By Bradley Hicks
AEDC Public Affairs

July 20 marks the 50th anniver-
sary of Neil Armstrong exit-
ing the lunar module known as “Eagle” and becoming the first man to set foot on the surface of the moon.

AEDC played an integral role in this “giant leap for man-kind.” In years leading up to the Apollo 11 moon landing, per-
sonned at Arnold Air Force Base were involved in thousands of hours of testing to ensure the success of the NASA Project Apollo program. The aim of this spaceflight program was to ac-
complish a goal set by President John F. Kennedy in May 1961 — to send a man to the moon and return him to earth by 1970.

NASA designed a test pro-
gram for AEDC to support the Apollo program. The goal of this program was to obtain data on aerodynamic heating, sta-
bility during reentry, reentry and escape operations, and aerody-
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...
Smokeless Tobacco products (e.g. snuff and dip):

- Traditional Tobacco products (e.g. cigars and cigarettes):

Smoking is permitted solely in Designated Tobacco Areas (DTAs) identified by designated signage. If no signage exists, smoking is not permitted in that area. It is the responsibility of all smokers to keep DTAs clean. From July 22:

The AFMC Enterprise-wide initiative launched in late June, seeks inputs and recommendations from AFMC civil and military Airmen that can help the command to better support the National Defense Strategy today and in the decades to come. ‘We are nearing the end of phase one of the AFMC focus groups centered on AFMC headquarters and the launch of the online feedback questionnaire,’ said Col. Mark McShane, AFMC Deputy Chief of Staff. ‘We have received nearly 2,400 responses and have started the process of analyzing the data to identify trends. Our goal is to focus on gathering data from our career and wing personnel. The online questionnaire will remain open for inputs through mid-August.’

‘We received feedback from the command that the command will travel to AFMC headquarters for training and to support focus groups at Wright-Patterson Air Force Base, July 15-18. Teams will then continue to move AFMC operating locations July 22, with focus groups at Eglin AFB, Florida, Warner-Robins Air Logistics Center, Georgia, Fort Detrick, Maryland, Hanscom AFB, Massachusetts, Greenland-New Mexico, Alabama and Holloman AFB, New Mexico July 22-25, Edwards AFB, California July 30-31, and Arnold Engineering Development Complex, July 30-Aug. 1; and Arnold Engineering Development Complex, Aug. 5-6. Leadership of AFMC’s focus group evaluation has identified individuals to support our mission critical events. Select AFMC and Air Force leaders will also take part in one-on-one interviews with AFMC Airmen to provide the opportunity to provide recommendations and inputs through an online questionnaire. ‘This is an opportunity for everyone to participate and help shape our command for the future,’ McDonnell said. ‘We encourage all AFMC Airmen to contribute, either online or in person, should the opportunity arise.’

AFMC is seeking feedback opportunities to conduct leadership forums, open houses, and forums to identify trends. ‘We will focus on gathering data from our career and wing personnel. The online questionnaire will remain open for inputs through mid-August.’

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The San Francisco Bay Area Chapter of the Vertical Flight Society recognized Chris Hartley, Arnold Flight Test Director at the National Full-Scale Aerodynamics Complex in Moffett Field, California, for his role leading Tiltrotor Test Rig, or TTR, design and testing.

As part of the organizations 2019 Chapter Awards, Hartley received the Vertical Flight Society Outstanding Technical Support. Hartley said he’s honored to be recognized but commented that it’s really the entire team that made a project a success.

“It was a pleasure and an honor to receive the award this year,” Hartley said. “The project was successful because we have an amazing and cooperative team, and everyone worked across the lines of responsibility to truly get us as a combined test force. The team epitomized the spirit of the team, and I was lucky enough to be the focal point for the project for the NFAC. I am grateful for the award, but I am more grateful for the tireless efforts of talented, hard-working team members.”

Hartley has supported the TTR development from the beginning of AEDC participation in the development of the rig. He oversees the activates, safety and acceptance checkouts and anticipates the installation and checkout of the test rig. Hartley then led the TTR test team in executing the longest wind tunnel entry in the history of the 40-ft wind tunnel with successful completion of the 690 TTR wind tunnel test.

The TTR team as a whole was also recognized, receiving the Franklin Award for Outstanding Achievement in the Powered Lift Field. The team safely and successfully conducted the full envelope evaluation of the first civil tiltrotor system that will be entering commercial usage by 2020. This test was the first of its kind and served as operational verification test of the new $30 million national test capability for future generation tiltrotor aircraft.

The TTR Test Rig test team from the AEDC National Full-Scale Aerodynamic Complex in Moffett Field, California, conducts full envelope evaluation of the first civil tiltrotor system that will be entering commercial usage by 2020. This test was the first of its kind and served as operational verification test of the new $30 million national test capability for future generation tiltrotor aircraft. Two contractors, with Morsey Constructors, working on a common project recently saving the life of a co-worker by performing CPR when the man went into cardiac arrest. One of them, Robert Hart, left, poses for a photo with client superintendent Ashley Koepp. (U.S. Air Force Photo by Bradley Hicks) (Image was altered by obscuring badges for security purposes.)

“The exceptional care you provided directly contributed to the saving of the life of this patient,” the certificates read. “This care would not have been possible without your dedication and appreciation for a job well done.”

Hart and Halligan, the Morsey Constructors crew superintendent, were recently presented with the National Full-Scale Aerodynamics Complex in Moffett Field. California, conducts full envelope evaluation of the first civil tiltrotor system that will be entered commercial usage by 2020. This test was also recognized, receiving the Franklin Award for Outstanding Achievement in the Powered Lift Field. The team safely and successfully conducted the full envelope evaluation of the first civil tiltrotor system that will be entering commercial usage by 2020. This test was the first of its kind and served as operational verification test of the new $30 million national test capability for future generation tiltrotor aircraft.

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Two contractors, with Morsey Constructors, working on a common project recently saving the life of a co-worker by performing CPR when the man went into cardiac arrest. One of them, Robert Hart, left, poses for a photo with client superintendent Ashley Koepp. (U.S. Air Force Photo by Bradley Hicks) (Image was altered by obscuring badges for security purposes.)

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Five new 2019 AEDC Fellows inducted

By Claude Morse
Arnold Community Council

The Arnold Community Council (ACC) inducted the 2019 class of AEDC Fellows during a banquet at the Arnold Lakeside Center on Arnold Air Force Base June 25, which also marked the 68th anniversary of AEDC’s dedication by President Harry S. Truman, and 5-star General of the Air Force Henry “Hap” Arnold’s birthday.

More than 130 family members, friends and fellow employees attended the banquet honoring new Fellows Gary Clower of Manchester, Dr. Robert Howard of Manchester, Dr. Doug Garrard of Manchester, Dan Marren of Maryland and Anthony Taylor of Fayetteville.

AEDC Lifetime Achievement Fellow Retired U.S. Air Force Maj. Gen. Mike Wiedemer, a former AEDC Commander, who chairs the Arnold Community Council’s AEDC Fellows Committee was the speaker for the event.

The General gave the history of U. S. aerospace ground testing from World War II forward, including the team of Scientists led by Dr. Theodore von Kármán who investigated the German test facilities at the request of General of the Air Force Hap Arnold.

The long term effect of von Kármán’s 1945 report, “Toward New Horizons,” to Arnold that ultimately led to the establishment of AEDC and the U.S. Air Force’s research and development programs for the next 50 years.

Wiedemer then honored 1989 AEDC Fellow Dr. Jim Mitchell and his unwavering advocacy and tireless work that led to the construction of Aeropropulsion Systems Test Facility and Aerodynamic and Propulsion Test Unit.

These two facilities are critical to ground testing today for large and high performance jet engines and critical to hypersonic testing.

U.S. Air Force Retired Maj. Gen. Mike Wiedemer, left, chairman of the Arnold Community Council’s AEDC Fellows Committee, presents Gary Clower with a plaque recognizing him as an AEDC Fellow during a banquet June 25 at Arnold Lakeside Center on Arnold Air Force Base. Clower, a Flight Systems planner/scheduler for National Aerospace Solutions, the Test Operations and Sustainment contractor for AEDC, was named a Craft Fellow. (Courtesy photo by Claude Morse)

U.S. Air Force Retired Maj. Gen. Mike Wiedemer, left, chairman of the Arnold Community Council’s AEDC Fellows Committee, presents Dr. Robert Howard with a plaque recognizing him as an AEDC Fellow during a banquet June 25 at Arnold Lakeside Center on Arnold Air Force Base. Howard, a subject matter expert and principal investigator for Quanititech, the Technical, Management and Analysis Support Contractor for AEDC, was named a Technical Fellow. (Courtesy photo by Claude Morse)

U.S. Air Force Retired Maj. Gen. Mike Wiedemer, left, chairman of the Arnold Community Council’s AEDC Fellows Committee, presents Dan Marren with a plaque recognizing him as an AEDC Fellow during a banquet. June 25 at Arnold Lakeside Center on Arnold Air Force Base. Marren, the director of the AEDC White Oak Site in Silver Spring, Maryland, was named a Lifetime Achievement Fellow. (Courtesy photo by Claude Morse)

U.S. Air Force Retired Maj. Gen. Mike Wiedemer, left, chairman of the Arnold Community Council’s AEDC Fellows Committee, presents Dr. Doug Garrard with a plaque recognizing him as an AEDC Fellow during a banquet June 25 at Arnold Lakeside Center on Arnold Air Force Base. Garrard, Senior Staff Engineer for National Aerospace Solutions, the Test Operations and Sustainment contractor for AEDC, was named a Technical Fellow. (Courtesy photo by Claude Morse)

U.S. Air Force Retired Maj. Gen. Mike Wiedemer, left, chairman of the Arnold Community Council’s AEDC Fellows Committee, presents Anthony Taylor with a plaque recognizing him as an AEDC Fellow during a banquet. June 25 at Arnold Lakeside Center on Arnold Air Force Base. Taylor, who retired from National Aerospace Solutions, the Test Operations and Sustainment Contractor for AEDC, in 2018 as human resources manager-employee relations, was named a Lifetime Achievement Fellow. (Courtesy photo by Claude Morse)
In June 1962, the first wind tunnel testing of Apollo space capsules was conducted in the AEDC 16-foot wind tunnel. The experiment was part of the AEDC’s diffusion of wind tunnel data and was conducted in collaboration with the NASA Manned Spacecraft Center in Houston. The testing aimed to evaluate the effects of aerodynamic forces on the Apollo space capsule during reentry. The results of the tests were later used to design the Apollo space capsule and inform its aerodynamic performance. The data collected from these tests provided critical insights into the Apollo’s aerodynamic behavior and helped ensure its safe and successful reentry into the Earth’s atmosphere.
Investment in 3D printing helps keep Team Edwards’ fleet aloft

By Giancarlo Casem

EDWARDS AIR FORCE BASE, Calif. – 3D printers may still seem like a fad to most consumers, however, the 412th Test Wing at Edwards Air Force Base, California, views the technology as a way forward that is only limited by imagination, ingenuity, and creativity of those who employ them.

The 412th Maintenance Squadron is leveraging 3D printing technology to help keep Edwards’ aircraft flying, no matter their age.

“As our airframes age and parts become more difficult to procure, the ability to cost-effectively reproduce those end items allows the units to maintain a higher mission capability rate with a lower cost,” said Steven Conway, 412th Maintenance Squadron. “Technology is rapidly outpacing our current manufacturing capabilities, for any manufacturing entity to remain competitive, they need to invest in the now, while looking to the future, otherwise, they will be left behind in a race that could potentially take decades to catch up.

Currently, the 412th Maintenance Squadron has one industrial plastic printer. Their operators have successfully used the printer for part production and for fitting difficult pairs prior to manufacturing. It also is used as a training aid to allow more operators to become proficient.

Manufacturing parts through a 3D printer can cut down on time and cost in comparison to ordering specialized parts, especially if there is no longer a viable supply chain available for a specific part. It also allows engineers to design and construct brand-new designs and are able to test them. This capability provides engineers the creativity to no longer be constrained to the typical methods of manufacturing, said Staff Sgt. Cameron Camupp, 412th Maintenance Squadron.

“Any idea, from a new type of nozzle for fire trucks to firing mechanisms on a 70-year-old gun brought over from the museum. We are only limited by size and imagination.”

Staff Sgt. Cameron Camupp and Steven Conway, both of 412th Maintenance Squadron, visually inspect a part manufactured in a 3D printer at Edwards Air Force Base, California. (U.S. Air Force photo by Matthew Williams)
Changes to how overhead doors are accessed

By AEDC Safety

After reviewing industry standards and surveying the doors that are currently installed on base, the Test Operations and Support Contracting contractor has developed new rules for its personnel to facilitate accessing guideline-style overhead doors and roll-up or horizontally tracked overhead doors.

Guideline-style Overhead Doors

First, do not walk under guideline-style overhead doors. Buildings on base with the guideline-style doors include 678, 905, 912, 913, 914, 922, 929, 1400 and 1476. Overhead doors and roll-up or horizontally tracked doors. Buildings on base that do not roll up or rise up into a horizontal track are those that do not roll up or rise up into a horizontal track. They remain vertical.

Build-Up or Horizontally-Track Overhead Doors

Doors Where there is a personnel door adjacent to an overhead door, pedestrians are expected to use the personnel door. However, when the personnel door is not adjacent to an overhead door, the door is fully open, then the personnel may enter or exit using the overhead door, with the following provisions:

• The overhead door must be fully open and chain operated, the chain must be pinned; and
• Give right-of-way if there is an active vehicle entry and/or exit.

By Bradley Hicks

AEDC Public Affairs

Thanks to an agreement between the Air Force Medical and the Federal Drug Administration, help for multiple occupa
tions, and the efforts of members of its workforce, recurring industrial medi-
cal support services are once again in place for Air Force civilians employed at AEDC Hypervelocity Wind Tunnel 9 in White Oak, Maryland.

The agreement went into effect in May. The support now available to the Tunnel 9 Air Force civil-

employes had access to occ-
cupational health support when Tunnel 9 became an AEDC facility in 1997. These services were man-
gaged by the Chief of Bios-
environmental Engineer-
ing. AEDC headquarters at Arnold Air Force Base, Tenn.

The employees could receive services at the oc-
cupational health clinic at Joint Base Anacosta-
Bolling, formerly known as Bolling Air Force Base. According to Tunnel 9 Project Engineer Arnold Collier, who helped facili-
tate the recent agreement, Bolling AFB was only around 18 miles from Tun-
el 9, assuming employees took the "shortest." This route, however, involved driving through the heart of Washington, D.C., midday or rush hour traf-
ic.

"Medical testing at Bolling Air Force Base took the better part of a day if you were alone, and a full day if you had to use a co-worker," Collier said.

Years later, the exam process was refined. Air Force employees at White Oak were able to receive the same occupational health support locally from the same private ven-
dor providing support at the contract worksite.

"Medical testing times were reduced to around 3 to 4 hours, around 50 percent of what they were before. However, this arrange-
ment ended about two years ago. Collier then began working with Tech.
Sgt. Joshua Suggs with the Health Services Office, which is part of the AEDC Test Support Division at Arnold, to find an alterna-
tive source of occupational health support for the Tun-
nel 9 Air Force employees.

These efforts were aid-
ed by members of Team
AEDC from the Hyperv-

evelope Wind Tunnel 9
Branch, the Contracting
Division, the Finance
Management Division and
other in the Health Ser-

vices Office.

"They faced multiple challenges while explore-
ning options for providing occupational health support to Tunnel 9 personnel. Ultimately, a dual-path plan was defined. First, the team looked into providing immediate relief from overhead medical testing and surveillance. Contracting awarded a purchase order to an occu-
pational health vendor located near Tunnel 9 for fiscal year 2018. "This purchase order provided us immediate re-
liance in updating our occupa-
tional health exam status to 'current.'" Collier said.

Tony Clayborne, now re-

tired, and Kelly Pits, also retired, did most of the heavy lifting to put this purchase order in place. All exams were done in a matter of weeks.

"The transfer of medi-
cal records to the Medi-
cal Aid Station at Arnold AFB was managed by Tech. Sgt. Alexisa Hum-
phrey and Master Sgt.
Lashonda Morehead, both with the Health Services Office.

With the short-term solution proving effec-
tive, work began on the second of the 'dual-path' plan. This path was the establishment of an ar-
rangement that would provide recurring occupa-
tional health support for Air Force employees at Tunnel 9.

The AEDC facility at White Oak and the Food and Drug Administr-

ation are both tenants of the Federal Research and Devel-

opment Center Campus in Mary-
lnd. Tunnel 9 Site Direc-
tor Dan Marren reached out to the FDA to see if it could offer any assis-
tance in the way of occupa-
tional health services. Personnel from Tunnel 9 later met with Dr. Sa-

cha Gutierrez and CAPT. Dorene Spell-Leeb, the Chief Medical Officer and Deputy Chief Medi-
cal Officers of FDA Occupa-
tional Health Services, respectively.

We discussed AEDC White Oak's mission and corresponding occupa-
tional health support re-


requirements and FDA's oc-
cupational health mission and capability," Collier said. "The conclusion of the meeting was that the occupational health re-

quirements, coupled with the proximity of our orga-
nizations, coincides with the mission of the FDA Occupational Health Ser-

vices.

An interagency agree-

ment between AEDC White Oak and the FDA Occupational Health Ser-

vices Clinic to provide occupational health support to Tunnel 9 Air Force employees was written and approved. Collier said Mike Fair, AEDC financial manager, played an integral role in the writing of this inter-

agency agreement.

"To date, one-half of the Tunnel 9 Air Force employees have received their physicals for the year," Collier said. "We expect the rest of the physicals to be complet-

ed before the end of the fiscal year and look for-

ward to many years of continued support."

Agreement provides convenient occupational health support to Tunnel 9 personnel

Pictured is an example of a guideline-style overhead door at Arnold Air Force Base. Do not walk under guideline-style overhead doors. Buildings on base with guideline-style doors include 678, 903, 912, 913, 914, 922, 929, 1400 and 1476. (U.S. Air Force photo)
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By Donna Lindner
Air Force Research Laboratory

WRIGHT-PATTERSON AIR FORCE BASE, Ohio – Transparent aluminum, a technology first suggested in the science fiction film “Star Trek IV: The Voyage Home,” is now a reality. With a growing need in the Department of Defense for transparent armor for personnel protection and infrared windows for reconnaissance applications, the Air Force Research Laboratory along with the Defense-wide Manufacturing Science and Technology program, support the manufacturing of aluminum oxynitride products providing greater system performance.

The transparent ceramic armor provides superior ballistic protection at less than half the weight and thickness over traditional glass laminates. This provides the warfighter with superior protection for both air and ground vehicles.

ALON is a transparent ceramic material composed of aluminum, oxygen and nitrogen. It begins as a powder that is formed into unique shapes and made transparent through the application of high temperature and pressure.

The Air Force Research Laboratory and the Defense Production Act Title III program have been working on this material since 2006 when DPA Title III was improving manufacturing processes to improve the powder that is used to form transparent armor and infrared sensor windows. The DMS&T program is an investment mechanism that allows the department to advance the state-of-the-art for defense-essential manufacturing capability, through the development of technologies and processes necessary for the production of defense systems.

Prior to this program, the largest ALON window size was limited to 2.8 square feet. ALON is now manufactured routinely in sizes up to eight square feet by a small business, Surmet Corporation. Scaling up is performed incrementally, due to the multitude of complex manufacturing steps that must be used in order for the process to be accomplished appropriately.

AFRL is demonstrating that they are moving closer to providing a commodity material for government capability as a result of this work.

“Obtaining eight square feet is an accomplishment that we have been working on for years and couldn’t have done it without funds from AFRL and DMS&T as well as other organizations,” said Richard Porter, Manufacturing Lead of the Manufacturing and Industrial Technologies Division, AFRL. “Manufacturing a larger window that is both lightweight and durable is an enormous enhancement in enabling the warfighter to fulfill the mission.”

Transparent armor is currently used on U.S. Army Blackhawk and Chinook helicopters. ALON’s excellent durability and impact resistance have made it of interest to NASA for Cupola scratch pane windows on the International Space Station.

The next step in protecting warfighters is creating a curved window. Curved ALON will be attempted, but the use of a different material may be required for this process.

As depicted in the “Star Trek” and “Jurassic World” movies, ALON was used in creating windows in a giant aquarium as well as protective bubble vehicle. This effort demonstrates that science-fiction can become reality thanks to science and engineering.

AFRL produces lighter, thinner transparent armor

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“AFMC is the most important MAJCOM in the U.S. Air Force. It needs to become the most agile and efficient organization to achieve the National Defense Strategy and to get the Air Force We Need.” -Gen. Arnold W. Bunch Jr.
Students participate in 2019 Reach for the Stars Competition

By Deidre Ortiz
AEDC Public Affairs

Area students spent a Saturday during their summer break to participate in a rocket launching competition called Reach for the Stars.

Members of the Tennessee Section of the American Institute of Aeronautics and Astronautics, the Coffee County Airfliers, volunteers from Arnold Air Force Base, and Olga Oakley, the Air Force Science, Technology, Engineering and Mathematics (STEM) Program director, organized the Reach for the Stars event for students ages 10-18 from across southern Middle Tennessee. The competition was held June 1 at the Hands-On Science Center in Tullahoma.

To start the day’s activities, AEDC Vice Director Edward Ayer provided opening remarks and spoke to the kids about the future of rocketry and why STEM is important.

Then with the materials provided by the Air Force STEM program, area students designed and launched their rockets from the United Technologies Aerospace Systems field near the HOSC.

A winner was selected based on an average of the two launches closest to the target, which was marked 30 feet downrange from the launch pad. This year 11-year-old Aidan Floyd, from Tullahoma, won the competition with an average distance of 27 feet and 11 3/8 inches.

Oakley mentioned that the Reach for the Stars event is an annual educational outreach program meant to provide a fun, hands-on learning opportunity for students.

“One of the rockets that a student designed and built as part of Reach for the Stars event reads for take-off June 1. The Reach for the Stars event is an annual educational outreach program meant to provide a fun, hands-on learning opportunity for students.”

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One of the rockets that a student designed and built as part of Reach for the Stars event ready for take-off June 1. The Reach for the Stars event is an annual educational outreach program meant to provide a fun, hands-on learning opportunity for students. (Courtesy photo)
Students actually go through a research biological science project,” said Dr. Chia Hung, a research biological scientist with AFRL’s Materials and Manufacturing Directorate, and the Air Force Civil Engineering Center. They gathered at the team’s 2,500 square foot prototype site in Durham, North Carolina, to see the bacteria feeding process and test the strength of the surface. From left to right: Dane Thomason and Michael Dosier with bioMASON, Majors Laura Hunstock, MacKenzie Birchence, and Kelly Martin, the Project Media Team, 2Lt. Alex Campman, from AFRL’s Materials and Manufacturing Directorate, Glenn Johnson, from the Air Force Civil Engineering Center, and Kenney McAdams, also from bioMASON. (Photo courtesy of James O’Rourke)

Kenney McAdams, from bioMASON, applies a feeding to the bacteria to harden the surface of the Project Medusa 2,500 square foot prototype in Durham, North Carolina. (Photo courtesy of James O’Rourke)

For more information on the Project Medusa, visit: My Duty, mil 

“AFRL is excited to continue the support for the follow-on project,” said Dr. Chia Hung, a research biological scientist with AFRL’s Materials and Manufacturing Directorate: “We will continue to work with bioMASON in their optimization of the cementation process and we will also identify special unique requirements for different user cases. Based on what is learned from Project Medusa and will be identified from the follow-on, we will be better positioned in helping to mature this technology for many users in not just the Air Force, but also other services within DOD.”

The Project Medusa Team received strong support from bioMASON, the Air Force Research Laboratory Materials and Manufacturing Directorate, and the Air Force Civil Engineering Center. They gathered at the team’s 2,500 square foot prototype site in Durham, North Carolina, to celebrate the bacteria feeding process and test the strength of the surface. From left to right: Dane Thomason and Michael Dosier with bioMASON, Majors Laura Hunstock, Mackenzie Birchence, and Kelly Martin, the Project Medusa Team, 2Lt. Alex Campman, from AFRL’s Materials and Manufacturing Directorate, Glenn Johnson, from the Air Force Civil Engineering Center, and Kenney McAdams, also from bioMASON. (Photo courtesy of James O’Rourke)

The 18th Aggressor Squadron Blue Horizons Program at Air University in a CSAF-chartered, future-oriented think tank that creates and tests prototypes of new strategic concepts and capabilities. Three Blue Horizons Fellow, with different technical backgrounds, including a former member of the Air Force Life Cycle Management Center were among those who graduated June 3 as part of this year’s class of 16.

As part of their research, Maj. MacKenzie Birchence, a developmental engineer, and former Deputy Chief of the Commander’s Action Group at AFRL/CMC; Maj. Laura Hunstock, a combat systems officer; and Maj. Kelly Martin, an intelligence officer, formed a team called “Project Medusa,” to develop a prototype landing strip to ensure continuity of airfield operations at austere locations during future military conflicts.

Fellows spend a year in specialized academics and focus research on a CSAF-directed question. Their research is on developing and testing prototypes of ideas that can help the Air Force meet future threats.

“As the United States turns its focus toward a potential near-peer conflict, the Air Force may no longer have access to the current basing structure,” said Birchence. “In future fights, contingency operations will depend on the ability of mobility platforms to operate out of austere locations and under compressed timelines,” she said in describing the background for Project Medusa.

Students actually go through an entire prototype phase so that at the end of the year they can present their technology to even if they were able to address, what they need to do, and then give a recommendation, with the understanding that it’s going to transition at the end of their year.

“We started out thinking about the differences between the way we fight today in the Air Force and what tomorrow’s fight might look like, said Hunstock. “Knowing that we’re going into more of a near-peer competition, one of the things we talked about was how we’re going to have to move away from our centralized basing that we use today and more into a dispersed and agile type of basing.”

The team wanted to narrow the scope of the problem down, so they looked at the issue of not having the availability of a runway anywhere that the Air Force might need to go.

“We want to try and find a way that we could get into those austere locations to rapidly create landing zones for our aircraft where we don’t already have them,” Hunstock said. “That idea, during a scenario, you’re not going to have a month or two to go in and build your normal concrete runways. We need something that’s going to take a lot less time and require less people and less heavy equipment.”

While trying to think completely out of the box, which is what Blue Horizons Fellows are asked to do, the team came up with an innovative idea that might seem on the edge of reality:

“The idea that we came to was using biomanufacturing to take soil and turn it into something that can be translated into things like support that you might need. By saying biomanufacturing, what we mean is that we’re applying bacteria to the surface, feeding it and effectively growing a runway. This process could potentially replace the need to bring in cement, heavy equipment and dozens of personnel to create a concrete runway,” Birchence said.

“We think our prototype is a small step toward enabling full runways to be built with something other than concrete; it demonstrates the technology is absolutely feasible outside of the laboratory and could be used to support the warfighter much sooner than expected,” said Birchence.

They started by testing different protocols with two foot by two foot boxes, but their initial prototype was a 2,500 square foot prototype site in Durham, North Carolina, the team created the site near there. The really exciting thing about what we did next is that we could translate this into things like support for the warfighter much sooner than expected,” said Birchence.

The Project Medusa Team members received strong support from bioMASON, the Air Force Research Laboratory Materials and Manufacturing Directorate, and the Air Force Civil Engineering Center. They gathered at the team’s 2,500 square foot prototype site in Durham, North Carolina, to celebrate the bacteria feeding process and test the strength of the surface. From left to right: Dane Thomason and Michael Dosier with bioMASON, Majors Laura Hunstock, MacKenzie Birchence, and Kelly Martin, the Project Medusa Team, 2Lt. Alex Campman, from AFRL’s Materials and Manufacturing Directorate, Glenn Johnson, from the Air Force Civil Engineering Center, and Kenney McAdams, also from bioMASON. (Photo courtesy of James O’Rourke)

The Project Medusa Team briefed their recommendation to Gen. David L. Goldfein, Air Force Chief of Staff, on May 16. Six other teams of Blue Horizons Fellows also made presentations.

“Our recommendation to CSAF was to invest in biomanufacturing with a faster transition to the user, to continue this effort with both AFRL and SPDE to make sure that this technology will have great value to our users in not just the Air Force, but also other services within DOD,” said Hunstock.

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