AVIATION WEEK

PROGRAM EXCELLENCE AWARDS

INTELLECTUAL PROPERTY

(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 <u>not</u> 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

Leeya Gray ______________________________ ____6/27/2025___

Nominee's Signature Date

Nominee's Name (please print): <u>Leeya Gray</u>

Title (please print): <u>Program Director</u>

Company (please print): <u>Stratolaunch</u>

NOMINATION FORM

Name of Program: Talon A

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☑ Customer Approved

- Date: 6/26/2025 WILSON.GEOFFREY.WAYNE.1393336117 Digitally signed by WILSON.GEOFFREY.WAYNE.1393336117 Date: 2025.06.26 13:17:48 -04'00'
- Customer Contact (name/title/organization/phone): Geoffrey Wilson/TRMC/571-372-2679

☐ 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?

The vision for the Talon-A program is to revolutionize hypersonic flight test by providing a rapidly deployable, reusable air-launched system. We support commercial and defense customers with repeatable, cost-effective access to the hypersonic environment, accelerating the development of critical technologies.

- **Air-Launched Reusability:** Unlike traditional ground-launched hypersonic vehicles, Talon-A's air-launch capability offers significant operational flexibility, allowing for deployment from various locations and under a wider range of conditions. Its design for reusability dramatically reduces the cost and turnaround time associated with each flight, enabling more frequent and affordable hypersonic testing.
- **Modular Design for Payload Flexibility:** Talon-A features modular payload bays, enabling seamless integration of diverse experimental payloads tailored to specific customer needs. This adaptability makes it an invaluable platform for a wide range of hypersonic experiments.
- **Strategic Location and Integration in Mojave:** Located in Mojave, California, the Talon-A program benefits from its proximity to the established aerospace testing infrastructure and a skilled workforce experienced in rapid prototyping and flight operations. This location facilitates efficient integration with existing resources and fosters collaboration within the dynamic Mojave aerospace ecosystem.
- **Potential to Accelerate Hypersonic Technology Development:** By providing a cost-effective and readily available flight test platform, Talon-A has the potential to significantly accelerate the development and maturation of critical hypersonic technologies, addressing pressing national security needs and advancing scientific understanding of this challenging flight regime.
- **Commitment to Safety and Reliability:** While prioritizing rapid development, the Talon-A program maintains an unwavering commitment to safety (our first priority being the safety of our personnel) and reliability through rigorous testing, robust design principles, and adherence to stringent aerospace standards.

TA-2 at Sunrise

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 Talon-A program represents a defining achievement in Stratolaunch's mission to advance hypersonic innovation through rapid and reliable high-speed flight test capabilities. As the first reusable, air-launched hypersonic testbed, Talon-A signals a shift in how high-speed systems are developed and validated. It strengthens Stratolaunch's position as a trusted provider of cutting-edge flight services and reinforces the company's commitment to solving the complex challenges at the intersection of aerospace technology and national security. Talon-A is not just a program, it is a platform for sustained growth, long-term customer partnerships, and strategic differentiation in a rapidly evolving world of defense and aerospace.

TA-2 at First Light

- **Clearly define the value of this program/project to your customer**
  Talon-A offers government and commercial customers a unique, cost-effective path to hypersonic experimentation. Its recoverable design, flexible launch cadence, and in-flight instrumentation allow users to collect critical data in real-world flight environments. Customers rely on Talon-A to reduce development risk, inform design decisions, and reduce timelines for emerging capabilities. By enabling more frequent hypersonic testing, the program supports the advancement of next-generation systems that protect and project strategic advantage.

TA-2 Ignites Engine

- **Clearly define the value of this program/project to members of your team; quantify if possible**
  For the Stratolaunch team, Talon-A is a source of immense pride and purpose. It has fostered a culture of technical excellence and collaboration offering team members the opportunity to contribute directly to one of the most ambitious aerospace endeavors in hypersonics. Engineers, technicians, and operators are engaged in solving first of their kind challenges that push the boundaries of materials science, aerodynamics, autonomy, and flight systems integration. The program has become a catalyst for professional growth, creative problem-solving, and a shared sense of mission that unites the entire organization.

TA-2 Post-Landing

- **Clearly define the contribution of this program/project to the greater good (society, security, etc.)**
  Talon-A plays a critical role in strengthening national security by accelerating the development and fielding of hypersonic technologies. It addresses an urgent need for responsive flight test capabilities, ensuring that U.S. defense and research organizations can outpace emerging global threats. Beyond its strategic value, Talon-A advances the broader field of aerospace by laying the groundwork for future applications in commercial high-speed travel. It also serves as a powerful inspiration for the next generation of innovators, demonstrating what is possible when bold vision meets disciplined execution.

TA-2 Lands at Vandenberg Space Force Base

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 Talon-A team has cultivated a culture of innovation by developing and leveraging several key tools and systems that have directly contributed to our rapid development and performance:

- **Internally Developed GNC Software:** The in-house development and continuous maintenance of Talon-A's Guidance, Navigation, and Control (GNC) software have been critical to the program's agility and success. This allows for rapid iteration and tailoring of algorithms specifically for Talon-A's unique flight dynamics and mission profiles. Owning the codebase provides the team with deep technical understanding, enabling swift troubleshooting during development and flight testing. This direct control has resulted in optimized flight performance, enhanced stability, and the ability to quickly adapt to evolving mission requirements, all crucial for a rapid development program like Talon-A.
- **RIAB (Roc in a Box):** The "Roc in a Box" (RIAB) system is a vital in-house developed hardware-in-the-loop (HIL) simulator specifically designed for Talon-A's avionics and control systems. This allows for comprehensive testing in a lab environment without tying up Roc, the carrier aircraft. RIAB enables the team to simulate various flight conditions and mission scenarios, identify integration issues early, and validate system performance efficiently. This significantly accelerates the testing process, reduces costs associated with flight test hours, and increases confidence in the reliability of Talon-A's hardware before flight.
- **Landing Gear "Sled" Test Hardware:** We designed and built a dedicated test fixture, affectionately called the "sled," specifically for testing and validating the landing gear system. Rather than integrating the landing gear onto the full vehicle for initial testing, the sled allowed us to isolate the landing gear's complex mechanical, hydraulic, and control systems and test them through a wide range of simulated landing scenarios (varying loads, speeds, angles, and surfaces) in a controlled environment. This *how* enabled rapid iteration on landing gear design and control algorithms, provided critical data on structural loads and performance envelopes, and retired significant technical risk associated with a critical subsystem before committing to full vehicle integration, ultimately leading to a more robust and reliable landing system.

- **Development of LOX Subcooling System:** To maximize the performance of Talon-A's propulsion system, the team developed a Liquid Oxygen (LOX) subcooling system. This in-house capability allows for loading supercooled LOX, increasing propellant density and thus the amount of oxidizer carried. This directly translates to enhanced thrust and overall vehicle performance, crucial for achieving the demanding flight profiles required for hypersonic research. Developing this system internally allowed for specific optimization for Talon-A's engine and mission requirements.
- **Leveraged Propulsion Ground Test Facility:** The strategic utilization of a ground test facility has been crucial in demonstrating new propulsion system features rapidly. This capability allows for the early validation of engine performance and integration aspects in a controlled and accessible environment, without the risks and costs associated with flight testing. This rapid feedback loop enables quicker design iterations and accelerates the maturation of the propulsion system, directly contributing to achieving performance targets and reducing development timelines.
- **Closed Coupling Between Software Developers and Subsystem Owners:** This tight integration ensures that software development is deeply informed by the intricacies of the hardware and vice versa. This enables the rapid iteration of design solutions by facilitating immediate feedback and quicker implementation of improvements, ultimately leading to more efficient problem-solving and faster progress.
- **RALT Testing on Surrogate Aircraft:** Performing Radar ALTimeter (RALT) testing on a surrogate aircraft demonstrates a proactive approach to risk reduction and the refinement of landing performance. By utilizing a more readily available aircraft for these critical tests, the team can gather valuable data and de-risk the Talon-A landing system in a cost-effective and efficient manner. This allows for the early identification and resolution of potential issues, leading to improved landing performance and increased confidence in this critical phase of flight before committing the actual Talon-A vehicle to these high-risk scenarios.

TA-2 RALT Testing

- **Integration of Design Engineers into the Test Team:** This close collaboration ensures that the individuals with the deepest understanding of the system's design are present during testing, leading to better development of Concepts of Operations (CONOPS) and the creation of designs that inherently facilitate testing. This direct involvement allows for real-time feedback, quicker identification of root causes during anomalies, and more effective translation of test results into design improvements, ultimately accelerating the development cycle and improving the overall quality and testability of the Talon-A vehicle.

Crew Positions TA-2 at MHV

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

Leading and managing the rapid development of Talon-A has required unique practices centered on agility, empowerment, and focused collaboration:

- **Small, Cross-Functional Teams with High Autonomy:** The Talon-A team is structured into small, highly skilled, and cross-functional teams with significant autonomy. This allows for rapid decision-making and efficient problem-solving within focused areas, crucial for maintaining the program's fast pace.
- **Emphasis on "Fail Fast, Learn Fast":** Recognizing the challenges of rapid prototyping, the team embraces a "fail fast, learn fast" mentality. This encourages experimentation and risk-taking within defined boundaries, with a strong emphasis on quickly analyzing failures to drive rapid iteration and improvement.
- **Transparent and Frequent Communication:** Given the rapid pace, transparent and frequent communication is paramount. Daily stand-ups, clear articulation of goals and progress, and open communication channels ensure everyone is aligned and can quickly address any roadblocks.
- **Continuous Skill Development Focused on Agility:** Training and skill development are focused on fostering adaptability and agility. Team members are encouraged to develop a broad understanding of different aspects of the program to enhance collaboration and problem-solving across disciplines.

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

For the rapid development of Talon-A, we strategically leveraged the skills and technologies of our suppliers through close collaboration:

- **Selection of Agile and Responsive Suppliers:** We prioritized working with suppliers who demonstrated agility, responsiveness, and a willingness to adapt to our rapid development timelines.
- **Clear and Concise Requirements with Flexible Solutions:** We provided suppliers with clear and concise performance-based requirements, allowing them the flexibility to propose innovative solutions based on their expertise and existing technologies, rather than overly prescriptive designs.
- **Early and Frequent Communication:** Maintaining early and frequent communication with suppliers was crucial for keeping them aligned with our rapid progress and quickly addressing any technical or logistical challenges.

- **Leveraging Off-the-Shelf Technologies Where Possible:** To accelerate development, we strategically leveraged commercially available off-the-shelf (COTS) technologies from our suppliers where appropriate, adapting them to our specific needs rather than developing everything from scratch.
- **Collaborative Problem-Solving:** When technical challenges arose with supplier-provided components, we fostered a collaborative problem-solving environment, working closely with their engineers to find effective solutions.

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 Talon-A program faced unique challenges within the VUCA framework, particularly in the areas of Uncertainty and Complexity, significantly amplified by the ambitious goal of rapid hypersonic platform development:

- **Uncertainty in Achieving Rapid Hypersonic Flight Cadence:** A core objective of Talon-A is to establish a rapid and repeatable flight cadence for hypersonic research. This introduced significant **uncertainty** as we navigated the complexities of integrating novel reusable technologies, streamlining ground operations, and ensuring consistent reliability for frequent launches and recoveries. Predicting and mitigating all potential challenges associated with achieving this unprecedented flight tempo in the demanding hypersonic environment presented a unique area of uncertainty.
- **Complexity of Integrating Novel Reusable Systems with Aggressive Timelines:** The concurrent development and integration of multiple novel reusable systems – including the airframe, propulsion, recovery systems (like the "sled"-tested landing gear), and the in-house GNC – within an aggressive development timeline created a high degree of complexity. Ensuring seamless interaction and reliable performance across these cutting-edge systems, while adhering to a compressed schedule, required intricate planning, meticulous execution, and constant coordination across multiple engineering disciplines and supplier interfaces. This level of integrated innovation under tight time constraints presented a unique program complexity.
- **Reduced uncertainties for the in-house developed GNC system and software by conducting cozy testing:** Engineers significantly reduced uncertainties by integrating a specialized pallet, housing all of Talon's critical avionics, including the Vehicle Management System (VMS), Inertial Navigation System (INS) and Radar Altimeter (RALT) onto a surrogate aircraft testbed. This allowed the team to execute simulated landing profiles at Vandenberg Space Force Base, precisely mimicking Talon-A's approach and landing sequences, ultimately validating the GNC system's robustness for the historic first flight.

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

The Talon-A team responded to the uncertainties of achieving rapid hypersonic flight cadence and the complexities of integrating novel reusable systems under tight timelines through a proactive and adaptive approach:

- **Iterative Development and Incremental Flight Testing:** To address the uncertainty of achieving rapid flight cadence, we adopted an iterative development approach with a focus on incremental flight testing.

This allowed us to progressively mature the reusable technologies and operational procedures, learning and adapting with each flight, rather than attempting a fully mature system from the outset.

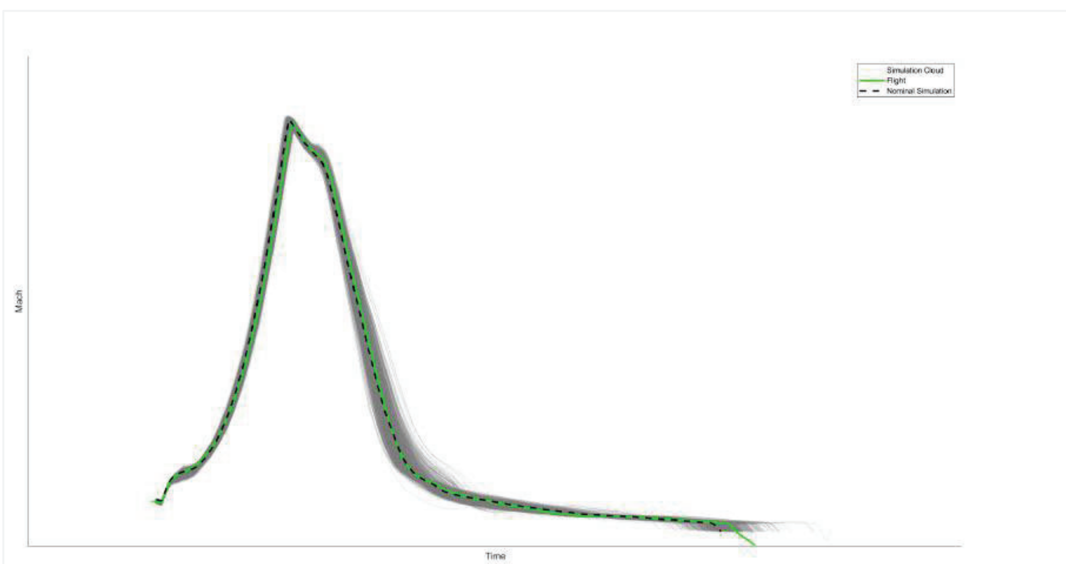
- **Modular Design and Parallel Development:** To manage the complexity of integrating multiple novel systems, we employed a modular design philosophy. This allowed for parallel development and testing of individual subsystems, reducing the risk of cascading delays and enabling more focused problem-solving. Standardized interfaces between modules also simplified integration efforts.
- **Digital Engineering and Simulation-Heavy Approach:** We heavily invested in digital engineering tools and simulation capabilities to model and analyze the complex interactions between different systems. This allowed us to identify potential integration issues and optimize system performance in a virtual environment before physical integration and flight testing, mitigating risks and accelerating the development process.
- **Dedicated Integration and Test Teams:** We established dedicated integration and test teams with expertise across different subsystems. These teams were responsible for ensuring seamless integration and conducting rigorous testing at each stage of development, proactively identifying and resolving interface issues.
- **Risk-Based Approach and Contingency Planning:** We implemented a robust risk management process to identify potential challenges to achieving rapid flight cadence and integrating complex systems. This involved developing mitigation strategies and contingency plans to address potential setbacks and maintain the program's overall schedule.

SECTION 5: METRICS

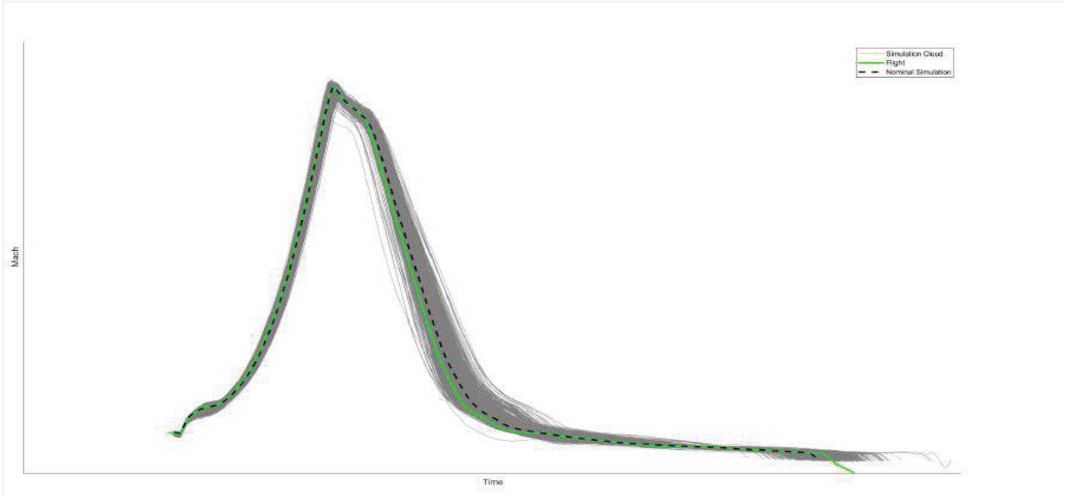
Value: 15 points
Use 12 pt. Times Roman typeface

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.

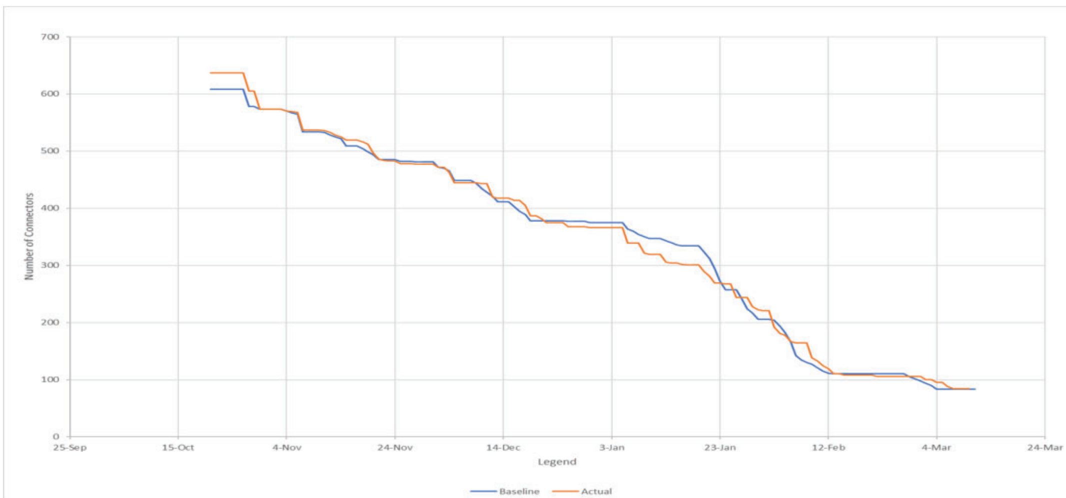
Provide charts/graphs that illustrate performance to these metrics:



TA-2 First Flight – Graphic



TA-2 Flight 2 – Graphic



Hardware Integration Velocity – Graphic

- **What are your predictive metrics?**
- **How did you perform against these metrics?**
- **How do your predictive metrics drive action toward program excellence? Please provide examples.**

Given the rapid development and ambitious goals of the Talon-A program, our predictive metrics focus on leading indicators that signal potential deviations from our planned schedule, cost, and performance requirements. These metrics allow us to proactively identify and address issues before they significantly impact the program.

1. **Flight Test Requirement Adherence:** Performance against critical objectives is tracked in each iteration of software and hardware changes in the integrated flight simulation using Monte Carlo analysis. This metric provides clear indication of progressing flight readiness, while customer driven objectives and system requirements satisfaction increase. Automated tools in JAMA and our HIL test system simplify assessment of this metric continuously. Flight test data confirmed the accuracy of both the integrated flight simulation and verification of system requirements, validating the effectiveness of these performance requirements tracking metric in driving the team to prioritize the right work.

2. **Hardware Integration Velocity:** This metric tracks the rate at which new hardware components and subsystems are successfully integrated and tested. It's measured as the number of planned hardware integrations completed per week/month against the planned integration schedule. A slowdown in hardware integration velocity can predict delays in achieving a fully functional flight vehicle.
3. **Customer Satisfaction:** To enable customer satisfaction the team utilizes a suite of metrics and tools to track on-time delivery, cost, schedule, and technical performance of the program. These metrics use the standard Defense Acquisition University (DAU) Program Management practices. For example, utilization of DAU's Earned Value Management (EVMS) gold card was heavily customized allowing us to meet both our customer and companies' desired outcomes.
4. **Resource Utilization Forecast:** This metric projects the utilization of key resources (e.g., engineering hours, manufacturing capacity, test facilities) against the planned resource allocation over the next 12 months. This metric predicted potential resource bottlenecks and allowed management to apply additional resources as required avoiding major impacts to cost, schedule and performance.
5. **Risk Adjusted Schedules:** The program utilizes the DoD industry standard Risk, Issue, and Opportunity Management (RIO) guide as a basis for its risk and opportunity management board. A customized risk adjusted scheduling framework was executed. This ultimately drove the team to making timely, informed programmatic decisions that met the risk boards acceptance criteria.
6. **Range Safety Approvals:** This metric tracks the burndown of critical approvals from our range safety partners at respective government agencies. A view of decreasing rate allows our team to rapidly respond to government partner needs and increase the resources we make available to collect flight safety approvals. Tracking approval rates allowed for proactive resource management and ensured flight-readiness.

By actively monitoring these predictive metrics and taking timely action based on the trends they reveal, the Talon-A program can proactively manage potential issues, maintain its rapid development pace, and strive for excellence in meeting its ambitious goals.

Predictive metrics such as these drove the Talon-A Program to achieve program excellence through delivering our customers two hypersonic, reusable, autonomous flights within a few months of each other. During both flights the program met and or exceeded all performance objectives, flying with nominal deviations from planned flight simulations and providing payload customers valuable test data. This signifies the first time the U.S. has had a hypersonic testbed since the X-15's last flight in 1968 and the first fully autonomous reusable hypersonic test bed.