

AEDC stands up ICBM Combined Test Force at Hill Air Force Base



An unarmed Minuteman III intercontinental ballistic missile launches during an operational test at Vandenberg Air Force Base, Calif. The Intercontinental Ballistic Missile (ICBM) Combined Test Force (CTF), operated by AEDC, was activated to support modernization and life extension for the LGM-30 Minuteman III (MMIII) and development of the next generation Ground Based Strategic Deterrent (GBSD) ICBM. (U.S. Air Force photo/Senior Airman lan Dudley)

By Deidre Ortiz AEDC Public Affairs

The growth of AEDC's critical role in providing the United States Armed Forces with developmental test and evaluation support for the newest and premier weapon systems continues with the stand up of an Intercontinental Ballistic Missile (ICBM) Combined Test Force (CTF) to support modernization and life extension for the LGM-30 Minuteman III (MMIII) and development of the next generation Ground Based Strategic Deterrent (GBSD) ICBM.

According to Col. Timothy West, Senior Materiel Leader, Test Operations Division, "the CTF at Hill [Air Force Base] will ensure that resources will be efficiently and effectively used to conduct testing and to oversee a confederation of Developmental Test and Evaluation (DT&E) organizations, each with different but necessary skills in support of ICBM DT&E programs."

On July 24, 2015, the Air Force Test Center was designated as the GBSD Lead Developmental Test and Evaluation Organization (LDTO). AFTC subsequently appointed the AEDC Test Operations Division, led by West, to serve as its primary interface to the GBSD Program Office and to serve as its LDTO Executing Test Organization (ETO).

See ICBM, page 5

Nominations for 2018 **AEDC Fellows open**

By Arnold Community Council

COFFEE COUNTY, TENN. - The Arnold Community Council (ACC) is currently accepting nominations for the 2018 AEDC Fellows Program with submissions due no later than March 26.

Established in 1989, the Fellows program recognizes AEDC individuals who have made substantial and exceptionally distinguished technical contributions to the nation's aerospace ground testing capability at AEDC facilities at Arnold Air Force Base and at all AEDC remote operating locations. Since the inception of the Fellows program, a total of 96 individuals (Technical Fellows, Craftsmen Fellows, Lifetime Achievement Fellows and Honorary Fellows) have been inducted as AEDC Fellows. Due to changed government rules and regulations in 2016 on awards to non-government employees ACC has assumed responsibility for continuing the AEDC Fellows program. AEDC Technical Fellow nominations may be submitted by any present or former AEDC government or operating contractor or subcontractor employee. All current or retired military, civilian and operating contractor and subcontractor personnel assigned or previously assigned to AEDC can be considered candidates for selection as an AEDC Technical Fellow. Candidates qualified for consideration as an AEDC Fellow must personally have made sustained, long-term, notable and valuable contributions in aerospace ground testing at AEDC. AEDC Craftsmen Fellow nominations may also be submitted in the same manner as the AEDC Fellow nominations. All current or retired military, civilian and operating contractor or subcontractor personnel assigned, or previously assigned, to AEDC can be considered candidates for selection as an AEDC Craftsmen Fellow. The Craftsmen Fellow category recognizes exceptional craftsmen who possess the ability to identify customer requirements and respond with sustained technical innovations, working effectively and efficiently as part of technical teams and have dedicated their careers to the success of the AEDC mission. They must have personally made notable and valuable lifetime contributions to AEDC in any area relevant to the AEDC mission.

Innovative analysis methodology making a difference for AEDC, Air Force and the warfighter



See NOMINATIONS, page 4

Using a photo of a Pratt & Whitney F135 engine in the AEDC Sea Level 2 test cell, Alan Hale, an AEDC analyst, left, describes how full frequency range screech analysis methodology is being used to reduce instability during aeropropulsion testing in AEDC engine test facilities at Arnold Air Force Base. Looking on is Jonathan Lister, center, and Wesley Cothran, right, AEDC team members who were also instrumental in developing and demonstrating the screech analysis methodology. (U.S. Air Force photo/Rick Goodfriend)

By Deidre Ortiz

AEDC Public Affairs

AEDC analysis team members have developed and demonstrated a first generation full frequency

testing in the facilities at for its dedication in in-Arnold Air Force Base.

range screech analysis this one are common in to the warfighter by inmethodology for a re- daily work across AEDC spiring and providing the heater on turbine engines and the U.S. Air Force, necessary tools and supto reduce instability when as the Air Force is known port. novation and delivering Innovative ideas like war winning capabilities

See INNOVATIVE, page 5





Col. Scott Cain Commander

Jason Austin Chief, **Public Affairs**



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Arnold AFB Legal Office offers free tax assistance

By Leslie McGowan Arnold AFB Legal Office

The 2017 income tax season has arrived and the Arnold Air Force Base legal office is offering free Volunteer Income Tax Assistance (VITA) for eligible personnel.

All service members on active duty, retirees and their dependents are eligible to receive their W2s from the MyPay website at https:// a free tax prothese free services. This year the legal office will be able to provide tax services to other categories of filers including DOD civilians whose total income is less than \$54,000.

Trained IRS volunteers assist tax-filers in preparing, reviewing and electronically filing their income tax returns. Most customers receive their refund within two weeks. Please note, by law, the IRS must hold refunds claiming the Earned Income Tax Credit and/or the Additional Child Tax Credit until Feb. 15.

Tax assistance appointments are available and continue until the yearly tax filing deadline of April 17. Eligible personnel may call the Arnold AFB Legal Office at (931) 454-4657 to schedule an appointment.

VITA volunteers can provide tax preparation up to Advanced and Military certification levels, which include rental properties and

filing taxes that are beyond the VITA scope of now training and certification, with complicated re- on-line for downturns such as non-deductible IRAs, businesses involving employees and inventory, and com- at plicated capital gains and losses, will need as- or through the sistance from a paid professional preparer for individual state tax assistance.

Military members should access and print IRS also offers mypay.dfas.mil/mypay.aspx before arriving gram, Free File, for their appointment.

If you prefer "do-it-yourself" tax returns, where individu-Military One Source has a free federal and up als who makes to three state tax forms tax preparation and an e-filing program available to military members can also e-file for free. For more information, and their dependents through their website at call the legal office at (931) 454-4657. www.militaryonesource.com. The website alof H&R Block. The software is a simple question and answer program that is a quick and easy way to complete and e-file your federal tax returns. The program also allows military members the option to e-file their state returns for a small fee. You can also receive military cost by speaking to a trained Military One- tion services again this tax year. Source tax consultant at 1-800-242-9647.

Schedule A itemizations. However, taxpayers taxes using the paper forms, these forms are office, call (931) 454-4657.

load and printing www.irs.gov tax websites. The at www.irs.gov

less than \$64,000

available



Leslie McGowan

Those not eligible for the military tax assislows tax filers to utilize a free online version tance program may locate their nearest VITA site by calling the IRS Information VITA line at 1-800-829-1040. At this time, it is not certain if the program will be offered at the Coffee County Lannom Memorial Library in Tullahoma; however, Murfreesboro, Sewanee and Favetteville have confirmed their sites will be specific advice regarding tax questions at no operational and providing VITA tax prepara-

If you are interested in assisting taxpayers If you prefer to file your federal and state with tax preparation at the Arnold AFB legal

Arnold AFB leadership provides update on water quality report

By Col. Eric Leshinsky AEDC Test Support Division

The surveying of each Arnold Air Force Base facility and sampling of all Base water fountains, ice machines, and select sinks is now complete. A total of 236 sample tests were conducted; 39 total water sources (33 water fountains and six sinks) exceeded the Environmental Protection Agency action level for lead (0.015 mg/L).

The impacted water fountains were taken off line or removed along with those identified to be lead contributors by the EPA. Nine water fountains still have open work orders to be replaced with new ones while others located previously in industrial areas will not be replaced in accordance with current Occupational Safety and Health Administration requirements.



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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 succe · 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 car do attitude

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

· Relationships. We build positive, longterm business relationships through trust

respect, and collaboration. · Innovation. We overcome challenges through creativity, perseverance, technology, and flexibility. We actively seek to continually improve.

 Sustainability. We plan and act for the long term benefit of our communities and our environment.

Since sinks serve multiple purposes, they will remain labeled or marked with appropriate notices.

All surveyed ice machines tested below the action level. Although the concentrations detected during testing does not pose an immediate health risk to adults, elevated action levels will remain a concern of leadership and our team is now working with the Tennessee Department of Environment and Conservation (TDEC) to evaluate and implement future corrosion control initiatives and treatments in our potable water treatment systems.

Additionally, we'll continue to provide semiannual sampling results on TDEC-specified drinking water sources until we have repeatable results below the established action level.

Always follow the EPA recommendation of flushing water sources for at least 30 seconds every time to remove lead which may have leached into the water.

For more information regarding water surveys and sampling, contact the Arnold AFB Water Utility Office at 454-6066.

For more information regarding bioenvironmental engineering, call 454-5351.

For any and all personal health or medical concerns, contact your preferred medical professional.



(AEDC photo)



www.arnold.af.mil

Smoking Policy

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

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.

4 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

Team AEDC

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 Fire and Emergency Services special rescue team highly trained

By Deidre Ortiz AEDC Public Affairs

The Arnold Air Force Base Fire and Emergency Services is a fully certified fire department, with all personnel trained in the core competencies of firefighting and emergency response, including specialized rescue training.

Because of the industrial natakes place at the Base, Arnold Fire and Emergency Services Chief Daryle Lopes explained that being trained in rescue from es is important for his team.

"There are a lot of individuals on base who work high above ground, on cranes, scaffolding or platforms, and we're very well prepared to effectively rescue from these higher elevations," he said. "When folks working in these plans annually. confined spaces find themselves ready to help them too."

Of the firefighters at Arnold, 12 are certified rescue technicians who have received exten- might arise. sive training through the Depart-Academy.

"Such specialized training provides the skills they need to effectively lower people down from a high spot or lift people from locations far below grade," Lopes said.

Upon reaching the scene of an accident where a rescue is needed, the first step is to analyze the situation.

"As we arrive, we survey the ture of much of the work that scene, develop a plan and then apply our training to safely remove the person from their situation," Lopes said.

One of the initial requireelevated areas and enclosed spac- ments after joining the Arnold Fire and Emergency Services as a firefighter is completing familiarization training of the test facilities and buildings on base. Furthermore, the department develops pre-fire plans for all major facilities on base and updates

Though one can't anticipate in an emergency situation, we are every emergency scenario, Lopes commented that his firefighters strive to be as prepared as they can be for any situation that the J-4 Rocket Engine Test Fa-

"When special projects such



Members of the Arnold Fire and Emergency Services rig a 260-foot lift using a power winch during an exercise at the J-4 Rocket Motor Test Facility at Arnold Air Force Base. The winch allows firefighters to raise or lower a victim quickly and safely. (U.S. Air Force photo/Jacqueline Cowan)

dinate with project managers to help our team develop the technical rescue solution for any emergency situation we anticipate," he said.

For example, Arnold firefighters have performed exercises at cility in which they performed a 260-foot vertical lift of a simument of Defense Fire Training as construction or Complex lated victim using rescue ropes maintenance occurs, we coor- and a power winch. The power

winch, which was purchased spehoisted a 165-pound rescue manikin out of the J-4 shaft.

"The winch allows firefighters to raise or lower a victim quickly and safely, and because it's portable, the winch can be set-up built-in safeguards to help ensure rescue basket. the victim's safety during rescue operations."

A similar exercise was also cifically for that operation, safely performed during the RC Cooler renovations at the Aeropropulsion Systems Test Facility, in which the fire team used a crane to raise a simulated victim out of the cooler and then lowered the manikin to the ground with reswherever it's needed. It also has cue ropes and a Stokes litter or

See RESCUE, page 6

Bolden to speak at Black History observance

By Bradley Hicks AEDC Public Affairs

The AEDC African-American Heritage Committee will host a Black History Month observance Feb. 9 in the auditorium of the University of Tennessee Space Institute beginning at noon.

The theme of the event will be "African-Americans in Times of War." The guest speaker will be



Charles Bolden Jr. photo/Bill (NASA Ingalls)

Telescope, the successor aftermath." to the Hubble Space Telescope scheduled to launch next year.

traveled to orbit four times aboard the space shuttle between 1986 and 1994. He commanded two of

ing that office in 1980, he Terrorism," the ASALH of struggles abroad and at call 454-5494.

War inevitably provide "Those very concepts the framework for many provide a broad, useful stories related to African framework for focusing American soldiers and Bolden spent 14 years on the roles of African sailors, veterans, and civilof his 34-year career with Americans in every Ameri- ians. This is a theme filled tend. Refreshments will be the Marines Corps as a can war, from the Revolu- with paradoxes of valor member of NASA's As- tionary War Era to that of and defeat, of civil rights tronaut Office. After join- the present 'War against opportunities and setbacks,

of the James Webb Space national struggle and its website states. "Times of home, of artistic creativity and repression, and of catastrophic loss of life and the righteous hope for peace."

> The event is free to atserved and a reception will follow Bolden's speech.

For more information,



Charles Bolden Jr.

Bolden is a retired U.S. Marine Corps Major General, former astronaut, and the first black administrator of NASA. Former President Barack Obama nominated Bolden as the 12th NASA Administrator in 2009, and Bolden served in this capacity through January 2017.

According to his biography on the NASA website, during his time as NASA Administrator Bolden oversaw the transition of space shuttle missions to an era of exploration focused on the utilization of the International Space Station and space and aeronautics technology devel-

opment. The South Carolina native led the agency in developing a Space Launch System rocket and Orion spacecraft to carry astronauts to deep space destinations such as Mars. He also established a new Space Technology Mission Directorate to develop cutting-edge technologies for

the missions of tomorrow. NASA's activities under Bolden included the landing unprecedented on Mars with the Curiosity rover which AEDC helped develop, the launch of spacecraft to Jupiter, the enhancement of the nation's fleet of Earthobserving satellites, and progress toward the launch

those missions and piloted the others. His flights included deployment of the Hubble Space Telescope and the first joint U.S.-Russian shuttle mission.

He was inducted into the U.S. Astronaut Hall of Fame in 2006.

The Association for the Study of African American Life and History previously announced "African-Americans in Times of War" as the 2018 Black History theme. According to the organization's website, this theme commemorates the centennial of the end of the First World War in 1918 and explores the "complex meanings and implications of this inter-

Scholarship available to children of NAS employees

By Deidre Ortiz

AEDC Public Affairs

It's time again for the high school seniors of NAS, LLC employees to apply to the Bechtel scholarship program.

This program, called the Citizen Scholars Program, is open through March 1.

In total, Bechtel awards 15 scholarships of \$3,000 across all companies and projects within its Nuclear, Security and Environmental business.

Who may apply: Children of NAS, LLC employees who are in the last year of high school, pre-college or pre-university study and plan to enroll in a full-time undergraduate program at an accredited college, university or vocational-technical school in 2018.

Program must be: Children of full-time *com* or NAS Human Resources at (931) employees at NAS, LLC. NAS, LLC em-

ployees must have at least one year of continuous AEDC service as of the March 1 deadline. Children are defined as natural or legally adopted children, stepchildren, children of registered domestic partnerships, or legal wards of the NAS, LLC employee. Children of retired NAS, LLC employees are not eligible. To remain eligible, the NAS, LLC employee must continue to be employed with the company at the time the award check is mailed.

Degree eligibility: All degrees are eligible. A minimum of 70 percent of the scholarships will be awarded to students declaring science, technology, engineering and math degrees.

Applications must be submitted online at https://www.scholarsapply.org/ bechtel/ by the March 1 deadline. For more information, contact Bechtel Hu-Applicants to the Citizen Scholars man Resources at nseaward@bechtel. 454-6020.

National Engineers Week February 18-24

AEDC/Tennessee

MathCounts® Competition - Feb. 3, 1 p.m. University of Tennessee Space Institute, Tullahoma

Student Design Competition - Feb. 20. 9 a.m. - 2 p.m. Hands-On-Science Center, Tullahoma

Engineer for a Day - Feb. 21, 7 a.m. - 3 p.m. **AEDC, Arnold Air Force Base**

Engineers Week Banquet - Feb. 22, 5:30 - 8 p.m. Location: UTSI Dining Hall - The View

For more information, call (931) 454-6542

ENGINEERS wonder

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Arnold AFB blood drives set for more donors in 2018

By Bradley Hicks AEDC Public Affairs

The bloodmobiles that have become a fairly common sight at Arnold Air Force Base over the years will be even more prevalent in 2018, providing members of Team AEDC with more opportunities to save lives.

The American Red Cross and the regionally-based Blood Assurance are each set to conduct three-day blood drives at Arnold throughout this year.

The 2018 AEDC blood drive schedule is:

- Feb. 14-16 Blood Assurance •
- April 11-13 Red Cross
- June 13-15 Blood Assurance ٠
- Aug. 15-17 Red Cross ٠
- Oct. 17-19 Blood Assurance
- Dec. 12-14 Red Cross •

This represents an increase in the number of drives held in the past. Prior to 2018, five total blood drives were held annually at Base. The Red Cross and Blood Assurance would alternate years on which organization held three drives and which held two.

For the past couple of years Tech Sgt. Joshua Suggs, with Arnold AFB Medical Operations, has coordinated the on-base blood drives. Suggs said the scheduling change not only offers personnel more chances to donate life-saving blood, it also offers stability in the blood drive schedule, as the drives will be scheduled roughly two months apart.

"The blood drives are a great way to give back to the community," he said. "When someone donates a pint of blood, that one pint of blood can actually be used to save up to three people.

"Being able to set something up that has the possibility of saving hundreds of lives throughout the year is rewarding."

Donors are allowed to give blood once every 56 days. Suggs said his goal was to add a drive at Arnold while adhering to this 56-day rule. He looked at the 2018 calendar and arranged a schedule that would allow all donors to participate in all the drives.

"The 56 days is important because for a lot of people this is the primary place they give blood because it has been going on for so long," Suggs said. "We want to make sure during each drive that the individual is



Blood Assurance technician Lauren Phillips bandages Daniel Ogg, a research mechanical engineer with the High Speed Systems Division of the Air Force Research Laboratory at Arnold Air Force Base, following a recent blood donation. Blood drives across Arnold AFB are set to increase in 2018. (U.S. Air Force photo/Brad Hicks)

either the Red Cross or Blood Assurance she said. out because of the 56-day timeframe."

Both the Red Cross and Blood Assurance have for a number of years had memorandums of understanding in place that allow them to conduct blood drives at Arnold AFB. Suggs said both organizations are eager to conduct drives here, as there is no shortage of willing donors.

"For all those years, Arnold has been really good at producing donors," Suggs said. "We have quite a few donors who donate every time, and at the last one, we had a few new donors come in. So the Red Cross and Blood Assurance definitely want to come out here because it's a very valuable resource to them."

Vickie Shelton, donor recruiter for Blood Assurance, said the response at Arnold has been strong, adding personnel are aware of the importance of giving and that it takes a collective effort to ensure that an adequate supply of blood remains on the shelves.

"We're very grateful for everyone who

able to give because we don't want to leave comes out and participates in these drives,"

Suggs said the target is for both the Red Cross and Blood Assurance to collect 15 pints of blood per day from Base personnel, for a total of 45 pints collected per visit. He said with few excepthat mark.

Cross and Blood Assurance provide Suggs with signup information which he disseminates throughout Arnold. This allows potential donors to schedule an appointment main in place for 2019 and beyond.

and provide information to help expedite the donation process.

All of the 2018 Arnold AFB drives will be held on Wednesdays, Thursdays and Fridays. On Wednesdays, the bloodmobile will be set up at the Administration & Engineering Building, Building 100. On Thurstions, Team AEDC has managed to meet days, the drives will take place outside the Propulsion Wind Tunnel facility. On Fri-Ahead of the blood drives, the Red days, the drives will occur outside the Main Auditorium building.

> Suggs said if the 2018 schedule proves successful, a similar arrangement would re-



The Blood Assurance bloodmobile awaits donors outside the Administration & Engineering Building. (U.S. Air Force photo/Brad Hicks)

NOMINATIONS from page 1

AEDC Achievement nominations may be submitted by any present or former AEDC government subcontractor or retired military, civilian AEDC mission. and operating contractor or subcontractor person- may submit a nomination nel assigned or previously for an AEDC Honorary

Lifetime assigned to AEDC can be Fellow. AEDC Honorary Fellow considered candidates for selection as an AEDC Lifetime Achievement Fellow. Candidates who are or operating contractor/ qualified for consideration employee. as an AEDC Lifetime AEDC Lifetime Achieve- Achievement Fellow must ment Fellows are reserved personally have made nofor exceptional candidates table and valuable lifetime and are not necessarily se- contributions to AEDC in lected each year. All current any area relevant to the

Only AEDC Fellows

Fellows are reserved for exceptional candidates and are not necessarily selected each year. Candidates qualified for consideration as an AEDC Honorary Fellow must have made sustained, notable, valuable and significant contributions to AEDC. These eminent individuals need not have worked at Arnold AFB or any of AEDC's remote operating locations.

Newly selected AEDC Fellows will be honored this year during a banquet at a location to be announced at a later date. The Fellows banquet is held every year on or close to June 25, the birthday of General of the Air Force Henry "Hap" Arnold and the anniversary of the dedication of AEDC by President Harry S. Truman in 1951.

For more information and forms for AEDC Fellows nomination submissions, call (931) 308-1923 or email wiedemerm@ gmail.com.

Nominations must be submitted in written form with supporting materials to arrive by March 26 to Arnold Community Council, ATTN: AEDC Fellows Committee, P. O. Box 553, Tullahoma, TN 37388-0553.

ICBM from page 1

pointed as the GBSD ETO lead with responsibility for ICBM weapon system while GBSD is being develstanding up a team of technical experts from across oped. Soon after the reviews were completed, AFTC the AFTC Enterprise to support GBSD DT&E efforts and the ICBM CTF at Hill AFB.

"I was honored and humbled the Air Force allowed me to lead efforts to stand up a team of subject matter experts [SME] from across the enterprise to support DT&E for a total system replacement of MMIII with enhanced accuracy and terminal survivability to ensure ICBM warfighting edge in all environments and to address new threats out to 2075," Malloy said. The enterprise team includes cybersecurity, physical security, command and control, and communications SMEs from the 96th Test Wing at Eglin AFB to support future DT&E of flexible targeting and survivable twoway communications for pre-, trans-, and post-attack launch. To support DT&E of the enhanced accuracy requirements for GBSD, Dr. Malloy also brought in navigation and guidance system SMEs from the 704th Test Group at Holloman Air Force Base.

"AFTC SMEs in AEDC's Space & Missile CTF at Arnold Air Force Base and at Eglin and Holloman AFBs will continue to provide reach back support to the CTF at Hill after it reaches full operational capability. That reach back includes support for testing at AFTC locations and continued development of technical innovation and cost and risk reduction initiato make informed, timely, and independent assessments," Malloy added.

AEDC support for ICBMs and associated subsystems has grown in response to reevaluations by Headquarters U.S. Air Force, Air Force Materiel Command, Air Force Nuclear Weapon Center (AFNWC), AFTC and AEDC of the risk associated with mod-

was assigned as the LDTO for MMIII Modernization and Life Extension Programs (MLEP), and AEDC was assigned as the ETO for this effort in addition to the work already being done for GBSD. Lt. Col. Jason Armstrong and Capt. Hedison Doe were assigned campaign.

CTF." Doe said. "The work AEDC is doing touches every aspect of the missile system, requiring a broad spectrum of technical expertise. The expectation for the technical breadth needed to timely execute these crucial programs along overlapping development cycles is critical and requires a special blend of both test will be steered by the ICBM CTF, coordination beexpertise and ICBM system expertise to make this tween the CTF and key stakeholders including the CTF successful."

what a CTF is and the importance of this organization at Hill AFB.

"A CTF is an integrated test and evaluation product team that is empowered to evaluate a weapon system and/or related hardware and software. At Hill AFB, we co-located our team next to the program office teams at one primary site; integrating our efforts in a manner to execute combined test planning, provisiontives necessary for the CTF and the U.S. Air Force ing, execution and data acquisition while maintaining independent analysis and reporting," he said.

> The LGM-30 MMIII is the currently-fielded, landbased leg of the strategic nuclear triad, complementing air-based strategic bombers and sea-based submarine launched ballistic missiles. The launch systems and weapon system physical infrastructure being used for MMIII today first became operational in the GBSD matures, in future years.

That same summer Dr. Donald J. Malloy was ap- ernizing and extending the life of the legacy MMIII mid-1960s. While certain components and subsystems have been upgraded over the years, including a transition to the MMIII configuration in the 1970s, most of the fundamental infrastructure in use today is original and has supported more than 50 years of continuous operation. The MMIII flight systems in use today were fielded in the late 1990s and early 2000s.

> Glen Lazalier, a senior subject matter expert for responsibility for leading the MMIII MLEP DT&E the GBSD LDTO/ETO, stated, "The MMIII has served admirably in assuring that no adversary dared "We are looking at AFTC's first ICBM-focused to launch a nuclear attack against the USA. However, it is time to develop and deploy a new state-of-theart ICBM that will ensure that future generations will enjoy the same protection that I, my children, and grandchildren have enjoyed."

While all facets of DT&E for GBSD and MMIII ICBM Program Office, users, and the Operational Robert Lamb, the ICBM CTF Chief, explained Test Organization personnel will be ever present. The Air Force Operational Test and Evaluation Command (AFOTEC), will lead the operational test efforts when DT&E has been completed.

> The ICBM CTF includes AEDC MMIII and GBSD military, DOD civilian staff, and contractor personnel from AEDC Technical and Management Advisory Services (TMAS) contractors. The ICBM CTF team members at Hill AFB work alongside the Air Force Nuclear Weapons Center (AFNWC) ICBM Systems Directorate (ICBMSD), the GBSD System Program Office and AFOTEC test team members. Staffing for AEDC expanded responsibilities in the ICBM leg of the nuclear triad will continue to grow over the next four years and will include a remote operating location at Vandenberg Air Force Base, California, as

INNOVATIVE from page 1

tion in the Air Force.

you rely on to push the limits of innovation," Gen. Goldfein said. "It's in our bloodline. We've faced challenges before and overcome them with ideas."

One such idea is known as Screech Wave Analysis Methodology (SWAM), the technique created by Hale, Wesley D. Cothran, Massachusetts of Technology, uses sensors to provide integrated is a practical methodol- The full frequency range analysis.

General Dave Gold- these sensors located top fein, Air Force Chief of dead center and a third Staff, has commented on sensor located elsewhere the importance of innova- on the cylinder surface 45 degrees from vertical methodology determines "We are the service or horizontal. Longitudinal sensor arrangements should be non-uniformly spaced and distributed to avoid instability nodes."

not typically located at the maximum pressure, no one sensor is expected to measure the maximum pressure over the period. This analysis is only concerned with longitudinal and an AEDC programmer, transverse modes, since no only two or three surface and Kevin Sabo, of the sensors are located in the mounted static pressure Institute radial direction."

ogy for analyzing multiple characterizes the ability

any screech period for low modes. Mach number flows.

"Additionally, the direction of lumber [movement] for longitudinal modes; the direction of rotation for transverse modes; and the direction "Because sensors are of helical rotation for complex modes," he said.

The objective of this work is to provide cylindrical geometry analysts with a near real time view of the underlying wave structure of screech by having sensors in the longitudinal Hale mentioned this and transverse directions.

maximum pressure over clude complex helical type

The methodology is the currently being used to investigate facility generated screech at the Aerodynamic and Propulsion Test Unit. It provides test teams the analytical capability to identify and characterize both transverse as well as longitudinal combustion instabilities and acoustic screech behaviors in the test data, allowing for improvement strategies for combustion instabilities and undesirable acoustic behaviors to be developed.



"The methodology determines the underlying wave structure of combustion instabilities from surface mounted high response static pressure sensors," Alan Hale, AEDC analyst, explained.

multaneously in order to dinal and transverse mode determine the underlying instabilities in isolation simple or complex screech or in combination. The wave structure and the analysis methodology has magnitude and location of also been extended to in-

static pressure sensors si- to analyze simple longitu-

Screech is defined as an acoustic combustion instability that drives pressure oscillations higher than normal. More simply put, it is feedback generated by combustion, which in turn creates instability.

According to Hale, instability when testing is caused by feedback mechanisms between acoustics, hydrodynamic interactions and combustion.

"Instabilities grow when driving mechanisms are greater than damping until limit cycle operation is reached. For non-driven instabilities, screech frequencies correspond closely to combustor geometry natural modes," he said.

So Hale and his colleagues utilized the existing high response static pressure sensors placed on the inside surface of combustor to detect screech pressure fluctuations.

"Typically, two or three sensors in a transverse plane and two or three sensors in a longitudinal plane, both data planes usually share a sensor, provide necessary information to analyze screech," Hale said. "For cylindrical combustion geometries without a center body, good sensor arrangements in the transverse direction include two sensors 90 degrees apart with one of

Use extra care when around or operating cranes

By AEDC Safety

Whether rigging a load, operating a crane, working nearby, or simply in the vicinity of crane operations, situational awareness is vital.

The supervisor has the responsibility to ensure the crew has the necessary skills and qualifications.

operations, such as:

- Ensure qualified operators are operating the crane and basic)
- Type of crane that can safely perform the lift ٠
- Crane inspection and load test status ٠
- Access including staging areas and space required to maneuver equipment and materials
- Guarding of the machine and all pinch points ٠

RESCUE from page 3

"We conduct these exercises and effective rescue operations," said Arnold Fire and Emergency Services Deputy Chief Daryl VanCise.

When performing these types of rescues, the Fire and Emergency Services uses its P-28 is stocked with rescue tools of Operations Jim Evans. and equipment. Of the 13 team members assigned to each opleast two trained rescue technicians available.

If needed, Lopes also mentioned that the Arnold Fire and rescue operations.

"If we need high reach capability to perform a rescue that's one of our Mutual Aid partners, option."

In addition to the rescue cato allow for safer, more efficient pabilities, the majority of the firemen and women at Arnold are certified Emergency Medical Technicians, Advanced EMTs or Paramedics.

"At least 28 of our fire team is trained at the EMT level or higher and have outstanding medical Heavy Rescue Vehicle, which capability," said Assistant Chief

In the event that an AEDC team member finds himself or erations tour of duty, there are at herself in an emergency situation or sees that someone else is, the fastest way to receive assistance is to call 9-1-1.

"9-1-1 calls from cellular Emergency Services will em- phones are connected to county ploy local fire departments, who dispatchers, so always explain have other equipment, such as that your emergency is located 102-foot extendable ladders, to on Arnold Air Force Base," help conduct safe and successful Lopes said. "They will transfer the call to us and we will respond.

The Fire and Emergency Sersafer or faster, we may call on vices is required to respond to a call and be at the location of the or even use AEDC equipment incident within 7 minutes of noand operators," he said. "We tification. According to VanCise, will always go with the safest the team beats this time and typically arrives on scene in less

- Awareness of the swing radius
- Congestion in the work areas
- Load capacity, rigging, and dynamics ٠
- Proximity of obstructions near the work
- Necessary personal protective equipment

Some other issues to look for when using mobile cranes include: proximity of overhead power lines; firm Several issues need to be considered with crane and adequate foundation for the crane; and proper use and extension of outriggers.

and there are signal personnel and riggers (advanced ensure barriers are set up to prevent people from being in harm's way. If you are in the work area, respect the barriers and stay out from under suspended hooks and loads. There's always a chance that during a lift, the load could shift and fall and there's the possibility of equipment failure. These occurrences are rare because of good rigging techniques and maintenance, but it only

takes once to cause a serious injury or a fatality.

You're not safe when not seen. Remember, too, that the crane operator may not see you. The point of operation may be a distance from the operator. He or she will be concentrating on moving and positioning the load. It's up to you to stand clear.

Avoid the swing radius or path of travel. Think of these areas as "no-man's land" and stay out. For mobile crane operations, this area must be barricaded. The Also, if you are working on the crew using the crane, Lead for the crew has the responsibility to ensure proper barricading is in place and the area is controlled. For overhead operations in shop environments, this is not always the case. Operators of overhead bridge cranes sound an alarm while the crane is traveling.

> All requirements can be reviewed in the AEDC Hoisting and Rigging Handbook and applies to all mobile cranes being used at Arnold AFB.



Prior to renovation work, members of Arnold Fire and Emergency Services conduct a training exercise raising a simulated victim out of a cooler. Conducting exercises such as this allows the Arnold Fire and Emergency Services team to have safe, more efficient and effective rescue operations. (AEDC photo)

than 5 minutes.

The Arnold Fire and Emergency Services directors also mention that they offer outreach to personnel on base to ad-

dress any questions concerning emergency response to particular work areas and the plans in or staff meeting, call (931) 454place. If interested in having a 5648. representative with the Fire and

Emergency Services come and speak during a Tool Box session





Safety Walk-through enhances safety mindset

Bill Horton (right), an AEDC pipe fitter supporting the AEDC Test, Operations and Sustainment contract at Arnold Air Force Base, speaks with NAS Deputy General Manager Doug Pearson about materials he uses and safe handling. Pearson was taking part in a safety walkthrough recently at the von Karman Gas Dynamics Test Facility. (U.S. Air Force photo/Rick Goodfriend)

A-10s bring thunder, lightning during fight against ISIS

By Staff Sgt. Trevor Rhynes AF Central Command Public Affairs

INCIRILIK AIR BASE, Turkey (AFNS) - The 74th Expeditionary Fighter Squadron is wrapping up a deployment that saw heavy involvement in the fight against the Islamic State of Iraq and Syria.

Upon arrival, their efforts were focused on Raqqa for approximately three months. During that time A-10 Thunderbolt IIs participated in an urban close air support role. Pilots focused on protecting friendly forces as they maneuvered in the city between very large buildings in which the enemy hid and used as fighting positions.

"It was a difficult location to work in and we faced some situations that we have not dealt with before we arrived here," said Maj. Matthew Cichowski, 74th EFS assistant director of operations. "Our weapons and tactics planners have done an excellent job preparing us for the variety of tactics and locations that we use and operate in."

planners.

"When we showed up we got thrown into this fight essentially on day one," said Lt. Col. Craig Morash, 74th EFS commander. "The fight itself was within the urban complex of Raqqa and the pilots had to get creative to figure out ways to strike targets at the bottom of these five story buildings. There was a lot of learning as this wasn't something we traditionally trained to when we arrived. We reached out to different communities to see what we could learn from them.



Two A-10 Thunderbolt IIs depart to continue a mission after receiving fuel from a KC-135 Stratotanker assigned to the 447th Air Expeditionary Group over Syria, Dec. 1, 2017. A-10s have been involved in fighting from Mosul to Raqqa and are currently used in the fight against the Islamic State of Iraq and Syria in countries such as Iraq, Syria and Afghanistan. (U.S. Air Force photo/Staff Sgt. Paul Labbe)

"Everyone jumped on board trying to figure out solu-Adapting the squadron to the new location and varied tions to the problems we faced even though we had long tactical situations fell to the squadron's weapons tactics days and a mountain of work to accomplish," Morash continued. "Our intel shop processed an unbelievable amount of expenditure reports to make sure (U. S. Air Forces Central Command) had an accurate picture for what we were doing. Our life support troops were generating equipment and doing it perfectly every single time."

The squadron's intelligence Airmen also provide vital key information to pilots before their missions, enabling those pilots to adapt to threats and challenges on the fly.

are, which allows us to give threat perspectives to pilots ground forces, no matter where they are.

with what's going on in the area of operations and how that affects the aircraft and pilots," said Senior Airman Jake Owens, 74th EFS intelligence analyst. "We brief pilots on possible threats they may face while flying missions and we're also tied into the intelligence reporting, where we report targets struck to higher headquarters. There's a lot of battle tracking and predictive analysis."

According to the squadron's weapons and tactics chief, one of the most difficult aspects of close air support isn't physically dropping the bomb, it's making sure the rest of the process has been done correctly. The pilots assigned to the 74th EFS are trained to work through that process correctly, making sure friendly positions are confirmed, any attack restrictions make sense and are adhered to, and they are flying above or are laterally deconflicted with any artillery that may be firing, and avoiding any exposure to threats like anti-aircraft fire or other aircraft.

"Positive identification is extremely important and is something that takes a large team and a long amount of time to get right," said Capt. Eric Calvey, 74th EFS chief of weapons and tactics. "Long before we show up there are individuals who use Intelligence, Surveillance and Reconnaissance assets to get an idea of what targets to strike and make sure that what we drop on is in fact a hostile target. We're the last link in the chain and there's a large amount of work done ahead of time to prepare these targets for strike before we employ munitions on them. It's amazing seeing the utmost care that is taken before we employ on these targets."

Although the squadron's deployment is coming to a "We're trained on what the capabilities of the aircraft close, Morash said they are still keen on supporting the

AFRL's advanced multi-junction solar cells deliver high efficiency, reduced costs for space

By Marisa Alia-Novobilski Air Force Research Laboratory

plications on a space-based platform."

leaving more mass and space for other ap- vor the use of multi-junction solar cells effectively grow IMM cells qualified for

that take advantage of multiple layers of use in space." light-absorbing materials, each of which

The process to grow IMM solar cells tions continue to rely more heavily on efficiently convert specific wavelength begins when thin layers of semiconductor materials are deposited on a growth substrate such as gallium arsenide. The entire device is turned upside-down, and the semiconductor materials are bonded to a mechanical handle. The growth substrate, which is now on top, is removed, and processing on the front-end of the device is then completed. "We found that by growing cells upside down on gallium arsenide, we can more effectively tailor the material properties of the individual absorbing layers. This results in more effective utilization of the solar spectrum and produces cells with significantly better performance," said Bennington. "By removing the rigid growth substrate, we end up with a cell that is lightweight and extremely flexible. A single IMM cell can convert more than 32 percent of captured sunlight into energy." The new IMM solar cells, said Bennington, are able to achieve a 15 percent increase in power when compared with a same-sized array of standard practice multi-junction cells. This enables engineers to decrease the mass and area of a solar array and still achieve the same power, leaving more space for other applications on a space platform.

WRIGHT-PATTERSON AIR FORCE BASE, Ohio – Experts at the Air Force Research Laboratory continue to expand the scope of their technological expertise, rising above the Earth's surface to meet the power needs of next generation military spacecraft.

A collaborative effort between the AFRL Materials and Manufacturing and Space Vehicles Directorates, the Space Industrial Base Working Group and SolAero Technologies has resulted in state-of-the art, multi-junction solar cells destined to reduce costs and increase power efficiency for military space applications.

"These are the most advanced, efficient and affordable solar cells available for use in space," said Kerry Bennington, an electronics engineer in the AFRL Materials and Manufacturing Directorate. "These cells provide 15 percent more power than current state-of-practice solar cells of the same size. Ultimately, you can get the same amount of power using less cells,

As both military and civilian populaspace-based applications for GPS, communications and more, satellites carrying these payloads require increased power to deliver additional capabilities. Maximizing power while decreasing mass and reducing cost has been an ongoing manufacturing challenge. In addition, the harsh operating conditions of the space environment, with extremes of heat and cold and high levels of radiation, require materials that can endure the volatility over longterm use.

Silicon solar cells, which are primarily used for terrestrial applications, are inexpensive when it comes to solar cell technologies, however, even the most efficient silicon-based solar panels only convert around 20 to 25 percent of sunlight to electricity. Silicon solar cells are extremely sensitive to radiation in space and experience severe efficiency degradation over time.

By contrast, modern spacecraft fa-

regions of the solar spectrum into energy. These cells, typically grown on germanium substrates, are more efficient than silicon and much more tolerant of radiation in the space environment. However, despite the increased output enabled by these types of cells, increasing payload power needs and limits in mass and volume of next generation spacecraft require continued development of more efficient, lighter cells of this kind.

To solve the efficiency and mass needs of the space community, a collaboration between AFRL, the U.S. government and industry was launched and ultimately led to the development and refinement of a new cell architecture that takes advantage of an upside-down growth process to manufacture multi-junction cells. The process results in what are called Inverted Metamorphic Multi-Junction solar cells, which are more efficient and a lighter weight than multi-junction cells currently in use.

"(AFRL) began looking at this specific technology back in the mid-2000s, recognizing that increasing power needs of spacecraft would require more efficient solar technologies," said Bennington. "The challenge was to efficiently and cost-



Inverted Metamorphic Multi-Junction Solar Cells are a more efficient and lighter weight alternative to the state-of-practice multi-junction space solar cells. A collaboration between the Air Force Research Laboratory, the U.S. government and industry has led to refinement of the IMM solar cell growth process, ensuring high yield, efficient solar cell production through industrial manufacturing optimization. (SolAero Technologies courtesy photo)

Wilhite earns Meritorious Service Medal following successful tour

By Bradley Hicks AEDC Public Affairs

Cmdr. David Wilhite, the Arnold Air Force Base Simplified Acquisition Base Engineering Requirements program manager, was recently recognized for his achievements upon completing a two-year tour as Commanding Officer of the Naval Mobile **Construction Battalion 14** (NMCB-14), a Reserve Navy Seabee Battalion located at 12 Detachments throughout the Southeast, including a Detachment in Puerto Rico, and headquartered in Gulfport, Mississippi.

Wilhite was awarded the Meritorious Service Medal (MSM) from Rear Admiral B.J. Brakke, commander of Navy Expeditionary Combat Command, during a Nov. 4 Change of Command ceremony at Gulfport. Wilhite's MSM was presented by Capt. Christopher Asselta, commander of the 7th Naval Construction Regiment, Gulfport, Mississippi.

The MSM was awarded to Wilhite for his performance as Commanding Officer of the NMCB-14, a role he assumed on Nov. 5, 2015. Wilhite led 554 total personnel made up of 17 active-duty military and 537 Navy Reservists.

"It was a great pleasure to have served and led all the outstanding men and women of NMCB-14 – the Headquarters



Cmdr. Brian McFarland (right) relieves Cmdr. David Wilhite as the incoming Commanding Officer of Naval Mobile Construction Battalion 14 on Nov. 4, 2017, in Gulfport, Mississippi. Wilhite is the Arnold Air Force Base Simplified Acquisition Base Engineering Requirements program manager. (Courtesy photo)

Staff, Executive Officer, Command Master Chief mance during Wilhite's Petty Officers, Ward- tour included the deployroom, Chief's Mess and ment of 204 Seabees in E-6s (Petty Officers, First 2017 to 20 geographically Class) on down," Wilhite dispersed said. "Without their leadership, dedication and rica and the Middle East. expertise, we would not have successfully execut- stressful and exciting two ed our daunting tasking years," Wilhite said. "It over the past two years, went by very quick." and for that I am truly grateful. I cannot thank of action recommendthem enough. Whatever ing Wilhite for the award successes I have achieved stated his performance as throughout my command Commanding Officer of tour are a credit to all of the NMCB-14 was "noththem."

The battalion's perfordetachment sites in Afghanistan, Af-

"It was a very busy,

The MSM summary ing short of phenomenal."



Commander of the 7th Naval Construction Regiment Capt. Christopher Asselta (left) presents the Meritorious Service Medal to the outgoing Naval Mobile Construction Battalion 14 Commanding Officer Cmdr. David Wilhite. (Courtesy photo)

tude of servant leadership tence and sound counsel and reinforced the idea of ensured successful missustained superior perfor- sion execution, readiness mance during his tenure," the summary read. "His wellness. His signifithe bar for exceptional Service Medal." performance but, more importantly, have dramat- NMCB-14 and the Wardroom. His Force Base - John Lavio- wife and mother."

"He instilled an atti- leadership, vision, persis- lette, Kris Hughes and training, safety and troop

Along with Jim Tapp - for their understanding, support and flexibility with his schedule and travel.

"But my greatest efforts over this period cant achievements merit thanks goes to my wife have substantially raised award of the Meritorious Carol," Wilhite said. "I know that without her, the I would not have sucpersonnel, cessfully completed my ically improved the com- Wilhite also expressed command tour. She is the munications and relation- his appreciation to the foundation of support, ships between the junior Civil Engineering Branch the steady anchor for our enlisted, the Chief's Mess leadership at Arnold Air family, and a wonderful

AEDC Woman's Club make time for tea

By Barbara McGuire AEDC Woman's Club

The Feb. 1 meeting of the AEDC Woman's Club will feature a presentation by the Southern Charm Tea Room of Bell Buckle, Tennessee.

The topic will be the history of tea, how to set a table for a tea party, a demonstration of English tea explaining high tea, cream tea and afternoon tea. It will also feature proper tea etiquette in case one would go to tea at Downton Abbey.

Presenting will be Tori Taff, event planner for the banquet hall at Bell Buckle, and her daughter Maddie Rose. Table donations at the February meeting will go to The Blue Monarch.

At the January meeting, Laura Joy Pewitt, author of the children's book "Wally, the Sea Turtle: A story about Choices, Mistakes, and Saving Grace," shared with AEDCWC meeting participants her journey to becoming a published author including some of the highs and lows which



The AEDC Woman's Club members look at products displayed by AEDCWC meeting presenter Laura Joy Pewitt at a Jan. 4 meeting. Pewitt is the author of the children's book "Wally, the Sea Turtle: A story about Choices, Mistakes, and Saving Grace." She shared with AEDCWC meeting participants her journey to becoming a published author. Pictured on the back row, from left is Anne Wonder, Kate Canady, Grace Anderson, Anne-Marie Pender; front row, Pewitt, and Sandie Simms. (Courtesy photo)

The AEDCWC ladies they planned on sharing child or two. occurred along the way. shared with Pewitt how her book with a grand-



\$80 were collected at ALC. Make reservations will go to Life Choice of 2552 or (931) 636-4152. Manchester.

made no later than noon Arnold Air Force Base to status.

Table donations of to gain access to the ber.

The social hour of the is open to the public and 455-3569. Feb. 1 meeting starts at provides the opportunity 9:30 a.m., with the busi- to meet the AEDCWC ness meeting and pro- members and become a which is not part of the gram beginning at 10 member. You don't need Department of Defense to have military connec- or any of its components Reservations must be tions or be involved with and has no governmental

Jan. 25 and are required visit and become a mem-

For information about the January meeting and by calling (931) 393- the AEDC Woman's Club, call the member-The February meeting ship chairman at (931)

> Disclaimer: This is a private organization



See the January Arnold AFB Services Branch calendar on page 6.