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CEs on Convoy Duty



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Continuing the Mission

It's a great feeling to know I'm a team member of the Air Force Civil Engineer warfighting force—one of the most diverse groups of knowledgeable professionals in the Department of Defense. You are the finest engineer force in the world and I'm confident you'll continue to raise the bar of excellence as the year progresses.

This fall, I visited most of the major commands to discuss where our programs are today and what areas we need to emphasize tomorrow. We are well-positioned to have a great year! The FY05 budget contains funding to continue eliminating inadequate housing through privatization and construction efforts, including \$128M for new dorms built in the "Dorms-4-Airmen" design, and the opportunity to execute \$747.6M in other new facility construction.

A new Air Force Environmental Strategic Plan, due for release in early 2005, will transform our environmental program and shift our focus toward increasing support for the warfighter. Compliance with environmental laws and regulations will continue to be important, but we'll improve how our program supports mission operations. Under the new plan, the quality program will concentrate on compliance for mission's sake rather than for compliance's sake; the restoration program will shift from a milestone- to a performance-based focus. I anticipate new program standards will be established during this transformation.

We will continue to showcase our readiness and expeditionary engineering skills as thousands of Air Force civil engineers deploy globally to support the war on terror. Many Air Force civil engineers now support Operations ENDURING FREEDOM and IRAQI FREEDOM taskings for the Army, whose leaders continue to be impressed by your ability to execute the mission with quality, professional work. I tell them that's how we do business every day, and that they should expect nothing less. Our installation defense initiatives will continue to progress in the upcoming year. For example, the Joint Staff-sponsored Guardian program will provide enhanced detection, protection and response to chemical, biological and radiological threats on 200 DoD installations worldwide. It will provide the highest level of detection and protection capabilities where we need them most.

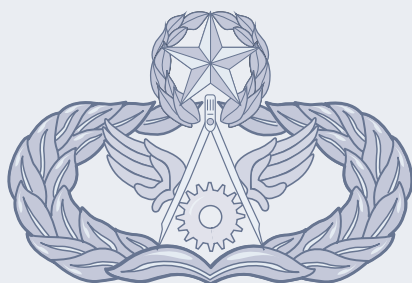
As 2004 comes to a close, I ask for your help in one very important area to make the year ahead even better. Recently, the Air Force suffered a spike in duty- and non-duty-related deaths, and we need to reverse this disturbing trend. Some of these losses might have been prevented if we'd taken a more active interest in our members' lives. During the holidays and throughout the year, please make that extra effort to look out for each other. A loss to one squadron is a loss to all of us.

You are doing a tremendous job. Take care of your troops and families, and I hope to see you in the months to come.

L. Dean Fox
Major General, USAF
The Air Force Civil Engineer



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On the cover:
A1C Joseph Lloyd,
407th ECEs, mans
the turret atop a
HUMVEE as part
of the security team
protecting a convoy
carrying needed supplies
from Kuwait City to
Tallil AB, Iraq.
(photo by SSgt
Christina Rumsey)

Command

Focus Pacific Air Forces

Ms. Teresa Hood
HQ AFCESA



The Pacific Ocean is the world's largest body of water. With a total area of about 70 million square miles, it covers a third of the earth's surface. In an office measuring about 250-square-feet on the 593-square-mile island of Oahu, Col Timothy Byers works as The Civil Engineer for Pacific Air Forces (PACAF).

From these headquarters at Hickam AFB, Hawaii, Col Byers and his staff are roughly in the center of their vast area of responsibility (AOR). Regardless of the direction, to get to any of their other main installations involves traveling thousands of miles, often crossing an international dateline.

"Around here we say that the sun never sets on the mission of PACAF's engineers," said Col Byers. "When we get to work in the morning, our folks in Alaska have been at work for a few hours and may already need something from us. At our bases in Japan and Korea, it's the middle of the night—*tomorrow* night. And in just a few hours, the folks in Washington [Air Staff CEs] will be closing up shop." According to Col Byers, it's a situation everyone in his office quickly learns to work with. "We're all 'clock-watchers' here," he joked.

Different time zones and long distances are not the only things that can make civil engineering in PACAF a challenge. Political, cultural and environmental differences also have an impact. Kadena and Yokota ABs in Japan and Osan and Kunsan ABs in the Republic of Korea must deal with host nation regulations and oversight. Osan and Kunsan have the additional concerns of strategic location and short tours of duty. Elmendorf and Eielson AFBs in Alaska have short summers and very long, frigid winters, while Anderson AFB on the remote island of Guam enjoys tropical weather year-round.

These and other circumstances mean that CEs at PACAF's bases often rely heavily on their command counterparts for resources and support, a detail Col Byers and his people

take to heart. "We constantly remind each other to keep our primary focus: everything we do needs to help [installation CEs] do their job better, whether it's for an emergency or day-to-day operations, whether it involves contingency support or planning and programming," said Col Byers. "Just by the nature of our command, we've been focusing on 'Back to Bases' for a long time."

One way PACAF maintains this focus is by taking a team approach in much of their work. They regularly partner with other agencies, such as the Air Force Center for Environmental Excellence (AFCEE) and the Air Force Civil Engineer Support Agency (AFCESA), to provide specialized help for their installations. Two key internal teams—the CE Management Assistance Team (CEMAT) and the Infrastructure Assessment Team (IAT)—systematically visit all their bases (see "PACAF Programs Cover All Bases," *AFCE*, Winter 2003). The CEMAT primarily supports the bases' engineering and operations flights, especially critical in Korea because of the rapid personnel turnover. The IAT validates and prioritizes project requirements, an important task in a command dealing with aging facilities and infrastructure.

Like the U.S. Air Forces in Europe, PACAF primarily relies on operations and maintenance (O&M) and host-nation monies for funding. Following decades of shortfalls, funding sources and amounts have increased and PACAF is now playing "catch-up" with infrastructure maintenance, repair and replacement. Compared with the rest of the Air Force, 14% more of PACAF's facilities were given the lowest rating (C-4) in the 2003 Installation Readiness Review. But, as Col Byers explains, "The real problem isn't necessarily how we got there, but how we're going to fix it."

Hard work and focus are the "uniform of the day" for all the divisions on PACAF's team. In 2003, PACAF handled over \$234M in

sustainment, restoration and modernization requirements. Some effort is concentrated on obtaining end-of-year funds through the Straddle Program, which is their “primary method to support requirements for our wings’ facility and infrastructure repairs,” according to Maj James Downs, PACAF’s chief of Facility Programs Branch. Last year, 76% of their A, B, and C programs were funded and they received a remarkable \$62M for a Straddle D program.

In 2003—for the eighth consecutive year—HQ PACAF awarded 100% of its MILCON funds (\$164M) in the year of appropriation. In FY04, their MILCON efforts included 17 projects totaling \$180M; by FY06 they anticipate MILCON funds of \$1.8B. At PACAF, most of the MILCON programming is actually done by the Engineering rather than the Programming Division. According to Mr. Don Ritenour, PACAF’s Engineering Chief, although his division works closely with Programming, they do ‘cradle-to-grave’—programming, design and construction—for MILCON and NAF [non-appropriated funds] in one office.

“I’ve been very impressed by the sense of partnership here,” said Mr. Ritenour, who recently came to PACAF following 12 years with AFCEE. After almost 20 years of working together, Engineering’s three branch chiefs—Mr. Harold Chun (Management), Mr. James Schaefer (MILCON Development/Funds) and Mr. Robert Matsumoto (Infrastructure)—make an impressive team.

“Our mission is the base and we stress to the commanders not to go it alone—it’s a team effort,” said Mr. Schaeffer. Mr. Chun and Mr. Matsumoto and their folks visit all the bases, serving as the “eyes and ears” for programming efforts. Their work can be especially challenging because of the diverse construction locations. “But these guys know what it costs to build anywhere in PACAF. They also provide a needed continuity, especially for our short-tour places, Guam and Korea,” said Mr. Ritenour.

Short tours and long travel distances can impact training availability in PACAF, so vendors are often brought in to provide on-site training. The 554th RED HORSE

Squadron trains students at their Silver Flag Site at Osan AB or sends their Mobile Contingency Training Teams to other bases. The nature of their AOR shapes PACAF’s expeditionary engineering strategies as well. Because of the high number of austere airfields within their AOR, they have created the first explosive ordnance disposal (EOD) contingency response capability at Anderson AFB. Two-person EOD teams can be air-dropped to quickly assess airfield or beddown areas and clear unexploded ordnance, if necessary. The 554th RHS fields an Assault, Assess and Repair Operations (AARO) team whose members are air assault capable (insertion by helicopter). “It has to do with our terrain, the aircraft in our theater, and the units in place that we partner with,” explained Capt Jason Warnick, PACAF’s RED HORSE manager. “It is really the best option for us.”

Rethinking options in the Pacific theater has recently given PACAF’s engineers a new and substantial challenge: restructuring Anderson AFB. The Air Force is looking at capitalizing on Guam’s location and status as a U.S. territory. Lt Col Russell Hula, chief of PACAF’s Planning and Requirements Branch, has been given the daunting task of working out the details. “It would roughly double the population of Anderson,” stated Lt Col Hula. “Because we’d be going from a ‘lily pad’ to a large operating base, we have a lot of work ahead,” he said.

Like his staff, Col Byers is excited about the future. “It’s how you look at it and what you do with it. It’s all opportunity. This is a great time to be here.”



Col Timothy A. Byers became The Civil Engineer for Pacific Air Forces in June 2003, after a 12-month assignment as the 8th Mission Support Group Commander at Kunsan AB, Korea. He is an honors graduate of the University of Kentucky (B.S. Civil Engineering). Commissioned in 1981 through the Reserve Officers Training Corps at Kentucky, in the course of his career Col Byers has served at all levels of command: HQ USAF, MAJCOM and field with responsibilities for design, readiness, contracting, programming and environmental planning. At Hickam AFB, Hawaii, he currently oversees all facets of civil engineering for PACAF’s 51,661 personnel (38,443 military).

This Island's for the Birds

Ms. Teresa Hood
Editor

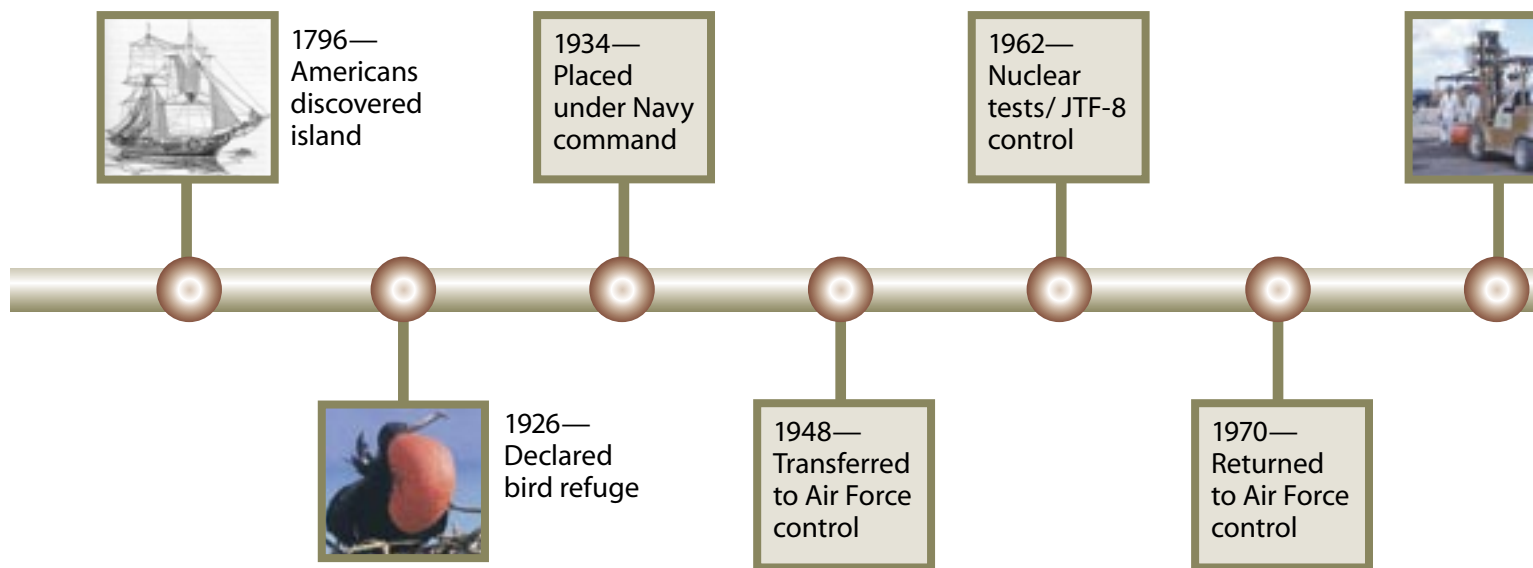
On June 15, 2004, Air Force personnel on Johnston Island lowered the American flag, then folded it and carried it with them as they left the small island behind for its original “owners”—green turtles, monk seals and a variety of seabirds. Civil engineers from Pacific Air Forces (PACAF) and the 15th Airlift Wing made sure that the island was ready to once again be a full-time wildlife refuge, as it was first declared in 1926.



“A total team effort by an outstanding group of professionals resulted in this extremely successful environmental cleanup,” said Col Timothy Byers, the PACAF Civil Engineer.

Experts from PACAF, the Air Force Center for Environmental Excellence, the U.S. Army, the Defense Threat Reduction Agency (DTRA), the Environmental Protection Agency, the U.S. Fish and Wildlife Service, the National Oceanic and Atmospheric Agency and several contractors, all worked together on the final cleanup. “We all worked well together on this huge project to bring about a good ending to our time on this island,” said Col Joyce Sohotra, chief of PACAF’s Environmental Division.

Johnston is part of the remote Johnston Atoll, located about 800 miles south of Hawaii. Originally just 60 acres, it was enlarged over the years to 625 acres by dredging. There has been a variety of overseers since 1934 (see timeline). After careful consideration and a joint-services review, the Department of Defense determined that Johnston was no longer needed for military purposes. But contamination from decades of use as a nuclear testing site and a storage/disposal area for chemicals and chemical weapons had put the island in the EPA’s Resource Conservation and Recovery Act corrective action program and left it sorely in need of a cleanup.



PACAF CEs complete Johnston Island cleanup

In 1999, the Air Force took over management from DTRA. After the last of the weapons stored there were destroyed in 2000, the Air Force began an intensive effort to clean the island to meet all federal environmental standards and then close the facility down.

“It was time,” said Mr. Mark Ingoglia, who was assigned the clean-up task. As PACAF’s Environmental Program Manager, he had studied the island since 1994 and was ready. “We had a total of eight major sites with various contaminants, including petroleum, heavy metals and dioxins,” he said. All Herbicide Orange stored on the island after the Vietnam War had been destroyed by 1977—burned offshore in an incinerator ship, the *Vulcanus*. But spillage and leakage onto the ground had to be removed.

“Our clean-up philosophy was to destroy and treat waste on the island as much as possible,” explained Mr. Ingoglia. “We didn’t want to remove it just to create a problem somewhere else.” A large burn pit used for years to deal with the island’s garbage was screened for recyclable metal and yielded 10,000 cubic yards of lead-contaminated ash. The metal was recycled, and the remaining ash was chemically stabilized and shaped to create a flat surface. That surface was covered with a bird-proof liner and two feet of soil. It is now prime bird nesting habitat.

The Herbicide Orange residues were treated using thermal desorption. “We looked at 13 different technologies and selected thermal desorption,” said Mr. Ingoglia. “Although it was extremely challenging, we met the EPA’s one part-per-billion standard for all 20,000 cubic yards of contaminated soil.”

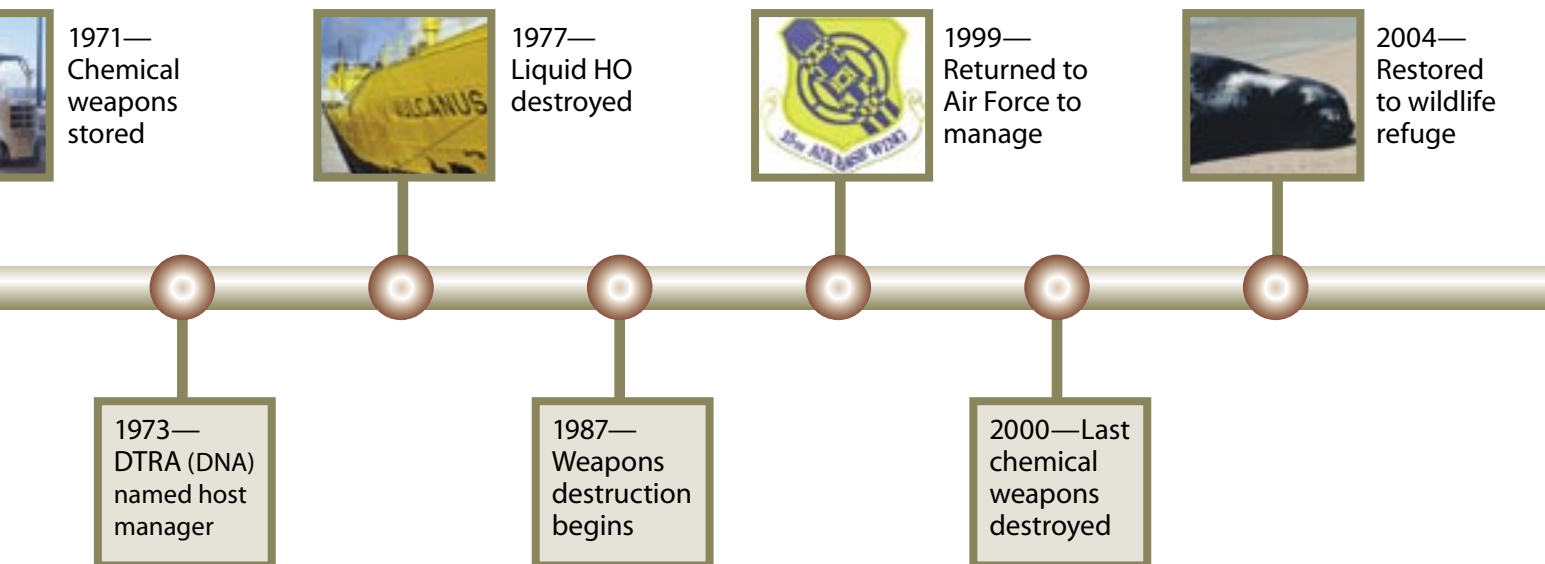
AFCEE oversaw the entire contracting effort and had to work with a multitude of contractors in a situation where time was critical. “More than \$80M in demolition, clean-up and mission-closure contracts were executed,” said Ms. Carol Gaudette, AFCEE’s Johnston Atoll Program Manager.

After contaminant cleanup was finished, the Air Force had more to do before they could leave Johnston. All structures were demolished or decommissioned; the clean wood was burned, the concrete rubble was buried, and all recyclable metals were shipped off the island. “Everyone involved was very interested in seeing this project through,” said Mr. Ingoglia. “Everything was done legally, using good science, but without a lot of the usual formality that can cause delays and cost overruns.”

However they did it, the birds, seals and turtles are no doubt grateful.

Brigantine illustration used with permission from the Joseph Bucklin Society (www.bucklinsociety.net)

Photo credits: aerial photo of Johnston Island by Mr. Robert Majka; red-breasted booby by Lt Col Craig Rutland; forklift from US Air Force archives; incinerator ship Vulcanus from US Air Force archives; seal courtesy NOAA (www.sanctuaries.nos.noaa.gov/news/features/news020320.html)



Airmen-Soldiers in Iraq

Lt Col Jeffery A. Vinger
732nd ECES/CC

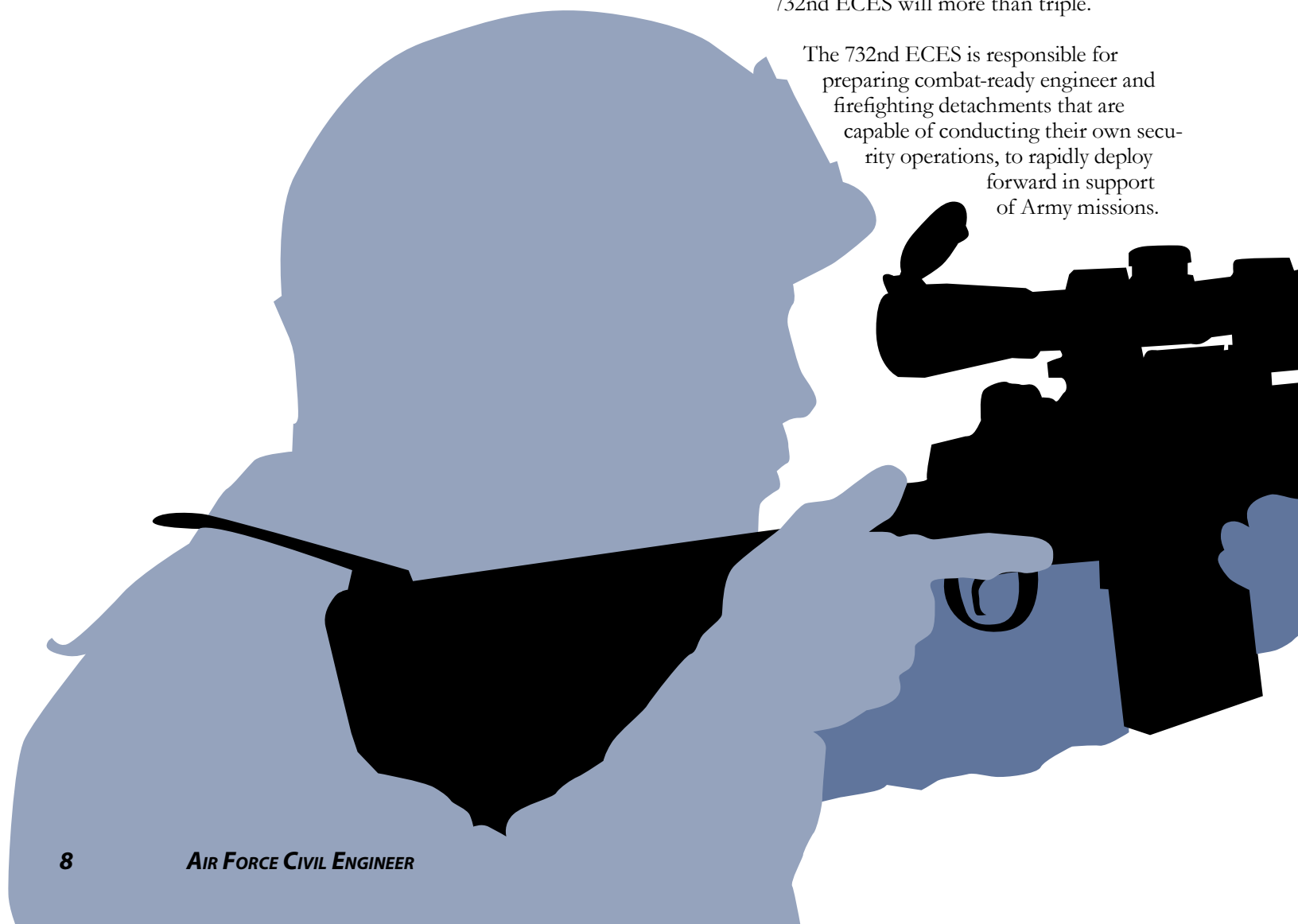
For the past six months, nearly 500 civil engineers have faced the enemy from the front lines as Airmen-Soldiers in support of Operation IRAQI FREEDOM. Rather than being a part of the routine Aerospace Expeditionary Force (AEF) rotation on established air bases in Southwest Asia, these CE Airmen-Soldiers have been embedded into Army units throughout Iraq, providing their expertise as engineers, craftsmen, surveyors and firefighters.

When the Army needed support from the other services to cover their critical shortfalls, the Air Force was tapped to provide manpower support in the areas of engineering, truck companies, and petroleum, oils and lubricants. The toughest job for Air Force CEs was creating the requested teams based on the Army's Modification Table of Organization and Equipment (their unit

manning and equipment requirements). In some cases, Air Force unit type codes from different career fields were combined to get an Army-required team.

As part of its mission, the 732nd Expeditionary Civil Engineer Squadron (ECES) at Balad AB in Iraq provides engineer utilities, design and firefighting direct and general support to the U.S. Army Combat Support Service from platoon to corps level throughout Iraq and Kuwait. Currently, there are ten different engineer teams or detachments under the operational and administrative control (command) of the 732nd ECES and the tactical control (day-to-day task assignment) of the Army. For the near future, the Army will continue to have shortfalls in critical areas and the Air Force will cover the gaps. During the coming AEF rotation, the manpower of the 732nd ECES will more than triple.

The 732nd ECES is responsible for preparing combat-ready engineer and firefighting detachments that are capable of conducting their own security operations, to rapidly deploy forward in support of Army missions.



Upon arriving in theater, team members undergo intensive training at a desert range prior to moving across the berm into Iraq.

Initial teams received training from an experienced Army

firefights and convoys. Every exercise is completed with live weapons to build a team's confidence in their ability to mass firepower on a target; to shoot on the move, especially from vehicles; and, most importantly, to skillfully

the desert gives our Airmen the training and confidence needed to operate and survive as Airmen-Soldiers.

The capstone event for training is a five-day live-fire exercise. The final exam

Air Force civil engineers stand upon the precipice of a paradigm shift: changing civil engineers into combat engineers or "Airmen-Soldiers."

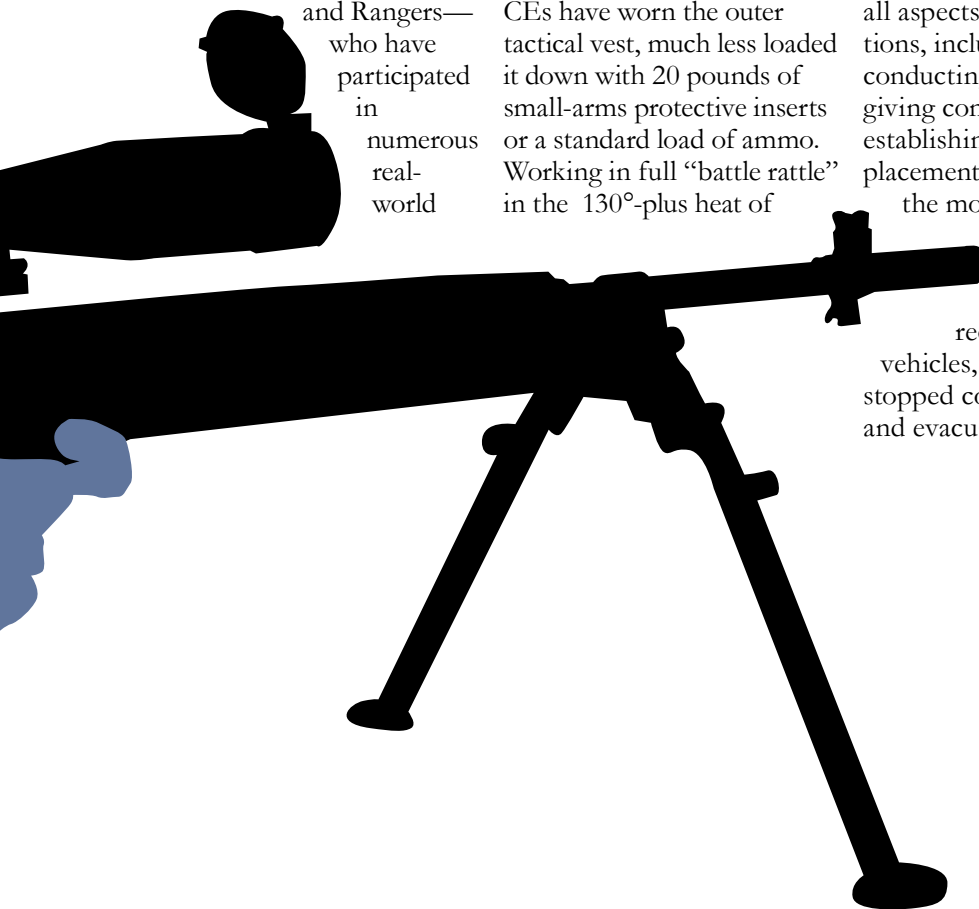
truck company fresh from the front where the main lesson taught was how not to be the next lesson learned.

The current training is expertly developed and delivered by experienced personnel—former SEALs,

Special Forces, and Rangers—who have participated in numerous real-world

handle weapons in combat. The typical Air Force civil engineer back at home station doesn't handle a weapon on a daily basis, and may only see and fire a weapon for one afternoon on an annual or 18-month cycle for a qualification test. This may also be the first time some CEs have worn the outer tactical vest, much less loaded it down with 20 pounds of small-arms protective inserts or a standard load of ammo. Working in full "battle rattle" in the 130°-plus heat of

is a 10-kilometer, live-fire convoy along a mock Iraqi roadway complete with villages, shops, roadside fruit stands and pop-up insurgents with weapons ranging from AK-47s to rocket-propelled grenades. The team must demonstrate the lessons they've learned in all aspects of convoy operations, including preplanning, conducting rehearsals, giving convoy briefings, establishing correct vehicle placements, massing fire on the move, suppression of enemy fire, executing rally point operations, recovery of disabled vehicles, defense of the stopped convoy, treating and evacuating casualties,



and the increasingly important task of identifying, avoiding and reporting improvised explosive devices.

Once validated by instructors, teams are quickly moved forward to begin transfer of authority (TOA), taking over their tasked mission from the Army. Our recent rotation of Air Force teams used the same TOA process as the first: Two weeks of overlap with the outgoing Army unit undergoing what the Army calls “right-seat/left-seat” procedures. For the first week the incoming team members shadow the people they are replacing; for the next week, the incoming team members are in the “driver’s seat” with the outgoing individuals watching their actions.

Current and future Air Force teams are in place for 179-day tours. The most recent teams benefited greatly from their trail-blazing predecessors and their newly acquired knowledge on all things Army.

Likewise, the Army has developed a familiarity with the Air Force’s capabilities and expertise. Whereas engineers entering the Air Force are pressed to learn their craft and gain their upgrades as soon as possible, personnel entering the Army have a primary duty of first learning to be Soldiers, then learning a trade or craft. Our Airmen-Soldiers now have the expertise of their craft coupled with the soldiering skills needed to accomplish their Army missions.

Over the past six months, our Airmen-Soldiers have not only taken care of their own beddown and operation center needs, but have also handled many of the Army’s mission tasks. Utility teams have completed thousands of work requests for the construction of detention centers, contingency hospitals and clinics; the layout and installation of miles of fiber optic cable, conduit and electrical power lines; the upgrading of force protection measures; and the

Airmen-Soldiers receive convoy security training at a desert training range before deploying to forward areas.
(photo by the author)



maintenance of contingency bridge systems and roadways. Air Force design teams have accomplished nearly \$500M in projects for the Army, including facility and infrastructure assessments of forward operating bases and construction or repair of roads, bridges or facilities. Each design team has its own survey team to facilitate rapid data collection, design and layout for follow-on utility teams. Fire teams have manned Army P-18 tankers and other firefighting vehicles, responding to numerous fires, accidents and emergencies. Our firefighters have provided extensive support in developing and delivering certification training to Army and Air Force firefighters.

What the Airmen-Soldiers of the 732nd ECES are doing here in this area of responsibility is historic. Not since World War II and the overnight construction of airfields across the battlefields of North Africa and Europe have air base engineers been so closely embedded with the Army

to accomplish a wartime mission. The Airmen-Soldiers have integrated completely into their Army units and perform each task with the full recognition that the lives of their fellow Airmen-Soldiers depend on their trained and immediate actions to something we engineers have rarely faced: actual combat. They are proud of what they are doing, and are doing things we can all be proud of.

Lt Col Jeffery A. Vinger is commander of the 509th Civil Engineer Squadron, Whiteman Air Force Base, Mo. He was the deployed commander of the 732nd ECES, headquartered at Balad AB, Iraq, from April–November 2004.



Above: Learning to drive with one hand on the wheel and one on your weapon is part of convoy security training at a desert training range. Right: Airmen-Soldiers are frequent members of convoys such as this one crossing the Tigris River on its way to a forward operating base. (photos by the author)



Airmen-Soldiers: What's Next?

Maj Pat Bouffard
HQ AFCESA/CEX

In his article titled "Airmen-Soldiers in Iraq," Lt Col Vinger articulated some of the challenges the Air Force had to overcome to support the Army in Iraq and Afghanistan. From doctrinal differences to training shortfalls, Air Force civil engineers have adapted well to their new environment, thanks in large part to the leadership provided by the 732nd ECES. As we enter our third round of deployments to fill Army shortfalls, we are striving to ensure that our Airmen are afforded every opportunity to succeed and, most importantly, return safely.

More than 800 civil engineers are expected to deploy for OIF and OEF between now and March 2005. RED HORSE, Prime BEEF, EOD, Fire and design staff augmentation UTCs, coming from several locations in many instances, will come together as a team to provide critical skills for the Army mission. The chart (next page) illustrates the correlation between the Army organizational structure and Air Force Civil Engineer UTCs.

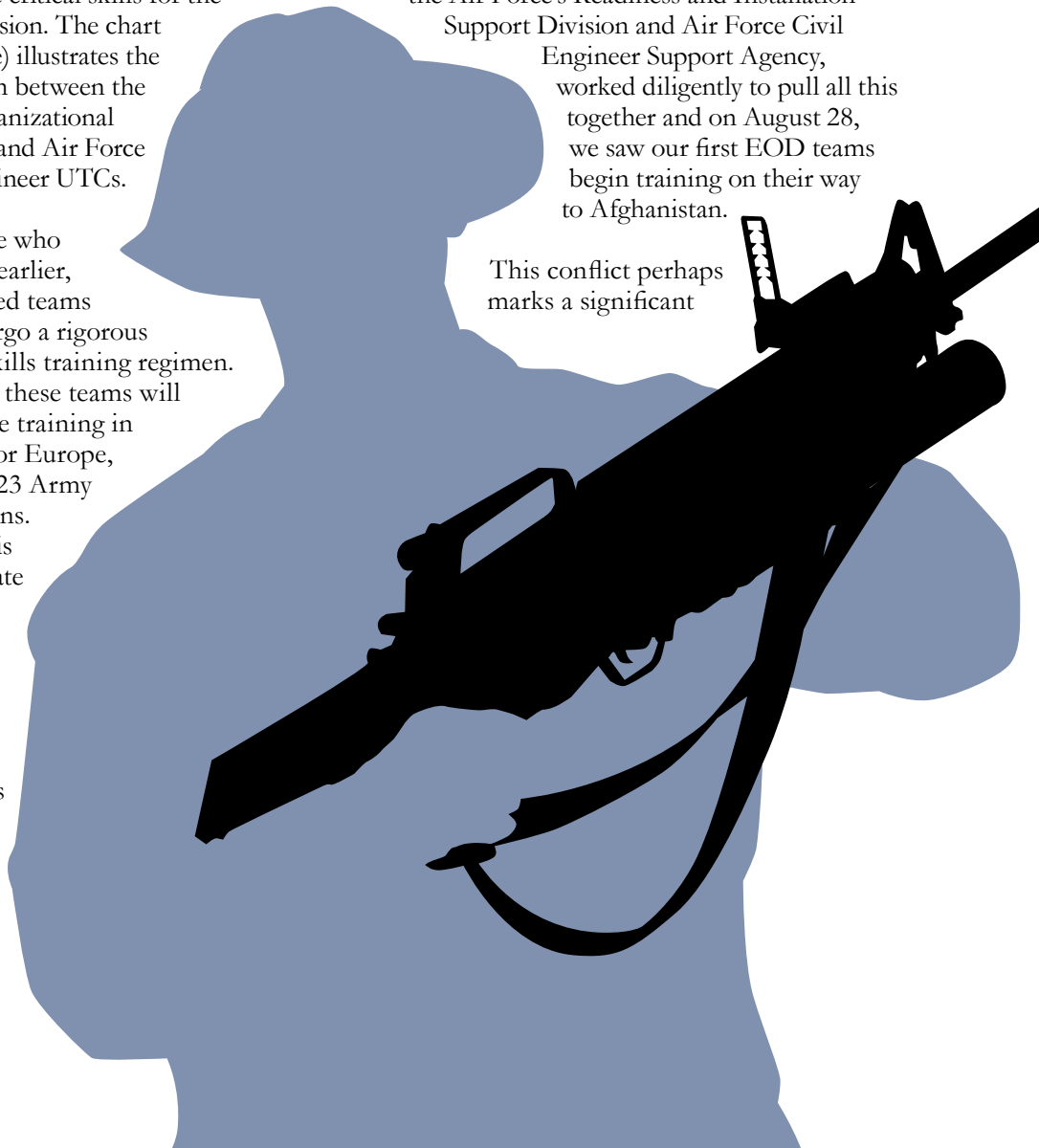
Like those who deployed earlier, the selected teams will undergo a rigorous combat skills training regimen. However, these teams will receive the training in CONUS or Europe, at one of 23 Army installations. The goal is to eliminate the difficulties experienced during OIF II when CEs arrived in Kuwait

without the necessary skills. The weeks they spent in training and certification before relieving personnel in the field resulted in extended tours for all involved.

Engineer teams will depart their home stations for the Army centers for about 24 days of training: troop-leading procedures and combat orders; HMMWV licensing (where required); combat life-saving; convoy live-fire exercises; crew-served weapons; land navigation; and tactical communications equipment familiarization. From there, they go directly to a desert training range in Kuwait to undergo a five-day validation and certification process. Teams should spend only 7 to 10 days in Kuwait before moving to the area of responsibility. The staff of the Army's Forces Command, Training and Doctrine Command, and Operations, along with the Air Force's Readiness and Installation Support Division and Air Force Civil

Engineer Support Agency, worked diligently to pull all this together and on August 28, we saw our first EOD teams begin training on their way to Afghanistan.

This conflict perhaps marks a significant





philosophical change in the way we prepare Airmen for future conflicts. While there are still unanswered questions, it is clear that we must continue working short- and mid-term solutions to address the current situation. Aside from the training given to CE's at Army installations, Installation and Logistics (Readiness) and Air Education and Training Command plan to continue the Basic Combat Convoy Course developed earlier this year to train transport personnel for OIF II. The course will still be used for that purpose, but it could easily be modified to accommodate the remainder of the Air Force population who need this type of training.

As time passes and we put things into perspective, it appears that we're getting closer to the original intent of the AEF construct. In fact, the concept calls for a "spin up" period in the months leading to a deployment, to

give teams a chance to carry out training, complete the necessary administrative actions, perform equipment checks, etc. This new training needs to become an intrinsic part of our culture. We must raise the bar on the basic core competencies that each Airman must possess to operate in a high-threat environment. We must also use our resources wisely; probably not all Airmen need to be trained to the same high level that is currently necessary for OIF/OEF. With that said, the use of just-in-time training venues may very well be the long-term solution, in conjunction with a robust home-station training program. Food for thought...

Maj Bouffard is an Exchange Officer on loan from the Canadian Airfield Engineers. He is responsible for managing the U.S. Air Force Civil Engineer Contingency Training program at HQ AFCESA, Tyndall AFB, Fla.

TSgt Steve Goe, Anti-Terrorism/Force Protection Manager with the 56th CES, Luke AFB, Ariz., fires the M-16 rifle as SSgt James Cox, Logistics NCOIC, 56th CES, finishes firing at Ben Avery shooting facility in Phoenix Ariz. Forty percent of the 56th CES prepared for upcoming deployments by training in weapons and tactics, self aid, buddy care, movements in convoys, and biological chemical gear. (photo by SSgt David W. Miller)

Army	Air Force
Utilities Det	4F9EB, 4F9EP, 4FZ99
Engineer Battalion Combat Heavy	4F9R1, 4F9R2, 4F9R3, 4F9R4 + 150 PB
EOD Company	4F9X1, 4F9X2(3), 4F9X3, 4F9X9(2)
EOD Det	4F9X1, 4F9X3
Fire Team	4F9FJ, 4F9FP(2)
Crash Fire Rescue	4F9FJ, 4F9FN, 4F9FP(3)
Facility Engineer Team (FET)	4F9S6, 4F9AV

We're *Hot!*

Air Force teams and individuals take top honors

**Mr. Guy Ivie
HQ AFCEA/CEBH**

A team of firefighters from Travis AFB, Calif., won the top prize at this year's World Firefighter Combat Challenge (WFCC), taking the winner's trophy away from Windsor, Ontario, Canada, where it's been for the past three years.

Team captain TSgt Mike Melton and teammates SSgt Jelani Brooks, SSgt Harry Myers, SrA Brendan O'Neil and Mr. Adam Groom turned in a combined winning time of 4:23.83.

Called "the toughest two minutes in sports," the annual WFCC puts to the test the best "firedawgs" from the U.S., Canada, the U.K. and Germany, as well as a number of Department of Defense (DoD) teams.

At this year's contest, WFCC XIII, held in Las Vegas, Nev., from November 9–12, the DoD in general—and the Air Force in particular—proved their mettle. Not only were the firefighters from the 349th Civil Engineer Squadron (CES) at Travis AFB overall winners, they took second place in the Streamlight Relay with a time of 1:11.51. During the head-to-head race, it sounded like a pro football game was in progress, with charged-up fans on one side chanting, "U! S! A!" and folks on the other side responding, "CA! NA! DA!" After

the event, TSgt Melton said, "I'm proud of the team. It's been a six-year journey to get where we are today."

The joint-services team from the Air Force-run DoD Fire Academy (aka "SAM" Squad, for "Soldier/Sailor/Airman/Marine") raked in third in the relay with a time of 1:17.98. Team captain Marine Gunnery Sgt Eric Aker led his team members, Marines Gunnery Sgt William Bockelman and Sgt Nathaniel Bruce, and Airmen TSgt Aaron McLane and SSgt Anthony McMurtry.

During the relay event, the previous world record was broken three times. The Windsor team broke it during the quarter-finals. Travis beat that time during the semi-finals, but Windsor undercut them one last time in the finals with a winning time of 1:10.60.

In the individual category, DoD firefighters pulled in three of the top four spots. Gunnery Sgt Aker was named "King of the Jungle" with a time of 1:23.92. Team Travis captain TSgt Mike Melton's 1:26.39 (16 seconds faster than his 2000 time) earned him third place. A competitor from Rhein-Main AB, Germany, A1C Brandon Cunningham of the 469th CES, was just 0.12 seconds behind him in fourth.



at the 13th annual Firefighter Combat Challenge

The course is designed to simulate and test real-world firefighting skills. The contestants, either individually or as part of a team, carry a 42-pound hose pack up five flights of stairs; lift a similar hose up five flights with a rope; use a nine-pound mallet to hammer a 160-pound sled five feet (to simulate axe work); “slalom” 140 feet through an obstacle course of fire hydrants and then drag a charged firehose 75 feet to hit a target with the water stream; and drag a 175-pound mannequin 100 feet to safety. All competitors wear nearly 50 pounds of “turnout” gear. For the relay teams, one man takes each leg for a single pass through the course. Individual competitors must do it all on their own... while wearing their air masks. In the overall competition, each team member runs the entire course and then the top three times are combined for a team score.

The event drew 845 individual contestants, 74 teams for the overall competition and 115 relay teams. DoD fielded 14 teams: USAF Academy, Colo. (overall); Rhein-Main AB, Germany (individual); Spangdahlem AB, Germany (relay, overall); RAF Mildenhall, U.K. (relay); HQ AFCESA, Tyndall AFB, Fla. (relay); DoD Fire Academy (SAM Squad), Goodfellow AFB, Texas (individual, relay, overall); Fort Bliss, Texas (men’s relay);

Ft. Bliss, Texas (ladies relay); Ft. Meade, Md. (relay); Fort Gordon, Ga. (relay); Edwards AFB, Calif. (relay); Travis AFB, Calif. (individual, relay, overall); Altus AFB, Okla. (relay); Niagra Falls AFB, N.Y. (individual).

Now in his second year of competing, A1C Cunningham earned himself a command-sponsored ride to Las Vegas by winning the individual competition at USAFE’s FCC event, held at USAFE’s rescue school at Ramstein AB, Germany. He gives credit to one of the school’s instructors, SSgt Jason Higgins, for keeping the sport alive within USAFE. “If it wasn’t for SSgt Higgins’ efforts, none of the USAFE guys would be competitors in the sport,” said Cunningham.

CMSgt Patrick Sheehan, a member of the HQ AFCESA relay team, remarked, “This was my first competition and I was blown away by the fitness levels of all the contestants—especially the 64-year-old fire chief that ran the course as an individual competitor!”

ESPN taped the event for broadcast beginning December 19, 2004. Visit the Firefighter Challenge Web site for more information: <http://www.firefighter-challenge.com/>

Below, from left to right: Relay contestants TSgt Aaron McLane (L) and Sgt Nathaniel Bruce of the SAM Squad encourage SSgt Anthony McMurtry during the mannequin pull. Gunnery Sgt Eric Aker of the SAM Squad catches his breath following his winning individual run. A1C Brandon Cunningham prepares for his run. TSgt Michael Melton accepts the traveling trophy with a speech as Team Travis looks on. (photos by Mr. Jim Monhollon)



Helping Build Iraq's Civil Defense

CMSgt Joseph Rivera
HQ AFCEA/CEXF

Over the past year, four Air Force chief master sergeants have worked with the Iraqi government to restore their country's civil defense capabilities. Under the guidance of the Coalition Provisional Authority (CPA), these senior fire and emergency services specialists served as key advisors to Dr. Ali Saeed Sadoon. Dr. Ali, as he is known by his colleagues, is the Director General for the Iraqi Civil Defense Directorate (ICDD), part of Iraq's Ministry of the Interior (MOI). The chiefs worked with a staff comprising members of the Air Force, Navy and Army, as well as members of coalition forces from the United Kingdom, Australia, The Netherlands and Poland. They provided guidance, while the Iraqis retained ownership of the process and responsibility for building, training and strengthening fire and emergency service (F&ES) teams within Iraq's 18 governorates.

After coalition forces secured Baghdad, restoring essential public services to the Iraqi people became a top priority. The ICDD, which handles F&ES and explosive ordnance disposal (EOD) teams, was in critical need of rebuilding and modernizing. Decades of neglect and damage from the war had taken a toll on equipment and infrastructure.

Although Iraqi emergency response teams lacked the necessary training and up-to-date equipment, they were extremely busy. In one year, Baghdad's F&ES responded to 4,618 fires and 4,790 EOD situations. Baghdad is approximately the same size as Los Angeles, but while Los Angeles has 250 fire stations with a standard response time of 5-9 minutes, Baghdad has only 25 stations; complete destruction from fires is commonplace.

CMSgt Glen K. Robinson, a fire chief from the 622nd Regional Support Group, Dobbins ARB, Ga., deployed in Air Expeditionary Force Blue as the first Air Force F&ES advisor to the ICDD. Working with Mr. Monte Fitch, a retired civilian assistant fire chief from Maryland, CMSgt Robinson had the difficult initial tasks of assessing the overall requirements and laying

the foundation for subsequent rebuilding of Iraq's fire and emergency services. An initial budget request for \$500M was established.

"The hardest part was identifying the needs. Communications had been severely disrupted, and there was a lack of commitment to the fire service over the last 30 years from the previous government," stated CMSgt Robinson.

CMSgt Gene Rausch, the Fire Chief of Kadena AB, Japan, was the second Air Force F&ES advisor to Iraq and, with Mr. Fitch, completed the assessment process and fine-tuned the budget for personnel and equipment. Retention of civil defense firefighters and EOD technicians was aided by tripling their pay. CMSgt Rausch and Mr. Fitch helped the ICDD develop a seven-year strategic civil defense plan, and secure both funding to build a national fire training academy and a contract to provide interim training for 4,000 new Iraqi firefighters during construction. More than 100 existing fire stations were renovated, 600 new trucks were purchased, and construction of 27 new fire stations was funded.

I was the third Air Force F&ES advisor to the ICDD, and worked hand-in-hand with Mr. Jack Myers, a fire program manager from the CPA. Our primary mission was to continue executing what those ahead of us had started, following everything through to a successful conclusion. We helped with contract negotiations between construction companies and the contracting office and, during the source selection process, helped ensure that technical requirements and delivery schedules could be met by companies submitting proposals.

One of our best experiences was helping the ICDD host the first-ever Fire Chiefs Forum over two days in May 2004 at the Adnon Palace in Baghdad. Mr. Myers and I briefed the Iraqi fire chiefs on the CPA's efforts to help improve the country's fire and emergency services. Dr. Ali spoke on his vision for the future. Representatives from each of Iraq's 18 governorates reported on



the current state of their fire and emergency services. This unique conference hosted Kurds, Shiites and Sunnis under one roof, and the atmosphere was very similar to one of our fire chief meetings. The Iraqi fire chiefs appreciated the work of the Air Force chiefs and were grateful for the forum's openness. As one Baghdad fire chief stated, "Firefighters are all brothers from around the world."

CMSgt Greg Winjum, Air National Guard Chief of F&ES from Andrews AFB, Md., followed me into Iraq as the fourth Air Force advisor. He continued to work with the ICDD and the Iraqi Reconstruction Management Office on designs for the fire training academy, the ICDD headquarters, and five types of fire stations. Many land issues had to be worked for final locations of the new fire stations and the academy. "One of the great things about my tour was seeing the arrival of the equipment that my predecessors had worked so hard to provide, and see it put to

use in protecting and providing security for the citizens of Iraq," said CMSgt Winjum.

Dr. Ali and the ICDD's public affairs officer were invited by the International Association of Fire Chiefs (IAFF) to attend their annual conference in New Orleans in August 2004. Dr. Ali was the keynote speaker for the Air Force's fire symposium, where he thanked the four chiefs for their support. In his words, they had "left their fingerprints" on his directorate and Iraq for years to come. Dr. Ali already has plans to attend next year's meeting.

Much work is left to be done, but Iraq's F&ES teams are well on their way to becoming a modern F&ES organization.

CMSgt Rivera is the Fire & Emergency Services program manager at HQ AFCEA, Tyndall AFB, Fla.

Iraqi firefighters from the Al-Salhy fire station train with a recently acquired firetruck in Karkh, Iraq. (photo by TSgt John Houghton)



"When Stormy

Mother Nature was relentless, hammering Florida



Charley, Frances, Ivan and Jeanne—they weren't welcome, but they came anyway. One-by-one the hurricanes arrived on or near Florida's coasts from the middle of August through September. The last state to be hit by four hurricanes in a single season was Texas more than a century ago. Throughout Florida, Air Force civil engineers were kept busy either preparing for the hurricanes' arrival or repairing the damage they left behind.

Hurricane Charley, a category 4 storm, narrowly missed MacDill AFB on August 13 and made landfall further south than expected, near Punta Gorda. Seventy members of the 202nd RED HORSE Squadron (RHS) deployed to Punta Gorda from Camp Blanding, Fla., to help reopen the nearby

Charlotte County Airport so needed supplies could arrive.

After Hurricane Frances hit Florida's southeastern coast on Sept. 5, the 202nd was called across the peninsula to Vero Beach. While there, the unit helped make the non-profit St. Francis Manor livable again for its residents, independent seniors on fixed incomes. "They saved our lives," said resident Mr. Richard K. Burghardt.

Further up the east coast, Frances did \$32.7M of damage to Patrick AFB and Cape Canaveral AFS before crossing the state and doing more than \$1M in "little damage" to MacDill AFB. Electricians from the 45th Civil Engineer Squadron (CES) at Patrick had to endure Frances's gale-force winds and rain while

repairing a generator at an annex at Malabar, southwest of the base. Members of the 45th secured and assessed the base as part of Patrick's Hurricane Recovery Team.

On Sept. 15, Hurricane Ivan landed at Gulf Shores, Ala., on the edge of Florida's panhandle, slamming hard into Eglin AFB and Hurlburt Field. Eglin officials estimate the cost of repair, recovery and evacuation will reach almost \$87M. Eglin's electrical system took heavy damage, and members of the 796th CES worked 14-hour days alongside civilian electricians to restore power to the base.

Hurlburt sustained \$40M in damage from Ivan. Because of high water levels, Lt Col William Kolakowski, commander of the 16th CES, had to do part of his



Winds Do Blow"

from Ye Mariners of England, by Thomas Campbell

military bases with four major hurricanes in six weeks

post-storm assessment from a jet-ski. Structural engineers from the Air Force Civil Engineer Support Agency at Tyndall AFB, Fla., and 55 CE Guardsmen from 11 states answered the call to work alongside the 16th CES and the 823rd RHS from Hurlburt to get the base up and running.

The 203rd RHS from Virginia Beach deployed to assist with the clean-up after Hurricane Frances, then stayed to help after Ivan hit. They cleared debris from the Pensacola Regional Airport so relief supplies could arrive.

The fourth and last hurricane of the 2004 season, Jeanne, hit Florida's southeast coast on Sept. 26, causing Patrick AFB to be evacuated for the second time in less than a month. Although no critical

facilities were lost, cost of fixing the damage to Patrick is estimated to be millions.

Monetary costs of the hurricanes to Florida's Air Force bases were high, but preparations and evacuations kept things from being worse. Seventy deaths were attributed to the four hurricanes for the state, but none were reported on Air Force bases.

Still, the storms took a toll. "This is getting a little tiring," commented Mr. Randy Ray as Ivan was heading for Florida. Facing a possible third evacuation at MacDill, the disaster training chief for the 6th CES was weary but ready to do what was necessary. "We've been lucky twice...but you only get so many chances before you get hit," said Mr. Ray.

Text compiled from news stories by Ms. Sarah McCaffrey, Eglin AFB, Fla.; 1Lt Elizabeth Kreft and Mr. Ken Warren, Patrick AFB, Fla.; 1Lt Erin Dorrance and Mr. Nick Stubbs, MacDill AFB, Fla.; A1C Heidi Davis, Hurlburt Field, Fla.; SSgt Stephen Hudson, Spc James Cornwell and Sgt Sarah Maxwell, Florida National Guard, St. Augustine, Fla.; and from MSNBC staff and news service reports.

Photo credits: (above) A1C Marlon Harris and other members of the 45th CES at Patrick AFB by MSgt Efrain Gonzalez; (below, L-R) SrA Robert Ryon of 202nd RHS by Sgt Sarah Maxwell; snapped power pole at Eglin AFB by Mr. Joe Piccorossi; Panama City Beach tornado by Ms. Jacqui Barker; slipped planes at Hurlburt Field and boat carried ashore at Hurlburt Field by A1C Kimberly Gilligan; roof work at Eglin AFB by Mr. Bobby Burns; A1C Mario Gonzalez and TSgt Gerald Sinex of 202nd RHS by SSgt Shelley Gill.



Learning How to Save Lives

SSgt Ruth Curfman
506th AEG/PA

A siren pierces the early evening sky as a pillar of smoke rises in the distance. A bright yellow, 10-ton fire truck speeds to the site, but the men behind the wheel have a far more compelling interest in their destination than the average U.S. military firefighter deployed to Iraq; they're Iraqi guards.



During a training session, SSgt Shannon Anderson teaches an Iraqi firefighter how to handle a firehose. (photo by SSgt Adrian Cadiz)

As part of a program to help rebuild Iraq, the 506th Expeditionary Civil Engineer Squadron's (ECES) fire department graduated 19 Iraqi students here Oct. 13 after completing a three-day first responder, first aid and firefighting course. In all, more than 284 people have received this training since it began in February 2004.

The firefighters and SSgt Shannon Anderson, course instructor and assistant chief of training, are "providing an invaluable service to the Iraqis and doing a remarkable job in solidifying our relationship with

them," said Col Phillip Murdock, 506th Air Expeditionary Group commander.

Part of the process of helping Iraq get back on its feet is to train people how to save lives. This course will help these students have the confidence and know-how to make a big difference in the lives of their people.

As class begins, there is a little nervousness in the air, but within an hour, the students begin to realize they are learning critical life-saving skills that will only enhance their on-the-job abilities. By the end of the class,

the students are interacting like old friends.

“The first two days of the course, we teach first aid/ first responder techniques as well as CPR, patient assessment, spinal immobilization [and] treatment for burns,” said SSgt Anderson, who is deployed from Moody AFB, Ga. “In addition, we teach them about certain explosives and how to safely identify them.”

In the morning, SSgt Anderson teaches students about the different aspects of being the first person on the scene. In the afternoon, training is more intense as students practice what they learned earlier.

The second day entails more aspects of life-saving techniques, such as splinting

fractures, controlling bleeding and treating for shock.

On graduation day, the students learn basic firefighting techniques including using a hose and personal protection equipment, and they get to practice putting out a structural fire.

When SSgt Anderson first deployed to Iraq, he said he had hoped to meet the local people and looked forward to helping them rebuild their country. This training program left the 10-year fire department trainer with a lasting impression of the dedication the local citizens have in protecting their homes and families.

The students said they consider this a way to show their country that they will do anything to help it out.

One Iraqi student said, “By taking this course in life-saving [techniques] it shows our country how sincere and faithful we are.”

“I wanted to become a firefighter because I want to save lives,” said another.

In the distance, the sound of another firetruck’s siren fades away as crews rush to the scene of another emergency. Thanks to the training of the 506th ECES firefighters and the dedication of a few brave Iraqis, the future of emergency response crews in northern Iraq is in good hands.

SSgt Curfman is a staff member of the 506th AEG’s Public Affairs office at Kirkuk AB, Iraq.



An Iraqi trainee learns from SSgt Shannon Anderson how to attack a fire. (photo by SSgt Adrian Cadiz)

Firefighters Rescue Blackhawk Crew

MSgt Don Perrien
407th AEG/PA

Just after 9:20 p.m. on Sept. 21, two Army UH-60 Blackhawk helicopters assigned to the 1st Battalion, 244th Aviation Regiment, took off from the flightline at Tallil AB, Iraq, after a short stop.

we discovered another Soldier, also strapped to his seat, underneath the first.”

While cutting the second Soldier free of his seat, SrA Byrum heard a female voice scream behind him. Still strapped in her seat, she was pinned against the side of the airframe.

TSgt Carolyn Clark, noncommissioned officer in charge of the emergency room, also responded to the crash. After directing an ambulance to transport the first three Soldiers, she joined the effort to free the remaining one.

“We were still working to move the last Soldier when [her] vital signs started to slip,” TSgt Clark said. Frantically, the rescue crews tried to devise a way to free her from the wreckage.

There was no way to get underneath the broken airframe, and the exposed undercarriage of the Blackhawk was too thick to cut through it effectively.

“When her pulse got low, we knew we had to do something,” SrA Byrum said. “So an Army firefighter jumped in there with me, and we pushed and pulled the wreckage around and finally managed to get her free for transport.”

Two minutes later, something went horribly wrong with one of them.

“The first thing I heard was a loud, dull thud, kind of like a fist hitting a wooden wall,” said SrA John Byrum, a firefighter assigned to the 407th ECES. “I looked out toward the flightline, and I saw the helicopter bounce off the ground.”

As the Blackhawk hit the ground and rolled to a stop, the aircraft’s interior became a jangled and crushed mess of wires, equipment and smoke. The largest part of the remaining fuselage rested on its side, with the side door open to the evening sky and four Soldiers trapped inside.

SrA Byrum said, “When we rolled up to the site, there was one guy who had already made his way out of the wreck. We directed him off to the side and headed into the main body of what was left of the helicopter,” the firefighter said. “I climbed to the top of the wreckage and found a second Soldier strapped to his seat. I reached out to cut the helicopter’s engine off and [free him] when

Less than 30 minutes after the crash, all four injured Soldiers were in the emergency room. The following afternoon, a C-17 Globemaster III landed here, passing by the remaining wreckage of the broken Blackhawk. Less than 24 hours after surviving their fateful crash, the four Soldiers were aboard the aircraft and safely on their way to a hospital in Germany.

The cause of the accident is under review by Army safety officials. At the time of the incident, no hostile fire was reported in the area, officials said.

MSgt Perrien is assigned to the 407th AEG’s Public Affairs Office at Tallil AB, Iraq.



Local safety officials inspect the wreckage of the Army UH-60 Blackhawk that crashed shortly after take-off from Tallil AB, Iraq, in September. (photo by A1C Jeff Andrejczik)

Doing What It Takes

A1C Aaron McDonald radios the air control tower for clearance to enter the runway. His mission: Break up five different 24-inch squares of damaged runway sections and put them back together again before the next aircraft takes off. Each repaired section is one less safety hazard the pilots have to keep in mind during takeoff and landing.

Jackhammers, generators and screwdrivers may seem out of place when talking about the flightline, but the mission of the 455th Expeditionary Operations Group's (EOG's) Civil Engineer Flight (CEF) is different than the one back home. Here, it's all about keeping the aircraft flying, whether it's through runway repairs or rehanging a B-hut door.

"It's a running joke for us. Every time we fix a door hinge, we say we're keeping the A-10 (Thunderbolt IIs) flying. But, the truth is, we are in a roundabout way, because if a broken door is keeping a pilot from sleeping, it could become a flight-safety issue," said SSgt Ricky Johnson, a heavy equipment journeyman deployed from Charleston AFB, S.C.

Serving at Bagram AB's Air Force sector, Camp Cunningham, differs from working back at home base in many ways. At his home station of Dover AFB, Del., A1C McDonald would call a contractor to repair the runway; here, however, he has found his niche in doing runway repairs himself.

"I love being out there on the runway," A1C McDonald said, "from the minute I begin jackhammering to the next minute when I get a call from air control telling me I have to rush off of the runway to allow aircraft to come in or fly out."

Within the team's first couple of weeks here, it repaired 41 spalls. It has also sealed cracks on about 10,000 linear feet of runway, built dirt-filled barriers, fixed bomb shelters and assisted with self-help living quarters improvements such as building shelves and repairing B-huts from doors to floors.

"Hooch help" is something extra the team does to help out the people assigned here,

said 2Lt Lloyd Mangaroo, the 455th CEF commander, deployed from Dover AFB.

While making camp improvements, safety is a concern the flight takes seriously. Something as simple as digging can be a harrowing experience because of decades of land and civil wars throughout Afghanistan.

"There's lots of [unexploded ordnance] out there; the teams have to keep their eyes open for all kinds of hazards," said MSgt Charmaine Regelman, the flight's superintendent who is also from Dover AFB.

Improving the base to reduce and even eliminate safety hazards when possible is another flight goal. Already, the team has poured concrete foundations for supplies storage, a vehicle maintenance ramp and an electronics storage shed. During the next few months, there are plans to improve the walkway from the entry control point to the base's main road, pour more concrete pads and foundations, pave a road to a taxiway and pave the sweeper storage yard road. This will prevent vehicle damage and save maintenance money and time.

SSgt Lindsey is assigned to the 455th EOG's Public Affairs Office at Bagram AB, Afghanistan.

SSgt Jennifer Lindsey
455th EOG/PA

A1C David Depouw (foreground) and SrA Derland Ellison, both assigned to the 455th CEF, ensure a newly poured pad will have a smooth finish by using magnesium floats to get the rocks down before the concrete dries. (photo by the author)



Looking Down

Developed for watching the skies, radar has uses looking in the other direction, as well

Mr. Jon Haliscak
AFCEE/TDR

Most people in the Air Force have a basic understanding of radar and its use to track aircraft in flight. Most people are also familiar with the use of radar to check vehicle speed on the road. Ground penetrating radar (GPR)—sometimes known as ground probing radar, georadar, or subsurface radar—applies the same principles to a different task: surveying below the surface of the ground. GPR is not a new technology (see sidebar), but it's becoming more available as technological advances make it more versatile and affordable.

Using a directional antenna, a signal of the desired frequency is directed into the ground. The frequency used depends on the application. Low frequency (long wavelength) signals penetrate more deeply than high frequency (short wavelength) signals. Generally speaking, frequencies can vary from a low of 25 mHz to 1,000 mHz at the upper end. The signal is sent in pulses. Objects or strata in the ground reflect it to a receiver antenna, which may be attached to the transmitting unit or may be in another location in some down-hole applications. The physical makeup of the materials determines the rate at which signals are absorbed or reflected. This differing rate of reflection is referred to as signal attenuation. The reflected signal is processed

even temperature can impact the generated picture. In general terms, the low frequencies required for deep penetration do not provide high resolution. Higher frequencies usually provide greater resolution, but at shallower depths. Regardless of depth, final image quality depends upon the quality of the unit, the signal it generates, the signal-processing software, and whether the unit is appropriate for the application. Selecting the appropriate unit for the application is critical to successful completion of the mission.

GPR has been put to a variety of uses, from locating underground storage tanks (USTs) and pipelines, to investigating subsurface geological formations, to mapping bedrock in the ocean floor. According to a "Modern Marvels" program on the Discovery Channel, GPR was also used for a state project to help locate the graves of native Alaskans.

State and federal highway departments are using GPR to obtain high-quality data on pavement and bridge deck conditions because, unlike core-sampling methods, it is real-time, moves at highway speeds and doesn't require lane closures. Air Force civil engineers could use the tool for the same purpose. GPR has also been used for quality control to look at rebar placement in concrete; it could be used to examine the rebar in runway construction and repair operations.

As a tool for the Air Force civil engineer, GPR has most commonly been used as part of the installation restoration program (IRP) to confirm the location of USTs, delineate the boundaries of old landfills, and look for other disposal sites. Because of its ability to detect the disturbance of some types of soils, GPR has occasionally been used to identify former excavation locations, including utility trenches.

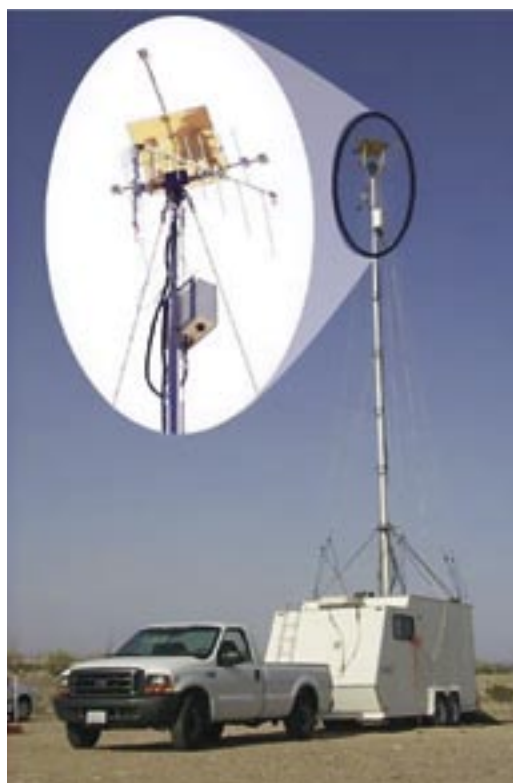
The CAMCOPTER® is a rotary-wing UAV with a GPR unit mounted on it. It has been successfully tested for locating shallow subsurface anti-tank mines.
(photo courtesy of Mirage Systems)



to provide a picture of the target. Several factors affect the rates of signal attenuation; material density, electromagnetic properties, moisture content, and

Over several years, a number of firms tested GPR as a tool for detecting subsurface unexploded ordnance (UXO) at depth. Initial results were less than hoped for, but the technology continues to be refined. Recent tests by Mirage Systems, Inc., successfully located and identified shallow subsurface anti-tank mines. The company downsized the GPR unit and attached it to the CAMCOPTER®, a rotary-wing, unmanned aerial vehicle (UAV). The weight of the GPR unit limited the UAV's flight time. Other tests scheduled in the near future will see a GPR unit fitted to a fixed-wing, manned aircraft to test wide-area UXO detection. GPR will more than likely be used in the Military Munitions Response Program, which cleans up closed ranges and other munitions-related sites, including munitions burial pits.

As wartime applications proliferate and the units become less complex, smaller and more affordable, GPR technology may well become part of the standard deployment equipment list for Air Force civil engineers.



The inset shows the GPR unit in this tower-mounted version. (photo courtesy of Mirage Systems)

The following short history of GPR is an excerpt from Dr. Gary R. Olhoeft's GRORADAR™ Web site (<http://www.g-p-r.com/introduc.htm>); reprinted with permission.

"RADAR is an acronym coined in the 1934 for **R**Adio **D**etection **A**nd **R**anging (Buder, 1996; Centre for the History of Defence Electronics). The first ground penetrating radar survey was performed in Austria in 1929 to sound the depth of a glacier (Stern, 1929, 1930). The technology was largely forgotten... until the late 1950's when U.S. Air Force radars were seeing through ice as planes tried to land in Greenland, but misread

the altitude and crashed into the ice. This started investigations into the ability of radar to see into the subsurface not only for ice sounding but also mapping subsoil properties and the water table (Cook, 1964; Barringer, 1965; Lundien, 1966). In 1967, a system much like Stern's original glacier sounder was proposed, and eventually built and flown as the Surface Electrical Properties Experiment on Apollo 17 to the moon (Simmons et al., 1972, see also the Apollo 17 Lunar Sounder Experiment). Before the early 1970s, if you wanted to do GPR, you had to build your own (Ohio State University Electroscience

Laboratory). But in 1972, Rex Morey and Art Drake began Geophysical Survey Systems Inc. to sell commercial ground penetrating radar systems (Morey, 1974). Thus began an explosion of applications, publications, and research, fostered in great part by research contracts from the Geological Survey of Canada, the U.S. Army Cold Regions Research Laboratory, and others. There are now over 300 patents that might loosely be related to ground penetrating radar around the world, several companies making commercial equipment, many companies offering it as a service, and many institutions performing research."

Mr. Haliscak is the Range Division Chief in the Technical Directorate of the Air Force Center for Environmental Excellence, Brooks City-Base, Texas.

Putting On the Pressure

2Lt William Powell
325th FW/PA

AFRL develops highly efficient ultra-high- pressure firefighting system

The Air Force Research Laboratory Deployed Base Systems Branch at Tyndall AFB, Fla., has been developing new firefighting technology for nearly two years. Dubbed the ultra-high-pressure system, the experiment combines high pressure with water and aqueous film-forming foam (AFFF).

“We were looking at ways to combine carbon dioxide with water to make a more effective firefighting agent. High pressure is required to keep the CO₂ a liquid, and we had to design a system that would allow us to operate at high pressures,” said Dr. Doug Dierdorf, Fire Research Group lead scientist. “We found that water with AFFF solution [under ultra high pressure] is extremely effective at putting out fires.”

Normal fire trucks deliver firefighting agents, including water, at pressures ranging from 100-250 psi. Fire trucks retrofitted with the UHPS deliver firefighting agents at 1,500 psi. Ultimately, smaller amounts of water required to extinguish fires could result in firefighting vehicles a fraction of current sizes, and light, lean vehicles are especially important in today’s rapid global mobility Air Force.

Another driving force behind the developing the new system is a reduction in the collateral damage and high repair costs involved with applying AFFF to large transport aircraft engines. “It turns out that the high-pressure water gives us better penetration, better dispersion of water, and helps us attack fires on the large scale engines,” said Dr. Dierdorf. “While the pure water and high-pressure are not enough to suppress these fires, we found that adding two or three pounds of a gaseous clean agent will do the final extinguishing. The agent evaporates and avoids collateral damage to the engine during firefighting operations.”

The ultra high-pressure also changes the physical dynamics of the firefighting agent, further increasing its effectiveness. “The UHPS atomizes the agent into very fine droplets, which increases the agent’s ability to absorb heat, thus improving its effectiveness,” said Mr. Donald Warner, chief of Air Force Fire and Emergency Services. “Efficiency is increased because less agent is required, which is very important in areas where water is scarce.”

2Lt Powell is with the Public Affairs Office of the 325th Fighter Wing at Tyndall AFB, Fla.



These are the primary components of the UHPS: the piston pump (L) and nozzle (R). (photos by the author)

Building Up Andersen AFB

Everywhere you look at Andersen AFB, Guam, there seems to be a new project started, a new building going up or “road closed” signs.

Andersen is currently undergoing a \$177 million makeover, with three main projects—a new medical clinic, a fitness center and a forward operating location aircraft hangar—totaling more than \$60 million, according to Capt. Sean White, 36th Civil Engineer Squadron (CES).

Each project is in various stages of completion, with the fitness center being the furthest along at 55% complete. “There have been some recent delays due to the excessive rain and weather we have experienced,” said Capt. John Gormley, 36th CES.

The new fitness facility, begun in August 2003, is scheduled to be completed in December 2004. With an estimated cost of more than \$12 million, the 54,370-square-foot fitness center will include locker rooms with saunas, a dedicated aerobics room, racquetball courts, a gymnasium and a health and wellness center.

The most recently started project is the new medical facility. Construction began in June 2004, and is expected to be finished in November 2006. The 47,716-square-foot facility will include optometry, dentistry, a family practice clinic, immunizations, a pharmacy, radiology, a lab, a skills center, Tricare, education and training rooms, and administrative space.

Despite the number of improvements being made, the 36th CES is trying to keep inconvenience to the base community at a minimum.

Although work on the medical clinic will cause some temporary road closures, there should be minimal impact to operations with the three main projects, said Capt Gormley.

The most recently completed project is the 13,450-square-foot security forces operations facility, which consolidated operations from two separate buildings into one custom facility.

A1C Gregory is a staff member of the 36th ABW Public Affairs office at Andersen AFB, Guam.

A1C Sarah Gregory
36th ABW/PA



Work crews continue construction of the new forward operating location hangar at Andersen AFB, Guam. (photo by A1C Joshua P. Strang)

A Lifetime of Service

SrA T.D. Cooper
36th AEW/PA

*36th Civil
Engineers
celebrate
Andersen
craftsman's
legacy as
a soldier,
supervisor,
mentor*

Seikichi Kaneshiro glides his hand across a huge trapezoid-shaped conference table made of solid oak. Bending down, he points out with a steady hand how he fit the top securely to the base without nails or screws, just wooden dowels. His steady hands have served his craft as well as he has served the U.S. government for more than 60 years.

The 83-year-old, known by many as "Mr. Paul," is the superintendent of vertical repair in the 36th Civil Engineer Squadron (CES). He's worked for the government for 63 years, longer than anyone else in the Air Force.

Mr. Paul's handiwork appears all over the base: countless storage cabinets, conference room tables and display cases; the renovated legal office; the archway in Andersen's passenger terminal. He built the area that anchors the B-52D Statofortress model at Arc Light Memorial Park. He even designed and assembled Andersen's traveling Pride Day trophies.

Mr. Paul has used his design and building skills throughout Guam. He's made furniture for several churches on the island. Following a typhoon, he and a school custodian rebuilt his children's convent school. He says he's still alive today because the convent sisters keep him in their prayers.



1976



2004

Mr. Paul helps build leaders, as well. He's credited with writing more than 30 award packages that led to CEs receiving the Guam Legislative Award and the Ancient Order of Chamorro, Guam's highest honor for non-residents who have made an outstanding impact in the community.

The most junior-ranking Air Force member that Mr. Paul helped to receive the honor is A1C Randall Diericks, a 36th CES structural apprentice. "I think of Mr. Paul as an inspiration because of some of the things that he has done," A1C Diericks said.

Mr. Paul joined the military in 1943. He was assigned to the 522nd Field Artillery, part of the famed 442nd "Go for Broke!" Battalion composed entirely of Japanese-American soldiers. This unit is known for their courageous rescue of an Army unit surrounded by German adversaries.

TSgt Christopher Foust, 36th CES NCO in charge of vertical repair, has a deep respect for Mr. Paul and all the Japanese-Americans who fought against the Germans during World War II. "They overcame racism and completed some of the hardest battles of World War II just to prove they were as American as any European-descended family," said TSgt Foust, the 31st person Mr. Paul helped attain an Ancient Order of Chamorro award.

As MSgt Kevin Monkman, 36th CES heavy repair chief, sees it, everyone who has come into contact with Mr. Paul is a better person for knowing him.

Mr. Paul has built more than furniture. He's helped build an air base, a community and American history.

SrA Cooper is a staff member of the 36th AEW Public Affairs office at Andersen AFB, Guam.

An Olympic Team of Air Force First Responders

The Air Force recently held its first-ever Emergency Services Symposium in New Orleans, La., where experts in fire protection, explosive ordnance disposal (EOD), Full Spectrum Threat Response (FSTR), and medical services met with civilian response agencies to discuss common missions and methods of future cooperation.

Maj Gen L. Dean Fox, The Air Force Civil Engineer, highlighted the symposium's theme, "Integrating Base Response," by drawing on the Summer Olympics. "You are the Air Force's Olympic heroes—among the best in the world in your specific area of expertise," he told attendees. "However, responding to an emergency is not an individual event." Maj Gen Fox encouraged participants from disparate functional areas to win a "team gold medal" by fusing themselves into a single squad that could respond to future challenges.

The keynote speaker, Dr. Ali Saeed Sadoon, head of Iraq's Civil Defense Directorate, thanked the Air Force for its help with the challenges his people have encountered, which include a shortage of equipment, facilities and personnel. Currently they have only 8,000 of the estimated 32,000 people needed to fully staff his department, and nearly every fire station was looted or damaged after the war.

"We have been working with the CPA [Coalition Provisional Authority] and multinational forces to re-establish the Iraqi Civil Defense as a respected and reliable service to the people of Iraq," said Dr. Ali.

Maj Rodger Schuld, Air Force Civil Engineer Support Agency, gave a comprehensive presentation on FSTR, an Air Force initiative to merge threat response capabilities into one cross-functional program. A main goal of FSTR is to plan, organize, train, and equip personnel, and to protect critical infrastructure from a possible

nuclear, biological, chemical or conventional enemy attack; a major accident; a natural disaster; or use of weapons of mass destruction by terrorists.

Lt Col Richard McCoy from the Air Force Medical Support Agency, Brooks City-Base, Texas, urged medics to join with an installation's entire emergency response team and agencies from local communities. One current initiative, Code Silver Training, teaches medics to focus on the follow-on actions to a typical base exercise involving biological agents. A representative from the Surgeon General's office attended, which was an important first step toward future integration with other critical functions such as Security Forces, other Services and off-base agencies.

"All disaster response begins and ends at the local level," said Col Michael Brown of the Louisiana Office of Homeland Security and Emergency Preparedness as he spoke on the role of the state and local communities. For Air Force people, that level is the air base, where Air Force first-responders are now better prepared to "go for the gold."

Dr. Hartzer is the chief of Professional Communications at HQ AFCEA, Tyndall AFB, Fla.

Dr. Ronald B. Hartzer
HQ AFCEA/CEBH



Dr. Ali Saeed Sadoon was the keynote speaker at the symposium. Here, he is seated to the left of Mr. Imad Hamza, ICDD Public Affairs Officer, during a break from the Fire Chiefs Conference held in Baghdad, Iraq this year. (U.S. Air Force photo)

Bronze Stars for RED HORSE

Amn James Dickens Two 823rd RED HORSE
16th SOW/PA Squadron members received
Bronze Star medals during a
brief ceremony at Hurlburt
Field, Fla., on July 30, 2004.



Bronze Star recipients TSgt Adam Henson and MSgt Don Petersen survey a runway crater at Baghdad International Airport, Iraq. (photo by Capt Joseph Logan)

MSgt Don Petersen and TSgt Adam Henson were presented the medals by Lt Gen Walter Buchanan, 9th Air Force commander, during his visit to Hurlburt Field and the RED HORSE unit. The men were honored for their engagement in ground operations against the enemy in support of Operation Iraqi Freedom. During this period, they were exposed to extreme danger from hostile gun fire and terrorist attack.

Both were thrilled to be recognized by their squadron, but gave most of the credit to their team.

“Receiving this medal is the greatest honor I’ve been given during my 20

years in the Air Force,” said MSgt Petersen. “But there were 32 guys on this team, and each of them deserves a Bronze Star for what they did.”

“I’m very proud and honored to have received the medal, but I wish everyone on the team could’ve had the same recognition,” said TSgt Henson. “It wouldn’t have been possible without the guys I had with me, so all my thanks goes out to my troops.”

After answering a few questions from unit members, the general applauded their success and encouraged them to keep up the good work. “The more you do, the more you’re able to do,” the general said, “and that’s even more true for civil engineers.”

AFMC Engineers Hit the Road

HQ Air Force Mobility Command civil engineers took to the road and completed the 8th annual Air Force Marathon at Wright-Patterson AFB, Ohio, on September 18, competing in the full marathon, half marathon and the military relay. The team was 17th of 49 in the military relay and Mr. Ed Finke placed 61st of 764 participants in the half marathon (time of 1:35:32). AFMC CE runners in this pre-race photo are (back row) Maj Rob Germann, Col Wes Somers, Maj Dayton Nooner, Maj Dwayne McCullion, (front row) Lt Col Jerry Christensen, Capt Shannon Gray, Capt Tammie Harris, and Maj Jim Kennedy; runners not pictured were Maj Chad Bondurant and Mr. Ed Finke. *(photo by Capt George Nichols)*



Selected for Promotion

David C. Abruzzi
John J. Allen
Mark S. Allen
Craig S. Biondo
Matthew J. Bobb
Gregory K. Brown
Sherry A. Brown
Charles K. Busch
Daniel J. Clairmont
Andra B. Clapsaddle
Ardyce M. Clements
Brett E. Crozier
Jacqueline Crum
Christopher O. Darling
Justin C. Davey
Andre R. Dempsey
Timothy C. Dodge
John T. Enyeart

Michael L. Furey
Robert T. Germann
John M. Griffin
Douglas D. Hardman
Valerie L. Hasberry
Marc V. Hewett
Anthony A. Higdon
James C. Hodges
Dathan B. Jones
David A. Kaweck
Steven E. Keller
Andrew A. Lambert
Rowene J. Lant
Steven M. Loken
Joseph R. Marcinkevich
Michael A. Mendoza
Ray A. Mottley
Brian C. Murphy

Michael L. Myers
Michael S. Nelson
Mark N. Neulander
Jeffrey W. Perham
David C. Piech
Paul A. Schantz
Gary J. Schneider
Rodger G. Schuld
Christopher L. Sharp
Nam N.M. Shelton
Dwayne E. Thomas
Brian D. Weidmann
Jonathan D. Webb
John C. Womack
Stephen D. Wood
James P. Zemotel
Stephen T. Ziadie
Mark A. Zimmerhanel

Lieutenant Colonel

Clark M. Andrean
Ronald A. Brown
Darryl J. Brundidge
Robert M. Buchanan
Mark T. Darden
Charles A. Dewar
James D. Donnett
Michael Drumming
Vincent Garrett
Denny J. Heitman
Robert C. Hodges

William N. Kendall
Jerry W. Lewis, Jr.
Scott R. Lohman
James B. Lucas
Wade F. Mackenstadt
Teresa G. Mangerson
Randall D. Marshall
Eddie R. McAnally
Anthony J. Michels
Brian I. Mosier
Troy D. Odden

James A. Route, Jr.
Bernard Sarinas
Jeffrey I. Schley
Michael A. Smith
Errol C. Tummings
Joseph A. Wright

Chief Master Sergeant



Technical Publications

Available on the AFCESA Web site:

<http://www.afcesa.af.mil/library/etl.asp?Category=Engineering%20Technical%20Letters>

ETL 04-5, Design Recommendation for Potable System Security
ETL 04-11, Recommendations for Incorporating Water System Emergency
Response Plan (ERP) Requirements
ETL 04-15, Electrical Safety Guidance
AFI 32-3001, Explosive Ordnance Disposal

Note: ETLs 04-5 and 04-11 are FOUO. They are available only on AFCESA's .mil-restricted Web site.

Senior NCOs Go Back to School

CMSgt Daniel Rohrbach
AFIT/CEM

Civil engineers are often the start-up, set-up troops for the Air Force, usually some of the first folks into a new area doing beddown at an airfield. CEs recently led the way again, but this time the “new area” was enlisted force development. When the Civil Engineer Superintendent Course (MGT 570) debuted in 2004, civil engineering became the first functional area to conduct continuing enlisted education at the Air Force Institute of Technology (AFIT).

The two-week CE Superintendent Course was developed to give senior enlisted CEs the broader view of their career field that they needed to become superintendents or managers. “We had to better prepare our top enlisted grades for what we were asking them to do in the future Air Force,” said CMSgt Mike Doris, Chief of Enlisted Matters for The Air Force Civil Engineer. “It was becoming more and more common for them to take over as flight chiefs, as superintendents, and as work section managers without the proper background.”

Each year, approximately 120 Active Duty, Guard and Reserve senior master sergeant-selects will attend one of the four courses

offered in residence at Wright-Patterson AFB, Ohio. Attendance is managed through the Air Force Personnel Center and is based on selection for promotion to senior master sergeant in the CE career field. It’s anticipated that, starting with the March 2005 line numbers, the course will be mandatory for obtaining a “9” skill level—a goal pursued by CEs from day one.

It took about two years and support from people at many levels to get the course online. CMSgt Doris initially briefed the concept as a senior enlisted force development tool at the 2002 CE Senior Leaders’ Meeting, then steered the course as it went through all the necessary channels—Air Staff and major commands, as well as Air University (AU) and Air Education and Training Command (AETC).

“When Mike Doris first broached this subject we—the MAJCOM Civil Engineers and I—put him through a pretty tough wringer to make sure that the concept was feasible and that the course would be properly targeted in terms of content and attendees,” said former Air Force Civil Engineer Maj Gen Earnest O. Robbins II (ret). “Based on what I saw when I visited the class recently,

Maj Gen Joseph A. “Bud” Ahearn (ret) chuckles while CMSgt Larry Daniels (ret) tells an anecdote to SNCOs at AFIT’s CE Superintendent’s Course. A highlight of each course is the opportunity for students to learn from CE’s founders. (photo by Ms. Kimberly A. Curry)



this was a watershed initiative in terms of contributing to the professional development of our key civil engineer NCO leaders.”

Both AU and AETC were involved because the CE Superintendent Course is a hybrid of sorts. Historically, most enlisted development courses have focused on technical training. As the first enlisted continuing education course at AFIT, all of AU’s requirements for new courses had to be met. At the same time, the course had to meet all of AETC’s requirements to be a prerequisite for a skill-level award.

The course covers a range of topics in civil engineering and related processes, including history, doctrine and mission; organizational structure; readiness issues; military and civilian personnel issues; funding and resources; and management techniques. Classes are structured around the eight CE flights to expose students to the different specialties within Air Force civil engineering and help them understand the interactions among the specialties.

SMSgt Rodger Brown oversees 45 people as the chief of operations for the 823rd RED HORSE Squadron’s Silver Flag site. On the job at Tyndall AFB, Fla., for only four weeks before class began, SMSgt Brown came prepared with questions on such topics as assignments and budgeting. “The range

and caliber of speakers and instructors in the class was outstanding, but honestly, for me, what I learned from the other students was almost as valuable,” stated SMSgt Brown. “It was a rare opportunity for me to get together with so many other CEs at my level and share our collective knowledge.”

The CE Superintendent Course benefits from having instructors and speakers representing an amazing depth and breadth of expertise within the Air Force. The Air Force Civil Engineer, Maj Gen L. Dean Fox, and CMSgt Doris came to all four classes in 2004, giving students the CE perspective at their level and conducting question-answer sessions. Former Air Force Civil Engineers and enlisted chiefs also contribute their time and expertise, giving students an appreciation for where Air Force civil engineering used to be and how far it’s come.

Subject matter experts are brought in for each of the eight CE flights. Ten hours of class time are devoted to what the students say is their number one concern: how to handle money or resources. Ms. Rita Maldonado, Chief of Resources for the office of The Air Force Civil Engineer, gives students a

capstone view of resources for civil engineering. A resident AFIT instructor details more specific strategies for handling resources at a squadron level.

The CE Superintendent Course remains a work in progress. To the question “What do you expect to get out of this class?”, students have invariably given three answers: knowledge on han-

AFIT’s first enlisted course prepares senior NCOs for heavy responsibilities as flight chiefs & superintendents.

dling money and resources; strategies for finding and managing manpower; and networking opportunities with other CEs. Our goals for the CE Superintendent Course are to meet these three expectations, while keeping the course relevant as the CE career field evolves.

The first enlisted instructor at AFIT, CMSgt Daniel Robrbach has 23 years of civil engineering experience. He came to AFIT from the 819th RHS at Malmstrom AFB, Mont.

Ed. note: The next session of MGT 570 will be held 4–15 April 2005.

ACES on the Web

Mr. Jeffrey A. Coleman
HQ AFCESA/CEO

Many civil engineers are familiar with ACES, the Automated Civil Engineer System. What they may not know is that there are also Web-based training modules for ACES.

ACES is a computer-based data collection and management system used by the Air Force civil engineer community to access a variety of information in real-time. Training on the system has traditionally been performed in classrooms or workshops, but with more functional areas coming on-line, ACES project managers needed a way to provide more efficient training.

“We’ve gone from user manuals and classroom training to more Web-based training because it is cheaper and you have ‘24-7’ access,” said Lt Col Delphine Rafferty, chief of the Technical

Integration Division of the Air Force Civil Engineer Support Agency (AFCESA).

“With Web-based training, you’re not locked into a standard classroom-type structure; you have the flexibility to learn in a way that suits you best. If you want to jump from one area to another you can. You don’t have to follow chapter one, chapter two, etc.”

Some classroom training is still available though, and trainers have even begun using the Web-based training as a supplement to their classroom training.

ACES was developed in the mid-90s by AFCESA, the Standard Systems Group and Northrop Grumman, and went online in 1998. The system is composed of components called modules.



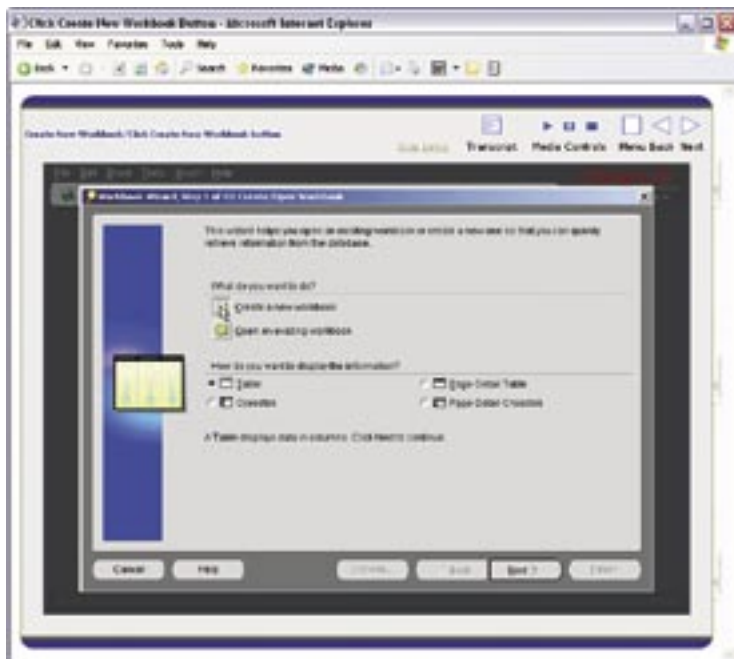
Personnel and Readiness, Real Property, and Program Management—and for the Discoverer report generating tool. It will be available soon for the Housing Management, Explosive Ordnance Disposal and Fire Department modules. Additional ACES training and support is available through two ACES “community of practice” Web sites. These sites contain forums where users can post questions, provide feedback for users who need help and browse discussions. Currently, only the personnel and readiness and real property module sites are available.

Each module supports a particular CE functional area.

To visit ACES Web-based training or create a community of practice account, go to <http://aces.afcesa.af.mil>.

Web-based training is available for several modules—

Mr. Coleman is a Northrop Grumman contractor who works as an interactive systems developer at HQ AFCESA, Tyndall AFB, Fla.



This is a screen from the Discoverer training module of ACES, with its media and navigation controls.

Wright-Patterson AFB OH

Course No.	Title	Off.	Start Dates	Grad Dates
ENG 460 (S)	Mechanical Systems for Managers	05A	07-Mar	11-Mar
ENG 464/466*	Energy Management Tech./Policy	05A/05A	24-Jan/31-Jan	28-Jan/04-Feb
ENG 555	Airfield Pavement Constr. Inspection	05A	07-Feb	11-Feb
ENV 022 (S)	Pollution Prev. Prog. Ops. & Mgmt.	05A	10-Jan	12-Jan
ENV 220 (S)	Unit Environmental Coordinator	05A	10-Jan	14-Jan
ENV 419	Envir Planning, Programming & Budgeting	05B	15-Mar	17-Mar
ENV 521 (S)	Hazardous Waste Management	05A	14-Feb	18-Feb
ENV 531 (S)	Air Quality Management	05A	24-Jan	28-Jan
ENV 541	Water Quality Management	05A	24-Jan	28-Jan
MGT 101	Intro to BCE Organization	05B	07-Feb	01-Apr
MGT 421 (S)	Contracting for CE	05A	28-Feb	11-Mar
MGT 423 (S)	Project Programming	05A	14-Mar	25-Mar
MGT 484	Reserve Forces AB Combat Eng.	05A	18-Jan	28-Jan
MGT 580	CE Advanced	05A	24-Jan	28-Jan
MGT 585	Contingency Eng. Command	05A	31-Jan	04-Feb
ESS 030 (W)	Stormwater Management	05B	14-Feb	18-Feb
ESS 090 (S)	Environmental Management	05C/05D	20-Jan/24-Feb	20-Jan/24-Feb

Resident courses are offered at Wright-Patterson AFB, Ohio. Registration begins approximately 90 days in advance. Students should register for CESS courses through the online registration process. Registration for the satellite offerings (marked with an 'S') closes 25 days before broadcast. For satellite registration, course information, or a current list of class dates, visit the CESS website at <http://www.afit.edu> (under Continuing Education).

** Must be taken together as a series.*

366th Training Squadron

Eglin AFB FL

Course No.	Title	Start Dates	End Dates
J3ACP3E871 - 000	EOD Craftsman	03-Jan/24-Jan/07-Feb/14-Mar	14-Jan/04-Feb/18-Feb/25-Mar

Sheppard AFB TX

J3ARR3E453 - 002	Pest Mgmt Recertification	24-Jan/07-Feb/14-Mar	28-Jan/11-Feb/18-Mar
J3AZR3E472 - 000	Liquid Fuels Storage Tank Supvr.	01-Mar/15-Mar/29-Mar	11-Mar/25-Mar/08-Apr
J3AZR3E051 - 003	Catholic Protection Maint.	24-Jan/07-Feb/28-Feb/15-Mar	04-Feb/18-Feb/11-Mar/28-Mar
J3AZR3E051 - 008	Electronic Distribution Sys. Maint.	06-Jan/04-Feb/07-Mar	03-Feb/04-Mar/01-Apr
J3AZR3E051 - 010	BARE Base Electrical Systems	06-Jan/07-Feb/28-Feb/21-Mar	20-Jan/18-Feb/11-Mar/01-Apr
J3AZR3E051 - 012	Fire Alarm Systems Maint.	06-Jan/02-Feb/01-Mar/25-Mar	02-Feb/28-Feb/24-Mar/19-Apr
J3AZR3E051 - 013	Intrusion Detection Sys. I&M	06-Jan/07-Feb/14-Mar	26-Jan/25-Feb/31-Mar
J3AZR3E052 - 013	CE Adv. Electronics	03-Jan/01-Feb/02-Mar/30-Mar	31-Jan/01-Mar/29-Mar/26-Apr
J3AZR3E071 - 001	CE Adv. Electrical Troubleshooting	06-Jan/04-Feb/07-Mar	03-Feb/04-Mar/01-Apr
J3AZR3E072 - 002	Troubleshooting Elec. Power Equip.	03-Jan/26-Jan/17-Feb/14-Mar	25-Jan/16-Feb/11-Mar/04-Apr
J3AZR3E072 - 113	BARE Base Power (Diesel)	03-Jan/31-Jan/28-Feb/28-Mar	27-Jan/24-Feb/24-Mar/21-Apr
J3AZR3E151 - 013	HVAC/R Control Systems	07-Jan/28-Feb	11-Feb/01-Apr
J3AZR3E151 - 014	HVAC/R Direct Expansion Systems	05-Jan/14-Feb/18-Mar	07-Feb/17-Mar/19-Apr
J3AZR3E151 - 015	HVAC/R Indirect Expansion Systems	10-Jan/28-Feb/18-Mar	28-Jan/17-Mar/06-Apr
J3AZR3E451 - 004	Fire Suppression Sys. Maint.	05-Jan/31-Jan/23-Feb/17-Mar	26-Jan/18-Feb/15-Mar/06-Apr
J3AZR3E471 - 101	BARE Base H2O P&D Sys.	05-Jan/01-Mar/15-Mar/29-Mar	14-Jan/10-Mar/24-Mar/07-Apr
J3AZR3E472 - 001	Liquid Fuels Sys. Maint. Techs	03-Jan/24-Jan	14-Jan/04-Feb
J3AZR3E050 - 001	Civil Engineering Work Estimates	24-Jan/21-Mar	11-Feb/08-Apr

Gulfport MS

J3AZP3E351 - 001	Low Slope Roofing M&R	24-Jan/07-Feb/28-Feb	03-Feb/17-Feb/10-Mar
J3AZP3E351 - 002	Fabricating Welded Pipe Joints	31-Jan/07-Mar	11-Feb/18-Mar
J3AZP3E351 - 003	Metals Layout, Fabrication and Welding	10-Jan/14-Feb/21-Mar	28-Jan/04-Mar/07-Apr

Ft. Leonard Wood MO

J3AZP3E571 - 003	Engineering Design	03-Jan/31-Jan/07-Mar	14-Jan/11-Feb/18-Mar
J3AZP3E571 - 005	Construction Materials Testing	18-Jan/14-Feb	28-Jan/25-Feb
J3AZP3E971 - 003	Adv. Readings	07-Feb/14-Mar	11-Feb/18-Mar
J3AZP3E971 - 005	NBC Cell Operation	24-Jan/14-Mar	28-Jan/18-Mar
J3AZP3E571 - 004	Construction Surveying	21-Mar	01-Apr
J4OST32E3D - 000	FSTR Mobile Training Team (MTT)	07-Feb/14-Feb/21-Mar	11-Feb/18-Feb/25-Mar

Ft. Lee NJ

J5AZA3E251 - 000	Sling Load Inspector Cert.	31-Jan	04-Feb
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Indian Head MD

J5AZN3E871 - 001	Adv. Access and Disablement	03-Jan/24-Jan/14-Feb/07-Mar/28-Mar	14-Jan/04-Feb/25-Feb/18-Mar /08-Apr
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Additional course information is available at <https://webm.sheppard.af.mil/366trs/default.htm> or <https://etca.randolph.af.mil>. Students may enroll on a space-available basis up until a class start date by contacting their unit training manager.

Engineer vs. "Engineer"

Air Force civil engineers have all sorts of duties: building construction, pavement repair, HVAC maintenance, bed-downs, contingency support ... Anyone could add to the list, but one contingency most people wouldn't think to add is battling other "engineers." In this case, the foe is one of Mother Nature's finest builders: bees.

At Davis-Monthan AFB, SrA Ruth Spierling (pictured) got called out to spray a hive of Africanized "killer" bees. Unbeknownst to most of us, such situations fall in the province of CE duties. Pest control is just one of the many things handled "behind the scene" by a base's civil engineers.

As with any job, this one has its own special gear. To protect herself from stings, SrA Spierling has to wear outer clothing made of canvas and a mesh-draped helmet. It's all in a day's work.

