

AVIATION WEEK

# Program Excellence Awards 2022

November 2, 2022

The Watergate Hotel • Washington, DC

Nomination Form

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Gregory Hamilton  
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Acknowledged, agreed, and submitted by

\_\_\_\_\_  
Nominee's Signature

\_\_\_\_\_  
Date

Nominee's Name (please print): Robert Roslawski

Title (please print): Sr. Mgr, Value Stream

Company (please print): Collins Aerospace

## NOMINATION FORM

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Supplier Approved (if named in this nomination form)

o Date: NA

o Supplier Contact (name/title/organization/phone): NA

## SUPPLIER SYSTEM SUSTAINMENT

## Make the Case for Excellence

### *Vision*

Considered by many to be an engineering marvel, the B-2 Stealth Bomber remains a key constituent of the U.S. Air Force's arsenal more than three decades after its entry into service. Despite its strategic importance to the air force delivering superiority in the sky, on the ground the B-2 has struggled through growing obsolescence issues and a strong need for technology advancement to ensure future relevance as future fleet elements like the 6<sup>th</sup> Generation Fighter and future Tanker (and evolving mission capabilities) are brought online. The vision of Collins Aerospace (Collins) is to ensure the cockpit of this tremendous aircraft is updated and equipped with the most advanced, state-of-the-art technology and human machine interfaces (HMI) and formatting to provide unparalleled and networked situational awareness capability to the operator. This includes high-definition Liquid Crystal Displays (LCD) as well as providing full color graphics and night vision capabilities to the flight crew to reduce cognitive loading leading to improved mission effectiveness and quicker decision making in the cockpit.

### *Unique characteristics and properties*

Built in the late 1980's to early 1990's, the B-2's current Cathode-Ray Tube (CRT) displays are seen as outdated and obsolete. The U.S. Air Force partnered with Northrop Grumman to develop a program to resolve obsolescence through 2025 and include additional enhancements to the Multi-Purpose Display Unit (MDU) to rectify previous deficiencies. The MDU is an avionic device that manages and displays information such as the aircraft's flight, navigation, engine, and alarms on a display screen with pilot-friendly graphics. With a long history of successful performance and a strong working relationship, Northrop Grumman awarded Collins a contract to resolve the obsolescence issues and add the much-needed technology enhancements to the MDU in early 2020.

Today, Collins is developing the first prototype MDU Replacement (MDU-R) to be used for lab testing in 2023. With the low number of B-2 aircraft to begin with, high and sustained utilization rates led to an aggressive development schedule as the most important requirement for the MDU-R program. Aggressive schedules along with general material shortages are tough challenges for defense contractors. Adding the global pandemic supply chain issues along with material shortages for an aircraft flying for over thirty years, this unique and challenging program went from difficult to borderline impossible for what is a strategic asset and program to the USAF. The normal lead time for parts availability were 30-60 days, and now lead times change daily with ranges extending over 700 days. The Collins team recognized the challenges and adapted quickly by making the below program management process modifications to address these significant unanticipated lead time increases:

- Early and frequent identification of materials that may become an issue (proactive reviews)
- Daily proactive supply chain communications between designers, suppliers, and leaders to ensure that visibility and priority is coordinated effectively
- Procurement and engineering collaborating and creatively utilizing the Collins supply chain management tools to identify alternate parts to support lead times needed for the B-2 program schedule
- Increased communication from Collins to Northrop Grumman ensuring alignment and collaboration. Northrop Grumman even reviewing their internal materials availability options to assist.

As the program successfully progresses past the Critical Design Review (CDR) and the build/test/qualification phase continues, the risk to the schedule becomes greater. Mainly, all parts not meeting environmental nor performance specifications will have to be replaced.

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Despite significant challenges, the combined Northrop Grumman and Collins team have effectively maintained the development schedule and continue to overcome material challenges without impacting design, producibility, cost, or ultimately the end-user's operational readiness.

## VALUE CREATION

### *Contribution of the program to the greater good*

The B-2 Bomber continues to serve as our country's heavy strategic stealth bomber as it has for almost 30 years, and the capabilities of the B-2 are known by military leaders across the world. Modest knowledge of these capabilities and history of successful combat missions from Kosovo, Iraq, Afghanistan, and Libya continues to serve as a strong deterrent to provocation of the United States or its allies. The strategic nature of this platform become heightened in future evolving missions with platforms and capabilities being integrated and upgraded more quickly at the "speed of operational relevance". Given advancements in existing and emerging fleets, enhancing the display accuracy along with HMI to accommodate the mission becomes an inherent enabler to ensure allied and fleet Air Dominance is maintained.

### *Value of this program for the corporation*

As a military supplier, Collins takes great pride in supporting B-2 pilots, air crews, and maintainers for safely defending our country's values, freedom, and dreams. Collins delivers a broad spectrum of advanced, battle-proven solutions that serve the warfighters of today and tomorrow, when lives are on the line, proven performance means everything. Collins' main purpose is to provide mission advantages to their operators to keep them connected, informed and safe during the mission. At Collins, we understand that platform capabilities and the fleet will evolve and this program allows our warfighters to be more situationally aware and relevant in the future fight. The MDU-R program to modernize the B-2 display system is at the core of Collins' existence. The Collins team has maintained strong communication and involvement with Northrop Grumman to efficiently and proactively overcome challenges as they are encountered and looks forward to a partnership with the USAF and Northrop Grumman as the B-2 platform evolves.

### *Value of this program for our customer*

The US Air Force can't afford to wait any longer for the MDU-R to be replaced and there is no room for schedule delays. This retrofit program will truly improve the decades old technology by replacing the aged CRT displays with 21<sup>st</sup> century LCD displays which will be maintainable through 2040.

The Collins team was faced with replacing nearly a quarter of the MDU-R required parts due to obsolescence. Additionally, Collins coordinated with Northrop Grumman the *last time buy* purchase of four components scheduled to become obsolete. With the priority of the program around obsolescence refresh, the MDU-R must also maintain the form, fit, and function of the CRT display, and bring into the cockpit High-Definition LCD's capable of full-color graphics, video, and night vision to once again, make the B-2 Bomber mission ready now and for the fight of tomorrow.

### *Value of this program for the team*

Supporting the military gives the Collins team an enhanced sense of pride and helps set priorities of high quality and safety with all aspects of the program. At every step of the way, the Collins team operates with an empowered mindset of keeping its military customer at the forefront while making program decisions. Many of Collins' employees are U.S. Veterans, Reservists, or have family members currently in service. The Collins team consists of dedicated and cohesive subject matter experts from across the company working together with one goal – safely execute our programmatic mission. In this case, to not only support design improvements of the B-2, but to ensure the solution is available for decades to

come. When the design and qualification phases are complete, the USAF will have a modern and reliable display capable of meeting (and exceeding) all requirements of the B-2 MDU.

## METRICS

Various metrics are captured to assess trends, effectively manage the program, and most importantly identify areas of concern as Collins see trends within the data and metrics. After progressing through the design phase in early 2021, just after the MDU-R Preliminary Design Review (PDR) and amid the global pandemic, Northrop Grumman contracted Collins to proceed to the Engineering Manufacturing Development (EMD) phase of the program. Collins completed the detailed planning process. The team analyzed every aspect of the program from requirements, specifications, contractual obligations, design, schedule, resourcing, and staffing to develop comprehensive plans supporting the structure and management of the MDU-R program.

To establish the schedule and plans to execute, the team drilled into the technical specifications and early environmental testing to reduce risk of updating the design of the MDU-R later in the program. It was at this time, Collins realized there was a big problem. While placing orders for the parts which typically have lead times of 30-60 days, the suppliers were responding with lead times of double or triple that timeframe. Procurement was internally working to evaluate other options. Unfortunately, as the days went on, the responses to the lead times were exponentially growing in excess of 700 days. The team quickly identified the growing lead time issues and took action to adjust Collins' normal business practices to focus on this unique and unexpected challenge.

### *Predictive Metrics*

Collins was well prepared for this unique challenge created by the pandemic. The team did not specifically require new tools or processes. Collins implements a culture for employees at all levels of the organization to practice strong adaptive and empowered decision making, with leadership fluidity to quickly change based on the needs of the customer. Collins relied on the initial plans developed during the detailed planning sessions, and a line-up of designers, environmental engineers, product component engineers, and procurement agents to overcome the critical growing lead times. Within these processes, standards were established and utilized to efficiently execute.

SmartSearch is a predictive tool used to analyze the Bill of Materials (BOM) for obsolete material, unacceptable components, producibility, and compliance, which helps Collins establish early obsolescence metrics. SmartSearch is a Collins proprietary database where information is maintained through a real-time connection to industry databases such as, Information Handling Services (IHS), Intelligent, and SiliconExpert. In the case of the B-2 MDU-R program, the BOM metrics were increasingly problematic due to the program requirement for Years to End of Life (YTEOL) greater than or equal to 5 years. The BOM metrics are categorized by: preferred, non-preferred, unacceptable and obsolete type. Initial results of the BOM, outlined in Table 1, revealed an astounding 23% of the parts presented had concerns to be addressed before the design was complete.

*Table 1 MDU-R >5YTEOL*

<b>Parts Availability Type</b>	<b>Initial BOM</b>
Preferred	77%
Non-Preferred	15%
Unacceptable	4%
Obsolete	4%

### *Performance against the metrics*

With a significant level of parts at risk (23% within non-preferred, unacceptable, and obsolete parts) the Collins New Product Introduction (NPI) team engaged (earlier than normal) to identify parts using the Smartsearch tool to fit the needs, cost, and schedule of the program. Located at each Collins manufacturing site is an involved NPI team dedicated to their expertise related to the build and test of the MDU-R display. These teams continue to focus on new product factory transitions and are responsible for establishing production capabilities, producing and delivering units through the successful completion of EMD to Full Rate Production (FRP).

Collins proactively seeks to avoid obsolescence problems well before engineering designers are engaged in part selection. Some of the key tools and philosophies include:

- Preferred Suppliers - these suppliers often enter into long term agreements which include the end-of-life support throughout the product life cycle
- Preferred Parts - a dynamic and Collins proprietary formula that automatically grades a component based on life cycle, manufacturer, business and other attributes, then "pushes" that component to the front of the design engineer's view during part selection
- Industry Technology Roadmaps - constantly evolving industry specific technologies which are road-mapped for long-term hardware and software architecture flexibility in support of the next generation technology
- Design reviews include all the above, creating strong motivation to score well in component selection, affecting obsolescence avoidance

Producibility, quality, and process flow data is collected throughout EMD and will continue to be addressed as the product matures into FRP. This ensures a successful transition of production responsibilities from the NPI team to the manufacturing Integrated Project Team (IPT).

### *Predictive metrics drive action toward program excellence*

Following the Collins Management System process, the program plans, development plans, manufacturing plans, and support plans are program documents frequently updated to address the latest metrics, set specific tenets and goals enabling the program to meet both EMD and FRP contractual requirements.

Once the high-risk materials are identified, the Product Component Engineer (PCE) uses SmartSearch to analyze the obsolete risk by determining the YTEOL. The PCE utilizes a process to mitigate identified obsolescence. This process starts with the most minimal risk by finding an alternate Collins part number which has the same form, fit, and function in SmartSearch with available inventory and where any extra processing can be eliminated. The next option to mitigate the material risk is to search in SiliconExpert and IHS Markit® for other manufacturer suggested replacements when Collins' internal tools do not have a similar part that meets the expectations. Often Collins will utilize established relationships with the manufacturer of the parts to discuss recommended drop-in replacements.

To address the long-lead part impacts related to the COVID pandemic, the team implemented a weekly review to assess the fast-moving, challenging information changes and address actions to mitigate potential risks. In addition, monthly reviews of the Parts Control Metrics, Functional Part List, and quarterly Diminishing Manufacturing Sources Material Shortages meetings provide additional opportunities to adapt to any logistical part challenge that negatively impact the program.

The last option for this program to consider is to coordinate a *last time buy* with the B-2 customer. This occurs when all other sources are exhausted and there are no alternate parts available. To prevent major



redesign efforts, resolution was needed around the four obsolete components which were identified at the beginning of the EMD phase. Through joint efforts, Northrop Grumman and Collins, the parts were purchased as a *last time buy* and will be held at a Collins facility until needed for development and manufacturing.

The Collins team also assessed the key producibility tenets, such as maximizing auto-placed parts, preferred parts, test coverage and first pass test yields for each of the manufactured assemblies. The display must either meet or exceed the requirements of the B-2 MDU-R to successfully enter Full Rate Production.

A key schedule requirement during Full Rate Production is to deliver a set number of MDUs each month. To meet this production delivery requirement, producibility goals were established as noted in Table 2.

For the production rate goal to be achieved, the Collins team maximized the effectiveness of the producibility tenets. The newly implemented Special Test Equipment provided the most impact to the producibility tenets by increasing the first pass test yield by 33%, and expanding the fault isolation coverage allowing quicker identification of issues. These and the remaining tenets are tracked throughout pre-production builds to ensure the MDU-R remains on track to meet all internal and external customer requirements while supporting program defined quantities during full rate production.

*Table 2 B-2 MDU-R Producibility Improvements*

<b>Key Producibility Tenets</b>	<b>Goal</b>	<b>Actual</b>
Auto Placed Parts	99%	99%
Preferred Parts	90%	90%
Test Coverage	100%	100%
First Pass Test Yield Improvement	33%	70% (forecast)
Touch Labor Reduction	39%	45% (forecast)
Test Labor Hour Reduction	56%	56% (forecast)

Collins successfully completed CDR and showed full conformance to 107 design-specific criteria for the 19 different functions. The team was able to show significant improvements in key producibility and material requirements from the initial parts availability of the BOM. Table 3 summarizes the current position with improvement over the initial BOM analysis.

*Table 3 MDU-R Producibility and Material Requirements*

<b>Parts Availability Type</b>	<b>Initial BOM</b>	<b>Current Status</b>
Preferred	78%	90%
Non-Preferred	15%	9%
Unacceptable	4%	0%
Obsolete	4%	1%

The preferred parts category also improved compared to the previous MDU display as shown in Table 4. Collins established plans to address components that become obsolete after the start of the program. With evaluation and coordination, the Collins team mitigated risk with these parts by segmenting the existing Collins stock to specifically support the B-2 Bomber beyond 2040.

Table 4 Preferred Parts Comparison

Type	MDU	MDU-R	% Improvement
Preferred	78%	90%	12%
Non-Preferred	15%	9%	6%
Unacceptable	4%	0.3%	3.7%
Obsolete	3%	0.7%	2.3%

## DEALING WITH PROGRAM COMPLEXITY (VOLATILITY, UNCERTAINTY, COMPLEXITY, AMBIGUITY, OR VUCA)

### *Volatility, Uncertainty, Complexity, Ambiguity (VUCA)*

Over the past two years, the COVID pandemic has had a significant impact worldwide for the procurement of electronic components and other commodities for manufacturing. Collins has seen the lead times for certain materials like semiconductors increase drastically, which has driven the procurement team to work alternate plans such as processing broker buys and establishing demand earlier than anticipated to meet customer delivery schedules.

Obsolescence is also an ongoing uncertainty when striving to achieve a five-year end of life guarantee. For the B-2 MDU-R program, this means looking decades ahead into the future at a time when supply chain volatility changes daily. The Northrop Grumman and Collins team leaned forward by purchasing four expensive components identified by the Collins NPI team as becoming obsolete within the five-year period using the Collins proprietary SmartSearch tool.

### *Collins Team response to the challenges*

The Collins program team rose to the challenges to extend and enhance the B-2 Bomber displays with urgency, teamwork, professionalism, and empowered leadership utilizing the Collins Management System to keep the MDU-R program on track in achieving and exceeding defined goals – not just maintaining resolution but keeping within the aggressive schedule and cost.

Parts are managed with the Diminishing Manufacturing Sources Material Shortages process and Collins utilizes an internally developed obsolescence tracking tool, SmartSearch. This tool proactively provides the procurement team the ability to prioritize issues, while mitigating risks and highlighting impacted aging products. This program serves as a model followed within Collins and showcases the value of many functional teams working together to achieve success. The MDU-R program is executing well due to early visibility into potential issues, adapting review cadences, using reliable earned-value methods, and leveraging team expertise to efficiently resolve issues through decisive actions. As Collins leadership continues to empower the team to employ critical decision-making and always keeping the customer in mind, this program will continue to be strong, successful and prosperous.

## ORGANIZATIONAL BEST PRACTICES AND TEAM LEADERSHIP

### *Innovative tools and systems*

Innovative tools are a competitive advantage for any business. The Collins program team evolved the use of existing tools (SmartSearch, Information Handling Services (IHS), Intelligent, and SiliconExpert) as soon as suppliers began to indicate parts were not as available as they were, increasing lead times beyond the required USAF schedule.

Communication across functional teams generally wouldn't be described as a traditional tool. However, with COVID creating the need for remote working or "hybrid" workstations, the daily feedback loop



between the Integrated Project Team (IPT) members allows consistent opportunities for team members to bring new perspectives to potentially older processes, which is critical on the B-2 program.

The organizational tools noted below are utilized specifically on the B-2 MDU-R program. These tools and processes are all designed and developed within Collins. Investing in the right tools to ensure team members have accurate and efficient information provides value across the IPT, the business, and customers. These resources enable the team to bring concepts, concerns, and observations to the integrated team for discussion. The information captured and collaboration allow the team to operate efficiently, often spending less time evaluating issues, and more time focused on driving forward with viable solutions.

- Collins Management System (CMS):
  - Company built, robust system to effectively lead each program similar-to running a business
  - As viewed by customers, offers clear decision making and accountability allowing for informed critical decision making
  - Developed to provide the Collins IPT access to resources and tools that assist in a wholistic perspective across all phases of the product life cycle (such as the end-of-life requirements for the B-2 program)
  - The Value Stream Leader (VSL) responsible to lead the overall IPT and to ensure the program is effectively meeting or exceeding objectives
  - The IPT consists of various functional members across the business (for example: VSL, Engineering, Business Development, Supply Chain, Contracts, Finance, etc.)
  - The IPT members lead their functional area and are empowered to make the best decision for the customer, while adhering to the company policies and procedures
  - Ensures essential alignment across the IPT with communications occurring sometimes daily to ensure strong collaboration, awareness, and timeliness to adapt to supply chain volatility

“We launched the Collins Management System well before the pandemic disrupted the industry to develop and evolve a value stream based operating model – one that allows the customer to be at the center of all we do. This was essential to consistently deliver world-class customer service and has proven very successful even through these turbulent times,” says David Schreck, Vice President Collins Aerospace.

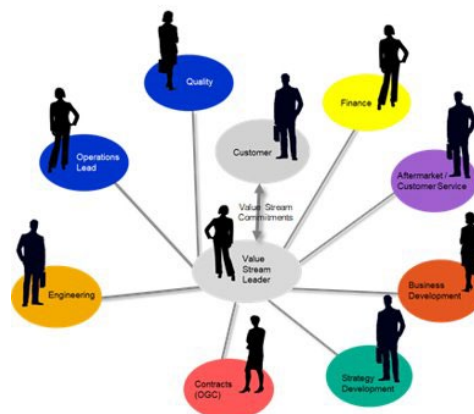


Figure 1 Value Stream Information Flow

- Collins Pre-execution Project Planning (PEPP):
  - A concentrated team-focused program planning event to coordinate all planning activities are outlined, evaluated, and reviewed prior to beginning execution of the program (triggering early awareness for potential concerns or opportunities, such as obsolescence)
  - Due to the complexities around obsolescence and program excellence, the PEPP file for the B-2 program, is now a template guide for future programs
  - PEPP leaders operate outside of the IPT, to ensure an unbiased planning effort
  - The PEPP team leads discussions addressing gaps and concerns based on prior lessons learned and best practices to help the IPT prepare a successful program plan to execute
  - Provides teams with added assurance the program is set up for success, as well as provides additional expertise and insight to areas the IPT may not have thought about, engaging in diversity of thought, such as creative supply chain management
  
- Integrated Master Parts Application Coordination Tool (IMPACT)
  - Collins' home-grown tool, utilized by design engineers and product component engineers to provide proactive obsolescence predictions on all components, serving as a basis for on-going obsolescence awareness. Tool highlights the changes to parts obsolescence prioritizing those parts at risk for procurement within a specific program
  
- Product Change Notification (PCN) Tool
  - Used by engineering and procurement agents to assist with tracking of all supplier notices, especially obsolescence
  
- OneSystem
  - Internal Collins tool used for tracking and resolution of obsolete parts. This tool provides active management of obsolescence after supplier notice has been received. The information from this tool is provided to the design engineers for review. This has been a significant part of the Collins' efficiency during the pandemic due to the rapid change in suppliers' ability to deliver parts. Even though an alternate part may be identified as a resolution, the engineering review, analysis, and design change impact processes must be complete before another part can be accepted
  
- Process Failure Mode Effects Analysis (PFMEA)
  - A step-by-step brainstorming analytical procedure to analyze, prioritize, and address risk of defects in Collins' processes continuously throughout product life
  
- Customer Oriented Results and Excellence (CORE)
  - The use of various lean tools and activities are common practice for operations and all teams conduct a "process walk." This process looks closely at all aspects of the manufacturing process during the first builds to capture lessons learned and the opportunities for improvement. These processes are a cross functional activity including operations for operators and engineering

The challenges of the COVID pandemic added complexity to how the Collins team collaborated, led, and managed the B-2 MDU-R program. At the beginning stages of the pandemic, and to ensure safety of team

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members, only those required to be onsite were allowed in the facilities. Collins leaders were encouraged to manage the program remotely, changing nearly all leadership principles normally practiced. Collins' Digital Technology capabilities adapted to the change. Major efforts, including a complete conversion to Microsoft O365 and Teams environment allowed team members to work remotely and in a secure manner to openly share, comment, and update files simultaneously. Naturally, it took some time to be comfortable with video conferencing, ultimately adjusting to the daily use of audio and video in virtual meetings while adapting to real-time document editing broadened collaboration for all team members, no matter if they were onsite or working from a remote location.

*“The health and safety of our people is our first priority, and we are committed to ensuring safe, responsible and continuous operations worldwide in supporting the fight against COVID-19.”* Collins President Steve Timm, on why our work matters now more than ever.

#### *Developing, leading, and managing people*

The worldwide pandemic not only impacted the supply chain, but it also impacted day to day business activities. A “day at the office” has taken on a whole new meaning. Working from home and limited lab access could have significantly hindered the collaboration opportunities one use to experience by simply walking down the hallway or into the lab. The Collins team continues to maintain effective people management, development, and motivation remotely with more proactive and deliberate meetings. A variety of structured and focused recurring meetings were established including core team status, schedule, and hardware status meetings. Recurring production and material reviews were conducted with buyers, operations, and engineering. These meetings allow for productive interaction among the team to work on actions and milestones. The team is empowered to openly interact and collaborate, address and elevate issues quickly and efficiently.

*“Our meetings allow for each team member to bring up dependencies, risk, issues as well as accomplishments. We take the opportunity to celebrate individuals who go above and beyond supporting the program by recognizing them in team meetings and with their leaders. The team also shares comradery and pride when wearing B-2 program shirts provided by the company for the successes achieved.”* as stated by Collins Value Stream Leader, Rob Roslawski.

#### *Leveraging skills and technologies of our suppliers*

Collins' success within the global supply chain during these challenging times is intrinsically connected to the team's open and honest relationship with suppliers. Re-inventing aerospace through bold creativity and intelligent technology requires a network of trusted, forward-thinking suppliers who understand, believe, and accept the mission of partnership to work with the agility needed to keep pace with our rapidly evolving environment.

Collins' ability to benefit and learn from its suppliers' skills and technologies has grown from building fundamental relationships where these external teams are often perceived as an extension of the internal program team. Collins' leadership proactively established a dedicated team supporting risk mitigation concepts and strategies. Procurement leadership supported this concept by approving the creation of the “Business Continuity Team.” Through this, the team worked together to enhance and promote internal system tools and processes aimed to proactively identify material availability risks and find solutions before customer and business impact. This concept enables the team to become more agile and ready as the procurement teams prepare for day-to-day operating environments and potential high impact risk events. Having this type of program in place and understanding our supplier capabilities through strong

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partnerships and regular engagement, proves advantageous to adapting during this pandemic. While there is no proverbial golden tool shielding Collins from all risks, the Business Continuity Team is a valuable asset that pushes the team to be proactive and solution-oriented when risks arise.

Collins' internal and external supply chain teams all play a key role in continuity of supply - from planning, procurement, quality, to suppliers and even customers. Collins' teams focus on supplier relations and a risk mitigation mindset allowed the team to engage and leverage its supply base in a meaningful way. At Collins, supplier relationships are invaluable in helping solve the toughest customer challenges through innovative solutions. Through mutual respect and a relentless commitment to achieve common goals, Collins will not only transform today, but help redefine the future of the B-2 platform and the USAF fleet leveraging its internal and external (industry) partners.

Like all challenges, there are opportunities, and over the past two years Collins' excellent communications network with its supply chain partners, forward looking tools for planning, and tools to identify potential risks enabled the company to address new and unique problems while successfully driving a very demanding schedule.

Collins Aerospace continues to overcome obstacles that no one could have predicted at the start of the B-2 MDU-R program. Collins believes in the power of intelligence and partnership to guide their customers into the future. The paths Collins paves together leads to limitless possibility, and the bonds formed propel us all higher. At Collins we are constant in evolution, being connected to customers, and are compelled to boldly step forward. With the B-2 MDU-R program, Collins is proving we are relentlessly tackling challenges due to COVID and the supply chain issues. Through a combination of utilizing trusted processes, adapting to new work environments, strict management of part availability, and obsolescence, Collins is playing an important role in the future of one of America's most strategic bombers and continuing to redefine aerospace.