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President
Aviation Week Network

Acknowledged, agreed, and submitted by

James R. Bates
Nominee's Signature

6/18/2020
Date

Nominee's Name (please print**):** **James R. Bates**

Title (please print): Program Manager

Company (please print): The Boeing Company

AVIATION WEEK NETWORK 2020 Program Excellence Awards

NOMINATION FORM

Name of Program: **T-38C Avionics Component Integration**

Name of Program Leader: **James R. Bates**

Phone Number: **(314) 451-6130**

Email: **James.R.Bates2@boeing.com**

Postal Address: **Building 32, James S. McDonnell BLVD, Hazelood, MO 63042**

☒ Customer Approved

- Date: **May 26, 2020**
- Contact (name/title/organization/phone): **Mr. Edward Waghorn / T-38 Program Manager / AFLCMC / 801.775.2484**

☒ Supplier Approved (if named in this nomination form)

- Date: **May 1, 2020**
- Contact (name/title/organization/phone): **Ms. Megan Boschen / Sustaining Program Mgt / Boeing / 636.795.0352**

CATEGORY ENTERED

Refer to definitions in the document "2020 Program Excellence Directions." You must choose one category that most accurately reflects the work described in this application**. The Evaluation Team reserves the right to move this program to a different category if your program better fits a different category.**
Check one

☐ Special Projects

☐ OEM/Prime Contractor Systems Design and Development

☐ OEM/Prime Contractor Production

☒ OEM/Prime Contractor Sustainment

☐ Supplier System Design and Development

☐ Supplier System Production

☐ Supplier System Sustainment

Biography

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James.R.Bates2@boeing.com

JAMES R. BATES

T-38 Senior Program Manager
Air Force Services
Boeing Global Services

James Bates serves as the Sustainment Program Manager for T-38C Talon. In this role, James directs the efforts of field modifications, Performance Based Logistics (PBL) and onsite supply chain activities, training courseware development, field services, and engineering support.

James has an extensive history of aircraft sustainment support and leadership, spanning more than 15 years of active service with Boeing and the United States Air Force. He was most recently a first line leader within Boeing Technical Data Services (BTDS), leading the technical data production for all F-15 operators worldwide. Prior to entering management, James was a Project Management Specialist, serving as an assistant to the Program Manager of the F-15 Korea Performance Based Logistics (PBL) program. In that role he was responsible for daily execution of the PBL program, holding weekly teleconferences with the Korean customer as well as interfacing with multiple teams and suppliers servicing the current contract. Additionally, James established and managed multiple projects in support of the Korean customer and Boeing interests. Previously, James was a Logistics Engineer in Phantom Works, concentrating on support systems process improvement and execution for Proprietary Programs. He was formerly a Systems Support Technologist lead for the F-15 Saudi Advance program.

James begin his career at Boeing in 2009 as a Provisioning Analyst for the C-130 Avionics Modernization Program. James was selected as a member of the 2019 class for the Enterprise Leadership Development Program (ELDP) and the Engineering Excellence Career Partnership (EECP). Prior to his time at Boeing, James spent 6 years as an aircraft maintenance technician and supervisor in the United States Air Force, honorably discharged in 2005 as a Staff Sergeant.

Bates holds a Master's Degree in Project Management from Washington University in St. Louis (WUSTL), a Graduate Certificate in Project Management from WUSTL, a Bachelor's degree in Management from Southern Illinois University Carbondale, and an Associates in Applied Science from Parkland College in Champaign-Urbana, Illinois.

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Contact:
Nancy King

June 2020

Point Distribution

Executive Summary: Make the Case for Excellence (15 pts)		
Metrics **10 pts** Predictive Metrics (10)	**Program Volatility/ Uncertainty/Complexity/ Ambiguity** **25 pts** Describe overall VUCA (10) Cite examples of team response (15)	**Organizational Best Practices & Team Leadership** **40 pts** Innovative Tools and Systems (15) Unique Innovative Processes for People Development/Knowledge Transfer (15) Unique Practice es for Customer Engagement (10)
Value Creation (10 pts)		

Note: The program will be evaluated on the basis of performance between January 1, 2016 and December 31, 2019.

Abstract

In 150 words or less, why is this program excellent in terms of execution?
(12 pt. Times Roman)

The T-38C Avionics Component Integration (AvCI) program provides a safe, reliable avionics experience to our nation's warfighters in training. T-38C AvCI creates synergies for focus on quality, production-proofing and readying new technologies for implementation across a large fleet of aircraft. The program's individual component and block upgrade cadence ensures continuous learning and self-improvement. Given ready access to test platforms and a high frequency of flights, the program rapidly incorporates lessons learned into future component modifications. Additionally, the program maintains company-owned aircraft parts stock at each main operating base for immediate retrieval. This arrangement facilitates instant transactions, enabling aircraft maintainers to keep Talons flying without interruption.

Such success is impossible without an outstanding partnership. For many years, Boeing has worked closely and seamlessly for the Systems Program Office (SPO) at Hill AFB, UT ensuring their priorities are Boeing's priorities. Program accolades abound for their pivotal role in keeping the fleet operational.

Purpose

Provide a 150-word descrioption of the purpose of this program, spelling out all acronyms and correct acronyms
(12 pt. Times Roman)

By critical demand, the venerable T-38C Talon is expected to operate past 2036. The U.S. Air Force has put its trust in Boeing to continue a legacy of critical avionics support in the form of a Performance Based Logistics (PBL) contract. Boeing has succeeded over the last three years in providing unrivaled expertise and customer satisfaction. In addition to its PBL support, the program's efforts have included upgrading and replacing avionics components such as mission display processors, heads-up displays, control panels, and state-of-the-art navigation equipment and transponders. This effort, coupled with

Boeing's outstanding engineering services, has brought immense value to the Air Force as well as other entities across the country. With Management based in St. Louis, this Program coordinates daily with its outstanding Air Force counterparts at AFMC and Field Service Representatives (FSRs) in Contractor Operated Maintenance Base Supply (COMBS) operations at five main bases and three satellite bases.

Executive Summary: Make the Case for Excellence *(Value: 15 pts)*
What is the vision for this program/project? What unique chracteristics and properties qualify this program for consideration? (12 pt. Times Roman)

T-38: Pilot Training Cornerstone of the Past and Future

The T-38 Talon is the primary training jet for the U.S. Air Force and NATO member nations. The U.S. Navy also operates 10 T-38Cs.

Following Boeing's successful avionics suite upgrade in 2007, converting more than 400 Talons to the T-38C standard by replacing analog components with new digital cockpits, consecutive multi-year sustainment contracts were awarded to Boeing. The Avionics Component Integration (AvCI) program, the current 10-year endeavor launched in March 2016, allowed Boeing to extend its outstanding relationship with the U.S. Air Force. Right out of the starting blocks, the AvCI team improved performance of the Air Force's fleet of T-38C aircraft and aircrew training devices, expertly tackling every challenge related to aircraft avionics, cockpit displays, control panels and communications systems. Applying decades of logistics and technical expertise, Boeing has continued to breathe new life into this mature platform.

Most importantly, Boeing's laser focus on safety has resulted in zero avionics-related mishaps – a truly impressive feat considering the grueling 90,000-hour pace at which pilot training bases operate annually. The Talon is planned to serve as a bridge to the future franchise program, the T-7A,with the potential for companion, aggressor and light attack aircraft variants, as well as associated support services, for air forces around the world. With this in mind, the T-38C is desired for future operations beyond pilot training through 2040, based on demand both domestically and abroad.

Building trust with stakeholders, the T-38 AvCI program continues to provide the safest, most reliable avionics experience to our nation's training warfighter with over two decades of interaction and demonstration of support. T-38 sustainment creates synergies for focus on quality, production-proofing and readying new technologies for implementation across a massive fleet. The program's individual component and block upgrade cadence also ensures continuous learning and program self-improvement. With the ability to quickly adapt its processes due to the accessibility to test platforms and frequency of flights, the program is able to rapidly incorporate lessons learned for the next component modification.

Bringing lasting value to its customers is this program's bread and butter. T-38C AvCI ensures continued supportable visual and communication technologies are delivered directly to T-38 pilots across the country. Pilots with a wide range of experience develop and hone keen sensory reactions and habit patterns that shape their future combat performance. Employing modern avionics inside a platform built in the 1960s requires top-end engineering talent and strenuous attention to detail, increasing aviation safety and enabling an uninterrupted pilot training pipeline.

Another key facet of the T-38 program's customer satisfaction portfolio is Performance-Based Logistics (PBL). Near-immediate availability of parts is enabled by aggregating demand across a keen, multi-base supply network with constant customer and supplier communication, allowing our customer to keep the training missions going with variable cost matching variable needs. Many individual pieces of the program provide focused attention for overall excellence. When part obsolescence brings lifetime buy opportunities for the customer, the program remains poised to take action. While this service is critical to aircraft supportability, none of it would be possible without a lockstep cadence with the T-38 SPO at Hill AFB, Utah.

When National Geospacial and Intelligence Agency (NGA) data is updated, the program provides critical analysis and appropriate software updates to the operators. The T-38C AvCI program also ensures continued support and operation at the squadron level of the Mission Debrief System (MDS), Integrated Maintenance Information System (IMIS), and Standard Desktop Configuration (SDC) updates. The operational tempo of cyber security and changes to networking restrictions require a flexible team that can anticpate changes, drive agile modifications and field upgrades to meet the protections required for the nations Air Force.

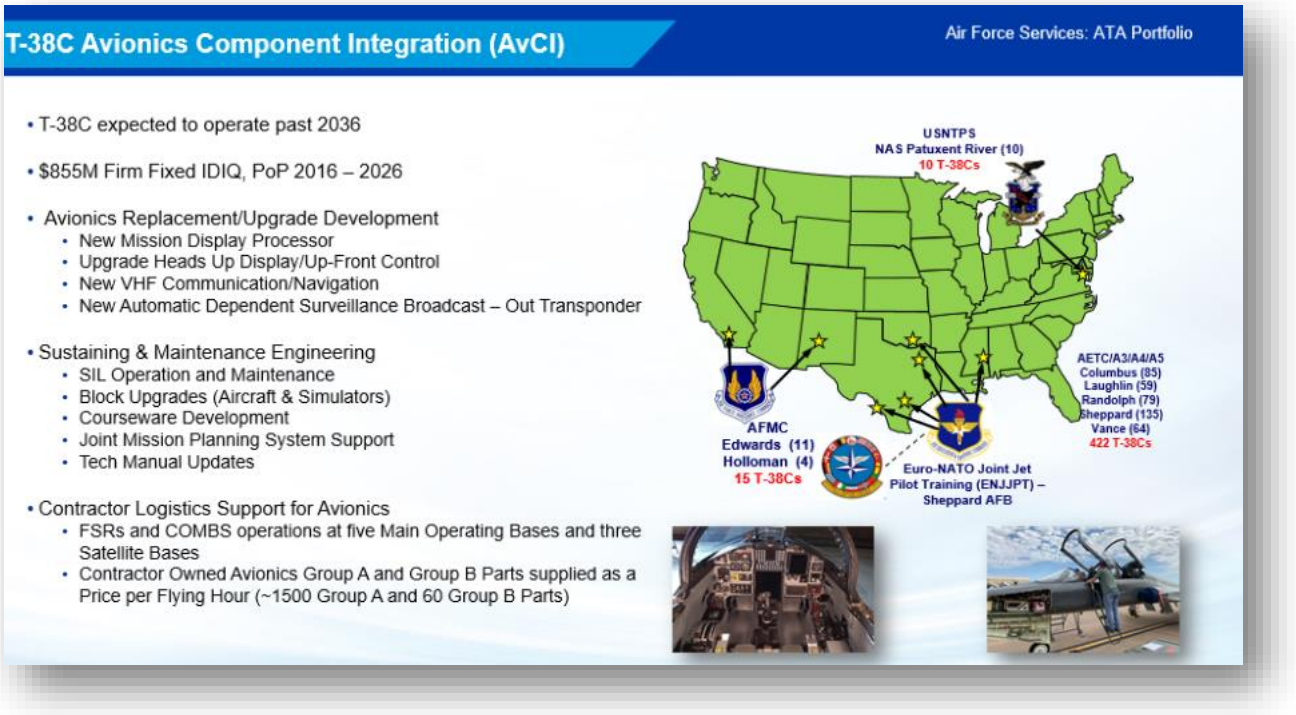
Providing this sustainment support also speaks volumes to team members as they seek and evaluate component upgrade opportunities: Watching the PBL in action teaches team members the value of life cycle planning in reducing aircraft sustainment costs. Lastly, the intrinsic value of national defense mission impact cannot be overstated. Enabling world class training for our nation's warfighters bolsters job satisfaction, taxpayer confidence, and trust in the Boeing company.

The worldwide pilot shortage will likely deepen over the next few years and pilot training aircraft performance is more critical than ever. Providing a dependable platform with which to train our future warfighters is one of several Boeing contributions to not only national security but to American society at large. Another area of societal contribution is through continual Small Business subcontracting engagement. The T-38 program has consistently awarded above the requirement of subcontracts to small businesses, displaying an above-and-beyond approach to positively impacting our communities.

The program's judicial use of predictive metrics, as part of its PBL program, has provided not only substantial savings but increased predictability and program performance. Program-encouraged 'outside-the-box' solutions highlight the topnotch T-38 engineering core and demonstrate an innovation-friendly atmosphere. Anecdotal examples abound from just the last three years to illustrate the power of intentional program leadership as it shapes ingenuity, freedom of thought and team member motivation. Ultimately, predictive metrics help the T-38 program to continually fine-tune our execution, establishing new standards for team performance that directly contributed to the T-38 team's achievement of outstanding service at minimum cost.

Managing parts and components brings a variety of challenges but the T-38 program has demonstrated both reliability and efficiency in every situation. The program manages parts and components across all T-38 supply chain locations instead of taking the traditional approach of managing parts and components at each separate location. Through this approach and through partnership with the Air Force, the T-38C support team has consistently exceeded the Avionics Mission Success Rate required by contract. Pilot training pipelines require a high level of performance and this success rate ensures that fleet avionics are essentially always ready whenever the customer needs it.

Because the fleet flies approximately 90,000 hours per year, daily support is needed. The team's work includes maintenance engineering, avionics component upgrades and contractor logistics support for avionics. It is truly a team effort: If one site has a surge of issuing a certain part, it rapidly can be replenished with parts from another site. Unused inventory at one site automatically is allocated to a site with demand. This allows the team to hold lower inventory levels, decrease cost and rapidly respond to demand surges at any of the locations. The team has a plan in place to issue parts in less than 30 minutes once requested from the customer. Predicting which site will need how many parts and when is difficult but, through decades of experience, aggregated data, predictive metrics and technical context, AvCI has optimized supply chain response with its fully mature PBL program.



Another area of potential uncertainty with this mature platform is equipment obsolescence and diminishing manufacturing sources (DMSMS). With today's rapidly evolving electronics technology, providing a relevant, updated solution can sometimes come with supplier dropout due to obsolescence issues. The T-38 program supply and procurement machine is well-tuned to respond and quickly qualify new equipment and suppliers as needed to provide up-to-date and supportable components for our customer. Fielding retrofits across a fleet of over 400 aircraft and 5 main locations can bring uncertainty as well. Boeing's Automatic Dependent Surveillance-Broadcast (ADS-B) retrofit execution via Contract Field Team (CFT) demonstrated a relentless commitment to quality. Finally, PBL ensures that the warfighter receives the well-maintained equipment needed for the fight. That focus is well-maintained through the use of a service contract tied to successful flying hours. A potential risk to Boeing is unforeseen or maintenance-unrelated circumstances that reduce flying hours. This scenario is being realized with the COVID-19 pandemic as flying operations at most training bases were reduced due, in part, to public safety concerns and other restrictions.

Both innovation and program leadership were on display throughout the last 3 years. Specifically, the 2019 ADS-B fleet retrofit demanded decisive action in order to complete with the highest quality and within schedule. In fact, it was due to program leadership and innovative atmosphere that enabled completion one month ahead of schedule and nearly two years ahead of the contract's due date. Critical phasing and scheduling decisions allowed work to start months earlier while awaiting government radio

frequency approvals. With a simultaneous laser focus on quality, program management elected to stand down early operations in order to address identified issues which were impacting not only quality but team morale and, potentially, safety. This decision to sacrifice schedule for quality and safety reflects Boeing's corporate culture and was ultimately beneficial to all stakeholders. Innovation also played a key role in this success, saving countless man-hours for the customer in aircraft movement, operational checkouts, and completed aircraft ahead of schedule.

Innovation plays a crucial role in other program initiatives such as virtual training. As this phenomenon gains in both effectiveness and popularity, the T-38 program set out to build a prototype Virtual Reality (VR) trainer version of the simulator (or aircrew training device – ATD) trainers, demonstrating to the world a fully operational flying VR system just four months later. Today's pilot trainees are already familiar with augmented reality and virtual worlds – this system augments existing world-class ATD and aircraft training and is one more demonstration of T-38 program excellence. Several other instances of demonstrations of innovation and lean thinking illustrate the priority placed on these areas by the T-38 program.

Both Boeing and our USAF customer understand the importance of close collaboration and trust as hallmarks to the success of the program. Customer engagement is enhanced in several ways, not the least of which is by constant communication via daily telephone tag-ups and multiple weekly technical meetings. Issues uncovered by either team are quickly and openly discussed to bring fast resolution to the warfighter. Measuring project schedule and aircraft reliability by days, weeks, and months are some metrics which help us understand overall performance. While these metrics provide contractual satisfaction, special projects and situations unique to an aging weapons system result in the need for more robust reporting beyond what is typically required. Feedback mechanisms are intentionally built into every process to ensure continuous improvement. Ultimately, the team measures customer satisfaction by scores received through an annual Contractor Performance rating (CPAR). The T-38 team has received consistent, demonstrated customer satisfaction & commendable CPAR scores.

(Do not exceed 10 pages in responding to the following four descriptions; allocate those 10 pages as you deem appropriate, but it is important that you respod to all four sections.)

VALUE CREATION *(Value: 10 pts)*

- **Clearly define the value of this program/project for the corporation beyond profit and revenue**

(12 pt. Times Roman)

T-38 AvCI continues to provide the safest, most reliable avionics experience to our nation's training warfighter. With over two decades of interaction and demonstration of support, the program allows for continual building of trust with the U.S. Air Force and taxpayers at large.

T-38 sustainment brings the Boeing team across our global enterprise together to solve challenging problems. It creates synergies for focus on quality, production-proofing and readying new technologies for implementation across a massive fleet. The T-38's individual component and block upgrade cadence ensures continuous learning and program self-improvement. The program is able to quickly adapt its processes due to the accessibility to test platforms and frequency of flights. This means that lessons learned can be rapidly incorporated as each component modification rolls out.

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

Long-term Value to the U.S. Air Force

Though the AvCI battle rhythm tends to focus on goals attainable within the next few years, there are many T-38 program benefits which bring lasting value to the U.S. Air Force, its sister services, and various stakeholders:

- Avionics component integration brings safe, reliable, and supportable visual and communication technologies directly to the nation's largest pilot production mechanism – U.S. Air Force Undergraduate Pilot Training. It is here where student pilots develop acute sensory reactions and habit patterns that shape their future combat performance. Providing an updated avionics suite provides feel and visuals similar to the fighter and bomber aircraft these pilots will fly in the future.

- Employing modern, safer, and more relaible avionics inside a platform built in the 1960s requires top-end engineering talent and strenuous attention to detail – qualities proven repeatedly by Boeing's T-38 AvCI program. Getting the modern avionics components to seamlessly work together with the legacy aircraft increases aviation safety and enables a critical slice of the Air Force's national security capability: An uninterrupted pilot training pipeline.

- Performance-Based Logistics (PBL) is key aspect of how the T-38 program consistently satisfies stakeholders. Near-immediate availability of parts enables our customer to keep jets flying. The program maintains a laser focus on its supply network through daily metric collection and verbal communication with both suppliers and COMBS personnel. The program remains poised to take action when part obsolescence brings lifetime buy opportunities.

- Another critical pillar of support provided to the flying warfighter is dependable analysis of aeronautical data within the Digital Aeronautical Flight Information File (DAFIF). Through organically-created software, the program has made improvements to the methods used to analyze the monthly updates, saving the Air Force and tax payer both time and money over the 20 plus year history. This software solution has borne fruit consistently for years to include discovery of anomalies that, if left undetected, could have impacted pilot training:
    - An Approach Type selection display anomaly was eroniously excluding seven approach procedures; quick program action resolved the issue
    - When the decision was made to exclude departures with turns over 180 degrees, the T-38 team worked quickly to remove these procedures prior to the next cycle

- In addition to automated software analysis of DAFIF, the T-38 program uses Matlab scripts to analyze our Flight test data. During the 2019 AvCI flight test effort, program analysts created automated scripts to analyze the ground-based indentification, friend or foe interrogator system (GBIIS) data, ultimately improving flight safety capabilities as the Talon zooms daily through congested air traffic patterns.

- The T-38 Program has exceeded many contractual requirements to the governments benefit with the Software Sustainment obligation to ensure continued support and operation at the

squadron level of the Mission Debrief System (MDS) and Integrated Maintenance Information System (IMIS). The Program has also supported six (6) Standard Desktop Configuration (SDC) updates, numerous GPO updates, and several Windows 10 issues to ensure continued cyber security protections and certification of the T-38C ground based software. Additionally, T-38 has consistently increased the IMIS capture rate across all squadrons. These efforts illustrate the lengths to which this program will go to support the customer and enhance the relationship beyond contract requirements.

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

Long-term Value to Boeing and its Teams

As T-38 AvCI members expertly integrate avionics components and work to sustain the operational fleet, there are several ways these actions have positive impacts on other Boeing teams and the company as a whole:

- Support of the T-38C has proven to be an excellent program for The Boeing Company to grow it's subject matter experts and create experiences for Boeing employess that can only be gained on the T-38C program. These experiences include, but are not limited to, supporting aircraft with 50 years of operational history, handling electronic obsolescence in real-time to support high op-tempo programs, forward thinking/planning on DMSMS, working across several, dispersed locations to aggregate supply and shift to where demand is needed in real-time, etc…

- Keeping the T-38 fleet viable for all stakeholders into the 2040s will provide a ready auxiliary as Boeing and its teams bring the new trainer online, further ensuring aircraft availability for training future warfighters. The program is remaining proactive with major suppliers employing spare part lifetime buys and other opportunities which ensure supply chain support out to 2040. The program is also working closely with T-7A to ensure economies of scope and scale are shared with the customer and across The Boeing Company.

- For AvCI team members, the contractor logistics support (CLS) effort teaches team members the value of life cycle planning in reducing aircraft sustainment costs. Every time the T-38 program researches options for avionics upgrades, these life cycle lessons will serve to decrease overall aircraft sustainment costs. Design for Supportability and life cycle cost are key tenant of the T-38C Program culture at Boeing.

- The intrinsic value of national defense mission impact cannot be overstated. As AvCI program efforts enable world class training for our nation's warfighters, it consistently bolsters job satisfaction, taxpayer confidence, and trust in the Boeing company.

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

It's no secret that aviation is currently experiencing a worldwide pilot shortage, one which will likely deepen over the next few years. It is felt everywhere from the military to corporate aviation, particularly in Asia and the Pacific and will likely impact the entire industry for years to come. It is easy to see why pilot training aircraft performance is more critical than ever. Providing a dependable platform with which

to train our future warfighters is one of several Boeing contributions to not only national security but to American society at large.

Another area of societal contribution is through continual Small Business subcontracting engagement. The T-38 program has consistently awarded above (some years, almost double) the Federal Acquisition Regulations (FAR) requirement of subcontracts to small businesses. This above-and-beyond approach to positively impacting our communities is just one more reason why this program is truly excellent.

METRICS *(Value: 10 pts)*

- **How do your predictive metrics drive action toward program excellence?**

(12 pt. Times Roman)

Historical analysis drives predictive metrics and part issue rates allow for time-optimized procurements. The program's judicial use of predictive metrics as part of its Performance Based Logistics (PBL) program, has provided substantial savings. Program-encouraged 'outside-the-box' solutions highlight the topnotch T-38 engineering core and demonstrate an innovation-friendly atmosphere. The following anecdotal examples from just the last three years illustrate the power of intentional program leadership as it shapes ingenuity, freedom of thought and team member motivation.

- Recently, the program experienced a trend of equipment failures due to minute amounts of water intrusion costing the Air Force over $100,000 in damages, annually. Creative planning and design enabled the attachment of deflecting hardware, improving the performance of the Traffic Collision and Aviodance System (TCAS) antenna by reducing failure rates and overhauls by nearly 100 events per year. Improvements such as these move the needle in favor of improved aircraft readiness and overall training system performance.

- Seamless program collaboration resulted in successful acquisition of a V-Tip antenna. Flexibility offered by program leaders allowed for additional parts investigation and shopping, providing substantial cost savings per unit by avoiding common competitive pricing for a similar antenna.

- Similarly, the program was able to acquire additional pitot tubes from the original equipment manufacturer with even more substantial savings compared to the alternate supply system.

- Continuous process improvement has driven substantial metric analysis efficiencies. Through organically-created software automation, program analysts are able to more quickly scan mountains of monthly maintenance data, catching 19 previously undetected anomalies all while saving 24 man-hours per month and associated program costs. This automated software also quickly produces a list of the top ten line-replaceable unit (LRU) failure trends, clarifying current trends and assisting program managers with risk reduction decisions.

Ultimately, these and other predictive metrics helped us continually fine-tune our execution, establishing new standards for team performance that directly contributed to the T-38 team's achievement of outstanding service at minimum cost.

DEALING WITH PROGRAM CHALLENGES (VOLATILITY, UNCERTAINTY, COMPLEXITY, AMBIGUITY, OR VUCA) *(Value: 25 pts)*

- *10 pts:* **Describe overall VUCA faced by your project/program.**
- *15 pts:* **Cite specific example(s) and how your team responded.**

(12 pt. Times Roman)

In theory, logistics support — which ensures the right parts are in the right place at the right time — may seem cut and dry. However, doing it reliably and affordably can be challenging. To meet this challenge, the program manages parts and components across all T-38 supply chain locations instead of taking the traditional approach of managing parts and components at each separate location. Through this approach and through partnership with the Air Force, the T-38C support team, which recently surpassed a quarter of a million flight-hours of AvCI support, and consistently exceeds the Avionics Mission Success Rate. Pilot training pipelines require a high level of performance and exceeding the success rate ensures that fleet avionics are essentially always ready whenever the customer needs it.

Because the fleet flies approximately 90,000 hours per year, daily support is not only needed, but essential. The team's work includes maintenance engineering, avionics component upgrades and contractor logistics support for avionics.

If one site has a surge of issuing a certain part, it rapidly can be replenished with parts from another site. Unused inventory at one site automatically is allocated to a site with demand. This allows the team to hold lower inventory levels, decrease cost and rapidly respond to demand surges at any of the locations. The team has a plan in place to issue parts in less than 30 minutes once requested from the customer. Predicting which site will need how many parts and when is difficult but, through decades of experience, aggregated data, predictive metrics and technical context, AvCI has optimized supply chain response with its fully mature PBL program.

Another area of potential uncertainty with this mature platform is equipment obsolescence and diminishing manufacturing sources (DMSMS).

- Today's rapidly-evolving technological sphere sometimes presents obsolescence challenges. Recently, one of our display sub-teir suppliers, due to shifting market demands, stopped producing the program's planned Electronic Engine Display (EED) glass upgrade. As the program was qualifying another supplier, they too stopped producing the requested unit. Lesson learned: Subsequent procurements for rapidly-evolving technologies have included requirements for supply and sustainment through the remaining contract period.

- With a keen eye on avionics performance, fielding, and predictive metrics, Boeing engineers identified an emerging trend of internal faults within the Traffic Collision Avoidance System (TCAS) later found to be driven by the systematic increase in ADS–B broadcasts in the operational environment. The ensuing period of independent testing and root cause analysis showcased Boeing's rigor, integrity and commitment to quality and aviation safety. T-38

AvCI demonstrated excellent management in its prompt response to emerging TCAS faults. Throughout the technically-complicated root cause analysis, the program stayed focused on the needs of the pilot community and Air Force leaders.

- Uncertainty with changing technologies have also illustrated the outstanding nature of our customer. When the existing Video Data Tranfer Unit (VDTU) was experiencing unforeseen human induced damages, corrective action options from our major suppliers were not meeting the customer's expectations. The program collaborated with the customer and industry to find a solution, which was celebrated by the customer as a collaborative success.

- Despite the inevitable uncertainty that follows aircraft sustainment, our suppliers have shown great trust in the T-38 program, in some cases providing next-generation products even before signing a contract and, in other cases, loaning equipment to the program at no cost to the USAF or Boeing in order to maintain productivity and schedule. These actions show not only trust in the T-38 program but a great degree of confidence in program leadership.

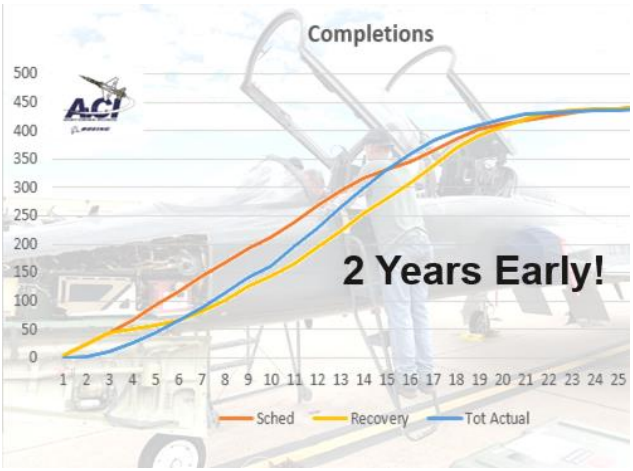
Finally, performance-based logistics ensures that the warfighter receives the well-maintained equipment needed for the fight. That focus is well-maintained through the use of a service contract tied to successful flying hours. A potential risk to Boeing is unforeseen or maintenance-unrelated circumstances that reduce flying hours. This scenario is being realized with the COVID-19 pandemic as flying operations at most training bases were reduced due, in part, to public safety concerns and other restrictions.

ORGANIZATIONAL BEST PRACTICES AND TEAM LEADERSHIP *(Value: 40 pts)*

- *15 pts:* **In executing the program, what unique and innovative practices, tools and systems frame your program and help you achieve program excellence**?

(12 pt. Times Roman)

From July to December of 2019, the program completed a massive project one month ahead of schedule and nearly two years ahead of the contract's due date. The project was a critical avionics modification to approximately 430 T-38C aircraft located at eight military installations simultaneously in six months, before the end of 2019, per U.S. Federal Aviation Administration regulations.



The program had some critical scheduling decisions to make before going to work replacing Mode S transponders, wire harness installation, structural modifications, software updates, and GPS sensors and antennas. Government approvals for radio frequency and certification typically took up to two (2) years. Boeing and SPO leadership quickly divided the retrofit into phases which allowed work to start months earlier while awaiting the frequency approvals.

Next, the program delineated further those components which needed to be completed by the end of the calendar year and executed a plan to do just that. It was truly a team effort, engaging 75 Boeing employees from across the country with simultaneous ADS-B Out modifications.

T-38 program focus was not only providing service ahead of schedule but doing so with a laser focus on quality. During the early days of this retrofit, program management elected to stand down operations in order to address identified risks and issues which were impacting not only quality but team morale and, potentially, safety. This decision to sacrifice schedule for quality and safety reflects Boeing's corporate culture and was ultimately beneficial to all stakeholders.

- *15 pts:* **What unique and innovative processes and practices are you using to develop people and transfer knowledge and how do you know they are working?**

The T-38C AvCI program has developed innovative processes and practices to develop people and transfer knowledge. One main methodology of the program is by accepting and rotating engineers, project managers, and logistics professionals support within the program. T-38C has trained and groomed new hire and senior employees alike. For example, the T-38C AvCI program trained an F-22 avionics engineer on T-38C avionics for more than 9 months before the engineer assumed her role on F-22. Additionally, T-38C engineers, support, and logistics professionals have trained on T-38C but gone onto work on P-8, F-15, 777x, JDAM, A-10, T-7A and F/A-18. Likewise, T-38C pulls employees from other programs to work long-term on T-38C. Our current team has experience from T-7A, F-15, F-22, spares, F/A-18, etc…

This cross-training allows for Boeing to ensure to we can pull resources back to T-38C to help with surges or to backfill employees who retire or otherwise leave the program. We know this process is working because we have brought back engineers to help us through surges and allow us to manage a variable demand for knowledge and resrouces in a fixed price environment. Additionally, T-38 and T-7A program teams are working collaboratively to share knowledge and streamline support for the USAF as the team works to begin fielding T-7A aircraft.

Lean initiatives are another tangible result of this program's relentless drive to continuously improve performance and optimize operations through innovative processes. The following are just a few examples of those initiatives which have realized savings.

- When purchasing compact flash cards for aircraft maintenance data downloads, samples from each batch must be tested for proper operation. In order to reduce testing costs, the program wisely purchased from the same batch enough cards to last the remaining contract period,

reducing annual testing costs incurred by the U.S. Air Force of approximately $150,000 per year.

- A fleet-wide retrofit is typically a massive undertaking. With the employment of contract field teams (CFT) comes program risks related to both cost and schedule. However, with clear lines of program communication, an innovation-friendly climate can substantially lower that risk. During a recent fleet retrofit, the CFTs noted difficulties obtaining a GPS signal from inside the aircraft hangar. As this signal was needed to verify equipment operation, the CFTs resorted to towing aircraft outside the hangars for avionics checks, costing resources in terms of both time and equipment. Through collaboration, an innovative solution sprang from the CFTs and engineers to bring the signal to the aircraft rather than the aircraft to the signal. These creative and decisive program actions saved countless man-hours for the customer in aircraft movement, operational checkouts, and completed aircraft ahead of schedule.

- Responsive procurement despite diminished manufacturing: When parts are no longer produced, it puts a strain on suppliers to restart a manufacturing line. Recently, a map light supplier quoted a replacement part at four times the original price in order to restart their line. Instead, T-38 engineers went above and beyond to research alternatives, collaborate with stakeholders, and ultimately find a suitable replacement part (also used on the T-7A) which saved over $3,000 per unit.

- Program-encouraged innovation was also demonstrated with the help of the T-38 program Depot Repair Facility (DRF) in San Antonio. Program engineers collaborated with DRF members to establish internal procedures for the manufacturing and installation of aircraft glare shield harnesses. This effort highlights AvCI's breadth of operations and will save the company over $3,000 per month.

➢ *10 pts:* **What unique practices are you using to engage customers and how do you know?**

As virtual training gains in both effectiveness and popularity, the T-38 program set out to build a prototype Virtual Reality (VR) trainer version of the simulator (or aircrew training device – ATD) trainers in one month. With full support of program leadership and paid for by internal Boeing development funds, program engineers used the aircraft's CAD/CAM drawings to build the aircraft and cockpit visual models and modified the Desktop Trainer Environment used for testing code, to provide the driving software. The program demonstrated a fully operational flying VR system four months later at Interservice/ Industry Training, Simulation and Education Conference (I/ITSEC), the world's largest modeling, simulation and training event.

The system includes a flying T-38 aircraft, actual mission computer software, instructor operating station, and networked units to allow a multiple aircraft session. This organically-built system is mated with VR visual that includes aircraft interior visuals (with operating cockpit instruments and displays), touch screen activation of cockpit switches, buttons, and dials, and exterior views that include accurate representation of the world at the current aircraft's position and other aircraft in view. For maximum realism and effectiveness, all training malfunctions and ATD scenarios are operational and selectable by the instructor.

Today's pilot trainees are already familiar with augmented reality and virtual worlds – this system augments existing world-class ATD and aircraft training and is one more demonstration of T-38 program

excellence. Feedback from instructor pilots gave us unique engagement oportunites to ensure we are meeting the need and intent for future pilot training.

Both Boeing and our USAF customer understand the importance of close collaboration and trust as hallmarks to the success of the program. Customer engagement is enhanced in several ways, not the least of which is by constant communication via daily telephone tag-ups and multiple weekly technical meetings. Issues uncovered by either team are quickly and openly discussed to bring fast resolution to the warfighter. Measuring project schedule and aircraft reliability by month are some metrics to help us understand overall performance. While these metrics provide contractual satisfaction, special projects and situations unique to an aging weapons system result in the need for more robust reporting beyond what is typically required.

When it comes to mission execution, no team is closer to the action than our COMBS personnel. Through a unique effort, the T-38 program maintains company-owned aircraft parts stock at each main operating base for immediate retrieval. Once the part crosses the counter into the hands of the customer, it becomes government-owned property and vice versa. This arrangement facilitates immediate transfers and enables aircraft maintainers to keep Talons flying without interruption or delay. Our customer does not take this timeliness for granted: Kudos to the T-38 program abound for doing their pivotal part of keeping the fleet operational.

Feedback mechanisms are intentionally built into every process to ensure continuous improvement. Ultimately, the team measures customer satisfaction by scores received through an annual Contractor Performance Assessment Report (CPAR). The T-38 team has received consistent, demonstrated customer satisfaction & commendable CPAR scores.