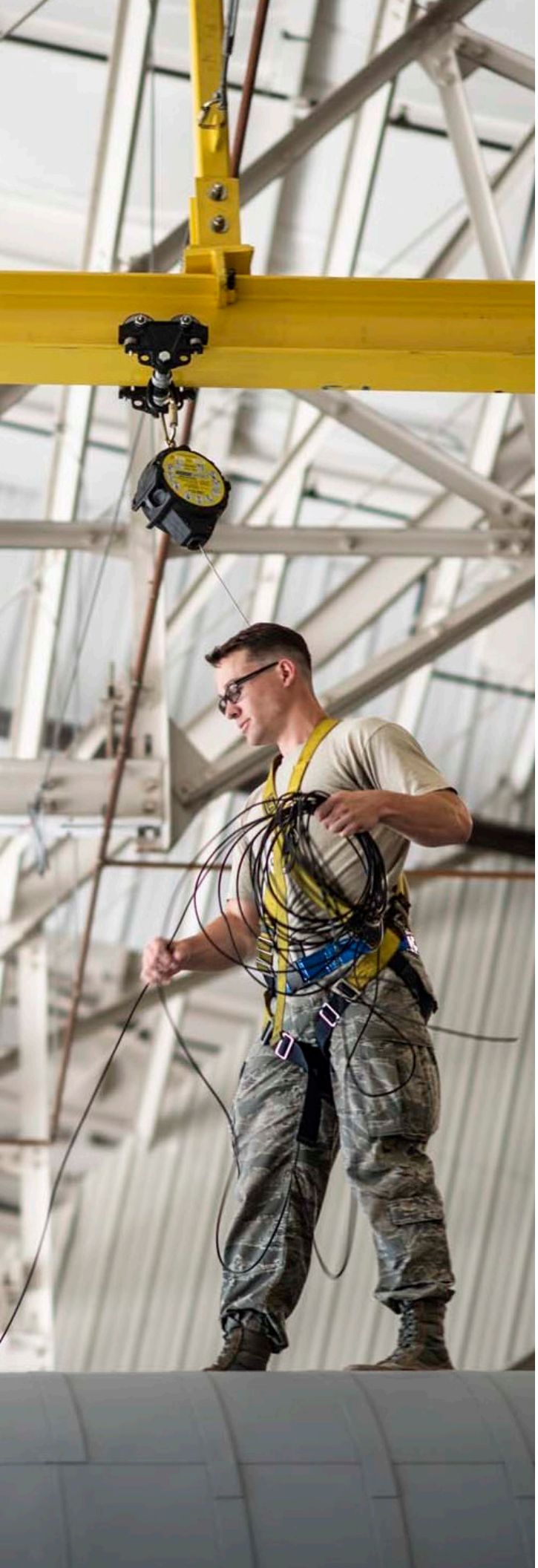
AFLCMC/RO

RAPID SUSTAINMENT OFFICE

Quarterly Report

April - June 2021

RSO



CONTENTS

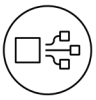
MISSION

TRANSFORM THE OPERATIONS AND SUSTAINMENT ENTERPRISE VITAL TO THE WORLD'S MOST ADVANCED AIR FORCE

OBJECTIVE

INCREASE MISSION READINESS BY IDENTIFYING, APPLYING, AND SCALING PROVEN SOLUTIONS AT THE SPEED OF RELEVANCE TO ADVANCE THE OPERATION AND SUSTAINMENT OF THE UNITED STATES AIR FORCE

RSO TECHNOLOGY FOCUS AREAS



ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

We apply machine learning and artificial intelligence to optimize fleet maintenance, increase aircraft availability, and minimize aircraft downtime.

The Condition-Based Maintenance Plus (CBM+) program is RSO's AI-powered solution for the maintenance needs of the entire Air Force. We're able to improve maintenance data quality and evaluate large sets of aircraft sensor data in order to predict and prevent component failures before they happen. CBM+ already saves thousands of maintenance hours each year.

ADVANCED MANUFACTURING

The RSO Advanced Manufacturing (AM) program office works to identify, develop, transition, and scale AM technology to the entire Air Force. The AM program office will leverage both emerging and mature technology to reduce operations and support costs and improve readiness.

AUTOMATION & ROBOTICS

The RSO applies 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 are standardizing maintenance and sustainment data collection to serve as a connector of data sources across the U.S. 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

The RSO provides Airmen with effective tools, leveraging modern, cross-cutting technologies to reduce the U.S. Air Force's logistical footprint and enhance mission capability. We want to be the USAF's leading office for rapidly implementing emerging and solution-oriented technologies in austere environments.

KEY ENGAGEMENTS

22-23 JUNE 2021
CBM+ Annual Stakeholder Summit

AFLCMC PSM Forum
VIDEO

10-12 AUGUST 2021
Tinker and the Primes 2021

25 | 22-23 | 7-8 | 10-12

25 MAY 2021
Lighthouse Integrator Pitch Day
LIGHTHOUSE RSO

7-8 JULY 2021
SBIR 20.3 Phase II Pitch Day

RSO SPOTLIGHT

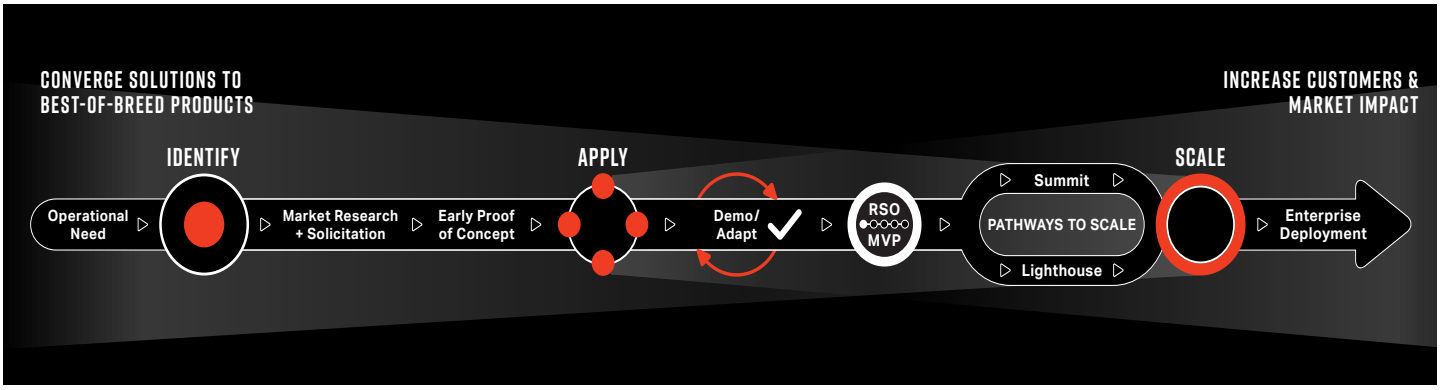
RSO'S PATHWAYS TO SCALE: REINVENTING THE ROAD TO SUSTAINMENT TECHNOLOGY IMPLEMENTATION FOR THE AIR FORCE

In the oft-quoted poem "The Road Not Taken," Robert Frost muses about the difficulty of choosing between forked pathways while meandering through the woods one fine Autumn day. The beloved American author ultimately selects the route less traveled, which metaphorically has a profound influence on his life's journey.

Not unlike Frost's poem, the Air Force Rapid Sustainment Office also stands before two divergent pathways – but instead of trails that lead to melancholy reflection, they are blazing paths to the development and implementation of novel sustainment technologies for the Air Force. The RSO's game-changing Pathways to Scale system's profound influence will be on sustainment for the Air Force, reinventing how technologies advance from prototype to innovative solution for the Air Force fleet.

The many obstacles and challenges of successfully moving one-off prototypes to implementation – or scale – in the National Security Innovation Network are well-documented. From inception, the RSO has sought to find quicker and more innovative ways to develop a pipeline of technologies which compete to solve some of the Air Force's most pressing sustainment challenges.

The RSO uses a funnel approach across three phases: Identify, Apply, and Scale. Over the last two years, the team at the RSO has identified and evaluated over 4,000 proposals, on-boarding a small subset for initial prototype projects we refer to as 'Apply' projects. All of these activities were necessary, but they were only the start, and not the destination.



The destination is Scale, and in 2021, the RSO launched two Pathways to Scale efforts to ensure technologies get there. This innovation system allows for a continuous flow of transformative technologies positively impacting Air Force enterprise and legacy systems, platforms, and operations. These two distinct Pathways are Summit and Lighthouse.

The first Pathway, Summit, focuses on taking the most successful Apply projects to a broad user base across multiple Air Force bases and units. The RSO will navigate the Department of Defense technology acquisition system while companies focus on delivery of the very best scalable technology for the Air Force. This broad user expansion is critical to gather diverse feedback to help ensure the best solutions win at the Scale decision. Currently, technologies developed by three RSO partners have achieved Summit status - Beacon Interactive Systems, 3D Media, Pvilion and Invoke.

SUMMIT RSO

The second Pathway, Lighthouse, represents a critical phase of the RSO technology pipeline and seeks to develop an innovative pilot of interconnected emerging and disruptive Industry 4.0 technologies – which include automation, machine learning, and real-time data – at a singular base, unit, or site. The expectation is that there will be a significant step function performance improvement from this network of technologies. Think: 1 + 1 = 5.

Lighthouse takes a minimal viable product and prepares it for Scale across the Air Force enterprise. Technology solutions entering Lighthouse can come from current RSO pipeline projects or external sources, as long as they have met maturity requirements and fulfill a need for the Lighthouse user. This pilot effort seeks to avoid the "valley of death" experienced by many innovative technology solutions by creating a blueprint for Scale while measuring a technology's impact on readiness in an operational environment.

LIGHTHOUSE RSO

This Pathway also provides an opportunity to evaluate multiple candidates for a single solution to determine the best-of-breed product. Upon exiting Lighthouse, a technology solution either meets the requirements for the RSO Scale phase or is off-boarded due to unmet criteria. A successful Lighthouse technology solution will be postured for deployment across the Air Force enterprise, managed by the RSO or by another government organization.

The target location for the Lighthouse effort is Nellis Air Force Base, Nevada in partnership with the 57th Maintenance Group (57MXG) Strike Aircraft Maintenance Unit (SAMU). The technology solutions leveraged for this effort specifically target the maintenance operations performed by the SAMU maintainers on the F-15E aircraft.

The RSO's Pathways to Scale system of Summit and Lighthouse is a trailblazing approach to taking innovative prototype solutions and advancing them to utilization by our Airmen. They are two roads RAPIDLY "travelled by" to meet Air Force sustainment technology needs.

BY THE NUMBERS

AM

Total parts delivered

3,026

Total AM parts flying

229

Individual AM part numbers flying

76

Completed Technical Data Packages

251

*AM numbers in preceding RSO Quarterly Reports have been re-evaluated and adjusted to reflect more accurate reporting.

CBM+

Aircraft platforms fielded

14
(C-5, KC-135, C-130, C-17, B-1, B-2, B-52, AC/MC-130, F-15, RC-135, HH-60, F-16, A-10, EC/HC-130)

Maintenance units trained

555

Aircraft platforms on-boarding

8
(KC-46, ICBM, CV-22, T-6, MQ-9, RQ-4, U-2, F-22)

Aircrafts actively monitored across the USAF

3,214

Troubleshooting hours saved

5,000+

eRCM removals since implementation (April 2019)

555

Sensor Based Algorithm maintenance alerts issued since implementation (October 2018)

282

DELIVERING CAPABILITIES

The RSO Innovation and Integration (i2) team continues to identify small businesses to execute prototype contract efforts addressing RSO focus areas and the RSO's objective of increasing mission readiness and decreasing sustainment costs.

The RSO Innovation & Integration (i2) team has a total of 32 Small Business Innovation Research (SBIR) projects being prototyped and evaluated in the Apply phase.
The RSO also added three non-SBIR projects (PANDA, L3, and Essentium), and awarded 23 brand new SBIR PH I- Identify projects (SBIR 20.3); 19 proposals for follow on Apply phase received, pitch day in next quarter.

HIGHLIGHTS FROM 3 OF OUR 32 PARTNER COMPANIES

Three recent SBIR project developments address the technology focus area of Rapid & Austere Maintenance Environments: providing rapidly deployable, hurricane resistant, aircraft maintenance structures, solar powered integrated structures (SPIS), and modular shelter systems.

The Rapidly Deployable Hangar (RDH), developed by Green Magic Homes, is an innovative structure with features and dimensions that support aircraft systems and maintenance needs. The built-in modular components allow the RDH to be deployed in response to early warnings of incoming hurricanes, to provide protection for immobile aircraft and equipment.

The Solar Powered Integrated Structure (SPIS) is a state-of-the-art structure utilizing cutting-edge technology to provide rapidly deployable structures and needed power capabilities in rapid and austere environments. SPIS reduces fuel consumption with the use of photovoltaic fabric panels as the structure's framework, in turn decreasing the overall logistics footprint for military operations.

The EXOHAB, developed by Trac9 LLC, is a new type of rapidly deployable shelter that is more efficient and more agile than traditional shelters. The EXOHAB is a modular, rigid wall shelter system that is founded on a proven and scalable architecture. Variants of the EXOHAB shelter system can be further adapted to provide facilities for corrosion control and painting/ de-painting processes, additive manufacturing, composite repair and many other aviation maintenance activities not currently possible with existing shelter systems.

2021 CBM+ STAKEHOLDER SUMMIT

The RSO hosted the 4th annual Condition Based Maintenance Plus (CBM+) Stakeholder Summit, held June 22 & 23 at Nellis AFB, Nevada. Stakeholders gathered to discuss lessons learned and share success stories of implementing this revolutionary collaborative initiative. The event also provided the 313 total participants – 231 of which were on-site attendees – with the opportunity to listen and ask questions to speakers and discussion panels. Attendee interest was strong, with 475 total questions asked during the two day event.

Additionally, the Summit gave participants the chance to interact with other CBM+ stakeholders during training and breakout sessions.

Day One included a video from Lt. Gen. Shaun Q. Morris, Air Force Life Cycle Management Center Commander and RSO Program Executive Officer, who provided his insights on CBM+. Additionally, recorded messages from Lt. Gen. Warren Berry, Deputy Chief of Staff for Logistics, Engineering and Force Protection, and Lt. Gen. Eugene Kirkland, Air Force Sustainment Center Commander, touted their organization's progress and committed their respective organization to going "all in" on CBM+.

The day finished strong with an overview of the Predictive Analytics and Decision Assistant (PANDA) capability and panel discussions and updates from Air Combat Command, Air Mobility Command, Air Force Global Strike Command, and the program offices employing CBM+.

Day Two began with another message from Lt. Gen. Kirkland stating, "It's time to take a look at Air Force policy to ensure the framework supports CBM+." This was followed by presentations and panel discussions from the Air Force Sustainment Center and an insightful presentation from Delta Tech Ops that gave insight into their predictive maintenance journey.

Following the closing of the 2021 CBM+ Stakeholder Summit, participants returned to their units empowered to accelerate the momentum of CBM+ by adopting the principles of predictive maintenance and working towards solving difficult challenges collaboratively as an enterprise.

Thank you to everyone who attended and made this year's event a success. Details about the 2022 CBM+ Stakeholder Summit will be released this fall. Stay tuned!

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EVENT 38
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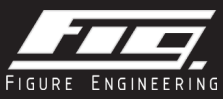
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