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November 20, 2017

CFD verifies new AEDC Hypervelocity Wind Tunnel 9 nozzle design

By Deidre Ortiz

AEDC Public Affairs

The new Mach 18 nozzle design at the AEDC Hypervelocity Wind Tunnel 9 in White Oak, Maryland, near Silver Spring, has been successfully verified using computational fluid dynamic (CFD) codes.

A new nozzle was needed to extend the range of desired conditions from the Mach 7, 8, 10 and 14 conditions currently available.

According to Ken Tatum, AEDC modeling and simulation engineer, the nozzle had to be designed analytically to yield the near-uniform conditions in the test section required for the design of advanced future hypersonic weapons.

CFD analyses, performed by Tatum and Derick Daniel, AEDC aerospace engineer, assessed the physically complex hypersonic flows within the nozzle and showed that a high-quality flow within the test section that is undisturbed by excessive wave reflections is theoretically achievable.

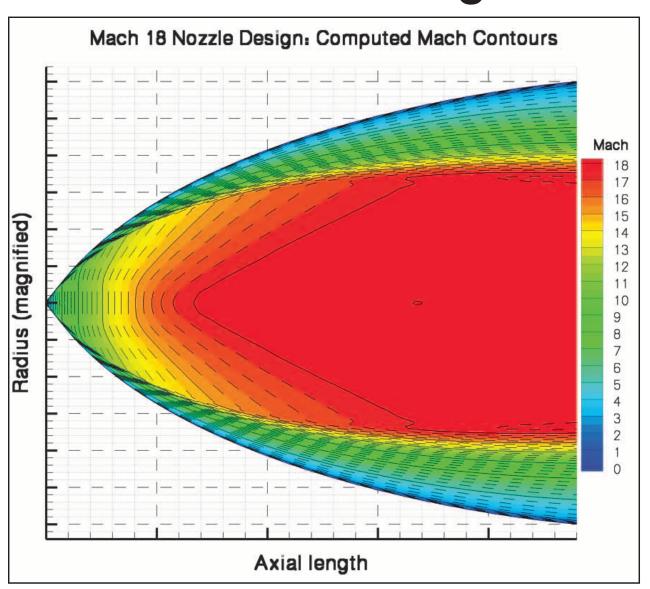
"Ensuring that these facilities provide high-quality test results at the desired conditions and that the facilities are applicable to understanding extreme flow conditions requires advanced numerical analysis to fill in details that are unavailable from testing," Tatum said.

"The thermodynamic chemistry model used in the CFD codes were validated with Coherent Antistokes Raman Scattering system test data taken by Andrew Alexander, instrumentation and diagnostics engineer," he added. "Andrew's measurements verified the existence of non-equilibrium effects at high Mach speeds. We also assessed the effects of pressure waves generated at nozzle joint locations and their effects on the test section for the new nozzle design at equilibrium and non-equilibrium extremes. Accurate modeling of both these effects are critical to building the best nozzle and test capability possible."

The facilities at Tunnel 9 will be used to study advanced hypersonic system development. Part of these studies are continued advances in the understanding of turbulent boundary layers. High-quality flows will be necessary to provide useful data for such studies. One such diagnostic used to interrogate these boundary layers is particle-image velocimetry (PIV).

design a local particle injector nozzle for a PIV system in Tunnel 9.

"Particle-image velocimetry seeder designs have range of capabilities of the Tunnel 9 facilities and to



The new Mach 18 nozzle design at the AEDC Hypervelocity Wind Tunnel 9 in White Oak, Maryland, near Silver Spring, has been successfully verified using computational fluid dynamic (CFD) codes. This image shows computed contours of Mach number within the new Mach 18 nozzle design. (AEDC image)

been shown to provide satisfactory particle distribuadd to the testing techniques available to Tunnel 9 respeed boundary layers with satisfactory particle dis-niques. tributions for PIV techniques."

designs for both Mach 3 and 10 flows to assess bound- and often challenging, work. It's these ideas, accord-CFD analyses performed by Tatum were used to ary layer particle densities and disturbances on the ing to Dr. Woodrow Whitlow, that "provide long-term boundary layer from particle injection into the stream. benefits to test operations."

These efforts are just two of many to expand the

tions needed for future test programs," Tatum said. searchers. The efforts are highly coupled in the sense "Studies of hypersonic boundary layers require care- that high-quality nozzle flows are essential to obtain ful design of injection flow paths for seeding high- high-quality data from new and improved test tech-

AEDC team members are using innovative ideas Tatum performed analyses of numerous PIV seeder to address issues that arise when taking on unique,

See **DESIGN**, page 3

AEDC releases 2017 Arnold AFB Water Quality Report

By AEDC Civil Engineering **Branch**

IS THE WATER SAFE?

We have conducted numerous tests for more than 80 contaminants that may be in drinking water. As you will see on the chart with this report, we detected nine of these contaminants.

While eight of these contaminants were within the United States Environmental Protection Agency (U.S. EPA) health standards, sampling that occurred in August 2017 detected lead in a few water fountains above the EPA action level of 15 parts per billion (ppb), or 0.015 milligrams of lead per liter of water. Any detectable level of lead in the water is of concern, but the limits that were detected do not pose an immediate health risk to the base population.

However, Arnold Air Force Base is committed to ensure personnel health and safety are protected, and is taking steps to test 100 percent of water fountains, food preparation sinks and ice machines on base. Any water

sources determined to exceed 15 ppb of lead are being removed from service until remediation actions are implemented to fall below the EPA action level.

WHAT IS THE SOURCE OF THE WATER?

The water on Arnold's Main Base area comes from Woods Reservoir and is treated at the Base Water Treatment Plant (Building 1503).

The golf course is served by a well located at the golf course. The water is filtered through cartridge filters and disinfected with liquid calcium hypochlo-

Arnold Village is served by the Estill Springs water system. They have conducted numerous tests for more than 80 contaminants that may be in drinking water and only detected 12 of these contaminants. All of these contaminants are at safe levels.

WHY ARE THERE **CONTAMINANTS IN THE DRINKING WATER?**

Drinking water, including



Arnold Engineering Development Complex (U.S. Air Force photo/David Househ)

bottled water, may reasonably be expected to contain at least small amounts of some contaminants; however, this does not necessarily indicate that the water poses a health risk. This report is provided to show that Arnold AFB routinely samples

water to determine whether it meets all EPA health standards and is safe to drink. More information about contaminants can cause serious health proband potential health effects can lems if too much enters your be obtained by calling the EPA Safe Drinking Water Hotline at (800) 426-4791.

DO I NEED TO TAKE

SPECIAL PRECAUTIONS? According to the EPA, lead body from drinking water or other sources. It can cause

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HIGH MACH Arnold **Air Force**



Col. Scott Cain Commander

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Core Values

- · Integrity first Service before self
- Excellence in all we do



Vision

"NAS will be integral to the success of AEDC, the U.S. Air Force's premier aerospace testing facilities, while applying the highest standards of ethics, innovation, safety, security, and quality to daily

operations. Values

Ethics. We are uncompromising in our integrity, honesty, and fairness. Safety & Health. We are relentless in keeping people safe from harm, and we provide a safe and healthy work

environment. Security. We are disciplined and vigilant in protecting sensitive AEDC information and ensuring system integrity to support national security and our customers. Excellence. We thrive on challenge

accomplishment, and mission success · Quality. We are passionate about doing our work right the first time. · People. We have a mission-focused,

inclusive workforce who have a diverse skill set, are committed to success, demonstrate innovation and have a can do attitude

· Culture. Our team is proud of our diversity, inclusiveness, and collaborative work environment. We are proud of what we do and how we do it.

Relationships. We build positive, long-

term business relationships through trust, respect, and collaboration. · Innovation. We overcome challenges through creativity, perseverance, technol-

ogy, and flexibility. We actively seek to continually improve. · Sustainability. We plan and act for the long term benefit of our communities and our environment.

Why do you work at AEDC?

AEDC Test Systems Sustainment Division

"I have 2,500 hours in the F-4 Phantom and I came home on my feet because of you and guys like you (total of 5700 hours of flying high performance airplanes up to the F-15).

Lt. Col. Charles Huff, U.S. Air Force re-

Charley is a college friend from way back when at Eastern Oklahoma A&M. There will be more of his story shortly but for nowwhy do you work at AEDC?

There are many reasons for choosing a career. Some people do it for money, and I feel sorry for them. Others choose because the way in front of them seems to be the only open way. Still others choose because of peer pressure or even parental pressure. Some choose because they love the line of work on make flying his career. their career path. Then there are the guys like Charley who chose to be of service to this

If you work at AEDC you are a part of the greatest test and evaluation capability in the world! I have been to England, Germany, and France and evaluated their T&E capabilities. AEDC wins, hands down! Just as in the military, work at AEDC falls into many categories. In the U.S. Air Force not everybody can be a pilot. In order for a USAF airplane to fly and do its job it has to have maintainers. logistics personnel, clerical personnel, human resource personnel, and many others. Typically, the "point-of-the-spear" (those actually in combat) is about 10 percent of the total force required. So it is at AEDC. Some are test engineers; some are test facility craftsmen; some are boilermakers; some are timekeepers; some are planners; some are electricians; at Luke AFB." some are IT specialists...you get the picture. It takes all of us to make AEDC work.

Let me fill in a little more of Charley's 21year career in the USAF in his own words. The AFROTC Wing at EOA&M took a familiarization visit to Dyess Air Force Base in 1960. Charley was part of the group of cadets and guys like you."

Charley said. "That trip propelled my in- aircraft that guarantee that the U.S. has, not sharp!

You work here to bring our warriors home on their feet instead of in body bags. -Glenn Lazalier

terest into flying. I remember a guy named Mike Doyle and I sat outside and watched the B-47s and B-52s lifting off the runway. It must've been some kind of exercise because it lasted about 45 minutes, one right after the other. Mike told me that night that he was going to make the Air Force a career."

Charley was also motivated that night to

"I flew out of Ubon, Thailand, which was pretty colorful," he said. "We were at the Eighth Wing and known as the Wolfpack."

"I had a three-year tour at Tactical Air Command Headquarters at Langley Air Force Base Virginia. I was the program director for operation Ready Eagle. I am sure you know that was the equipage of F-15 Eagles into the European fighter bases. Although it was a year in completion, it appeared to the Russians that we equipped Bitburg and Camp the Phantoms out of Europe the same night. It was quite a shock to the Ruskies to see 72 F-15s on the ramp at Bitburg where just the opportunity to brief Dr. Kissinger and General Haig."

"I was the Operations Officer in the F15

Wow! What a career! Charley chose to put his life on the line daily for you and for me. That still leaves the question of "Why do you work at AEDC?"

Look back at that first quote from Charley. "I came home on my feet because of you

You are the guys now. Your work will pro- on their feet instead of in body bags. "I remember that trip to Dyess very well," vide our Air Force, Navy, and Marines with



Lt. Col. Charles Huff, U.S. Air Force retired

only air superiority, but will guarantee that we have air dominance. Because of your work, the most feared words in our adversaries' vocabularies will be "Cleared for takeoff."

AEDC contributes to the national defense New Amsterdam with Eagles and flew all of in many ways that are vitally important. We have done and continue to do work for the Air Force, the Navy, the Army, and the Marines. The ground leg of our nuclear triad (Minuteday before, there had been 72 F-4s. I had the man III) had every bit of the aero vehicle including the propulsion, except the first stage booster, developed here. Our chambers develop satellite technologies. Our wind tunnels are busy extending the knowledge base for air platforms and missiles. Our engine test cells are at the cutting edge of the next generation of propulsion systems. Our ranges investigate the hypersonic regimes. The examples are too many to enumerate in this article.

Why do you work at AEDC?

You work here to bring our warriors home

Keep the warriors fit and the spear points

A holiday to remember

By Brian Meverden

holidays and you have lots unresponsive. Your daughof food and drinks avail- ter comes running into the

Arnold AFB Safety Office

great time. into the living room and can be transported to the asks for help changing the hospital where her parents channel on the TV in the spend all night crying and extra room you had set pacing the halls before she up for them for this party. passes away in the early You're in the middle of a morning hours. great conversation and politely remind them to wait in to investigate, but offiuntil the conversation is cers describe her death as finished before interrupt- a tragic accident and the ing. You go back to your matter has been passed conversation and forget to the coroner. A police about changing the chan-spokesman said "As a

tained. room and you immediately recognize Sarah and Har-

able, activities for the kids room with her cell phone and everybody is having a in hand asking what's going on. An ambulance is One of the kids comes called so the 4-year-old

The police were called nel. Besides, your 13-year- result of a very sad and old daughter is there to tragic accident, which take care of the kids and was reported to police at make sure they stay enter- 8:20 p.m., a 4-year-old girl passed away at the hospital A little time passes in the early morning hours. when you hear a crash The family is understandfrom the extra room and a ably very distraught by the lot of yelling and scream- tragic accident and request ing. Everyone runs to the to be left alone during this incredibly difficult time."

During the investiga-

up and reach the TV to multiple internal injuries. change the channel. Of the

ry's 4-year-old girl under tion, it was revealed the lower drawers to climb,

Unfortunately, five drawers, the two bot- cause and result above tom drawers were full of is true. The details of exbooks and the rest were actly what happened are empty. The TV was an unclear, but you've been old CRT model weigh- given a realistic scenario ing 73 pounds. When the of how such mishaps can child pulled out the two occur.

As the holidays apthe TV set and dresser. Af- child pulled out a few of the furniture being used as proach and you begin planter moving the items you the bottom drawers of a a stand became very unstanning; take the time to look You have family and notice bleeding from the chest of drawers being ble and the TV came down closely at the environment friends visiting for the nose and mouth and she is used as a stand to climb on top of her, resulting in and who will be occupying it. Common sense isn't common. If you're the one visiting and see something, don't just say something, do something. Take time in planning your activities, consider all the possibilities and have a safe and enjoyable holiday season.

ARNOLD ENGINEERING DEVELOPMENT COMPLEX Arnold AFB, Tenn.

Join AFDC on Social Media!

















Learn about our mission at www.arnold.af.mil

Smoking Policy

- The following revised Arnold AFB smoking policy is effective immediately and applies to all individuals on Arnold AFB.
- Traditional Tobacco products (e.g. cigars and cigarettes):

Smokeless Tobacco products (e.g. snuff and dip):

- a. 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 of cigarette butts.
- b. Tobacco use on the Arnold AFB Golf Course is permitted, but discouraged based on the health hazards of tobacco use and secondhand smoke. No smoking is permitted within 50 feet of golf course buildings except in the approved DTA.
- c. Smoking in government-owned/leased vehicles is strictly prohibited. Personnel are allowed to smoke in their personal vehicles at any time; however, at no time will personnel discard cigarette butts outside their vehicle.
- d. For government employees, the fact that a person smokes has no bearing on the number of breaks they may take. Breaks should be taken in accordance with the current supervisory and personnel policies that afford all employees the same break opportunities consistent with good work practices and accomplishment of the mission.
- Smokeless tobacco products are not to be restricted to DTAs. Smokeless tobacco use will be permitted in all workplace areas (inside and out) subject to reasonable safety and sanitary conditions. Specifically, containers of tobacco waste product, including sealed containers, must not be left unattended or disposed of in trash receptacles. Users of smokeless tobacco must flush tobacco waste down the toilet. Electronic Cigarettes (also known as "e-cigs"):

Pursuant to Air Force Instruction (AFI) 40-102, Tobacco Free Living, e-cigs are considered to be equivalent to

tobacco products; however, e-cigs are not restricted to DTAs and are allowed to be used outdoors at a minimum

distance of 25 feet from building entry/egress points. (This policy is dated July 27, 2016)

Action Line

I believe in free and open communications with our Team AEDC employees, and that's why we have the Action Line available. People can use the Action Line to clear up rumors, ask questions, suggest ideas on improvements, enter complaints or get other issues off their chests. They can access the Action Line via the AEDC intranet home page and by calling 454-6000.

Although the Action Line is always available, the best and fastest way to get things resolved is by using your chain of command or by contacting the organization directly involved. I encourage everyone to go that route first, then if the situation isn't made right, give us a chance.

> Col. Scott Cain AEDC Commander

Arnold AFB Legal office offers holiday gift guidance

By Sara Anderson

Arnold AFB Legal Office

It's the season for giving and as the holidays approach, it is important to be mindful of the ethics rules as they apply to gift coworkers are free to exchange giving and gift acceptance.

The Arnold Air Force Base Legal Office aims to provide the necessary ethical guidelines so everyone can go forward and enjoy the holiday season.

Any time something with monetary value is offered to a government employee - includor wrapped gift - federal ethics regulations apply. The three holiday season are 1) gifts besupervisor; and 3) gifts between source of gift giving, Federal

ployees.

Gifts between Government Employees

As a general rule, peers and gifts. There are no legal restrictions on gifts given to peers or subordinates. However, common sense and good taste should

Gifts between Subordinate and Supervisor

Generally speaking, superviing a meal, party invitation, sors may not accept gifts from subordinates or Federal personnel who receive less pay. Exmain areas of concern during the ceptions include any occasion on which gifts are traditiontween government employees; ally given or exchanged. With 2) gifts between subordinate and the holidays being a traditional

items valued at ten dollars or less to their superiors. Also, supervisors may accept food and refreshments shared in the office and may share in the expenses of an office party. Lastly, if a subordinate attends a social event at the supervisor's residence, the subordinate may give the supervisor a hospitality gift of the type and value customarily given on such an occasion.

Gifts between Government and Contractor employees

Basic ethics rules state that government employees may not accept gifts from "prohibited or non-federal entity currently doing business with or seeking to do business with the federal government. In addition, gifts

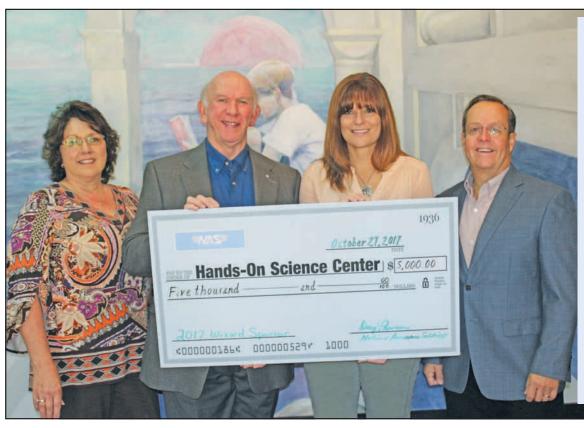
of a government employee's official position cannot be accepted. However, in limited circumstances, government employees may accept gifts from contractors and other outside sources. Gifts from prohibited sources must never exceed \$20 per gift or \$50 per year. This is often referred to as the "20/50 rule." Under no circumstances is the giving of cash permissible, even via a gift card (however, a gift card from a specific vendor, such as Starbucks, is permissible as long as it is within the limitations of the 20/50 rule).

Other exceptions to the gensources," defined as any person eral gift giving guidelines exist. For example, gifts motivated by a genuine personal or family relationship are acceptable the Legal Office at (931) 454on a much broader basis. Also,

government and contractor em- law allows subordinates to gift from any source offered because certain items are not classified as gifts, such as greeting cards and modest items of food and refreshment like coffee and donuts. There are many other requirements and exceptions, and it's always a good idea to consult with an ethics counselor before deviating from the general

> Whether you think the holiday season begins the day after Thanksgiving or the day Army & Air Force Exchange Service puts up its first Christmas tree, being mindful of the ethical guidelines ensures everyone in the AEDC family at Arnold is able to enjoy the holiday fun!

> If you have any questions or concerns and would like to consult an ethics counselor, contact



Donation made in support of Hands-On Science Center's **STEM** programs

Doug Pearson, deputy general manager of National Aerospace Solutions, LLC, the contractor overseeing the AEDC Test Operations and Sustainment contract, presents a check for \$5,000 to Deb Wimberley, director of the Hands on Science Center in Tullahoma, to help support the HOSC's Science, Technology, Engineering and Math (STEM) programs. AEDC supports many STEM efforts throughout middle Tennessee impacting nearly 19,000 students in more than 60 schools since 2013. AEDC also has a program dedicated to STEM at Arnold Air Force Base. Pictured left to right are Carole Thomas, president of the HOSC Board of Directors; Pearson; Wimberly; and Jim Jolliffe, a member of the HOSC Board of Directors. (Courtesy photo)

November safety campaign focuses on importance of explosive safety

By AEDC Safety

The NAS Safety Condition Campaign focus for November is Explosives Safety.

The purpose of the Safety Condition Campaign is to identify conditions that make compliance with safety requirements a challenge, to ensure we are in compliance with the Air • Force safety standards, and to establish consistency in practices.

Safety, Health and Environmental • Standard E15 lists all of the requirements for Explosives Safety. The standard is summarized as:

- A minimum of two persons must be present when conducting explosives operations.
- explosives, must be grounded and/or
- developed in accordance with SHE property.

Standard E15 requirements.

- Hand tools used in locations containing explosives must be nonsparking.
- In facilities containing explosives, personnel limits must be posted.
- Cell phone and/or radio transmissions are prohibited within specified limits, 10 ft. or 25 ft.
- Transporting rocket motors shall be done during off peak travel times and not during shift change.
- The name and title of those responsible for safe handling of explosives shall be designated in writing.

Improper handling of explosive Metallic equipment, used with components may not only result in malfunctioning and loss of test data and time, but may cause mishaps that could An Explosives Site Plan must be result in injury, loss of life or damage to

of the human factors that contribute to Contractor employees under the supervision of an employee who is trained and qualified to understand the hazards of the operation. For this reason, a two-man rule is always safety program. in effect when working with explosives. Personnel must be trained to work with year 10 safety focus topics have been explosives and follow written work completed: fall protection, barricades instructions. They must also know to question such instructions or other work practices that are or have the potential to become unsafe.

The Base Operating Contractor Explosives Safety Officer or ESO is the individual designated to oversee AEDC Air Force Safety Office will have an individual designated AEDC are underway.

Inattention to detail, failure to Explosives Safety Manager with Work instructions must be approved follow written instructions, improper overall responsibility for direction and by the Fire Department and Air Force work practices, complacency and poor management of the AEDC explosives housekeeping practices are just some safety program. The Base Operating Safety, a mishap. Explosives operations must Environmental also has an individual be performed by trained and qualified designated as the Base Operating Contractor ESO who will be responsible for the administration of the Base Operating Contractor's explosives

In addition to explosive safety, this and signs, lock out/tag out, confined space entry, energized electrical work, lifting & rigging, excavation & trenching, scaffolding, elevated work platforms and hazardous chemicals. Efforts resulted in successfully identifying areas that need to be improved. In each case, a short the explosives safety program. The term solution was identified and the process for identifying longer term fixes

DESIGN from page 1

Innovative ideas are also important to the U.S. Air Force because complex security and fiscal challenges demand that Airmen are innovative and find better and smarter ways to "fly, fight and win." The Air Force leverages many channels to empower Airmen and industry partners to submit ideas as part of an overarching culture of innovation.

In a recent interview with Defense News, Air Force Secretary Heather Wilson commented on the Air Force's focus on innovation and looking toward the fu-

"What kind of an Air Force do we need in 2030, and how do we start ourselves on the process of getting there? We are a service whose roots and history are very deep in innovation, and I want to make sure that we're not losing that," she said.

If any AEDC team members have an idea about how to do work more efficiently or how to reduce mission risk, the AEDC Technical Innovations Branch managers would like to hear about it. Contact the Technical Innovations Branch at (931) 454-7491.

Mach number Mach 3 Facility Injector #113ae 3.2 2.4 1.6 0.8 0.0

An AEDC modeling and simulation engineer performed analyses of numerous particle-image velocimetry (PIV) seeder designs for both Mach 3 and 10 flows to assess boundary layer particle densities and disturbances on the boundary layer from particle injection into the stream. This image shows simulated particles being injected from below, into and down a duct of Mach 3 flow. (AEDC image)

AEDC quarterly award winners announced



1st Lt. Roy Fisher **Test Operations Division,** Arnold AFB Company Grade Officer of the Quarter



Staff Sgt. Oscar Samame Financial Management & **Comptroller Division, Arnold**

Honor Guard of the Quarter



Kristina Herrera 704th Test Squadron, Holloman AFB Civilian of the Quarter Category II



James Tapp Test Support Division, Arnold AFB Civilian of the Quarter

Category III



John Garner Services Branch, Arnold AFB Non-Appropriated Fund employee of the Quarter Category II



Steven Barnes Services Branch, Arnold AFB Non-Appropriated Fund employee of the Quarter Category I



Patricia Henderson AFTC Contracting Execution Division, Arnold AFB Directorate of Contracting of the Quarter, Category III



Kathy Swanson AFTC Contracting Execution Division, Arnold AFB AFTC Staff 2016 Civilian of the Year, Category II



Scott Williams Test Operations Division, Arnold AFB AEDC Technical Achievement Award

Photos unavailable for:

Tech. Sgt. Daniel Hansford; 704th Test Group, Holloman AFB - Non-Commissioned Officer of the Quarter

Master Sgt. Marc Berger; 704th Test Group, Holloman AFB -Senior Non-Commissioned Officer of the Quarter

AEDC Exceptional Innovator Award

746th Test Support NAVWAR Direct Inject Capability 704th Test Group, Holloman AFB

Team Members: Nicolas Arosemena, Daniel Bacungan, Jason Bingham, Jerome Echelbarger, Grant Graupmann, Jeremiah Johnson, Kalyn Jones, Dominick Martin, Don Morales, Carlos Ruiz, Rodney Smith, Jill Stevens, Nicole Tekell, Eddie Thompson, Kim Tillotson, Brandi Wong



Preventative measures include:

- Do not post any information you want to protect on any device that connects to the internet.
- Always use high security settings on social networking sites, and be very limited in the personal information
- Use anti-virus and firewall software. Keep them and your browser, and operating system patched and updated.
- Change your passwords periodically and do not reuse old passwords. Do not use the same passwords for more than one system or service.
- Do not post anything that might embarrass you later, or that you don't want strangers to know.
- Verify those you correspond with. It is easy for people to fake identities over the internet.

Internet-based social networking sites have created a revolution in social connectivity; however, con artists, criminals, and other dishonest actors are exploiting this capability for nefarious

REPORT from page 1

the production of red blood cells that carry oxygen to all parts of the body. The greatest risk of lead exposure is to hygiene, and precautions in handling infants and pets Arnold Village, call Estill Springs City Hall at (931) infants, young children and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and on appropriate means to lessen the risk of infection by high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

While Arnold AFB personnel are testing all drinking water sources on base and removing from service lead, there are steps you can take to reduce exposure to lead in drinking water both at work and at home:

- Run the cold water 15 to 30 seconds to flush out the water in the faucet body and plumbing. This is the source of lead in almost all drinking water from a home tap.
- hot water from the tap for cooking. Boiling water
- bottled water, or use a water filter.

Some people may be more vulnerable to contaminants in drinking water than the general population. lead above the EPA action level, the number and fre-Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS in all tests. or other immune system disorders, some elderly, and infants can be particularly at risk from infections. Arnold AFB and the AEDC Golf Course, call the Base

damage to the brain and kidneys, and can interfere with These people should seek advice about not only their bioenvironmental engineer at (931) 454-5635. drinking water, but also food preparation, personal from their health care providers.

EPA/Centers for Disease Control (CDC) guidelines Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline at (800) 426-4791.

WERE THERE ANY CONTAMINANTS DETECTED IN THE DRINKING WATER?

All sources of drinking water contain some natuany that test above the EPA action level of 15 ppb for rally occurring contaminants. In order to ensure that tap water is safe to drink, the USEPA prescribes regulations which limit the amount of contaminants allowed in water provided by public water systems. At low levels, these substances are generally not harmful in our drinking water. Removing all contaminants would be extremely expensive, and in most cases, (II) Drink and cook with cold water only, do not use would not provide increased protection of public health. The EPA or the State requires us to monitor for certain contaminants less than once per year be-(III) Look for alternative sources of water, such as cause the concentrations of these contaminants do not change frequently.

> Due to the water fountains that were found to have quency of water samples has been increased until such time the detection levels for lead falls below 15 ppb

> For more information about the drinking water on

For more information about the drinking water in

Detailed Information on Contaminants

Barium occurs naturally at very low concentrations in our groundwater.

Chlorine Residual Disinfection is maintained throughout the distribution system. Chlorine is added to the drinking water supply at well sites to provide assurance that water delivered to customers will remain free of microbiological contamination. This also ensures that the water meets microbiological drinking water standards from the time it is pumped from the ground until it reaches the customer's tap.

Disinfection Byproducts are the unintended reactions of disinfectants with naturally occurring materials in the water (e.g., natural organic matter, bromide, or disinfection by-product precursors).

HAA5s (Halo acetic Acids) are chemicals that can form resulting from water treatment, when water acidity and temperature are slightly high and treatment chemicals react with organic particles or bromide.

Lead and Copper are naturally occurring metals which are generally found at very low levels in source waters. If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing.

Nitrate is a form of nitrogen and an important plant nutrient. Nitrate in drinking water at levels above 10 ppm is a health risk for infants less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant, ask advice from your health care provider.

PFOS/PFOA (Perfluorooctanesulfonic acid/Perfluorooctanoic Acid) is a synthetic, fully fluorinated organic acid; it used in a variety of consumer products and in the production of fluoropolymers, and it is generated as a degradation product of other per fluorinated compounds.

TTHMs (Total Trihalomethanes) are a group of four chemicals that are formed along with other disinfection by products when chlorine or other disinfectants used to control microbial contaminants in drinking water react with naturally occurring organic and inorganic matter in water.

*The Action Level for Naturally Occurring Metals (Lead and Copper) is calculated based on the 90th percentile of all the samples taken in the distribution system (e.g., of 10 samples collected, if two samples are above the Action Level, then the Action Level has been exceeded). The levels found in the AEDC drinking water system are below the Action Level, therefore, we are in compliance, and the water is safe to drink.

What does this chart mean?

- MCLG Maximum Contaminant Level Goal, or the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.
- MCL Maximum Contaminant Level, or the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology. To understand the possible health effects described for many regulated constituents, a person would have to drink 2 liters of water every day at the MCL level for a lifetime to have a one-ina-million chance of having the described health effect.
- AL Action Level, or the concentration of a contaminant which, when exceeded, triggers treatment or other requirements which a water system must follow.
- Parts per million (ppm) or Milligrams per liter (mg/l) explained as a relation to money as one part per million corresponds to a single penny in \$10,000.
- Parts per billion (ppb) or Micrograms per liter explained as a relation money as one part per billion corresponds to a single penny in \$10,000,000.
- Parts per trillion (ppt) or Nano grams per liter explained as a relation money as one part per trillion corresponds to a single penny in \$10,000,000,000.
- MRDL Maximum Residential Disinfectant Level The highest level of disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for the control of microbial contaminants.
- MRDLG Maximum Residential Disinfectant Level Goal The level of drinking water disinfectant below which there is no known or expected risk to health.
- RAA Running Annual Average of the Results.

Water Quality Data

Contaminant	MRDLG	MRDL	RAA	Range	Sample Year	Violation	Typical Source
				Golf Course			
Chlorine (ppm)	4	4	1.6	0.4 – 2.2	2017	0	Water additive used to control microbes.
				Main Base			
Chlorine (ppm)	4	4	2.1	1.6 – 2.3	2017	0	Water additive used to control microbes.
Chlorite	MCLG 0.8	MCL 1.0	0.59	0.52 - 0.70	2017	0	Byproduct of disinfection
TTHMs	N/A	MCL 0.08	0.074	0.062 - 0.074	2017	0	Byproduct of disinfection
HAA5s	N/A	0.06	0.003	<0.003 - 0.007	2017	0	Byproduct of disinfection

Inorganic Contaminant							
Contaminant	MCLG	MCL	Highest Level Detected	Range	Sample Year	Violation	Typical Source
Barium (ppm)	2	2	0.01	N/A	2014	0	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits.
Nitrate [measured as Nitrogen] (ppm)	10	10	0.70	N/A	2017	0	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.

Naturally Occurring Metals						
Contaminants	MCLG	<u>AL</u>	Level Found*	Sample <u>Date</u>	Typical Source	
Copper (ppm) - action level at consumer taps	1.3	1.3	0.54	8/8/2017	Erosion of natural deposits; Leaching from wood preservatives; Corrosion of household plumbing systems.	
Lead (ppb) - action level at consumer taps	0	15	24	8/8/2017	Corrosion of household plumbing systems; Erosion of natural deposits.	

Fully Fluorinated Organic Acid					
Contaminants	MCL	AL	Highest Level Detected	Sample <u>Date</u>	Typical Source
PFOS (ppt)	70	N/A	3.9	8/24/2016	Aqueous film forming foam used in firefighting.

See the December Services Calendar on page 11.



Speed drives Air Force, DoD innovation, improvements

By Jim Garamone

DoD News

WASHINGTON (AFNS) - Speed is the crux of innovation and improvements the Defense Department will make to ensure the force is ready for any contingency, Air Force Vice Chief of Staff Gen. Stephen eral said, something the DoD has not had W. Wilson said at the Defense One Summit for years. Still the service is working with Nov. 9 in Washington, D.C.

Wilson said the Air Force is focused on the need for speed.

"We can't buy new capabilities using old ways," he said.

Different Threats

The Air Force has been globally engaged for the past 26 years, Wilson said. But, he added, the nature of today's threats are different. They range from countering violent extremism to the return of Great Power politics with Chinese adventurism in the South China Sea and Russia illegally annexing Crimea and fomenting a civil war in Ukraine.

North Korea developing nuclear weapons and the means to deliver them - including testing an intercontinental ballistic missile – helps "focus" Air Force goals and aims, the general said.

"We are focusing our efforts to be ready for any potential conflict around the globe and give the president options," Wilson said. "We organize, train and equip forces to make sure they are ready to go for any contingency."

modernization push, he said, because the changes in threats require it. The Air Force is modernizing its ICBMs and bomber force. New aerial refueling tankers are needed for global reach. The F-35 Lightning II aircraft is hitting its stride and research has begun on a 6th-generation aircraft.

"Everything we do is to try to compress that time," Wilson said. "Speed is the big driver."

Moving Quickly

Developing military capabilities is an

involved process, the general said. There is the requirements process, an acquisition process, a contracting process, a testing process and finally a fielding process.

"That takes time," he said. "We are doing everything we can to shrink that time."

All this requires a stable budget, the genindustry partners to do everything we can to compress the time to develop capabilities, Wilson said.

Part of this is enabling service men and women and their civilian peers. The general spoke of going to bases and meeting young Airmen who - on their own - developed new methods to speed processes or wrote new code to automate a particular capabil-

Wilson was part of the small Air Force team that worked on the F-117 Nighthawk stealth aircraft in the 1980s. That team, he said, was empowered to make decisions quickly and the result was a game-changing aircraft that performed brilliantly when needed.

"We are trying to do that broadly across all our acquisition programs," the general

The Air Force is heavily invested in artificial intelligence research, he said, especially looking at how computers can sift data and learn.

Data, Speed

"Data is the new oil," Wilson said. "How The Air Force is in the midst of a major do we sense the environment? How do we understand it? And how are we able to provide effects around the globe? With speed."

> The Air Force and DoD need to work with industry to exploit this new capability, Wilson said. Still, it will present challenges from a development angle, he said, from a use angle and from an employment angle.

"We are going to have to be thoughtful about this as we go about making truly autonomous things," Wilson said. "We can't just unleash technology without being thoughtful about how autonomous it can really be."



Runners leave the starting line during the 32nd annual Turkey Trot. The 5K run on Nov. 9 drew more than 50 participants made up of AEDC staff, their families and retirees and service members at Arnold AFB. (U.S. Air Force photo/Rick Goodfriend)





Paul Wright, program manager with Arnold Air Force Base Capital Improvement Branch, approaches the finish line with the fastest time during the 32nd annual Turkey Trot. (U.S. Air Force photo/Rick Goodfriend)

Return of Turkey Trot draws dozens of runners

sidering ways to enhance the event now

lending a helping hand to a worthy cause

will remain the priorities, but the 2018

AEDC Turkey Trot could be a venue for

participants to get their pre-holiday com-

By Bradley Hicks

AEDC Public Affairs

The vibrant hues of the falling leaves blanketing the ground outside the Arnold Air Force Base Administration & Engineering Building along with the crisp autumn air created an ideal backdrop as AEDC team members and local community lined up to take part in a pre-Thanks- again after a brief layoff, had taken part giving tradition, the AEDC Turkey Trot.

The 32nd annual Turkey Trot was Nov. 9 and the 5K, or approximately 3.1-mile run that began outside the A&E Building, took the 55-registered participants around the loop in front of the building, onto the Fitness Trail and back to the A&E Building.

a way, marked the return of the decadesold event hosted for years by the Arnold AFB Company Grade Officers Council. First-time organizer 2nd Lt. Ryan Boudreaux, with Space and Missiles Combined Test Force, said an official Turkey Trot was not held last year. Still, around 15 avid runners and prior participants across AEDC joined forces to hold an ad hoc Turkey Trot in 2016.

"They kind of missed the Turkey Trot last year," Boudreaux said. "They didn't have an officially sanctioned one last year, so we wanted to make sure that we absolutely got it this year so that we could keep up the tradition."

To resurrect the Turkey Trot, organizers of this year's event reviewed notes left by past race coordinators to glean what has worked and what could be tweaked.

"One of the obstacles we ran into this year was that it's during CFC [Combined Federal Campaign] time, so we didn't really want to do it as a fundraiser," Boudreaux said. "I think in years past they've done it as a fundraiser either for the CGOC or for a local charity, so we went with the food donations."

While each participant was able to purchase a Turkey Trot T-shirt for \$5, the true entry fee for this year's run was the donation of nonperishable food items. The food donations will be provided to a local food bank.

Registration for the 2017 Turkey Trot began weeks prior to the event. Boudreaux said the response was very posi-said.

"A lot of people were very excited we were doing it," he said. "I was surprised that we had 55 people come out. That's a pretty big number, I think, for fitness stuff, at least when it's not forced."

Unlike past Turkey Trots, this year's event did not have divisions based on age and gender. There were no prizes

and the only thing on the line was brag- looking toward the next Turkey Trot, con- petitive juices flowing. ging rights. Those bragging rights were earned by Paul Wright, program manager in Arnold AFB Capital Improvements, who outpaced the field with a time of 20 minutes, 22 seconds, crossing the finish line more than two minutes ahead of the next finisher.

Wright, who recently took up running in the AEDC Turkey Trot each of the seven years prior to this year. He intends to run in the 2018 installment.

"It's a really fun event to get contractors and government folks out here together to have some camaraderie and just have some fun together," Wright said.

Shanda Peterson, who works in Ar-This year the AEDC Turkey Trot, in nold AFB Financial Management, took up running in July and the Turkey Trot was her first 5K. Her goal is to run a half-marathon, which is 13.1 miles, and the Turkey Trot was a way to gauge her progress. She finished with a time of 25 minutes, 42 seconds.

"I think it's just a good way to start off Veterans Day, and it's near Thanksgiving," she said. "So, when I'm running, I'm envisioning all that I'm thankful for."

Jory Boudreaux, who works in the Air Force Research Laboratory at Arnold AFB and wife of Ryan Boudreaux, trained with her 12-year-old daughter Annawyn to participate in the Turkey Trot. It marked Annawyn's first 5K, and she accomplished her goal of running all the way through it.

"I'm happy and tired at the same time," Annawyn said following the run. "I'm glad I didn't stop."

The mother-daughter duo not only trained together, they also coordinated their Turkey Trot attire, donning the official event T-shirts and the same striped, Turkey emblazoned knee socks.

"We decided to go all out," Jory said. Beth Sinemus, wife of 1st Lt. Tom Sinemus with the Arnold AFB Integration & Support Branch, arrived wearing the same socks, even though she had not coordinated with Jory and Annawyn, allowing them to form a Turkey Trot trio. Sinemus also got into the spirit by running while wearing a colorful turkey hat.

"It's not a trot without a turkey," she

Jory, Annawyn and Sinemus all said they will continue to participate in future Turkey Trots at the Complex.

"It's neat to see everybody come together to do it, and I think the loop was really fun," Jory said. "It was so leafy and pretty. It really gets you in the fall mood."

Boudreaux said organizers are already

"This year was a fun run, but I think that the race is back. Fun, fellowship and with the amount of success we had this year and the notes we were able to take, I think we'll probably do some kind of prizes or something next year," Boudreaux said.

AEDC Woman's Club prepares for Christmas

By Barbara McGuire

AEDC Woman's Club

TULLAHOMA, TENN. - During the AEDC Woman's Club Dec. 7 meeting, singer and songwriter Carson Hill, from South Carolina, will entertain

Christmas will be the theme of the meeting and will include Christmas music, a Christmas Boutique, donations for Toys for Tots and a Christmas sing-along. Gifts and food items will be available to purchase at the meeting through the Christmas Boutique, and participants are encouraged to bring toys for the Toys for Tots donations or give to the Toys for Tots table donations. The Tullahoma Fire Department will pick up donations.

The Nov. 2 meeting featured Dan Thomas, meteorologist from WSMV/ TV. His presentation featured a Weather Challenge with questions concerning thunderstorms and tornadoes. He spoke about misinformation concerning tornadoes and what to do if caught in a tornado. The members and guests viewed his experiments showing a cloud in a bottle and a tornado in a box.

The meeting also featured the Secret Shoppers. Three members shop and display their wares. Members purchase the items and the money raised goes toward the AEDCWC scholarship fund. The secret shoppers were Kate Canady, Suzette McCrorey and Patti Mathis. Suzette was a.m. crowned Queen of the Secret Shoppers.

Table Donations of \$125 at the Nov. 2 meeting went to Fisher House of Mur-



Meteorologist Dan Thomas, fourth from left, takes a moment to pose for a photo with the AEDC Woman's Club members during his presentation at the AEDCWC meeting Nov. 2. Thomas is a meteorologist at WSMV/TV. Pictured left to right are Sande Hayes, Kate Canady, Suzie Schultz, Thomas, Anne Wonder and Violet Nauseef. (Courtesy photo)

freesboro.

The social hour of the Dec. 7 meeting starts at 9:30 a.m., with the business meeting and program beginning at 10

than noon Nov. 30 and are required to military connections or be involved with ment of Defense or any of its compogain access to the ALC. Make reserva- Arnold Air Force Base to visit and be- nents and has no governmental status.

tions by calling (931) 393-2552 or (931) come a member. 636-4152.

public and provides the opportunity to chairman at (931) 455-3569. meet the AEDCWC members and be-

For information about the AEDC The December meeting is open to the Woman's Club, call the membership

Disclaimer: This is a private organi-Reservations must be made no later come a member. You don't need to have zation which is not part of the Depart-

Airman shares story of family, service in wake of natural disasters

By Staff Sgt. Robert

Hicks

621st Contingency Response Wing

ROOSEVELT ROADS, Puerto Rico (AFNS) - Growing up in Puerto Rico five miles from Roosevelt Roads, one Airman from Travis Air Force Base, California knows all too well the dangers due to the location of the island.

"Since I was a child, my devastating the U.S. Virgin

family would always stock Islands. pile food and water in preparation for the hurricane cane Irma, Ocasio and his season," said Capt. Christian Ocasio, 821st Contingin Islands to perform an gency Response Support airfield assessment of air-Squadron civil engineering ports in St. Thomas and St. officer. "There would always be a powerful storm but would change directions at the last minute."

That's exactly what Hurricane Irma did after

In the wake of Hurriteam were sent to the Vir-

After the assessments heading straight toward us, were complete, the team went to Puerto Rico to wait for a flight back to Travis AFB. While there, Hurricane Maria formed.

family tracking Hurricane Maria's every move. As the storm grew to a cat-MacDill AFB, Florida.

ment are a few things I felt when I had to leave Puerto storms ever."

According to Puerto Rican Governor Ricardo Rossello, Puerto Rico has not experienced an event of this magnitude in their modern history. The hurwithout water, power or telephone coverage.

made landfall, Ocasio was in constant contact with his mother and sister until around 4 a.m. when they lost cell phone service.

getting messages from my sister saying how the kids were scared, and how they like this before. This was Puerto Rico," he said. only the first hours of the

in Puerto Rico with his storm, I knew they still had ished in St. Thomas, Ocaanother eight hours to go. it sio was sent to Puerto Rico. was terrifying." After Ocasio lost con-

egory 4 hurricane and was tact with his family, he aton a direct path to hit the tached himself to the news island, the assessment team and social media, trying received orders to move to to get any information he could to paint a better pic-"Fear, anger, abandon- ture of what was going on in Puerto Rico. "My family lives in a

Rico right before Hurri- lowlands area, and you see I felt like I abandoned them have to leave the house ing they were okay." during one of the worse during the storm and fight to higher ground," he said. "Then you start creating all these scenarios in your mind that could happen, but are probably not.'

After Hurricane Maricane struck the island ria passed, the assessment with winds up to 155 mph team was tasked to reassess and left millions of people the airfield in St. Thomas to ensure the runway was not damaged and could still The night the storm support aircraft delivering relief supplies to the island.

"When they told me I was going to St. Thomas, it bothered me a little...it had been several days after "I didn't sleep at all that the hurricane and I still had night," Ocasio said. "I was not heard anything from my family, but I knew, just like I was responding to St. Thomas, my brothers-inhad experienced nothing arms will be responding to

Once the team was fin-

"As soon as I landed, I went to check on my family," he said. "When I drove up to my sister's house, she was outside trying to get leftover water from the pipes. She didn't recognize me until I got out the car, and she immediately got emotional. Then my nephew came over and gave me cane Maria devastated the the videos of the massive a hug and started crying as He spent several nights Island," he said. "I didn't flooding online and you well. It was just a total rewant to leave them behind. immediately think, 'They lief seeing them and know-

> Once he knew his famthe dangerous winds to get ily was okay, he wanted to be hands-on with any type of operations assisting Puerto Rico back on its

> > "My family was safe," Ocasio said as he smiled. "Now I just wanted to help, so I drove to Roosevelt Roads where I knew there would be a contingency response element arriving in a couple days. I performed an airfield assessment and started creating relationships with the other agencies already on the ground."

> > When the contingency response element arrived from Travis AFB, Ocasio was the first person the team met.

"After all his family had just gone through with Hurricane Irma and Hurricane Maria devastating the island, he was still here ready to complete the mission," said Lt. Col. John Berger, CRE commander at Roosevelt Roads. "He provided us with a detailed brief on the status of the airfield and then he served as a translator and trusted advisor as we met with local airfield authorities."

Since arriving in Puerto Rico, Ocasio has traveled to Aguadilla and Ponce to perform airfield assessments to ensure humanitarian aid can continue to flow through Puerto Rico by aircraft.

"By performing assessments on three of the four major airports in Puerto Rico, Ocasio has done more for the relief effort on the island than anyone I've met," Berger said.



