



RAPID SUSTAINMENT OFFICE

Quarterly Report

July - September 2023





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PURPOSE

ACCELERATE DELIVERY OF CRITICAL OPERATIONAL SOLUTIONS TO THE DEPARTMENT OF THE AIR FORCE SUSTAINMENT ENTERPRISE

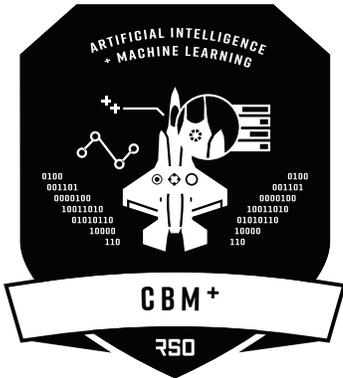
MISSION

OPTIMIZE WARFIGHTER READINESS BY EXPLOITING TECHNOLOGIES TO REVOLUTIONIZE SUSTAINMENT OPERATIONS

VISION

TO BE THE PREEMINENT DEPARTMENT OF DEFENSE SOLUTIONISTS THAT CHALLENGE CONVENTIONAL MINDSETS, PUSH THE BOUNDARIES OF INNOVATION, AND GENERATE CONCEPTS THAT SOLVE PROBLEMS AT THE SPEED OF USER NEED

RSO TECHNOLOGY FOCUS AREAS



Artificial Intelligence & Machine Learning (AI/ML)

We apply AI and ML to optimize fleet maintenance, increase aircraft availability, and minimize aircraft downtime.

Our most prominent application of AI is within our **Condition Based Maintenance Plus (CBM+) Program Office**. This technology employs AI that enables us to improve maintenance data quality and evaluate large sets of aircraft sensor data and maintenance history to predict component failures. These applications empower our CBM+ program office to save thousands of maintenance hours every year.



Advanced Manufacturing

The RSO's **Advanced Manufacturing Program Office (AMPO)** scales organic capability and serves as the Air Force's focal point for the application of AM in matters related to acquisition and sustainment.

The AMPO executes four major functions:

- Technology Assessment
- Airworthiness Certification Support
- Product Support Management
- Deployment Across the Enterprise

Vision

Empowering supply chain management and scaling AM capabilities across the Department of the Air Force to ensure continuous Warfighter advantage and readiness anytime, anywhere in the world.



Accelerating Innovation and Modernization to Scale (AIMS)

The AIMS Team drives and leads the rapid adoption of sustainment-centric technologies to improve readiness and positively impact costs, be that in-garrison, or in both a contested and non-contested deployed environment, while exploiting modern tools to increase expertise, eliminate waste, enhance situational awareness, and produce and restore mission-critical materiel for the Air Force.

The AIMS Team discovers, develops, matures, and modernizes sustainment technologies within the following focus areas:



**AUTOMATION
& ROBOTICS**

We apply automation and robotics to eliminate maintenance tasks that are repetitive, labor-intensive, or hazardous, making it possible to accomplish these tasks safely and efficiently with a high degree of accuracy.



**DATA & DIGITAL
ENVIRONMENTS**

We standardize maintenance and sustainment data collection to serve as a connector of data sources across the Air Force. Our process is to collect the data, identify what's useful, turn it into a functional format, and then leverage it to inform smart and proactive decisions.



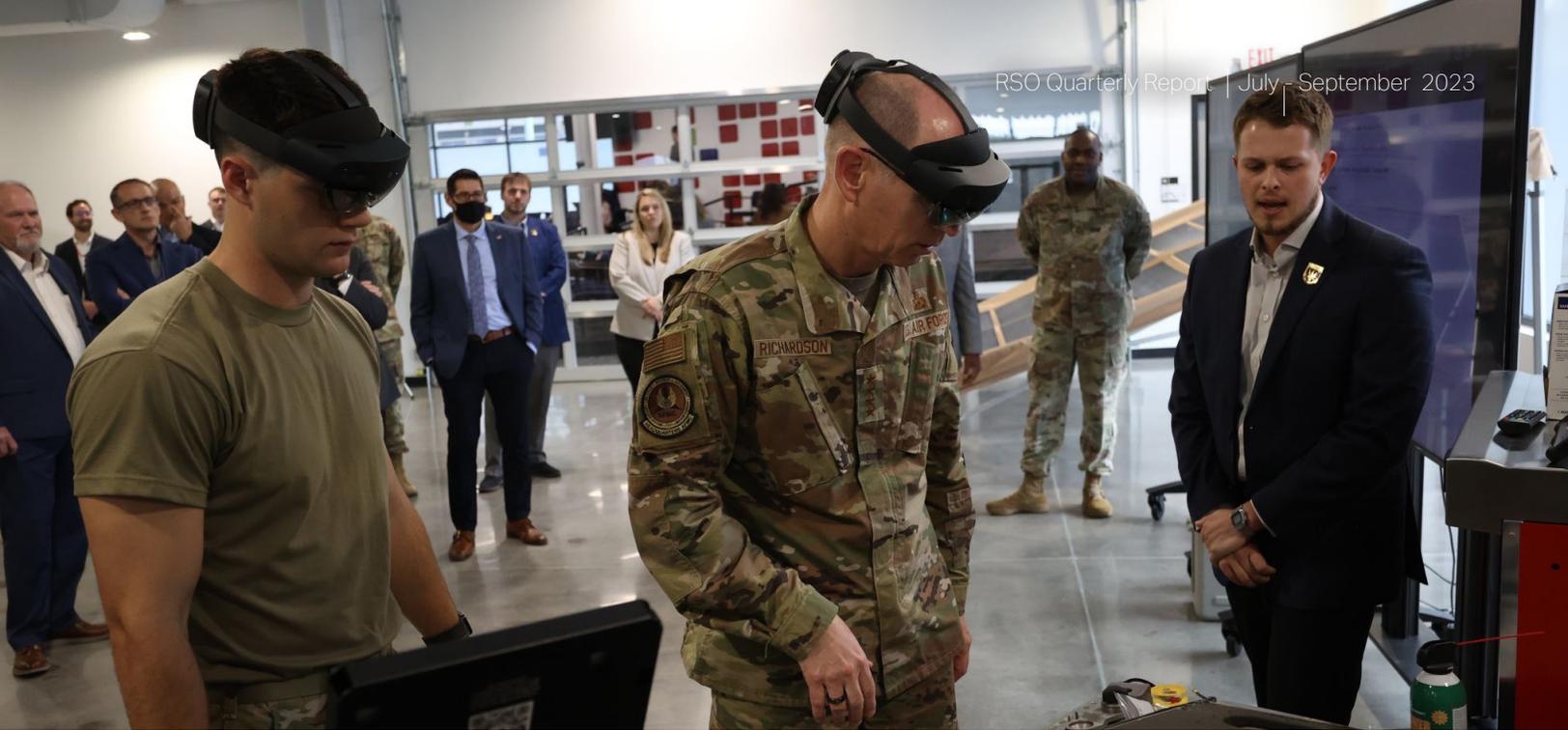
**AUGMENTED &
VIRTUAL REALITY**

Augmented and Virtual Reality (AR/VR) technology creates an immersive environment for Airmen to train and execute more efficiently and effectively. The immersive access to digital resources allows the Air Force to predict, analyze, and solve problems faster, leading to a decrease in sustainment costs and increase in Airmen readiness. The AR/VR Product Team aims to continuously collaborate with users, characterize problems, and design and scale turn-key technological solutions that benefit the entire sustainment enterprise.



**RAPID & AUSTERE
MAINTENANCE
ENVIRONMENTS**

We provide Airmen with effective tools, leveraging modern, cross-cutting technologies to reduce the Air Force's logistical footprint in conjunction with enhancing mission capability and readiness. We are focused on rapidly implementing emerging and solution-oriented sustainment technologies and modernization within austere environments.



RSO SPOTLIGHT

RSO BOARD OF DIRECTORS EXPERIENCES MAINTENANCE "KILL CHAIN" DEMONSTRATION

We hosted our annual RSO Board of Directors meeting at Hangar-01 in July 2023. RSO board co-chair, Gen. Duke Z. Richardson, Commander, Air Force Materiel Command, Lt. Gen. Shaun Q. Morris, RSO Program Executive Officer and Air Force Life Cycle Management Center Commander, and distinguished Air Force members were given a hands-on demonstration of an integrated capability workflow of numerous RSO technologies.

Beginning with a maintenance alert from our Predictive Analytics and Decision Assistant (PANDA), an F-15 part was cycled through to production and completion via our Advanced Manufacturing Program Office (AMPO) and Accelerating Innovation and Modernization to Scale (AIMS) Team's projects, including an augmented and virtual reality maintenance program and an electronic drill fastener removal technology.

RSO board members, co-chair Honorable Andrew P. Hunter, Assistant Secretary of the Air Force for Acquisition, Technology & Logistics, Lt. Gen. Tom D. Miller, Deputy Chief of Staff for Logistics, Engineering and Force Protection., and Lt. Gen. Stacey T. Hawkins, Air Force Sustainment Center Commander, then joined the group virtually for a sustainment innovation alignment overview and RSO program updates.



QUARTER HIGHLIGHTS

ACTING UNDER SECRETARY OF THE AIR FORCE VISITS RSO - JULY 2023



We welcomed Honorable Kristyn E. Jones, Performing the Duties of the Under Secretary for the Air Force, to our Advanced Technology and Training Center (ATTC) in Dayton, Ohio in July 2023.

Leadership from our AMPO, which is the Air Force's focal point for the application of AM in matters related to acquisition and sustainment, provided

Hon. Jones with hands-on demonstrations of our program office's additive manufacturing capabilities at the state-of-the-art facility while University of Dayton Research Institute technicians demonstrated 3D printing equipment and current projects.



RSO AT LCID - AUGUST 2023

The RSO had a large presence at the 2023 Air Force Life Cycle Management Center's Life Cycle Industry Days (LCID) in Dayton, Ohio in August 2023, including an exhibit booth and panel discussions featuring our Deputy Program Executive Officer, James Lawrence, and our former Chief of Contracts, Mary White. We enjoyed networking with potential industry partners and various AFLCMC directorates.

Want to know more about the RSO and the kinds of sustainment technologies and solutions we are seeking?

Watch this overview with our Deputy Program Executive Officer, James Lawrence:

▶ [WATCH HERE](#)



RSO HOSTS AFLCMC KINGFISH ACE EVENT - AUGUST 2023



The RSO hosted the Kingfish Agile Combat Employment (ACE) wargaming event August 2023, featuring some great minds of RSO staff tackling military readiness and strategy challenges. Led by members from the Headquarters Air Force Futures and Concepts Division, this engaging strategic board game challenged players from a variety of fields, such as operations, aircraft maintenance, and support functions to work together to solve a challenge. Kingfish ACE closely resembles games like Risk and Dungeons and Dragons.

NOTABLE TEAM ACCOMPLISHMENTS



Advanced Manufacturing Program Office (AMPO)

- The AMPO delivered 269 Additive Manufacturing (AM) Technical Data Packages consisting of 87 metals, 183 polymer, and 19 Cold Spray repair sets. This foundation equips the Department of the Air Force's (DAF) ever-evolving network with affordable tools, enhancing operational readiness and setting a new standard for mission excellence.
- The team made one Small Business Innovation Research (SBIR) and two Commercial Solutions Offerings (CSO) awards this quarter:
 1. A Small Business Innovation Research Phase III effort to assess Additive Friction Stir Deposition (AFSD) additive manufacturing and repair technology that aims to improve fleet readiness and reduce the cost of maintaining aircraft. AFSD will provide the capability to manufacture and/or repair components using solid metal bar feedstock as opposed to powder. AFSD poses significant advantages including larger build volumes, faster processing times, and more cost-effective part manufacture/repair.
 2. CSO Call 011 for an effort to optimize the readiness of fifth-generation aircraft by establishing an organic capability to innovatively blend and additively repair turbine engine components.
 3. CSO Call 013 for an effort to leverage existing commercial technology, expanding the Air Force's ability to produce more complex hydraulic components on the current fleet of printers and standardizing and reducing development costs for Additive Manufacturing processes in the Air Force.
- The AMPO is reviewing Always Guaranteeing Operationally Ready Aircraft (AGORA) internal controls associated with the risk management framework. The next step is a risk recommendation to the Authorizing Official requesting an "Authority to Operate" (ATO), expected November 2023.
- The AMPO Cyber team tackled cybersecurity challenges, weaving security across nine contracts. Their collaboration birthed the first Additive Manufacturing Baseline for Operational Technology, fortifying the Air Force's cyber resilience and establishing a benchmark for secure tech advancements.
- The team received a decision memorandum from HAF/A4 to proceed with deployment plan to scale AM technology across the DAF. This includes development and stand up of two Centralized Air Force Manufacturing Centers and fielding of 32 large format polymer printers across the MAJCOM to establish manufacturing capabilities.
- RSO & AMPO leadership met with key stakeholders at the second AM Summit held at Oak Ridge National Laboratory, TN. Attendees were given briefings on the latest AM technologies and discussed key topics on supply chain challenges and airworthiness processes related to AM.
- The AMPO participated in three additional outreach events and hosted three distinguished visitors.

SUPPORTING HAF/A4'S PROVIDED "ABILITY-TO" STATEMENT:

- Counteract parts obsolescence issues by capitalizing on a network of advanced manufacturing & repair technologies/tools/equipment, reverse engineering capabilities, and advanced non-destructive inspection techniques, provided at the point of mission generation and throughout the supply chain (e.g. additive manufacturing, 3D printing, cold spray, composite materials/repairs, etc.)

SUPPORTING SECRETARY OF THE AIR FORCE'S OPERATIONAL IMPERATIVES:

- #5 Defining optimized resilient basing, sustainment, and communications in a contested environment



Condition Based Maintenance Plus (CBM+)

- Deployed Predictive Analytics and Decision Assistant (PANDA) Release 4.2, featuring:
 1. A new Predictive Fleet Health (PFH) application allowing users to make risk-based operational fleet decisions based predictive analysis
 2. Enhancements to Analyst Workflow application enabling improved analysis capability
 3. Enhancements to Sensor Based Algorithms (SBA) application enabling automated and streamlined SBA alert workflow management
 4. Enhancements to various applications and backend data architecture providing improved user management, metrics tracking, and data automation and process efficiency
- Completed migration of our Atlassian software management toolset from the sunseting Air Force Research Laboratory RogueONE platform to the Business and Enterprise Systems Atlassian Toolset (BAT)
- Fielded two initial PANDA-generated SBA failure modes (8 models) for C-5 weapon systems

SUPPORTING HAF/A4'S PROVIDED "ABILITY-TO" STATEMENTS:

- Capitalize on analytical/decision tools, to include ingesting existing, untapped data resident on/in weapon systems, to better understand and predict aircraft, munitions, and equipment condition during operation, and prior to induction into major inspection/maintenance
- Modernize and digitize maintenance processes



Accelerating Innovation & Modernization to Scale (AIMS)

- The AIMS Agile Combat Team awarded the Members, Operations, Training, Analytics, and Reports (MOTAR) Platform StatFi in September 2023. This platform enables the Air Force to have a secure, approved Authority-to-Operate platform for hosting and delivering digital content. The MOTAR base effort was awarded in less than 90 days from process start.
- On 22-24 August 2023, the AIMS Team held an Aircraft Infrastructure Readiness System (AIRS) IRS operational evaluation kickoff with the 58th Maintenance Group, Kirtland AFB.

SUPPORTING HAF/A4'S PROVIDED "ABILITY-TO" STATEMENTS:

- Have a common operating picture and push information across multiple "battlespaces" from enterprise logistics/sustainment to integrated base defense
- Reduce the materiel footprint required to establish an operational foothold and generate missions by developing modernized, modular, flexible, multi-capable and interoperable support equipment
- Train and experience our workforce faster and more effectively to bring their proficiency levels higher, sooner (e.g. Virtual Training, AR/VR)
- Optimize sortie generation and operational logistics capability & capacity through automation, robotics, etc.
- Distribute and provide secure, on-demand, and mobile access to information (tech data, forms, mission data, engineering documents, schematics, and tech orders) and logistics systems at the point of use
- Leverage and capitalize on accurate maintenance and logistics information from the field and depot that will allow the sustainment enterprise to more effectively plan activities to reduce downtime and increase aircraft and materiel availability
- Modernize and digitize maintenance processes

SUPPORTING SECRETARY OF THE AIR FORCE'S OPERATIONAL IMPERATIVES:

- #5 Defining optimized resilient basing, sustainment, and communications in a contested environment
- #7 Readiness of the Department of the Air Force to Transition to a Wartime Posture Against a Peer Competitor

BY THE NUMBERS

As of September 2023



AMPO

4681 Total parts delivered

467 Individual part numbers delivered

311 Total parts flying

174 Individual part numbers flying

344 Completed technical data packages

43 Completed repair data packages



CBM+

ENHANCED RELIABILITY CENTERED MAINTENANCE (ERCM) PATHWAY

13 aircraft platforms currently fielded - C-5, KC-135, C-130, B-1, B-2, B-52, AC/MC-130, F-15, F-16, A-10, EC/HC-130, CV-22, U-2

2,647 aircraft actively monitored across the Air Force (as of 30 October 2023)

1,419 eRCM removals since implementation (April 2019)

SENSOR BASED ALGORITHMS (SBA) PATHWAY

Legacy:

4 failure modes operational for KC-135 in production

365 scheduled maintenance actions completed since implementation (October 2018)

Modern (PANDA):

15 failure modes (39 models) operational for B-1 and C-5

14,153 operations ingested

1,468 alerts generated (B-1 and C-5)

273 cases created (B-1 and C-5)

800 active users registered in PANDA

PARTNERSHIPS





CUSTOMERS



RSO
VISIT OUR WEBSITE

To contact the RSO, please email: AFLCMC.RSO.workflow@us.af.mil



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