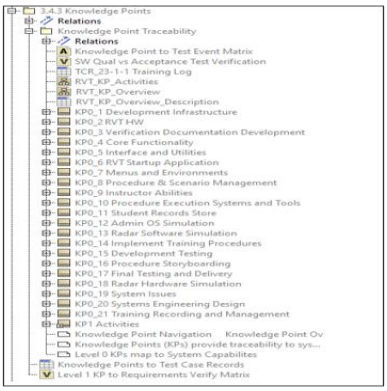
- **Knowledge Point (KP) Modeling in SysML –** The team developed a structured KP hierarchy to organize programmatic complexity and ensure end-to-end traceability:

  - **Level 0 KPs** mapped directly to system-level capabilities
  - **Level 1 KPs** decomposed capabilities into actionable requirements
  - **Level 2 KPs** aligned with detailed training procedures used by end-users

  This structure enabled crosswalks between engineering, instructional design, and test teams—allowing for continuous validation during Agile cycles and seamless transition into formal verification events.

Figure 1: RVT Knowledge Point Structure

The structure identified in Figure 1 enabled the team to seamlessly link test cases to requirements and learning objectives—facilitating both iterative Agile testing and formal verification.



Integrated V&V: Bridging Agile and Waterfall Capabilities

TRVT blended Agile and traditional Waterfall V&V practices:

- Development Testing was conducted incrementally during Agile sprints and documented via Test Case Records (TCRs) in Cameo
- Formal Verification followed a traditional model, anchored in Cameo, conducted via Software Qualification & Acceptance Testing, and documented through Test Data Records (TDRs)

This integration allowed the team to validate iteratively while still meeting formal compliance standards—a key advantage in defense acquisition environments.

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

The TRVT team redefined how large, distributed defense teams can operate—fusing Agile principles with disciplined program oversight to create a high-functioning, mission-focused organization.

Distributed Team, Unified Execution

Comprising internal staff and subcontractors spread across the U.S., the TRVT team overcame geographic barriers through rigorous virtual collaboration practices. Leaders instituted:

- 3-week sprint cadences across disciplines
- Daily standups at the tasking-group level
- Cross-functional sprint demos and retrospectives
- Sprint planning anchored in both technical and delivery goals

These practices fostered a sense of ownership, responsiveness, and transparency—turning a geographically dispersed team into a highly aligned delivery machine.

Model-Informed Decision Making

Program leaders used Cameo as a programmatic command center—not just an engineering tool. Requirements, testing outcomes, and user feedback were all captured and analyzed in one ecosystem, enabling:

- Evidence-based milestone reviews
- Accelerated risk mitigation
- Real-time traceability of delivery artifacts to contractual deliverables

This data-centric approach ensured alignment with customer expectations while enabling adaptive planning and prioritization.

Tools that Empowered People

Rather than layering tools for compliance, the TRVT program used tools to empower autonomy and accelerate insight. Developers, testers, instructional designers, and PMs all worked from a shared, transparent foundation. Cameo generated granular connectivity of requirements and customer deliverables, desired learning outcomes and user roles. Cameo provided traceability, enhanced accountability, and increased delivery velocity.

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

The TRVT team's supplier strategy exemplified smart, modular integration—leveraging industry innovation to amplify capability while reducing complexity and risk.

COTS Hardware: Leveraging the Best of Commercial Innovation

A key program decision was to rely on Commercial Off-The-Shelf (COTS) hardware—including gaming-grade VR systems and high-performance laptops. The COTS approach of proven

performance by consumer market innovation allowed for rapid procurement cycles and lower lifecycle cost. COTS hardware not only simplified logistics and spares management, but also aligned with user expectations—providing an intuitive interface for digital-native soldiers.

VR & Unreal Engine Experts: Purpose-Built Software Partnerships

To realize the immersive, high-fidelity environment at the heart of TRVT, the team partnered with industry specialists in VR and 3D training development. The team brought Unreal Engine expertise to the program, enabling rapid prototyping and real-time environment tuning. By treating suppliers as integrated teammates, rather than transactional vendors, the program was able to seamlessly integrate with RTX systems allowing for high responsiveness and technical alignment across the board.

Summary: Setting a New Standard in Program Management

The TRVT program succeeded not just by building innovative technology—but by executing with innovative management. Through integrated digital tools, a modern systems engineering backbone, agile delivery methods, and empowered supplier collaboration, the TRVT team delivered a transformative solution on time, on budget, and with measurable impact.

More than a training product, TRVT represents a future-forward blueprint for managing complexity, aligning stakeholders, and accelerating mission-ready outcomes in defense.

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.)**

Volatility: Business Transitions, Contract Shifts, and Organizational Change

The transition from an IRAD effort to a formally contracted Foreign Military Sales (FMS) program occurred during a period of significant corporate transformation. Mergers, divestitures, and shifting organizational ownership impacted every layer of the program, including tools, personnel, and reporting structures.

To maintain continuity, the program team:

- Maintained a digital thread from IRAD to FMS phases using Cameo and Azure DevOps, preserving decision history, technical rationale, and requirements traceability across changing ownership.
- Implemented a decentralized leadership model, empowering technical and program leads within functional teams to make timely, informed decisions in the absence of stable reporting structures.
- Established a living backlog and continuous sprint planning process to remain agile as contract scope and team composition evolved.

Uncertainty: Managing Evolving Requirements Through Collaboration

As with many innovative programs, some TRVT requirements began as high-level or evolving, reflecting the complexity of aligning emerging technology with training needs. Rather than treating

this as a barrier, the team partnered closely with the customer and internal development SME's to clarify expectations and evolution through an agile, iterative approach.
Key strategies included:

- Embedding cross-functional experts to interpret and refine requirements collaboratively with the customer.
- Using Cameo to maintain traceability and align evolving requirements with system models and test artifacts.
- Conducting regular demos and feedback sessions to validate understanding before finalizing subcontractor scope.

Complexity: Multiphase Integration, Parallel Development, and Cross-Team Dependencies
From the outset, TRVT required simultaneous development of software, hardware, training content, and technical manuals—each owned by different teams and some involving third-party contributors. The short contract period of performance further intensified the challenge by compressing typical waterfall sequences into a concurrent, integrated execution model.
To manage the complexity:

- The program used Agile-at-scale, with three-week sprint cadences, integrated demos, and cross-functional retrospectives to de-risk parallel development.
- Azure DevOps was used to visualize interdependencies, allowing teams to align release schedules, validate inputs across disciplines, and surface potential blockers in real time.
- Assumptions were documented early and tracked through change control, particularly around the transformation of static CAD models into interactive 3D assets—a known complexity with inherent risk.

Ambiguity and Legal Uncertainty: Licensing and Export Challenges with Open Source Software
As the program matured, a previously underappreciated ambiguity surfaced: the use of Free and Open Source Software (FOSS) components with restrictive, non-transferable licenses. These licenses, common in gaming and simulation development, conflicted with the government's need for system transferability and exportability under the FMS framework.
Rather than stall progress, the team:

- Immediately launched a legal and technical Tiger Team to assess impact, explore license alternatives, and evaluate mitigation paths.
- Revised system architecture and deployment plans to support government-operated environments while preserving compliance with FOSS licensing terms.

This proactive, solution-focused approach demonstrated the program's ability to pivot while preserving both technical integrity and legal defensibility—critical in government contracting and export environments.

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

Innovative Program Management in a Complex Environment
The TRVT program was executed during a period of significant organizational and technical complexity. Raytheon responded with targeted changes to systems, processes, and roles—resulting in a high-performing program delivered on time and within budget.
Transition to Model-Based Systems Engineering (MBSE)
Raytheon implemented a model-based approach using Cameo to manage requirements across a

distributed team. This shift replaced traditional document-heavy methods with a centralized, digital "source of truth," enabling real-time collaboration between Raytheon, subcontractors, and the customer.

- Result: Improved traceability, faster decision-making, and a shared understanding of evolving requirements.

Enhanced Agile Practices for Complex Stakeholder Coordination

The team adapted Agile program management to include structured customer engagement. Sprints were synchronized with technical interchange meetings, demos, and feedback cycles to ensure continuous alignment.

- Result: Reduced rework and strengthened customer confidence, even as requirements evolved.

Dynamic Scope Management:

When model integration challenges arose, Raytheon adjusted scope ownership—shifting specific deliverables from the subcontractor to internal teams.

- Result: Maintained development velocity and avoided schedule delays.

Integrated Communication Structure:

To support a geographically dispersed team, Raytheon introduced daily technical syncs, weekly cross-functional reviews, and monthly program checkpoints.

- Result: Faster issue resolution, consistent progress tracking, and stronger cross-team collaboration.

License Strategy Innovation:

Facing non-transferable software licenses, Raytheon created legal and technical solutions—including custom executables and contract language that clarified licensing responsibilities.

- Result: Delivered a fully compliant solution without compromising legal or delivery integrity.

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?**

  Innovative Use of Predictive Metrics Through Model-Based Systems Engineering (MBSE)

  - To manage complexity and ensure delivery confidence, the TRVT team leveraged Cameo as a predictive program management tool—transforming requirements into measurable, traceable indicators of readiness.
  - By structuring both stakeholder (PIDS) and decomposed system-level (CIDS) requirements within a Cameo-based MBSE environment, the team created a real-time, data-driven model of technical progress. Each requirement was mapped through a hierarchy of dependencies and linked to testable "Knowledge Points"—milestones that provided early indicators of system maturity.

  Key Innovations:

  - **Predictive Readiness Tracking:**
    Early alignment of Knowledge Points to requirements enabled the team to forecast test readiness and track progress sprint-by-sprint using model-based dashboards.

- **Integrated Test Planning:**
  Test cases tied directly to requirements helped identify issues early, supporting agile adjustments and informed decision-making throughout development.
- **Automated Verification Reports:**
  Cameo auto-generated traceable, contract-ready test reports—saving time, reducing errors, and improving auditability.
- **Instructional Alignment Modeling:**
  System behavior and learner roles were modeled in Cameo to ensure training design stayed aligned with user needs and requirements.
- **Result:**
  Cameo became more than a documentation tool—it served as a predictive engine for technical performance, enabling data-informed decisions, reducing rework, and increasing stakeholder confidence. This approach established a repeatable model for using MBSE to drive measurable, agile-aligned program outcomes.

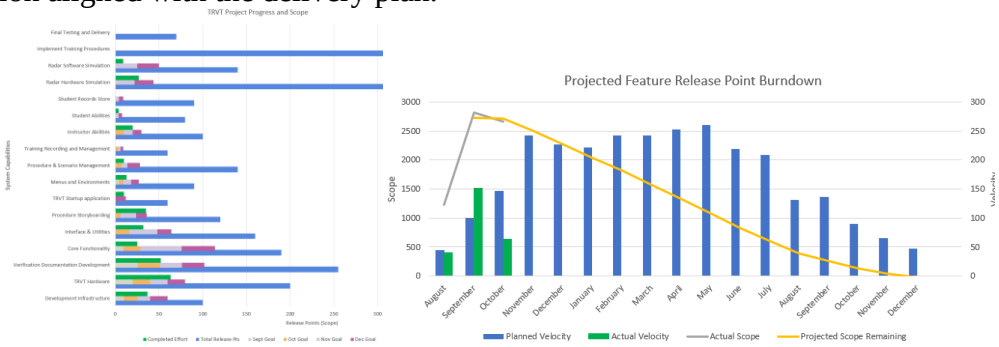
  Azure DevOps: Real-Time Performance Metrics Driving Agile Execution
  Azure DevOps (ADO) played a central role in transforming TRVT's day-to-day execution into a measurable, data-driven process. While Cameo provided the authoritative system model, ADO served as the operational dashboard—translating requirements into actionable tasks and enabling predictive oversight.

  - **Agile Cadence with Metric-Driven Planning:**
    ADO was used to structure 2-week sprints, plan daily work, and allocate resources against requirement-driven tasks derived from Cameo. Each user story or task linked back to specific technical and instructional outcomes, creating traceability between execution and system requirements.
  - **Progress Forecasting and Burn-Down Analytics:**
    Sprint performance data—task completion rates, carryovers, blockers—was captured and analyzed in ADO to track velocity and identify trends. These metrics enabled the team to:
    - Predict schedule risk early
    - Adjust scope or resources proactively
    - Provide defensible estimates to leadership and stakeholders
  - **Continuous Improvement Through Sprint Retrospectives:**
    Post-sprint reviews in ADO highlighted task throughput, blockers, and bottlenecks, giving the team data to iterate and improve. This turned every sprint into a feedback loop—not just for technical work, but for program management maturity.
  - **Real-Time Reporting and Decision Support:**
    ADO dashboards allowed program leadership to visualize task-level progress across teams, identify misalignments, and make timely decisions—all while maintaining alignment with higher-level system requirements modeled in Cameo.
  - **Outcome:**
    This integrated use of ADO as a performance metrics engine enabled the TRVT team to move beyond traditional tracking. It introduced real-time situational awareness, proactive risk mitigation, and evidence-based decision-making - hallmarks of innovative and adaptive program execution.

- How did you perform against these metrics?

The TRVT team implemented an integrated metrics strategy using **Cameo and Azure DevOps (ADO)** to drive performance, adaptability, and predictability throughout development.

- **Cameo – Predictive Accuracy Through Requirement Repurposing**
  By repackaging system requirements into discrete Knowledge Points (reference Figure 1), the team created a measurable framework for tracking development testing progress. Once the initial items were executed, this structure enabled the team to predict effort and duration with high accuracy, optimizing sprint planning and resource allocation. Cameo's system model served not just as documentation, but as a forward-looking performance tool that supported reliable forecasting and scope control.
- **ADO – Real-Time Execution Feedback**
  ADO served as a tactical execution lens, tracking sprint velocity, task completion, and team throughput in real time as exhibited in Figure 4 and 5. While variability in performance was expected due to the complexity of the work, this variability provided meaningful insights:
  - It helped distinguish between isolated task delays and trends that could impact program-level milestones.
  - It gave program leadership data to quickly identify blockers, rebalance workloads, and keep execution aligned with the delivery plan.



Figures 4 and 5: ADO Progress to Scope and Baseline

- **Outcome:**
  Together, Cameo and ADO created a dynamic performance management environment. Cameo drove long-term predictability and scope alignment, while ADO delivered short-term agility and actionable insights, ensuring the team could not only monitor progress, but continuously adapt, improve, and deliver on schedule.

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

Through iterative development testing, predictive metrics were generated that revealed real-time progress toward final system readiness. These metrics were not just observational—they were actionable, informing sprint planning, prioritization, and resource allocation.
As a result, performance excellence was achieved by:

- Proactively identifying gaps between intent and execution
- Quantifying readiness for key program milestones like Software Qualification and Acceptance Testing
- Enabling informed decision-making that reduced rework and ensured traceable compliance

This approach turned metrics into a strategic asset—one that ensured the team remained focused, agile, and aligned with both customer expectations and contract deliverables.