AEDC arc heater undergoing significant upgrades in support of advanced hypersonic systems

By Deidre Ortiz
AIA Public Affairs

In light of current and future Department of Defense testing needs for long-range strike and hypersonic vehicle materials development, a facility upgrade for the H2 arc heater at AEDC has been funded. As part of the upgrade, a state-of-the-art segmental heater is being placed in the H2 arc to replace the vintage Huels heater built in the 1960s.

The upgrade is necessary as hypersonic flights place extreme demands on vehicle structures and materials. Survivability testing of thermal protection system materials and structures for hypersonic environments requires high-temperature air flows with gas temperatures between approximately 4,500 degrees and 17,500 degrees Fahrenheit.

AEDC arc heater testing is performed at the Complex.

Arc heaters meet this requirement by providing an efficient source for heating simulations, with realistic run times that are consistent with the time of most hypersonic flight missions. The H2 arc tunnel was built from 1988 to 1989 as part of the Air Force consolidation of arc facilities at AEDC. It is one of three arc tunnels currently in use at the Complex.

At the time H2 was built, AEDC was operating a similar Huels heater in atmospheric freestream mode, as well as the high-performance segmental heater which had been developed at AEDC and put into operation in about 1972. The H2 arc tunnel was expanded to support arc heater testing of hypersonic vehicles.

The H2 arc heater is used to test the aerothermodynamics of hypersonic vehicles during flight. It uses testing materials developed at AEDC and throughout the Department of Defense.

The upgrade is expected to help transition the facility to support thermal protection system testing of future generations of hypersonic vehicles. The new H2 arc heater is the first of its kind in the world and will provide significant improvements over the old Huels heater. The new heater will be able to produce higher temperature and pressure conditions, allowing for more realistic testing of hypersonic vehicles.

The upgrade is expected to be completed by 2020, and it will enable AEDC to continue conducting research and development in hypersonic technologies.
**W A S H I N G T O N**

(AP) – Senior leaders kicked off the Air Force’s Sexual Assault Prevention and Awareness Month campaign March 17, 2016, at the Pentagon.

The secretary, chief of staff and chief master sergeant of the Air Force joined other senior leaders to engage service members from sexual assault prevention and response (SAPR) programs in a series of discussions, leading down the road to decreasing sexual assault and preventing this crime.

The event promoting the month-long campaign came in the face of the Department’s official recognition of Sexual Assault Awareness Month, which Air Force officials decided to hold April to highlight the importance of Airman’s engagement and support to the cause.

Using the Air Force core values as the foundation for their comments, Air Force officials stressed the importance of being honest and leading by example. Laurel James said integrity is imperative in this issue and the Air Force needs to lead, think in the mirror and accept the responsibility to prevent sexual assault.

“We talk about it,” James said. “Let’s ask ourselves and our subordinates: Can we continue to improve?

James went on to say that if “Airman’s service before self” is not only about serving the nation’s collective interest, but also the call to serve the nation.

“Survivors of sexual assault may find they are not part of the institutional Air Force, but they also deserve the support of their peers and their wingmen,” James said.

The challenge leaders face from commanders to lower levels is to become more demonstrative of setting an example across the command, enforcing the standards of conduct, and being a role model.

Chief of Staff Gen. Mark A. Welsh, III, spoke about members of one Air Force base, National Guard, Air Force Reserve, officer, enlisted and civilian members who stand side by side and shoulder to shoulder to prevent sexual assault.

“We have lots of numbers in the business, as it is the truck different things,” Welsh said. “I would offer you that if the number really matters is one. One victim, one crime, one event, one life, one family, one unwanted forever affected — now multiply that one person by all the lives they teach and multiply that number by 2,400. That’s the impact.

Welsh also said that prevention starts with asserting one sexual assault, and it must continue by one unit forever affected.

“Victims and survivors of sexual assault and rape deserve the support of our wingmen, friends,” Welsh said. “With unity, we will work harder the next day to make sure one stays thing.”

Chief Master Sgt. of the Air Force James A. Cody said that in this time as the highest-ranking enlisted member in the Air Force, he has evolved how he looks at sexual assault prevention after hearing a friend’s story.

“They have been shared an ideological background,” said Cody. “I wasn’t helping her to be a biter, any,” Cody said. “I was just reading an environment where I sit something happening that isn’t going to go to be there to help and help. We can never meet to stop the crime, but we can always look at the crimes and support them.”

Cody said the experience changed his trust with his daughter and helped him better understand prevention. They began talking about the sexual assault she was going when she was going out with and who would have her.

“You are going to go out, you are going to experience life,” Cody said. “Our Air Force have to prepare each other to protect to be there to help and help. We can never meet to stop them from doing that. There is something that’s happening. We are just going to be there to help and help. We can never meet to stop the clock, but we can always look at the crimes and support them.”
By Deidre Ortiz

First Lt. Chris Handy, AEDC flight systems test engineer, recently won the Air Force Test Center Annual Award for Company Grade Officer for 2015. Among his other duties, Handy is an active member of the AEDC Honor Guard. He is pictured here as a member of the detail which posted colors at a recent ceremony at the Arnold Lakeside Center. (U.S. Air Force photo/Holly Fowler)
is still in use today,” said Mark Smith, an AEDC facilities technology engineer. “Major components of the legacy 50-megawatt arc tunnel at Wright-Patterson Air Force Base, such as nozzles and diffuser sections, were relocated from Ohio. The facility test cell, model positioner system and air cooler were new designs fabricated expressly for the new H2 test cell at AEDC. These components continue to be used today and will be a part of the upgraded Mid-Pressure Arc Heater facility.”

The H2 arc tunnel has contributed greatly to testing at AEDC since 1988. Smith explained that the expanded flow, sub-atmospheric exhaust configuration of the H2 has provided a unique simulation capability within the flight regime from 80,000 to 160,000 feet altitude and velocity range from Mach 8 to 12. DOD programs supported by H2 have included the intercontinental Ballistic Missile, Navy Submunitions-Lauded Ballistic Missile, Defense Advanced Research Projects Agency (DARPA) Hypersonic Technology Vehicle-2 and HTV-3, DARPA Materials Development for Platforms, the Air Force Hypersonic Technology (HYTECH) Scramjet, multiple Army missile programs and Materials Defense Agency hypersonic interceptor programs. Civil and NASA programs supported include the Crew Exploration Vehicle, Mars Science Lab, Heat Shield for Extreme Entry Environments and Ocean/Multi-Purpose Crew Vehicle.

“Those tests could not have been conducted in the H2 test facility because of the unique capabilities,” Smith said. “Since 2005, H2 has been one of the most active arc heater test facilities at AEDC, and at date has accrued the highest total number of arc-minute hours of any of the AEDC arcs.”

The heater upgrade is being carried out to address an existing deficiency in the test capabilities provided by the national arc heater assets at AEDC and NASA. The upgraded H2 arc heater will provide temperature test conditions up to three times higher than the legacy Huds heater. The upgrade will directly support development of future advanced hypersonic systems by providing improved aerothermal simulation environments for high-speed vehicle materials and structures.

The first phase of the upgrade, the prototype, involves installation of the segmented arc heater in the H2 test cell, installation of the new diffuser and a facility calibration test series to demonstrate and document the new test conditions for customers.

“The Prototype will re-place the older Huds heater with a higher-performance 70-megawatt segmented arc heater,” Smith said. “The new [Mid-Pressure Arc Heater] segmented heater will be based closely on the operational AEDC H3 segmented heater design and will operate in the H2 test cell to provide much higher temperature levels for testing.”

In addition to the heater replacement, AEDC is fabricating a new diffuser that connects the H2 test cell to the exhauster system that provides lower pressure in the test cell. The diffuser work was completed in the AEDC Model Shop, and installation of the new diffuser began in January. Further upgrades to the facility water systems and the power supply are expected as follow-on to further expand the facility test capability to larger test sizes and longer run times during subsequent years.

“The MPAH upgrade will greatly expand the test temperature regime for arc jet testing,” Smith said. “The MPAH heater is funded by the DOD, and represents a significant new capability. The improved thermal simulation capability of the proposed MPAH facility is not available anywhere else in the world.”

The Prototype heater upgrade is well into design phases, and material procurement and fabrication are ongoing at this time to support the various system interfaces. Expected completion for facility shake-down of the Prototype is fall of 2016, with initial test capability starting soon after.

The total cost of $21 million for the upgrade effort is shared by AEDC and DOD. The project is being led by the AEDC Test Operations Division with support from the AEDC Space and Missile test and maintenance groups. Test Operations is also providing planning for the expanded Central Test and Evaluation Investment Program upgrade of the water system and electric power supply supporting the full MPAH facility.

“The upgraded facility will be an essential tool supporting materials development and qualification for all next-generation and advanced hypersonic vehicles,” Smith said. “This class of vehicles will be uniquely capable of executing many advanced strike missions. The ability to provide improved test and evaluation simulations for such missions will position our arc heaters as crucial enablers for all future programs having need of advanced thermal protection materials.”


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By Monica D. Morales

AFMC executive director reflects on career start, successes after 34 years

Green Team members received informational composting bags when they volunteered to be captains in the AEDC composting program. The program began last year as part of an Air Force grant. There have been 25 compost bins placed for Air Force Materiel Command Executive Director Michael A. Gill, who retires April 1 after spending three years in the command’s top civilian post.

“We all talk about retirement, but you don’t realize just how quickly the time goes,” Gill said. “I can’t believe I’ll get to the end because I enjoyed the ride so much.”

More than three decades ago, the prospect of an Air Force job was foremost in the mind of a college-aged Gill, who grew up near Robins Air Force Base, Georgia, watching F-15s fly overhead and living with his mother who also had a successful Air Force career.

A stint in the Reserve contracting office changed that mindset, however, and introduced Gill to a career field he said he equated with building a good steward of taxpayer dollars.

“Both my parents had worked for the Air Force and I had a comfort level and I knew the mission,” he said. “It just seemed like the right fit.”

That opportunity set the course for a diverse career that would eventually include three assignments at Headquarters AFMC and jobs at three different bases in the command. As executive director, Gill now advises the AFMC commander in managing all aspects of the command’s mission, in addition to advising her on labor union relations and development of the civilian workforce.

Gill’s most recent tenure here began as AFMC reached full operational capability of the then-newly established five-center construct. It was that climate of transition and focus on efficiency that would lay a foundation for what Gill regards as accomplishments on the job.

“Take a lot of pride in being a part of the planning, the implementation and the latter part of the five-center – and now six-center,” Gill said.

“This innovative program has no operating costs to the Air Force beyond the initial monetary grant to buy the composting equipment. The labor of scrap collection is done on a volunteer basis by dedicated employees, and the compost generated from the process has been used to improve the soil in participants’ homes gardens and landscaping projects.

If anyone wishes to participate in the program and does not currently have a bin, they are still available and can be set up at a convenient location.

Call 454-4284 with questions about the composting program.

FOOTPRINT from page 1

Green Team members received informational composting bags when they volunteered to be captains in the AEDC composting program. The program began last year as part of an Air Force grant. There have been 25 compost bins placed at 11 locations throughout AEDC. (U.S. Air Force photo/Jacqueline Cowan)

Help Keep Our Information Secure
Germs are often transmitted when a person touches something that is contaminated with germs and then touches their eyes, nose, or mouth. Some viruses can live on surfaces like doorknobs, desks, and tables. Even if you don't feel sick, you can spread germs 24 hours before your symptoms begin. To maintain your health, orifice a healthy lifestyle, eat nutritious food, and get plenty of sleep. When you are sick, rest, and check with your doctor when needed.

Common symptoms of the flu include fever (usually high), headache, extreme tiredness, cough, sore throat, runny or stuffy nose, muscle aches, nausea, vomiting, and diarrhea.

Take these precautions even if you don’t feel sick:

- Clean your hands often. When available, wash with soap and warm water then rub your hands vigorously together for 15 to 20 seconds. The soup combined with the scrubbing action helps dislodge and remove germs. When soap and water are not available, alcohol-based hand wipes or gel sanitizers may be used.
- Avoid touching your eyes, nose, or mouth. Germs are often spread when a person touches something contaminated with germs and then touches their eyes, nose, or mouth. Some germs can live for a long time on surfaces like doorknobs, desks, and tables.
- Cover your mouth and nose when you sneeze or cough. Cough or sneeze into a tissue, not into your hand or into the air. If you don’t have a tissue handy, your upper sleeve will do. If possible, clean your hands after you cough or sneeze.
- Wear a mask when you are sick; see a health care provider as needed. Remember: Keep your distance from others to protect them from getting sick.

This should be completely avoided if there is any risk of a flu pandemic.

- Stay home if you are sick; see a health care provider as needed. When you are sick or have flu symptoms, stay home, rest, and check with your health care provider as needed.
- Avoid close contact with others.
- Avoid sharing utensils or drinks.
- In cafeteria settings, it’s not uncommon for people to casually shuffle cutlery and drinks. Don’t share utensils or drinks.
- Make sure to make a reservation for the luncheon.

Dr. Lisa Burke-Smalley

A former student also anonymously created a recurring national scholarship in Burke-Smalley’s name through the National Society for Human Resource Management Foundation, which is awarded each year to a deserving student in the U.S. Burke-Smalley won the 2013 College of Business Research Award and in 2012 was inducted into the UTC Council of Scholars, the University’s highest recognition for those who research, publish and have national and international reputations in their fields.

Burke-Smalley was awarded the UTC College of Business Teaching Award in 2014, a UTC Think-Achieve Award in 2013 for using experiential learning methods in the classroom, and was nominated for the National Society for Collegiate Scholars’ 2012 Inspire Integrity Award. She earned the 2005 HR Educator of the Year Award in the Southwestern United States, is a prior recipient of the Professional Trainer of the Year Award from North Louisiana Association for Talent Development and is a member of Who’s Who Among America’s Teachers.

AEDC Safety

Illnesses like the flu and colds are caused by viruses. These viruses spread from person to person by way of coughing, sneezing or simply talking. Droplets from an infected person get into the air and are inhaled by people nearby. Anyone within three feet can easily be infected. Viruses can also spread when a person touches something that is contaminated with germs and then touches their eyes, nose or mouth. The soap combined with the scrubbing action helps dislodge and remove germs. When soap and water are not available, alcohol-based hand wipes or gel sanitizers may be used.
April 10 begins National Crime Victims’ Rights Week, a time to honor crime victims and our nation’s progress in advancing their rights.

Every year in April, the Office of Justice Programs (OJP) helps lead communities across the country in their annual observances of National Crime Victims’ Rights Week. NCVRW is an opportunity to highlight high-impact challenges faced by crime victims and emphasize the ongoing struggle to establish victim’s rights.

This year’s theme—Serving Victims. Building Trust. Restoring Hope—underscores the importance of early intervention and victim services in establishing trust with victims, which in turn supports their hope for healing and recovery. Meeting victims where they are today is crucial, authentic, and persistent to establish a welcoming, community-based and victim-centered environment for healing and recovery.

Vic- tims are to trust that the criminal justice system will work for them, in the places where they are physically and emotionally violated. ’Less than,’” said Joyce E. Foster, director of the Office for Victims of Crime (OVC), U.S. Department of Justice. “We can take the time to focus victims of the victim in the aftermath of their needs for safety and justice, we can begin to build trust and restore the hope of these victims. Our role is to help victims as they rebuild their lives.”

National Crime Victims’ Rights Week honors and celebrates the achievements of the past thirty years in securing rights in most states in America, and in ensuring that victims have rights. OVC, a lead agency in victim services, supports services for victims of all types of crime, including assistance for homicide survivors, survivors of child sexual abuse and victims of human trafficking as well as rape crisis centers and other victim service programs among others.

OVC also finds victim compensation programs that pay victims out-of-pocket expenses such as counseling, funeral expenses and lost wages.

The Tennessee Department of Treas- ury, Division of Claims Administration, administers the Crime Victims Compensation Fund. The purpose of this program is to assist victims of crimes or in the case of victims’ death, their dependents relative to just over $30,000. Payments made under this program are in- tended to defray the costs of medical services, funeral costs, burial costs, and other financial losses. OVC assists with the direct re- turn of personal possessions stolen by a criminal.

The bipartisan Victims of Crime Act (VCOA), passed by Congress in 1984, created a national fund to cover victims’ suffering. Financed by fines and penalties paid as the result of criminal conviction, the Crime Victims Fund supports services for victims of all types of crime, including assistance for homicide survivors, survivors of child sexual abuse and victims of human trafficking as well as rape crisis centers and other victim service programs among others.

The U.S. Department of Justice will host NCVRW’s annual Service Awards Ceremony on April 12, in Washington, D.C., to honor outstanding individuals and pro- grams that serve victims of crime.

National Crime Victims’ Rights Week. Let’s com- memorate this important week by getting to know our neighbors. Take the time to listen, explore, and value differences. We must work together in end victim’s rights. By reaching out and creat- ing relationships, we can help others share our stories.

To contact the Victim Witness Assistance Program (VWAP) Coordinator at 454-4667 for additional information about this year’s National Crime Victims’ Rights Week by phone or e-mail at victormis@vawc.org.

By Barbara Birdsong
By Leslie McGowan

By Air Force Safety Center

TULLAHOMA, Tenn. Two teams of graduate alumni who have been recognized as finalists in the University of Tennes- see Space Institute March 4.

Julie King won in the PhD category and received a $2,000 travel award. Second place winner was in the Master’s category and received $1,000 travel award.

King is from Mount Airy, North Carolina. Her research he is working on high-speed CFD and applied aero- dynamics. As part of his research he is working on the design of a Mach 4 Ludwig Tube by means of CFD simulations. The main focus of this involves flow analy- ses and mitigation of the effects of poor bluff bodies.

The competition was made possible by a donation from one of UTSI’s alumni who wishes to remain anonymous.

The competition was open to all final- and prior year grad students currently enrolled at UTSI. The 2-13. The best presentations, according to a panel of judges, were awarded travel grants.

Graduate students participated in the competition. Each par- ticipant gave a 10 minute presentation followed by five minute question and answer session.

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Air Force IT Conference returns with ‘cyberpower’ addition

By Phil Berube, 42nd Air Base Wing Public Affairs

MAXWELL AIR FORCE BASE, Ala. (AFNS) — The Air Force Information Technology Conference held annually in Montgomery, Alabama, which has been canceled since 2012 due to budget constraints, is returning to the state capital this year with an emphasis on cyberpower.

The rebranded Air Force Information Technology and Cyberpower Conference will be held at the Renaissance Montgomery Hotel and Spa at the Convention Center, Aug. 29-31. The theme for the conference is “Amer- technology and Cyberpower.”

The rebranded conference is now sponsored by Air University, the Air Force’s accredited education system that provides professional military and professional continuing education.

“Given the advances in technology and cyber operations in the years since the last conference, the commander at Air University, the Air Force, decided to reinstate it and include strong cyber and academic elements,” said Col. Michael Ande- son, AFITC chair.

The conference is one of the primary tools for keeping Air Force and private industry cyber leaders and experts current on the latest concepts, strategies, technologies and capabilities in both the military and civilian sectors. Attenders will get firsthand insights from leading government and industry experts on what challenges America is facing in the defense of the United States.

The new Air Force Cyber College at Air Uni- versity will lead the conference academic tracks that will jointly evolve the collaboration, concepts, methods, IT applications and strategies to ensure national security and eco- nomic vitality for America. The college will lead collaborative focus groups with the aim of building a network of professionals for public-private action to foster trusted partnerships between government and industry to drive the develop- ment of a plan geared toward policy changes to strengthen the country’s national and economic sec- urity.

“The purpose of the conference is to continue the cyber dialogue we began at the Cyberpower Con- ference series in 2011 and 2012 at Air Univer- sity,” said Dr. Panos Yan- nakoglu, dean of the Air Force Cyber College. “AFITC offers a platform to reinvigorate this net- work. Cyber College will serve as the steward of a trusted collaborative pro- cess to identify problems, discover solutions and de- sign strategies to inform recommendations to deci- sion leaders.

“The cyber and academ- ic elements will bring to- gether cyber professionals, decision makers, commer- cial businesses, Air Force professionals and Air Uni- versity students and academ- ics with the common goal of advancing the ef- fectiveness, thought and discussion of the nation’s and Air Force’s approach to the cyber domain. Air University un- derstands that success in technology, cyberpower, defense, agile acquisition and con- tinuing education. AFITC 2016 is ex- pected to attract more than 150 vendors and more than 2,000 attendees. Registration is open to Defense Department per- sonnel, military retirees, government contractors and local and state em- ployees. The conference will also hold an education day for high school stu- dents focusing on science, technology, engineering and math, or STEM, edu- cation.

45th Space Wing supports successful Atlas V OA-6 launch

The 45th Space Wing supported NASA’s successful launch of Orbital ATK’s Cygnus spacecraft aboard a United Launch Alliance Atlas V rocket from Space Launch Complex 41 at Cape Canaveral Air Force Station, Fla., March 22. The rocket carrying Cygnus cargo vessel OA-6 is a reusability mission to the International Space Station sup- porting NASA’s Commercial Resupply Services program. (Courtesy photo/ United Launch Alliance)
The last GPS IIF satellite is encapsulated inside a payload fairing at a processing facility before it was launched aboard an Atlas V rocket Feb. 5 at Cape Canaveral Air Force Station, Fla. The mission ended a 27-year legacy of processing second-generation GPS satellites for the 45th Space Wing. (Courtesy photo/United Launch Alliance)

Airmen look ahead after historic GPS satellite mission

By Sean Kimmons,
Air Force News Service

CAPE CANAVERAL AIR FORCE STATION, Fla. — Capt. Trung Nguyen was born the first of its 32 satellites was blasted into space.

Twenty-seven years lat-er, the Airmen helped pro-
cess the final GPS IIF sat-ellite, worth about $1.31 mil-
lion, before it was launched on an Atlas V rocket in early February.

“All your work leads up to that point where the rocket is launched and the satellite is in orbit,” said Nguyen, the 45th Launch Support Squadron’s GPS IIF field program manager. “It’s very gratifying work.”

The next round of Air Force-owned GPS satellites, Block III, is now in produc-
tion by Lockheed Martin, which is expected to launch the first of its 32 satellites in late 2017.

Global influence

GPS satellites offer countless civilian and mili-
tary uses. From getting cash out of an ATM or sharing a picture on social media to track-

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Air Force News Service

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