Air Force
CIVIL ENGINEER
Vol. 14 • No. 1 • 2006

Seconds before disaster

photo by Mr. Keith Fred

From the Top

Recognizing the Best!

In February, we recognized the "best seen to date" from a career field that continues to astound me each and every day. Selecting this year's recipients was tougher than ever; it's increasingly difficult to choose the MVPs from our team of absolute all-stars. As is the tradition, senior leaders and former Air Force civil engineers came together for the annual recognition reception and awards luncheon, and they wholeheartedly share my view that the future of our career field is in great hands. My thanks to everyone for putting the time into building outstanding nomination packages, spending long hours reviewing and grading submissions, and ultimately orchestrating the pinnacle events held here in Washington, D.C. We've again raised the standard for how an annual awards program should be run. Congratulations to all the Air Force Civil Engineer Annual Award winners!

Turning to daily Air Force business, we are again entering an era of major transformation, making the next few years as exciting and challenging as any in our careers. When the Secretary and Chief of Staff of the Air Force announced this new transformation initiative last year, we immediately started the planning effort to support their vision. The Air Force Transformation direction is clear: "We are applying Capabilities-Based Planning and Programming and relentlessly pursuing Innovation to develop 'Transformational' Capabilities that will enhance Joint and Coalition Warfighting. New Flexible and Agile Organizations are being created to facilitate transformation and institutionalize cultural change while new Business Processes will provide fast, predictable operational support to the Warfighter."

To meet the challenge, senior civil engineers gathered to carve out a path to success. We are seeking initiatives that will make the career field leaner, operate smarter, and focus on the #1 warfighting mission priority for our Chief of Staff: "Win the War on Terror." We will unveil these initiatives over the next few months as the Air Force lays out its major transformational movements. Our intent is to be aggressively proactive in this process to shape the future of civil engineering the way it ought to be shaped.

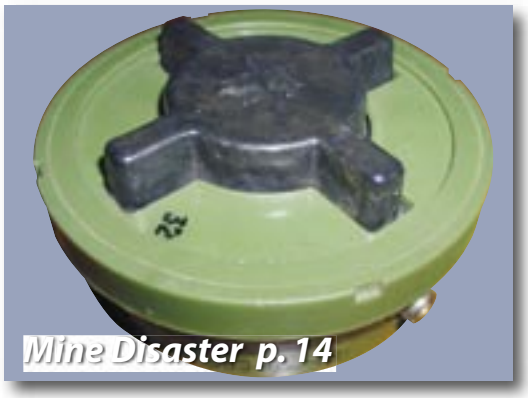
These next few months will also bring warmer weather to our bases, and we'll start making plans for weekend activities and upcoming summer vacations. Additionally, our motorcycle enthusiasts tend to pull the covers off their bikes and take to the open road. As part of your activities, I urge you to keep safety in the forefront, promote the "wingman" mindset and stick with your fellow airmen. For those more experienced motorcycle riders, take the time to mentor young riders through their initial safety courses; keep them focused and keep them safe. I'll be traveling a lot this spring, and I look forward to seeing many of you over the next couple of months.

Sallie and I wish you and your families continued health and success!

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

Air Force Civil Engineer

Vol. 14 • No. 1 • 2006



Air Force Civil Engineer
Vol. 14 • No. 01 • 2006
ISSN 1555-8991

Air Force Civil Engineer is published quarterly as a funded newspaper by the Professional Communications staff at the Air Force Civil Engineer Support Agency, Tyndall AFB, Fla. This publication serves the Office of The Civil Engineer, HQ U.S. Air Force, Washington, D.C. Readers may submit articles, photographs and artwork. Suggestions and criticisms are welcomed. All photos are U.S. Air Force, unless otherwise noted. Contents of *Air Force Civil Engineer* are not necessarily the official views of, or endorsed by, the U.S. government, the Department of Defense or the Department of the Air Force. Editorial office: *Air Force Civil Engineer*, AFCESA/CEBH, 139 Barnes Drive, Suite 1, Tyndall AFB FL, 32403-5319, Telephone (850) 283-6242, DSN 523-6242, FAX (850) 283-6499, and e-mail: cemag@tyndall.af.mil. All submissions will be edited to conform to standards set forth in Air Force Instruction 35-301 and The Associated Press Stylebook. *Air Force Civil Engineer* is accessible on the Internet from AFCESA's home page: http://www.afcesa.af.mil.

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On the cover: Maj Matthew Conlan snapped this photo in Afghanistan shortly before SSgt Chris Ramakka (kneeling) stepped on a land mine. When the mine exploded, both men were severely injured; A1C James Wesson (standing) was treated for minor injuries and released.

Command Focus Air Combat Command

Ms. Teresa Hood
Editor

At the end of every staff meeting, civil engineers in the Installations and Mission Support Directorate at Headquarters Air Combat Command leave with the same final instructions: "Make a difference. Make it better."

The CE's call to action comes from Col Timothy Byers, the HQ ACC/A7 director and the command's Civil Engineer. Like the other major commands, ACC is looking toward the possible changes brought by BRAC and the Quadrennial Defense Review and the challenges of potential reductions in funding and manpower.

"I keep emphasizing that we need to be ready, we need to be thinking outside of the box, to get rid of redundancies and become more efficient, to provide a better product to our warfighters and to our customers—the wings," said Col Byers. "We need to concentrate on our core competencies and, in my opinion, lead the Air Force through a resource-constrained time as [it] reorganizes and recapitalizes for the future. We will have to stop doing some things because it is not about 'doing more with less,' but rather 'doing less with less.'"

ACC ranks as the largest major command in several categories—the most major bases (15); the greatest number of personnel (113,000), and the most housing units (23,668) and dorm rooms (13,892)—all of which give the command's CEs a lot to handle. ACC's Military Construction program total for 2005 was $384M; operations and maintenance was $960M; and sustainment, restoration and modernization totaled $415M. These amounts don't include the funding and projects HQ ACC handles through U.S. Central Command Air Forces for bases in the Southwest Asia area of responsibility.

"We do for the AOR what we do for the stateside bases: typical headquarters functions," said Col Neal McElhannon, HQ ACC/A7's Deputy Director for Civil Engineering. "It adds a very broad piece to what we do."

Among other projects in Southwest Asia, HQ ACC is managing a $400M+ upgrade program for Al Udeid AB, Qatar; a $65M airfield project at Bagram AB, Afghanistan; and a $150M airfield improvements project at Balad AB, Iraq. The total value of projects managed by HQ ACC within the SWA program is more than $1B.

The 210 military and civilian CEs in HQ ACC's A7 Directorate furnish more than support to bases in SWA. Because ACC is the primary force provider for the combatant commands, they also contribute expertise and management in training, equipping and maintaining combat-ready CEs for deployments. Currently, ACC has approximately 4,000 Prime BEEF and 1,600 Total Force RED HORSE personnel postured across the 10 AEF buckets.

"All of the engineer functions—[explosive ordnance disposal], fire, readiness and traditional Prime BEEF—are deploying at a pretty good rate," said Maj Patrick Obruba, ACC's PB manager. "And increasingly, what we're deploying folks for is 'in lieu of Army' support missions." On an average, 50–60% of ACC's PB engineers could deploy with each rotation; some other specialties, including EOD and pavements, could deploy at a rate of 100%.

"Our first focus has to be on the AEF and the warfighter," said Col Byers. "Second behind that is recapitalizing and maintaining our infrastructure back home, because we're going to have it for a long time."

HQ ACC's CEs play a lead role in several Air Force and joint service programs. "ACC/A7 has the lead for the Agile Combat Support module for the Combat Air Forces Strategic Master Plan," said Col Andrew

Knapp, who heads the Integrated Mission Support Division. "We've also been tasked to be the ACS master capability flight lead for the Sustain the Mission, Forces, and Infrastructure modules."

ACC is also the CAF lead for new weapons, "which means any newly identified facility requirements to support a new system beddown in another command must be sourced within our [program objective memorandum]," said Col Maryann Chisholm, head of the Programs Division. "And for ACC, some of our more important MILCON programs are for new weapons—the beddown of the F-22A Raptor at Langley and Nellis will total over $167M from FY02 through FY08, and the Predator beddown at Creech in Nevada includes facilities costing over $140M through FY09."

HQ ACC's Readiness Division also serves as the lead for several key joint service modernization programs. Mr. Joe Fisher, who heads the program, said, "EOD robotics and equipment development, which the Navy heads, is one. The joint initiative to improve capabilities for airfield damage repair and rapid ramp expansion is another."

Most of the focus has been on EOD robotics because of the SWA mission. "The Air Force had 31% of the manpower in Operation Iraqi Freedom," said CMSgt James Petree, ACC's EOD functional manager. "And we're handling 38% of the missions 'outside the wire.'" But in the last year or year-and-a-half, the modernization program has begun to refocus on airfield damage repair. "This is a requirement coming out of CENTAF because many of the Soviet-designed airfields we're occupying were not built for both fighters and heavies, so we're having a lot of deterioration," said Mr. Fisher.

The Readiness Division also has responsibility as the Air Force lead for the joint Chemical, Biological, Radiological and Nuclear defense equipment modernization program. "We have about 29 different research and development and acquisition programs ongoing across the CBRN defense spectrum," said Lt Col Daniel Clairmont, chief of ACC's Incident Management and Modernization Branch. "It's actually run at the DoD level; they're trying to standardize the CBRN defense equipment across all the services."

Within Air Force civil engineering, HQ ACC's Readiness Division serves as the lead for RED HORSE and has just begun an initiative—RED HORSE Way Ahead—to ensure that RH remains viable and relevant in the future. "We are taking what was previously 10 [unit type codes] and breaking them out into 33 task-organized UTCs," said Maj Stephanie Wilson, HQ ACC's RH Manager. "At the same time we're reducing the RH deployment equipment set by 33%, to maximize capability while minimizing airlift requirements. It will make RH leaner and more efficient."

"We have to make sure we're lean in what we do, and that we're doing it in the most efficient and effective way," said Col Byers, "because we just won't have the resources that we've had—manpower or dollars will be reduced as the Air Force reorganizes and recapitalizes."

In the goal of becoming more lean and efficient, the civil engineers in HQ ACC's A7 directorates have integrated some basic headquarters processes and have developed some innovative tools (see *ACC Builds the Right Tools*, p. 6).

"Regardless of our resources, we still want to provide quality products and services, whether deployed or in garrison." said Col Byers. "The only way I know how to do that is by letting my great staff loose to be more innovative, to take risks as they work with the smart people at the bases to find a better way…to make it faster, cheaper and better. If they can't find a better way to do it, I don't know who can."

Colonel Timothy A. Byers became the Director of Installations and Mission Support for Headquarters Air Combat Command in September 2005. He leads ACC's base and expeditionary Mission Support Group activities for Civil Engineering, Security Forces, Services and Contracting. At Langley AFB, Va., he currently oversees all aspects of civil engineering for ACC's 113,000 personnel at 15 major bases and numerous smaller installations.

ACC Builds the Right Tools

Ms. Teresa Hood
Editor

Faster, cheaper, better—three goals for the civil engineers in Headquarters Air Combat Command's Installations and Mission Support Directorate as they look for new ways to do business in a resource-constrained environment. Reduced funding and manpower mean, as it's commonly said in industry, "you can't do today's job with yesterday's methods and be in business tomorrow."

3D visualization (Ellsworth AFB main gate) is just one of the tools that HQ ACC/A7 uses to work faster, cheaper and better. (graphics courtesy HQ ACC/A7)

"We have to stop doing some things because it's not about doing 'more with less,' but rather doing 'less with less,'" said Col Timothy Byers, head of the A7 Directorate, and the command's Civil Engineer.

It takes the right tools to meet those goals. "The Air Force is providing us with the AFSO 21 toolkit [Air Force Smart Ops for the 21st Century] that includes process improvement initiatives like Lean and Six Sigma," said Col Byers. "This will give us the tools and authority to make improvements where we can, while allowing oversight to ensure safety and combat effectiveness."

HQ ACC/A7 is already following the Lean process, making operations as efficient as possible and cutting the time needed to complete projects. However, they're also coming up with some tools of their own, for themselves and for CEs to use at their bases.

For CEs at their own bases, there are two tools. The first, the Civil Engineer Repair and Maintenance Program, "is a contract initiative to provide repair and maintenance capability, but only for units with a deployment," explained Col Otis Hicks, chief of the Civil Engineer Operations Division. "It's basically a 'plug and play' template for the base CE operations flight. It provides a contracted workforce and covers direct scheduled work orders, recurring work programs, and facility maintenance teams." The second tool is a template for performance-based service contracts. "It obviously saves time for the bases, but it provides cost savings as well," Col Hicks said. "It covers the big three: custodial, refuse and grounds."

To streamline base planning processes and create more 'visible' installation road maps, HQ ACC's Programs Division is employing electronic tools into an Installation Dashboard. "We're linking electronic or Web-based general plans to real-time project data in the Automated Civil Engineer System and to dynamic GeoBase data," said Col Maryann Chisholm, who heads the division. "We're creating the required mission data sets to support all aspects of a comprehensive base plan, and we're upgrading our airfield obstruction management systems to integrate better with GeoBase."

CEs in the Programs Division developed a unique Military Construction scoring model to prioritize the command's building projects. "This is the second year we've

used it," stated Mr. Bruce MacDonald, chief of Program Development. "The mission supported and its impact on mission capability are the most important factors, but the scoring model also helps us do a better job of capturing the priorities of the wing commanders and our directors."

To execute ACC's MILCON projects, the Design and Construction Division uses the customer concept document as one of its primary tools. "It's something we started here about 10 or 12 years ago," said Mr. Mike Ethier, chief of Project Management West. "We invest about $75,000 in O&M up front for a charrette process, getting the users and the architects and engineers together, and we end up with a preliminary study of the customer's requirements, a good parametric cost estimate, and concept floor plans and elevations. This way we have a lot fewer changes down the road—it really reduces the time and cost of the follow-on technical design."

As an extension of the customer concept document, the Design and Construction Division recently added another planning tool: 3D visualization. "We just started it at full effort this year," said Mr. Mark Hunt, Chief of Project Management East. "The floorplans and elevations developed at the end of the concept document process are re-created in three dimensions, in color, on a computer, and customers are taken through floor plans to an exterior fly-by or walk-about and an interior walk-through of their proposed facility. It really helps customers identify problems or needed changes early on."

HQ ACC's Environmental Division has been using its Future First Planning process for several years, integrating individual clean-up sites into base development plans to optimize an installation's land use. "We've gone a bit further now," said Mr. Robert Barrett, the division chief. "We developed a larger solution that we call performance-based restoration or PBR, a 'fence-to-fence' concept where everything within the fence is under a contract with regulatory site closure as the end goal. Whiteman was our test run, and we've done that for Langley, Shaw and Seymour Johnson. We've also implemented larger contracts, including a four-base and five-base effort designed to reduce the number of operating systems and monitoring requirements across the command, achieving a better than 30% cost savings. With PBR, we're going to achieve our regulatory cleanup goals in the established time frame and return usable property to the installations."

HQ ACC has integrated a lot of processes. Environmental planning has been integrated with community planning and this unified planning is now linked to program requirements and project development. Col Chisholm said, "This integrated planning concept gives us early input and resolution of siting and environmental impacts to new and current mission projects."

"Integrated planning is essential to our installations, and is something I think we'll see more of in the future," said Col Byers. "It's one of the good things we're doing, and I think you'll see a lot of other good things coming out of our command. I've challenged my people: It's their job to come up with great, innovative ideas on how we can do things better, to best use our resources—time, money and manpower. We will have to do less with less in the future; we have to make a difference, and we have to make it better."

Never tell people how to do things. Tell them what to do and they will surprise you with their ingenuity.

Gen George S. Patton, Jr.

From Rubble to

The arrival of a lone KC-135 at Grand Forks AFB, N.D. on Oct. 30, 2005 marked the unofficial opening of Air Mobility Command's newest state-of-the art runway and the end of a long summer of construction at the base.

2Lt Joseph Wierenga
319th CES/CECE

Originally built in 1956, the 47-year-old runway's history includes serving both B-52 Stratofortresses and B-1 Lancers under Strategic Air Command. In 1958, when the runway was widened from 100 to 300 feet to handle the larger strategic bombers, extra pavement was added to only one side, producing a crown that was actually 50´ east of the runway centerline. Grand Forks is now home to KC-135 Stratotankers, whose operational requirements call for a runway width of only 150´. A May 2003 infrastructure assessment revealed an urgent need to repair or replace the runway. That, combined with the runway's off-center crown and the rising costs of maintaining the extra pavement, convinced AMC that it was time to bring the runway up to current standards.

The $27.5M O&M project was the Air Force's largest in FY04. Grand Forks AFB's 319th Civil Engineer Squadron, AMC's Infrastructure Branch, and the Army Corps of Engineers' Transportation Systems Center collaborated with several contract firms to take an innovative approach to the project that incorporated state-of-the-art technology with revolutionary construction methods. With construction costs at an all-time high, cost containment was an important consideration.

Runway

The design process began in August 2003 and lasted almost 12 months. Several runway repair options were presented by the design team, ranging in scope from all new concrete to various combinations of concrete and performance grade asphalt placed on top of the existing concrete runway after rubblization. The latter was chosen based on life cycle cost analysis. Rubblization, which has been used on very few military airfields, involves breaking existing pavement, rolling it, and leaving it in place to serve as a base course for the new pavement (see article on rubblization, p. 11).

Construction began in earnest on March 22, 2005, with a climate-driven deadline of November 1—paving operations had to be complete before low temperatures hit or be delayed until the following spring. Construction started with concrete removal and crushing operations, followed by trenching and underdrain installation. Then the entire airfield was closed so the contractor could start rubblizing the concrete pavement.

The Army Corps of Engineers' Engineering Research and Development Center closely monitored the entire design and construction process. They performed tests both before and after construction in order to evaluate structural properties for rubblized concrete base courses.

The specifications called for rubblization using both resonant and gravity breakers. The project was started using a resonant breaker to send very fast shock waves into the concrete, literally vibrating it apart. The method worked, but was too slow, and the machine was plagued by breakdowns, so only a small percentage of the pavement was broken in this way. The remainder of the surface was done using a common guillotine breaker to crack the pavement into 12″–15″ pieces and then a multiple-hammer breaker—with up to 16 separate, 1,000 to 1,500-pound breaking hammers—broke the top half of the concrete slabs into 6″ pieces. These machines were followed by special rollers with "Z-grid" drums to seat the concrete pieces and vibrate them into a very stable permeable base. Because the new runway is paved atop the existing pavement, its elevation is 1.8′ higher than its predecessor.

The runway design called for 1000′ of 16″ thick concrete pavement at the north end; 1,080′ of concrete at the south end; 10,270′ of 9″ thick asphalt in the center; and 3″ thick asphalt overruns of approximately 1,000′, for a total length of 14,370′.

The Army Corps of Engineers' Engineering Research and Development Center closely monitored the entire design and construction process.

The asphalt proved to be a sticking point in the construction process. Performance grade 64-40 asphalt binder was specified for this project because it could handle temperature extremes (especially lows) without cracking. But PG 64-40 had never been used on an Air Force project, so the contractor had no experience with it and despite numerous attempts could not produce a test strip that met density requirements without check-cracking during rolling. Based on recommendations by a team of pavement engineers from private industry and the Department of Defense, design specifications were modified to allow the successful substitution of PG 64-34, a binder more commonly used in North Dakota, with a proven history in the harsh northern climate.

The contract specifications were also modified to include a sliding pay scale, which was originally included in draft specifications but was omitted in the final edition. This allowed the contractor to be paid at a reduced rate for deficiencies that didn't fully meet specifications but wouldn't significantly affect the strength or quality of the final product. Without a sliding pay scale, the contractor would have had to remove pave-

ment if it missed a parameter by only a fraction of a percent, significantly increasing the contractor's costs and greatly affecting the tight schedule and climate-driven deadline.

Paving was completed on September 19 and pavement marking and electrical work (see box) kicked into high gear. Much of the electrical work had been completed concurrently with paving, but the lights couldn't be installed until after paving. To prevent potential "birdbaths" created by paving around edge lights and to maintain a better transition between runway and shoulder pavement, the contractor used GPS to pre-position the light cans. After shoulder paving was completed, workers cut a circle above each light can location using an 18″ diameter core drill. The light cans were then installed in PVC liners and encased in concrete. This gave a very clean result that didn't require patching around the lights.

Grooving in the concrete portions of the runway was completed concurrently with the asphalt paving. However, transverse grooving of the asphalt portion won't be complete until early spring of 2006, because of the 30-day cure specified for the asphalt as well as lengthy delays caused by wetter than normal weather.

The Grand Forks runway officially opened with a ribbon-cutting on Nov. 7, 2005, giving the base a state-of-the-art runway that will carry Air Force aircraft for many years to come.

2Lt Wierenga is a project engineer with the 319th CES, Grand Forks AFB, N.D.

Left: The guillotine breaker cracked the pavement into 12″–15″ pieces. Center: The multiple-hammer breaker—with up to 16 separate, 1,000–1,500 lb. breaking hammers—broke the chunks from the guillotine breaker into 6″ pieces. Right: The Z-Grid roller seated the rubblized concrete and vibrated the pieces into a stable base. (photos courtesy Applied Research Associates)

Runway lighting at a glance

In addition to the pavement work, a large amount of electrical equipment was installed during the runway project:

- Installed new High Intensity Runway Edge Lighting System on the primary runway.
- Modified two existing ALSF-I approach lighting systems.
- Relocated two Precision Approach Path Indicator Systems.
- Re-installed runway distance markers.
- Installed new taxiway edge lighting and signage system.
- Installed new electrical duct bank system and updated computerized controls.

Electricians installed over 126,100 linear feet of cable, over 102,100 linear feet of conduit, 391 light fixtures mounted to base cans, and over 500 L-823 connector kits with heat shrinks. Runway 17/35 at Grand Forks AFB now has a lighting system that meets all current Air Force criteria.

Mr. Don Marlen, HQ AMC/A7O, Command Electrical Engineer

The Rubblization Procedure

Mr. Guy Ivie
Staff writer

Rubblization isn't exactly a new idea. Over the past 20 years, the procedure has gained in popularity as an option for rigid pavement rehabilitation. It's been used successfully on highways and airport runways around the United States. With this procedure, the existing concrete material, rather than being removed from the site, becomes a structural layer overlaid with new concrete or asphalt. One of the biggest advantages is monetary: rubblization costs 66% less than removing the old concrete and starting fresh. Other benefits can be time savings, reduced environmental impact and a smoother ride.

Rubblization fractures the existing slab and breaks it into particles ranging from sand-sized to 3″ at the surface and from 12″–15″ at the bottom of the rubblized layer. The end result is a material comparable to a high-quality aggregate base course. There is no need to align joints when the new concrete overlay is applied. The rubblized layer also eliminates thermal expansion/contraction, thus helping to prevent reflective cracking in the concrete overlay.

Two types of breakers are used for rubblization: resonant and gravity. Resonant breakers use vibrating hammers to send high-frequency, low-amplitude shock waves into the concrete layer while maintaining the base integrity of the pavement. Gravity breakers work in pairs. The first, a guillotine breaker, employs a wide drop-hammer to make the initial fracture. Then a multi-head breaker—with up to 16 individual drop-hammers weighing 1,000–1,500 pounds—breaks up the fractured slab into smaller particles. After the breakers comes a vibratory drum roller that seats the fractured concrete and breaks up larger particles on the surface.

Although rubblization is becoming more popular, there is still no single standard design procedure or methodology for characterizing the rubblized layer. Without standards, there is a risk of premature failure. The U.S. Army Engineer Research and Development Center in Vicksburg, Miss., conducted a study of airfield concrete pavement rehabilitation using rubblization. The goal is to help set the standards to be followed in future projects.

The first phase of the study evaluated existing equipment and techniques for use on thick airfield pavements. The second phase involved validation and calibration of the rubblization procedure through field demonstration projects. Researchers conducted visual pavement condition surveys and then performed structural evaluations using a heavy-weight deflectometer. Hunter Army Airfield in Savannah, Ga., and Selfridge ANGB in Selfridge, Mich., were selected for the study because they've both undergone rubblization projects in the past three years.

Although this study was completed before the Grand Forks AFB project (see page 8) got fully under way, the USACE ERDC monitored the work done there. Those observations will be used in the determination of rubblization construction specifications.

For more information, contact Mr. Jim Greene at HQ AFCESA: DSN 523-6334 or james.greene@tyndall.af.mil.

Intermediate results of rubblizing at Selfridge ANGB, Mich. (U.S. Air Force photo)

Closing K2

The last members of the 416th Expeditionary Civil Engineer Flight departed Karshi-Khanabad AB, Uzbekistan, on Sept. 1, 2005. Four years of Air Force CEs providing front line support in the Afghan theater of operations had come to a close.

Maj Derek Ferland
100th CES/CEC

Prior to K2's closure, the U.S. Army acted as base operating support integrator and the CEF's role was narrowly focused to managing airfield construction projects to support the 416th Air Expeditionary Group's intratheater airlift mission. With 16 C-130 aircraft and approximately 500 personnel, the 416th AEG made up about half the base population. The CEF comprised nine contractor escorts, six heavy equipment operators (a.k.a "Dirt Boys"), an engineering assistant/construction inspector, and two officers who worked closely with the Army's Directorate of Public Works.

During four years at K2, the various CE Air and Space Expeditionary Force rotations executed contracts worth more than $13M plus many troop labor projects. The contract construction projects included several ramp expansion projects as well as a $6.2M state-of-the-art airfield lighting system to replace an Emergency Airfield Lighting System that was well beyond its useful life. During the final AEF rotation, the Dirt Boys inaugurated an airfield obstruction reduction program at K2 and hauled away approximately 200 tons of debris from the flightline area.

From the Air Force's perspective, K2's closure was methodical and relatively painless. Following the host nation's notification on July 29, 2005, that all U.S. forces had to leave K2 within 180 days, we immediately canceled $700K of funded construction projects that had not yet started. By mid-August, all ongoing projects were completed and the flight's tools and equipment were shipped to other CE units in the theater.

From the Army's perspective, however, base closure was an entirely different exercise. Capt Alan Taylor, from the U.S. Army Facility Engineer Group – Southwest, FET-12, was responsible for ensuring compliance with environmental guidelines and cleaning up the base. He was part of the final contingent of U.S. personnel to leave K2 on November 21—nearly 2 months ahead of schedule.

According to Capt Taylor, time was the most critical limiting factor for base closure. Not much could happen until the aircraft left K2, and the aircraft couldn't leave until other bases in-theater completed several critical infrastructure projects to accommodate the 416th AEG assets. But Capt Taylor noted, "The time spent waiting on the Air Force's departure from K2 gave us time to finalize the closure plan, so we were ready to execute once the Air Force was gone."

Capt Taylor was able to put his closure plan into action by early September. Its main component was a $7M contract to transport the modular billeting and admin facilities from K2 to Bagram AB using Uzbek transport companies before adverse winter weather closed the mountain passes in October. (A few relocatable buildings also went into Afghanistan by rail.) Capt Taylor described the frenetic pace of the project: "We used three contractors to save time and stay ahead of the winter weather. It was important for us to get the barracks into Afghanistan to help get our troops out of tents before the really cold weather arrived."

Capt Taylor had to eliminate infrastructure and utilities while still providing them to the 250-person team—a delicate balancing act. Expeditionary assets (Harvest Eagle/Falcon) were not an option. Security lights, power to buildings, and status of the cell phone tower became hot topics for daily discussion.

Generators and tents had to be shipped to Afghanistan in August in preparation for nationwide elections there in September. Fortunately, K2 had a few facilities with dedicated standby generators. Closure crews moved into them, which allowed the generator plant—four 1.5 megawatt generators—to be forward-deployed. After the dining facility closed on November 9, the closure team got by on MREs and bottled water. A portable toilet service contract provided much-needed relief, and an old Soviet treatment plant was put back into service to handle black and gray waste water.

In all, 16 troop billeting facilities and several admin buildings were relocated to Afghanistan, providing an immediate quality-of-life upgrade for hundreds of troops there still living in tents. K2's closure team lived in reasonable comfort over the final two months, but it was a far cry from previous standards. The base had been widely recognized as having the finest facilities in the theater.

From an engineer's perspective, K2's closure yielded valuable information in three areas:

1. Understanding the critical path. The U.S. Army was responsible for managing the list of closure actions, yet the critical path was driven by Air Force infrastructure projects to support the 416th AEG beddown at other locations.

Weather was a critical 'X' factor because the plan relied exclusively on ground transportation.

When the 416th AEG departed K2 in mid-September, Capt Taylor was left with about six weeks to execute the plan with a guarantee of reasonably good weather. This tight timeline contributed to the decision to use three separate contractors to harvest and move the relocatable facilities.

2. Roles and responsibilities. For most of the Air Force units in the 416th AEG, the natural inclination was to contact the Air Force engineers for closure support. The Air Force engineers did coordinate several cleanup efforts at the airfield and in Air Force admin areas, but many requests had to be passed onto the Army engineers for action. The Air Force engineers also coordinated with gaining installations as needed to make sure the 416th AEG's reception was as smooth as possible.

3. Maintaining infrastructure during draw down. Closing down K2 did not mirror the smooth build-up effort. All bare-base assets went to Afghanistan in August. Reliance on local contracts for bottled water, portable toilets, and rubbish removal was an absolute necessity. Had the back-up generators not been available, and if there were no generators available for rent locally, the closure personnel would have been billeted off base, which might not always be a feasible or desirable option.

An aerial view of K2 shows the scope of the closure task. (U.S. Air Force photo)

As is frequently the case in the theater, Air Force engineers worked hand in hand with Army engineers to make this project happen. Close coordination and open communication in this joint environment helped all parties understand the critical path for closure activities and ensured that they provided complementary—not redundant—support.

Maj Ferland commanded the 416th ECES during AEF 6.

Recovering from a Mine Disaster

MSgt Michael A. Ward
HQ AFCESA/PA

On June 17, 2005, two Air Force civil engineers assigned to the 455th Expeditionary Civil Engineer Squadron, Bagram AB, Afghanistan, were severely injured when a land mine exploded. One had his foot blown off. The other received serious damage to both legs.

Both men are now on separate journeys towards recovery. One underwent a below-the-knee amputation and is working through the long rehabilitation process at Brooks Army Medical Center in San Antonio, Texas. The other is in constant pain as surgeons at Wilford Hall in San Antonio work to help him keep his leg.

Their day started routinely— as routinely as a day in a combat zone could. SSgt Chris Ramakka, an explosive ordnance technician deployed from the 6th CES, MacDill AFB, Fla., and other EOD members were cleaning up an old Soviet artillery site approximately 12 miles from Bagram.

The type of Soviet mine that injured Maj Conlan and SSgt Ramakka.
(U.S. Air Force photo)

"The guys had scouted out the area the day before, and we were picking up 122mm and 155mm tank rounds," SSgt Ramakka said. "I was walking back and forth looking for stuff on the ground, picking it up and taking it away."

His squadron commander, Maj Matthew Conlan, deployed from the 422nd ABS, RAF Croughton, United Kingdom, was out with the team, observing the removal operation.

"I like to go out with my guys," the major said. "If they're swinging hammers, I'll swing hammers with them. If they're pouring concrete, I'll pour concrete with them. It gives me perspective and expertise."

The area was a few hundred feet from a known mine field, but it had been marked off and they were well away from it.

"If we had known we were working in a mine field we wouldn't have been there. It wouldn't be worth our time, because you can get blown up in a place like that," said SSgt Ramakka, irony gleefully intended.

"Besides," he tossed out, "the Afghans were walking around all over the place. If the locals are walking around, now, that's not a guarantee, but if the locals are walking in an area, you are pretty safe."

They weren't. Somehow, the markers had moved, been moved, or had been incorrectly placed to begin with. They had been walking in a mine field for hours without so much as a misstep. That was about to change.

"There's a picture of us Maj Conlan took probably not 30 seconds before I stepped on the mine," said SSgt Ramakka. "I was probably standing on it for a minute or so while I was talking to Maj Conlan. Then I went to move…"

SSgt Ramakka's story continues at the top of page 15. Maj Conlan's continues at the bottom of the page.

"I thought that the major had tried to kill me..."

SSgt Chris Ramakka
(U.S. Air Force photo)

"…It didn't even occur to me that it could have been caused by me, but eventually I realized what happened."

SSgt Chris Ramakka had stepped on an old Soviet pressure-sensitive anti-personnel mine, designed to blow up not when weight is put on it, but when it is removed. As he stepped off the mine, it exploded, blowing off his left foot and the tips of two fingers on his right hand, and damaging his right leg.

"Right after, I saw my leg and I was pretty irritated. I was angry and hitting the ground when sanity caught up to me and said, 'You know, you're in a mine field.' So I rolled back over and waited.

"I assessed myself, wiggled my fingers, took off my gloves, looked at my hands and I was happy because I still had my knee. If I was going to lose my leg, it's easier if it's below the knee. I never thought I was going to die. It hurt, but it's supposed to, so I wasn't really shocked by that."

Maj Conlan, who was behind SSgt Ramakka, was blown to the ground, his right leg shattered and his left leg severely injured (see page 17).

Civil engineers in the area quickly began applying self-aid/buddy care to try and stabilize the injured Airmen. Eventually they were joined by an Army medic.

"I remember the guys were down there looking for my foot and I'm thinking, 'It's gone. You're not going to find that thing.'"

Continued on page 16.

"I don't remember hearing the explosion..."

Maj Matthew Conlan
(U.S. Air Force photo)

"…What I remember was something like someone flicking the lights on and off," said Maj Matthew Conlan. "Then, everything went into slow motion and I'm on the ground wondering what the hell just happened.

"Chris [SSgt Ramakka] had been carrying a rocket-propelled grenade booster, and I thought it had blown up in his hand. I looked over, but his hands were still there. So I looked down, and there was this leg waving around, but the foot was gone. I thought, 'Oh, a land mine, better look at yourself.' I looked down and my right leg was bent off below the knee. There was this huge hole with bone and mud, and blood was just pouring out of it. I remember thinking, 'Is this thing even attached?'

"It was an old Soviet anti-personnel mine, and it did what it was supposed to do: incapacitate."

SSgt Ramakka's left foot was blown off and he sustained other injuries (see page 16). The blast shattered Maj Conlan's right leg, and his left leg was severely damaged by shrapnel. One piece tore a fist-sized hole in his left thigh and barely missed a major artery. "The doc told me that if the damage had been a millimeter off in any direction, I would have been dead in two minutes."

As nearby Airmen began attending to them and applying care, the gravity of the situation began to sink in. "I went through every emotion known to man in the hour after it happened. I remember being scared and thinking, 'Oh my God, I'm going to die, I'm never going to see my wife and kid again.'"

Continued on page 18.

SSgt Ramakka's Story, continued from the top of page 15.

The CEs were airlifted to the hospital at Bagram. Despite the severity of his injuries, the medical staff was able to save Maj Conlan's leg. SSgt Ramakka's left leg was too damaged to save and was amputated below the knee.

"It's not something somebody wants to happen to them, but at the same time it could have been worse. It was a crappy experience, but I'm alive."

Building up lost muscle mass is hard work, but SSgt Ramakka is motivated to succeed with the help of a physical therapist. (photo by author)

After two days in the Bagram hospital, SSgt Ramakka had short stays at Landstuhl Regional Medical Center, Germany, and Wilford Hall, San Antonio, Texas, before being transferred to the amputee unit at Brooks Army Medical Center in San Antonio to heal, begin rehabilitation and be fitted for a prosthetic leg.

"When I first got my leg, I wanted to just take off walking on it all the time. I started walking on it before they finished screwing it together. They weren't too happy about that."

It didn't take long for him to go from walking to running, something he said he never really cared for before. "Now, that's all I want to do. It's rough running on a regular prosthetic leg. It's jarring, but you get used to that."

He recently received a new leg designed for running. Made of high-tech materials, it's lighter, more flexible, and relatively more comfortable. "It hurts a little less than the other one, but there's still nothing really there absorbing your shock. If you don't have enough socks on, you'll bottom out and that really hurts."

He said he can already run a mile with it and hopes to get to get up to three miles soon. "It's just a matter of time and patience. If you go too fast you'll hurt yourself and set yourself back a few weeks. I've seen it happen. Guys will bruise so much they can't stand in their prosthetic, and they have to wait until the swelling goes down. I don't want to be one of those guys, but at the same time I don't want to go slow either. I used to be real patient, but I have a lot less [patience] now because of the accident. I'm reacquiring it, but it's taking time."

His new-found love of running is driven in part by his desire to stay in the Air Force and remain an EOD member.

"I got hurt over there, but you can't really blame the Air Force. You can't blame anybody. I tried to blame myself for a little bit, but it's not like I did anything stupid. I think if I had been hurt actually doing my job and trying to disarm something, I would be a little more concerned about getting back to work.

"We did everything right. We asked if there were mines there and they said 'no.' I don't know 100 percent whose ball that was, but you're in Afghanistan and there are mines everywhere. If you tried looking for them all, you'd never walk anywhere."

Before he can get back to work, he still has more surgery and months of rehab to go through. "There are 50 or so guys in there missing limbs, but there is a lot of camaraderie with the

SSgt Ramakka wasn't much on running before he lost his leg; now it's all he wants to do.
(photo by author)

other amputees. At the same time, it can get depressing, especially when the new guys come in. They are usually pretty down about the whole thing. I definitely have my ups and downs, but my leg's not going to grow back by complaining. I can't whine it back into existence."

He goes to the amputee unit at Brooks every day and spends hours going through an exhausting and sometimes painful process of relearning how to walk and function with his different prosthetic legs. "It has been a while since I can remember not being in pain, but that will go away they say. The upside is, I've got a bunch of different legs."

When he's not at the amputee unit or at home, he's at the EOD unit at Lackland AFB, Texas. "I like coming to the amputee unit and hanging out with these guys, but I miss work."

He's waiting for a medical board to clear him to return to work. If cleared, he will most likely spend the next few years as an instructor, but his goal is to become worldwide qualified again.

"I think I can do it. It's just a matter of giving myself the time to build back up physically. This isn't going to hinder me at all. It just might make it a little harder for me than for everybody else."

Update: SSgt Ramakka has been medically cleared to return to work. He is assigned to the 342nd Training Squadron, Lackland AFB, Texas, where he will be an instructor in the EOD Preliminary course. He'll begin instuctor training after he has additional surgery on his leg.

Editor's note: Since this story was written, an EOD technician was killed in the line of duty in Iraq; see story on page 25.

Maj Conlan's story, continued from the bottom of page 15.

"I also remember being extremely pissed at one point. SSgt Robert Jones (a heavy equipment operator deployed from the 437th CES, Charleston AFB, S.C.), who sat and talked to me while they worked on me, said he could tell when I got mad because I cursed a blue streak for about 10 minutes. He's a very devout man, but I think he understood. It was quite painful."

Eventually, a helicopter from Bagram arrived and evacuated them to the base hospital.

"When I woke up at Bagram after the first surgery, I asked, 'I have one leg, right?' They said, 'No, you have two.' I was surprised and ecstatic. I had my leg and foot, and while they looked like five little stuffed sausages, those were my toes."

The leg was saved, but Maj Conlan would have to endure eight surgeries, painful skin grafts and the relocation of two calf muscles. "Even with all the pain I've gone through, there's a certain joy in knowing that's my foot down there. It would have been a lot easier if I had just lost the leg and gone with a prosthetic, but that's my foot."

Eight surgeries left Maj Conlan in this painful brace, but he still has his leg. (photo by author)

The leg, which was swollen to almost double its size, is surrounded by an 18″ round metal brace called a Taylor Spatial Frame. Screws anchor it to the bones in his leg and wires run through the shattered bone fragments to hold them in proper alignment.

Although the brace is painful, the major takes a certain amount of glee in the reactions it draws. "It makes grown men cringe. People look at the wires, and go, 'Ohhhhhh!' Little kids stare at it and say, 'What is that?' and their parents get embarrassed."

The blast caused nerve damage to Maj Conlan's right leg, and he has no feeling in it. He could still lose the leg and is very religious about keeping the pins and screws clean to prevent infection. He's in constant pain, and he's only in the healing phase. When he's better, he can look forward to at least six months of physical rehabilitation.

"There are days where I'm completely frustrated because this is a long-term thing, and I'm never going to make it back to where I was. I may only get to about 80 percent. I could have lost my leg or lost my life, so I'll take the 80 percent, but it is frustrating. My family has been a great help, supporting me through all of this. I wouldn't be doing as well as I am without their help."

Adding to the frustration is the uncertainty about his future. Because of the extent of the damage, Maj Conlan said he may be facing medical retirement, something he doesn't want.

Maj Conlan at home with his wife, Becky, and son, Cameron. (photo by author)

"I've been associated with the Air Force every second of my life. I love being in the Air Force. I love what I do. If I can get to the point where I can meet all the standards and pass the physical training test, then there will be no need for a medical board. But because we're pretty sure there's going to be some residual nerve damage, I'll probably have to meet the board."

Despite the pain and the uncertainty about his career, Maj Conlan said he has no anger about being injured, and he doesn't second-guess his decision to go out that day.

"You can't see a land mine in the picture, and I've looked at it a number of times. You can't see it. I was three feet behind Chris and if he had missed the mine I probably would have stepped on it. Chris has apologized to me and to my wife, but we've both told him, 'It's nobody's fault.'"

"There are times when I think I'm the luckiest man in the world. I burned up a lot of mojo that day. My leg is still attached to me. Granted, I have a lot of rehab and a lot of healing and some loss of use for the rest of my life, but I'm pretty fortunate on how things could have gone. The only regret I have is that's not the way I wanted to leave Bagram."

Update: The frame was removed from Maj Conlan's leg in January. He wears a small brace on the leg and uses a cane to help maintain his balance, but there are no pins, screws, wires, or metal holding the bones together.

He still has nerve damage in his right leg, but has been able to move his toes slightly, which could mean the nerves in the leg are starting to come back. He hopes to begin physical therapy soon.

Maj Conlan returned to work part-time in November 2005 at the Air Force Security Forces Center, Lackland AFB, Texas, handling anti-terrorism/force protection issues for Northern Air Forces. He still faces the possibility of a medical board.

2005 Call for Photos

Wherever you find CEs, you'll probably find a camera. We asked you to send us your best stuff from 2005. These four photos received the most staff votes during the selection process. The voters had no information about who took the photos or where they came from; selection was based on image quality and appeal.

For 2006, rather than submit photos during a specific period, we'd like all CEs to submit photos throughout the year to cemag.photos@tyndall.af.mil. Submission requirements are the same as last year. (See *Air Force Civil Engineer* Volume 13, Number 3.) Please be sure to include the photographer's name and a photo caption *with* the photo(s). It isn't always easy to chase that information down after the fact.

Thanks to all the photographers who submitted photos: Mr. Jon Gaines, 460th CES; SSgt Jay Futrell and SMSgt Joseph W. May, Jr., 2nd CES; MSgt Adrian Barcomb, 16th CES; Maj Erik J. Lagerquist, 43rd CES; SSgt Catherine Elliot, Mr. Daniel Rosenbalm, SrA Jason McNabb, and Mrs. Jan Nonog, 36th CES; Ms. Redith Lee, 78th CEG; SSgt Lindsey Leitz, 379th ECES; Mr. Wesley L. Robison, 3rd CES.

SSgt Monty W. Woolam, an EOD journeyman deployed in Southwest Asia with the 386th ECES, digs up a suspicious piece of metal located with a Mk-26 Forster. The team is clearing 1.4 million square meters for a runway expansion project. Photographer: SSgt Lindsey Leitz. Camera: Olympus Stylus 400 Digital.

SSgt Jay Futrell, deployed to Iraq from the 2nd BW, Barksdale, La., recovers a 2.75" improvised rocket launcher from the roof of a hut in West Baghdad. The launcher was aimed at the EOD team's safe area, where they were working on an improvised explosive device. Photographer: SMSgt Joseph W. May, Jr. Camera: Sony DSC-P100.

Left: TSgt Robert Wyatt, 78th CES, Robins AFB, Ga., clears obstructions from a drain pipe at Luna Lake. The 8.25 acre lake was drained of 12 million gallons of water to allow installation of a new siphon overflow sytem. Photographer: Ms. Redith Lee. Camera: Kodak DX-7440.

Below: Fire-rescue personnel from 3rd CES at Elmendorf AFB, Alaska, "hang around" during the Rescue Technician 1 course taught by the DoD Fire Academy's mobile training team. Photographer: Mr. Wesley L. Robison. Camera: Sony MVC-CD350.

RROC Solid

Capt Brian Ellis
5th CES/CEO

RROCs—Regional Reconstruction Operations Centers—are part of the foundation developed to support the rebuilding of Iraq's infrastructure, key to the country's recovery. RROCs are formed from a matrix of various experts from different services or agencies, and Air Force civil engineers are part of the mix.

Created in November 2004, RROCs are non-doctrinal organizations charged with coordinating all Iraqi construction efforts and infrastructure rehabilitation within given Areas of Operation in Iraq. An AO consists of multiple "provinces" (similar to "states" in the United States); hence, the efforts of the RROCs fall in between the national and state levels of government in Iraq.

RROCs coordinate between Army Brigade Combat Teams on the ground and the various Iraqi organizations and command structure at the national level. RROCs also initiate regional-level projects, such as oil pipeline initiatives and power transmission projects. Because of the engineering/construction mission, the RROC falls under the Army Division Engineers to execute and man, although the mission is carried out in a slightly different manner in each AO.

There are six AOs (and respective RROCs) in Iraq, with the North Central RROC located in Tikrit. This RROC includes members from the Army National Guard, Army Reserve, Army Civil Affairs, Army Active Duty, Air Force Active Duty, Navy Active Duty, Department of State, Army Corps of Engineers, and private security companies, as well as 14 Air Force CEs.

The North Central RROC oversees approximately 2,000 projects, valued at more than $2.2B. Schools, clinics, hospitals, '911' emergency centers, police stations, fire stations, court houses, government buildings, Iraqi Army facilities, water treatment plants and distribution systems, sewage treatment plants, potable water wells, bridges, roads, rail stations, power generation facilities, substations, transmission/distribution lines, and all facets of the oil sector are all key areas of construction and rehabilitation that fall under the RROC's realm of activity.

The North Central RROC at Tikrit is organized into six sector leads: Buildings, Health, & Education; Public Works; Transportation & Communication; Security & Justice; Oil; and Power. The sector leads frequently travel outside of the wire to communicate face-to-face with the Iraqi Director Generals of infrastructure. Working together, Iraqi DGs and RROC personnel determine what projects would best benefit the infrastructure and people of Iraq and team to contract and execute projects on the regional level. Unlike members of other Coalition Force organizations, RROC members regularly interact with Iraqi engineers, plant managers, refinery managers, and a host of other Iraqi citizens.

The greatest number of projects for the North Central RROC falls under the Buildings, Health & Education sector lead. Most are for the rehabilitation and construction of schools and clinics, as these are easy to award, provide a good service to the community, and are highly visible to the Iraqi people. These schools and clinics (and other related projects) provide education and health care to both boys and girls in communities that have never before had these commodities.

An increasing number of Iraqi citizens now have a reliable source of potable drinking water, thanks to the Public Works sector lead. Water wells, water treatment facilities, waste treatment facilities, new distribution lines, and various other projects are sweeping the region and improving the quality of life for Iraqis. Hundreds of thousands of gallons of potable water in Iraq are lost daily due to leaks in old water distribution lines. A 2-week training program teaching Iraqis how to detect and repair system leaks is in place, one small step towards self-governance. Making running water available in all Iraqi homes, rather than just a few, will be the next big Public Works initiative.

Transportation projects are not as high in number, but affect everyone who travels the degraded roadways of Iraq. Major roadways and village road segments are being rehabilitated in every province in the North Central AO, and repairs are underway or scheduled for every major bridge needing them. An effective rail system in Iraq is key to the transport of imports, exports, and commercial goods throughout the country. Renovation of 21 cargo and rail station yards within the AO is nearly complete. Prior to the war, Iraq had the most sophisticated rail network in the Middle East and is building back up to that standard day-by-day.

The Security & Justice sector rehabs and initiates new police stations, fire stations, '911' emergency centers and network system, ambulances and Iraqi Army compounds, as well as overseeing numerous other projects. The RROC plays a key role in pushing security projects through so that the Iraqis have the capability to provide these vital services to their citizens. Iraqis are using the '911' centers, or Joint Coordination Centers, more and more often as their trust of the Iraqi police force builds.

The Power and the Oil sectors consume the majority of the time in the RROC. These sectors are vital to the stability of the country and the eventual success of the independent Iraqi government. In the Power sector, power substations, generation plants, and distribution systems are being rehabilitated and constructed across the country. The power generation facilities in the North Central AO have hundreds of miles of 400kV transmission lines; they provide 60% of Baghdad's power and 30% of the country's power. In the Oil sector, many similar projects are underway or complete for the oil refineries, storage facilities, pump stations, and miles and miles of pipeline. From 6%–15% of the world's oil lies beneath the province of Kirkuk in this AO, an amount second only to the total reserves in Saudi Arabia. Without all the refining and distribution process facilities in working order, the Iraqis cannot benefit from this natural resource.

The North Central RROC has begun many initiatives to better secure both the power and oil infrastructure, setting precedents that other RROCs now follow. Continuous power is a luxury to the Iraqis and is naturally equated to how well the new government is operating. Oil, the country's primary source of revenue and jobs, is the backbone of the economy and key to a successful independent government. Anti-Iraqi forces, terrorists, local thugs, and insurgents attack this infrastructure constantly in an effort to discredit the new government and bring disorder among the populace. The RROC has initiated millions of dollars in construction projects to harden the pipelines and powerlines, provide security forces (creating jobs), and supply spare parts for these highly vulnerable systems. Since these are not common problems in the United States thinking 'outside the box' is a must for the RROC engineers.

North Central Iraq RROC members tour a power generation facility in Kirkuk after the installation of a new 65mW generator. (U.S. Air Force photo)

The North Central RROC and those of the other AOs have quickly become valuable assets in the highly concerted reconstruction effort in Iraq. The unique ties made between this organization and the Iraqi infrastructure leaders will hopefully aid in the development of an independent, sovereign nation.

From May to October of 2005, Capt Ellis served as part of a 14-man public works team, the first to be attached to the Army. Within the AO Liberty North Central RROC, Capt Ellis was the Chief of Operations.

Father & Son Deploy Together

SrA Cassandra Locke
379th AEW/PA

While CMSgt Julio Morelos and his son, SSgt Julio Morelos III, have enjoyed watching football and playing sports together throughout life, they found a new way to bond while deployed together. The father and son duo worked together on an explosive ordnance disposal demolition operation, helping destroy more than 80,000 pieces of explosive hazards and ordnance.

Demolition as a family affair: Father and son EOD techs CMSgt Julio Morelos and SSgt Julio Morelos III worked together on a recent deployment to destroy more than 80,000 pieces of explosive hazards and ordnance. (photo by MSgt Stanley Coleman)

"I am very proud and honored to be able to serve alongside my son. While as a father you do not want your family members to be in harm's way, I take comfort in knowing that the Air Force will do everything possible to keep him and the rest of our Airmen safe," CMSgt Morelos said.

CMSgt Morelos, EOD program manager with the Combined Air Operations Center, said the setup required a lot of manual labor, and they worked closely with unloading the items and setting up the detonations. The chief's role was to oversee the setup of items and help with safety oversight. SSgt Morelos, 379th Expeditionary Civil Engineer Squadron engineering assistant with Service contracts, helped with the preparations. The sergeant helped unload, sort and place the munitions and explosives, then covered it all with C-4 and flares.

"The most rewarding aspect of my deployment here has been that as a chief, it has been a privilege and a joy to observe a young NCO develop and practice those quality Air Force traits. Those traits molded my son into an outstanding NCO with a bright future," CMSgt Morelos said.

The chief said all explosive components had to be set up very precisely to ensure they would add to the explosive detonation and be consumed. "The last thing you need with this type of operation is kick-outs, as it makes for a long day and unsafe environment."

This deployment has given the pair an opportunity to spend more time with each other than they are used to. "I will say, though, that as ironic as it may sound, we had to deploy to spend our first Thanksgiving and Christmas together in five years," said CMSgt Morelos.

SSgt Morelos enjoyed spending the holidays with his father. "I haven't spent the holidays home in four years, so it's kind of ironic that finally I get to spend one with my dad while being deployed," said SSgt Morelos. "Of course having my pops around for the holidays was nice, but I enjoyed being able to watch the Dallas Cowboys with him on Sundays the most."

SSgt Morelos said he and his father have had many opportunities to spend time together while on an assignment in Korea, Italy, Germany and England.

CMSgt Morelos is deployed from HQ AFCESA, Tyndall AFB, Fla. SSgt Morelos is deployed from the 769th CES, Eglin AFB, Fla.

CMSgt Morelos said now that his son is just around the corner, they visit each other frequently. "I guess you could say it has become a family affair. We have become accustomed to traveling and working alongside each other."

Memorials Honor CE Killed in OIF

More than 300 people attended a memorial ceremony for TSgt Walter Moss on April 1 at Sather AB, Iraq. TSgt Moss, a 447th Expeditionary Civil Engineer Squadron explosive ordnance disposal flight technician, was killed in an explosion while conducting safing operations near Baghdad March 29.

A 16-year Air Force veteran and career EOD technician, TSgt Moss deployed from the 366th CES, Mountain Home AFB, Idaho, to Sather Air Base, Iraq, in early January in support of Operation Iraqi Freedom. The Houston, Texas, native was part of an elite Air Force career field with only 1,000 people in its ranks. During his time in Iraq, EOD responded to more than 200 calls in the Baghdad vicinity without incident. Every successful call meant TSgt Moss potentially saved a life.

A musician opened the memorial playing "Amazing Grace" on the bagpipes. Capt Stephanie Root read handwritten messages that his fellow EOD technicians had written about TSgt Moss. One emphasized the challenge all EOD Airmen face.

"People who have never taken that long and lonely walk down to safe an (improvised explosive device) or a roadside bomb will never come to fathom how it feels," said MSgt J.T. Thrower, 447th ECES EOD flight. "He was willing to take that long and lonely walk so others will continue to live."

A Soldier renders a final salute in honor of TSgt Walter Moss at a memorial service held April 1, 2006, at Sather Air Base, Iraq. (photo by MSgt Will Ackerman)

After Capt Root finished reading, SSgt Dale Moser, EOD superintendent, conducted a "final roll call," saying each of the EOD team members' names. They responded, "Here, senior master sergeant." When TSgt Moss's name was called, there was silence.

On April 5, family, friends, co-workers and even complete strangers came together to honor TSgt Moss at his home station, Mountain Home AFB.

Those who knew TSgt Moss best praised his courage and dedication to duty, which often meant standing in harm's way so others could live.

SMSgt Robert Schmidt, 366th CES EOD superintendent, remembered a friend who always had a smile and was always willing to share his casual, thought-provoking ideas with co-workers and supervisors. His determination to overcome huge challenges, including a knee injury that threatened to sideline his ability to deploy, inspired everyone he met.

"He did so much every day without ever boasting or bragging," SMSgt Schmidt said. "He was a true leader, a friend, a super dad and husband, and he will be missed by so many."

The sergeant was a person who loved challenges on the job and at home, savored the opportunity to solve problems, and "made the difficult seem effortless," added MSgt Michael Bernard, 366th CES EOD flight chief.

Compiled from news stories by MSgt Will Ackerman, 447th AEG/PA, Sather AB, Iraq, and MSgt Brian S. Orban, 366th FW/PA, Mountain Home AFB, Idaho.

Another Spin on Wastewater Treatment

Dr. Fred Hall
72nd ABW/CEVPD

Air Force depot maintenance activities generate wastewater containing oils, fuels, solvents, solids, and metal-laden substances that ultimately end up at the industrial wastewater treatment plant for processing. To pretreat a portion of the industrial waste stream, Tinker AFB, Okla., has installed an air-sparged hydrocyclone system to remove contaminants from the industrial wastewater.

The hydrocyclone system has been demonstrated to be effective in removing aqueous film-forming foam, oils and grease, total petroleum hydrocarbons, biological and chemical oxygen demand, volatile organic compounds, suspended solids, and heavy metal constituents. The technology was developed by Dr. Ye Yi at the University of Utah in partnership with the Air Force Research Laboratory. Kemco Systems, Inc. of Clearwater, Fla., is involved in designing and manufacturing the units.

The ASH unit at Tinker was designed to treat 144,000 gal/day at 100 gal/min. The unit has a Monarch controller to automate most of the processes. To date the unit has realized removal efficiencies of 95% of the metals, 55% of the oil and grease, 25% of the chemical oxygen demand, and over 96% of the total suspended solids. This pretreatment step reduces the organic, metals and solids loading on the IWTP.

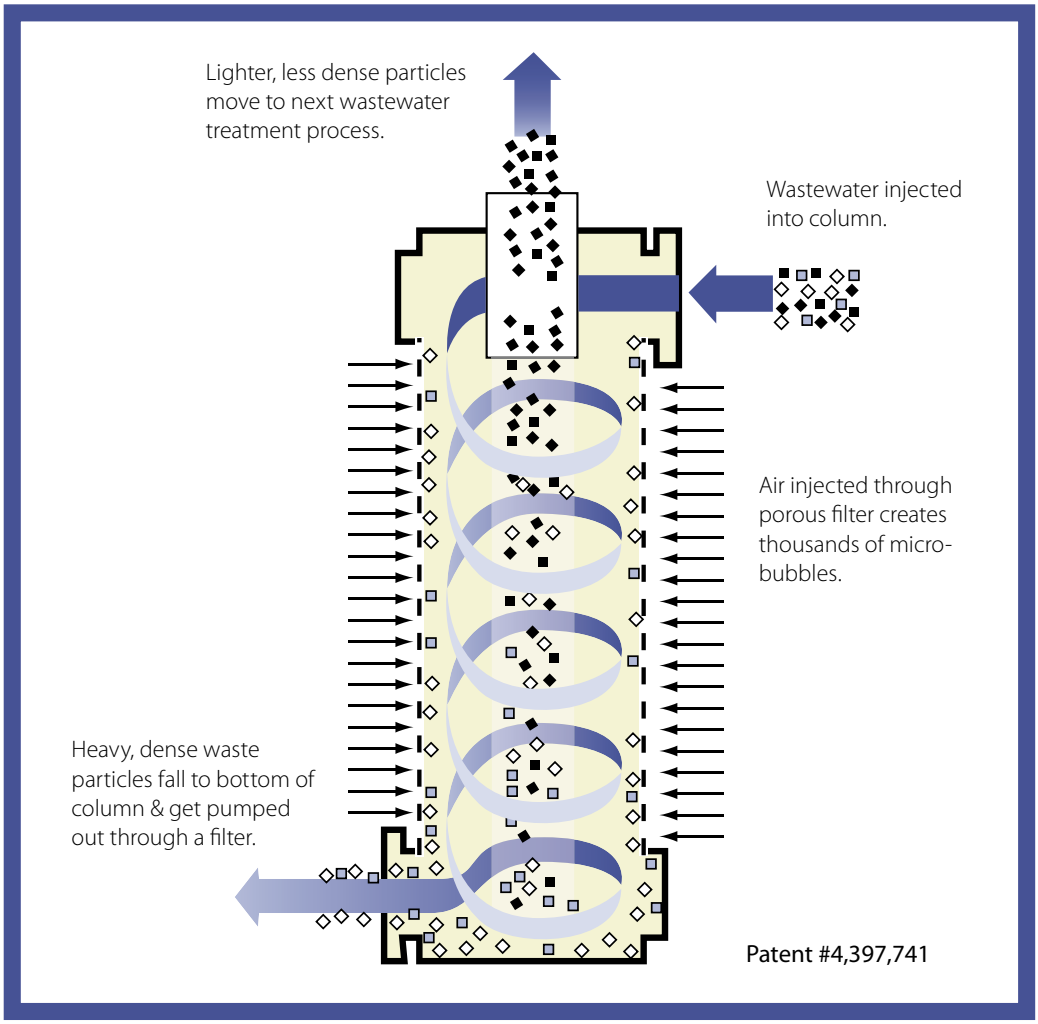


Diagram courtesy Kemco Systems, Inc.

ASH technology combines characteristics of a hydrocyclone and froth flotation principles. The ASH has two vertical tubes with a conventional cyclone header at the top and a froth pedestal at the bottom. Air is injected into the outer cylinder and forced through a porous filter inside that creates thousands of micro-bubbles. The contaminant-laden influent wastewater is pumped into the hydrocyclone and the heavier, denser waste particles are thrown to the outside perimeter of the cyclone, where they fall down to the froth pedestal and can be pumped back through a filter. The lighter, less dense waste particles stay in the center of the cyclone and move

with the influent flow to the next wastewater treatment process. The diffuse layer of bubbles promotes the removal of the insoluble contaminants from the wastewater. This is the key to the process.

Mr. Bill Clark looks over new vertical hydrocyclone tubes, the beginnings of four stages where forced air aids in cleaning Tinker's industrial waste water at a rate of 144,000 gallons a day. (Photo by Ms. Margo Wright)

ASH technology is ideal for replacing or enhancing the traditional primary and secondary stages of wastewater treatment. Previous treatment methodologies based on physical phase separation used large detention basins to provide the time for lighter materials to slowly rise to the surface while the heavier constituents settled at the bottom.

In field tests at nine Department of Defense facilities, the ASH unit removed 95% of the suspended solids, 78–96% of the heavy metals, 86% of the AFFF, 55–86% of the oil and grease, 25–90% of the chemical oxygen demand, and 40–90% of the volatile organic compounds.

Depending upon the characteristics of the waste streams, the operation and maintenance costs range from $0.50 to $1.50 per 1,000 gallons. Labor costs are estimated at $0.17, utility costs at $0.17, and wet chemical costs at $0.90 per 1,000 gallons treated. Some of the other system advantages include higher removal rates compared to conventional systems; greater surface loadings, between 3 to 10 times that of standard systems; reduced hydraulic retention times, as low as 7% of standard systems; ability to handle multiple contaminant variations and concentration levels; and a small system footprint requiring less physical operations space.

The advantages are not just limited to the wastewater treatment activities, but include operations upstream in the production and maintenance facilities. In the past, aircraft production activities were restricted on what chemicals and cleaning methods could be used on aircraft components in order to minimize the impact on the wastewater treatment plant. Now, aircraft operators and maintainers have more flexibility with the types and quantities of products that they can use. In general, the innovative technology will reduce flow days, reduce environmental compliance burden costs, reduce operational risks, increase workload capability, and lead to better compliance with the local, state and federal environmental regulations.

Dr. Hall is an environmental engineer with the 72nd ABW, Tinker AFB, Okla.

Safety First

Dr. Daryl Hammond, P.E.
HQ AFCESA/CESM

Maintaining electrical safety is important when containing transformer oil leaks

Every Air Force base has electrical transformers; they come in all shapes and sizes, either mounted on the ground or on poles high above it, and they all generate heat, especially in the summer. To help dissipate heat—and aid operation—many large electrical transformers contain a special type of oil. Unlike oils used in the past that contained environmentally harmful poly-chlorinated biphenyls, today's transformer oils are generally safe. Still, in the unlikely event of a transformer leak occurring from storm damage, rust, or other accidents, we don't want even the safe oil contaminating our environment.

Federal law puts some muscle behind the common sense to contain leakage. Regulations outline secondary containment requirements that apply to most of the oil-filled electrical equipment on our bases, primarily service transformers. Base civil engineers are working hard to ensure that these requirements are met, but in some cases the chosen solution may create a problem in another important area—electrical safety.

This article provides a no-nonsense way of protecting the environment from an oil-filled transformer leak while ensuring safety for our electrical workers: compliance through planning.

Federal Law and Base Compliance

The Spill Prevention, Control, and Countermeasures plan (Federal Register, Vol. 67, No. 137, 17 Jul 2002) requires any base, which has an aggregate above-ground oil storage capacity of 1,320 gallons or greater, to have secondary containment for all oil containers with a capacity of 55 gallons or more. This requirement is echoed by Title 40, CFR Part 112, which further states that secondary containment requirements are applicable to any operational equipment, electrical or otherwise, using 55 gallons or more of oil. This last statement applies to most of our oil-filled electrical equipment, but primarily service transformers on our bases.

Section 112.7 of the CFR, "General requirements for Spill Prevention, Control, and Countermeasure Plans," states that an entire containment system, including walls and floor, must be capable of containing oil and must be constructed so that any discharge from a primary containment system, such as a tank or pipe, will not escape the containment system before cleanup occurs. It also provides options for containment systems, stating that, as a minimum, one of the following prevention systems or its equivalent must be used:

- dikes, berms, or retaining walls sufficiently impervious to contain oil
- curbing
- culverting, gutters, or other drainage systems
- weirs, booms, or other barriers,
- spill diversion ponds,
- retention ponds, or
- sorbent materials.

Preserving Electrical Safety: What Not To Do!

There appear to be lots of options, but when it comes to keeping our electrical workers safe, one of them—curbing—doesn't really work well. It may be a permitted compliance option to use secondary containment curbs or "moats" for oil-filled electrical equipment, but experts at AFCESA consider them impractical and unsafe when constructed as shown in the photos.

Our experience with existing secondary containments shows that they fill up with precipitation during rainy seasons, making their capacity inadequate for their original purpose, as well as adding a recurring manpower burden to monitor, sample, and drain them. Further, the containments require a significantly larger footprint, are unsightly, and are unsanitary when filled with stagnant water.

Containment curbs can impede electrical workers' access to—and egress from—transformers. They can also fill up with rainwater, which becomes stagnant and unsanitary, adding a recurring manpower burden for monitoring, sampling, and draining. (U.S. Air Force photos)

Electrical workers on Air Force bases must comply with new National Fire Protection Agency 70E, Standard for Electrical Safety in the Workplace, requirements for wearing arc-flash rated personal protective equipment that limits their visibility and restricts their movement. Containment curbs built high enough to hold the anticipated maximum rainfall and contain a worst-case oil leak can impede electrical workers' unrestricted egress from the equipment in case of a problem, creating unsafe working conditions.

So What Can We Do at Air Force Installations?

Choosing one of the other compliance options is a possibility, but may not be feasible. However, the CFR contains a provision for alternative compliance if secondary containment as noted above is deemed impracticable. This provision allows bases to use administrative controls, via an oil spill contingency plan that outlines expeditious control and removal of any leaked oil from the electrical equipment.

Documenting a written commitment of manpower, equipment, and materials required to quickly control and remove any quantity of oil discharged in the installation's oil spill contingency plan is also required with this approach.

Since secondary containment curbs do not comply with established Air Force electrical safety requirements, AFCESA highly encourages each base to include transformer oil spill prevention countermeasures in their oil spill contingency plan as a preferred method of complying with SPCC requirements.

Additional information on electrical safety can be obtained from HQ AFCESA/CESM. Contact HQ AFCEE for environmental compliance issues.

Dr. Hammond is The Air Force Electrical Engineer. He works at HQ AFCESA, Tyndall AFB, Fla.

Members of the HQ AFCEE PROACT Program contributed to this article.

Ramstein's Transformation Edging Toward Fruition

Mr. Louis A. Arana-Barradas
Air Force Print News

Parts of the hectic airlift hub known as Ramstein AB are still under construction as the historic base in Germany transforms into the Air Force's European super base.

The work is part of the Department of Defense's largest ongoing construction project—a $500M boon for the base near Kaiserslautern, said Col Carlos Cruz-Gonzalez, commander of the 435th Civil Engineer Group. "The construction going on now is a continuation of the Rhein-Main Transition Program."

Two C-17 Globemaster IIIs taxi on the busy new ramp while construction of the new hotel continues at Ramstein AB, Germany. (photo by MSgt John E. Lasky)

The transition program resulted from a U.S.-German accord to return Rhein-Main AB, outside of Frankfurt, to Germany by the end of 2005. In return, Germany allowed the Air Force to replicate the base's vital airlift mission at Ramstein and 80 miles to the northwest at Spangdahlem AB.

German agencies agreed to foot most of the bill for 37 new construction projects that would allow the bases to take on the new mission. Ramstein got 32 of the projects. $200M was allotted for transition-related military construction, $200M for the Kaiserslautern Military Community Center and $100M for new military family housing.

Today, 22 projects—started in 2003—are finished, the colonel said, including the new south runway and "hot cargo pad" for handling munitions and hazardous cargo. Also completed is the parking ramp expansion for transiting wide-body jets and Ramstein's C-130 Hercules fleet. A huge, high-tech freight terminal, an expanded passenger terminal, a flight kitchen and dormitories for enlisted Airmen have been built. There was also extensive road construction done to keep up with the growing changes.

Currently, 10 projects are either underway or awaiting funding. "This construction has caused a true transformation of this base," Col Cruz-Gonzalez said. "I got here in July 2003—Ramstein is a completely different base than when I arrived."

Still to come is the completion of several key projects: new military family housing as well as refurbishment of the base's north runway which includes extending it to 10,500´.

The colonel said that between 860 and 870 town homes will be built at Ramstein and surrounding military communities for officers and enlisted Airmen. Some new housing has already been built in the large military community.

"In three weeks, we'll start construction here on what I call 100-year homes—built to last," Col Cruz-Gonzalez said. "When it's all said and done, the community will have more than 2,600 housing units." And they'll have just about all the amenities the Air Force now expects to be in family housing.

Another, more visible, goal is the completion of the KMCC. The center, across from the passenger terminal on the base's south

The still-unfinished hotel stands tall over the construction site and Ramstein AB, Germany. The 350-room billeting is slated to open in September and the shopping mall in early 2007. (photo by MSgt John E. Lasky)

side, will include an eight-story, 350-room hotel and a large shopping mall.

"It will provide one-stop shopping" for just about anything a person might need, Col Cruz-Gonzalez said. "And MWR operations will include a retail sales store, equipment checkout—even a two-story rock wall so people can practice their rock climbing."

The center will open in stages. Construction of the yet-to-be-named hotel should end in July. But it will not open until September because it will take about 60 days to furnish it and for businesses to move in. The colonel expects the mall to open "early next year."

Mr. Jeff Noorda is the KMCC project manager and works in a plans-filled office behind the center. The engineer from Kaysville, Utah, has never worked on a bigger and more involved project. He said there are more than 340 workers from across Europe representing 26 construction firms. They are also adding 2,800 parking spots around the complex.

The community has eagerly awaited the completion of the construction. But neither Col Cruz-Gonzalez nor Mr. Noorda can say with certainty when everything will open. Both agree some projects are behind schedule, some by as much as three months.

"Yes, we are a little behind schedule—we did plan to be done sooner," Mr. Noorda said. "We've slipped about three months now. But we're still hoping to open the mall in January."

An unusually harsh March takes part of the blame for the delays, the colonel said. Some buildings—including some housing—are ready to open. But cold and rainy weather has hampered outside work like putting in sod.

Construction on other projects will continue for several years, with some projected through fiscal 2009 and beyond. While construction at the base will continue to keep the pace hectic, Col Cruz-Gonzalez said teamwork has helped make the transition smoother.

"Everyone in this community has worked to ensure all the disruption the construction generated never interfered with our mission," he said. "We haven't missed a beat."

Eulberg Named AF Civil Engineer

As announced on March 16, Brig Gen Del Eulberg will become The Civil Engineer, Deputy Chief of Staff, Logistics, Installations and Mission Support, Headquarters United States Air Force, Pentagon, Washington, DC. He will replace Maj Gen L. Dean Fox, who is retiring effective August 1 and has served in that position since May 2003. Brig Gen Eulberg has been selected for promotion to the rank of Major General (announced May 1, 2005) and is currently the Director, Installations and Mission Support, Headquarters Air Mobility Command, Scott AFB, Ill. He is a native of Shelby, Mont., and was commissioned in 1978 following his graduation with honors from the U.S. Air Force Academy with a B.S. in civil engineering. Brig Gen Eulberg also earned an M.E. degree in civil engineering from Pennsylvania State University in 1981 and completed the Program for Senior Executives in National and International Security Management at the John F. Kennedy School of Government at Harvard University in 2005.

Other Key Personnel Changes

Mr. James Pennino has retired from his position as Command Civil Engineer, Installations and Mission Support Directorate, Headquarters Air Force Materiel Command, Wright-Patterson Air Force Base, Ohio.

There were three changes at Headquarters Air Force Civil Engineer Support Agency, Tyndall AFB, Fla. Mr. Bryon Bednar is the new Executive Director. Mr. Clifford Fetter is now the Director of Installation Support, replacing Mr. Myron Anderson, who retired. Mr. Robert Gingell is the new Director of Field Support; he replaces Mr. Gary Tyree.

Senior Leaders Meet at Tyndall AFB

The 2005 Civil Engineer Senior Leaders' Meeting was held December 5-9, 2005 at Tyndall AFB, Fla. Maj Gen L. Dean Fox, The Air Force Civil Engineer, presided over the annual meeting of major command, field operating agency, and direct reporting unit Civil Engineers, with representatives from the Air Staff. The theme of this year's forum was "Wartime & Peactime—Engineering in an Era of Air Force Modernization" and included presentations on various issues impacting today's civil engineer.

Selected for Promotion

Colonel

Thomas P. Brown
Gregory G. Emanuel
David W. Funk
Efren V.M. Garcia
Barry S. Mines
Salman M. Nodjomian
Philip E. Rainforth
Shane T. Stegman

Reserve Colonel

Paul T. Babin, Jr.
Scott L. Battles
David J. Bek
Michael Conner
Jennifer J. Dalrymple
James D. Frishkorn
Dennis J. Jacobs
Edward Garcia
Edward H. Henson
Rogelio Lozano, Jr.
Robert J. Martin
Sharon A. Olbeter
Steven T. Rose
Ronald D. Sims
Charles P. Unterreiner

Major

Milton J. Addison
Gretchen E. Anderson
Scott A. Bryant
Christina M. Campbell
Jason S. Campbell
David W. Carlson
Omar F. Coral
Andrew E. DeRosa
Justin H. Duncan
Peter P. Feng
Anthony S. Figiera
Deron L. Frailie
George Franklin Jr.
Walter D. Gibbins
Robert E. Grover
Tammie L. Harris
Francis R. Hughes
Bradley L. Johnson
Max E. Johnson
Michael E. Klapmeyer
John B. Lantz
Andrew S. Lauer
Christopher J. Leonard
Heather L. Mitchell
Mark J. Richter
Travis J. Scheel
Christopher T. Senseney
John M. Sevier
Chen Y. Su
Patrick C. Suermann
Sean P. Sutherland
Craig E. Thomas
Joel E. Trejo
Thomas B. Veselka
Paul J. Waite
Aaron N. Wilt
Michael J. Zuhlsdorf

Senior Master Sergeant

Nathan N. Adams
Donald S. Andrade
Mark E. Atlow
David A. Ayers
Max B. Babbitt, Jr.
Donald E. Barnes
James E. Bomboy, Jr.
Chad D. Brandau
Bobby G. Casey
Martin Cortez
Patrick J. Cowhey
Klaus E. Dannenberg
Brian K. Davis
Donald B. Echols
Hilary S. Edwards
Brian A. Field
David A. Frasier
Robbin C. Freeberg
Isaias S. Garza
Lawrence R. Greebon
William D. Grimes
Duane S. Grubbs
Danny D. Guttery
Craig S. Hall
Scott L. Hartill
Reco J. Houston
Ricky Jackson
Linda M. Jacobs
Kevin D. Johnson
Mark D. Kallas
Scott C. Knupp
Daniel L. Landry
Shawn M. Lee
Richard A. Lien, Jr.
Brian S. Loisel
Bryan P. Martin
John M. Mazza
Robert L. McAfee, Jr.
Adrian C. McCracken
Martin W. Meyer
Robert E. Miller
Christopher M. Mohr
Quentin J. Mulholland
Steven T. Oakes
Tamara L. Olson
Darreld C. Pearce
Richard A. Penny
Tony E. Phillips
David A. Poppinga
Jeffrey T. Rosen
Arthur J. Roy
Gerald A. Schenck, Jr.
Eva M. Schollmize
Mitchell R. Shimmel
Christopher D. Simpson
Peter A. Sorensen
Jonathan L. Stirewalt
Adolph C. Tallman
Trent R. Topolski
Jerome A. VanderZanden
Joseph W. Walsh
Thomas D. Yereance

DoD Firefighters Up to the Challenge

MSgt Craig Hall
HQ AMC/A7XF

Much like the hurricane that delayed the 2005 World Firefighter Combat Challenge, teams from the DoD Fire and Emergency Services "stormed" the competition at Deerfield Beach, Fla., walking away with top team and individual honors.

At the WFCC XIV, held Dec. 1-3, the team from Travis AFB—TSgt Mike Melton, SSgt Harry Myers, SSgt Omar Shamid-deen, SrA Joseph Almony, and SrA Jeff McClendon—repeated last year's triumph and won the team championship with a time of 4 minutes and 25.14 seconds. But this year they added a new award, claiming the relay championship that had eluded them the previous year—the first time a DoD team has ever won the relay event.

TSgt Mike Melton, 349th CES, aims at a target during the World Firefighter Combat Challenge. (photo by SSgt Matt McGovern)

"It is something we've been fighting for," said the team's captain, TSgt Mike Melton from the 349th Civil Engineer Squadron. "Last year we lost the relay to Windsor, Canada; however, I discovered earlier in the year—while training—that we had a better team."

Wearing nearly 50 pounds of "turnout" gear, WFCC competitors must perform five tasks that simulate real-world firefighting skills, including climbing, hoisting, chopping, dragging hoses, and dragging a "victim"—a 176-pound mannequin—100 feet to "safety."

The Fire Chief for Travis AFB, Mr. John Speakman, said, "This win is a testament to their hard work. The fact that TSgt Melton can build a team every year—even with the military mission—all on their off-duty time is amazing to me. They can have drastic team changes and still, with gifted leadership, they're able to win."

In all, 12 DoD teams (60 firefighters) competed in the Challenge against the best-of-the-best from over 200 fire departments located around the world. DoD teams came from Travis, Edwards, Scott, Whiteman, and Altus AFBs, Spangdahlem and Ramstein ABs, the Air Force Academy, Niagara Falls ARS, the DoD Fire Academy, Fort Meade, and Fort Hood.

The top individual winner, GYSgt Eric Aker from the DoD Fire Academy, kept his title as "King of the Jungle," a.k.a. "Fastest Man Alive." Fresh from a lengthy deployment in Iraq, GYSgt Aker's repeat performance was a first for the event; no other Individual Male champion has ever won two years in a row. His win was all the more remarkable because his training was interrupted repeatedly by the call to duty.

"Every firefighter takes their body to the limit sometime in their career; the firefighter challenge is a great opportunity to see what our limitations are," said TSgt Melton.

MSgt Hall is the Superintendent of AMC Fire Protection and the DoD Firefighter Combat Challenge Coordinator. SSgt Matt McGovern, 60th AMW/PA, also contributed to this article.

Gehrig's Disease Forces CE to Retire

MSgt Michael A. Ward
HQ AFCESA/PA

TSgt Jason Whitman, a member of the Air Force Civil Engineer Support Agency's Airfield Pavement Evaluation Team, was medically retired from the Air Force April 12, 2006, after 11 years of active duty service.

In January 2005, TSgt Whitman was diagnosed with amyotrophic lateral sclerosis, a rare neuromuscular disorder commonly known as Lou Gehrig's Disease. ALS is incurable and most patients die within a few years of being diagnosed, according to the American Academy of Family Physicians.

"My doctors gave me the standard response of three to five years," TSgt Whitman said. "You take it as you get it, and keep living while you can."

TSgt Whitman said he first noticed something was wrong after jogging one day in the summer of 2004. "One leg wasn't responding," he said. "Later that year I started having trouble with my balance."

He said he didn't handle the news very well initially, but eventually gained a different perspective. "There are people who die in battle and never get a chance to say goodbye. I started recording messages to leave for my family. Some members don't get a chance to do that."

His retirement ceremony at Tyndall AFB, Fla., was understandably more somber than most. He is no longer able to work, and his physical condition requires the constant use of a wheelchair.

"That was about the toughest retirement ceremony I've been a part of," said Maj Tom Defazio, a former Pavement Evaluation Team member. "Having worked with Jason, and knowing what type of person he is and how bright he is, it was very difficult to see."

TSgt Whitman said he's not bitter about his condition, but he had been looking forward to a longer career. "I love the Air Force and was hoping to do at least 20 years. I had aspirations for making senior but wasn't quite sure about making chief. I told my wife the other day though that I thought I would have had a good chance."

TSgt Whitman and his wife Tracy have four children: Seth, 7; Haley, 4, Jared, 3 and Emily, 5 months. They will move back to Jacksonville, Ark., where his parents live.

TSgt Jason Whitman, Air Force Civil Engineer Support Agency, receives a shadow box from Col Gus Elliott Jr, AFCESA commander, during his retirement ceremony March 29. (photo by Ms. Lisa Norman)

2005 Air Force

The Air Force and three civilian professional associations recently announced their 2005 Air Force Civil Engineer Award winners. The awards are sponsored by the Society of American Military Engineers, the National Society of Professional Engineers, the Northeast Chapter of the American Association of Airport Executives and the Air Force. The winners were honored at a ceremony in Washington, D.C., in February. Winners (highlighted in bold) and runners-up (where applicable) are listed.

Outstanding Civil Engineer Unit Award and the Society of American Military Engineers Major General Robert H. Curtin Award

Large Unit

35th CES, Misawa AB, Japan

435th CEG, Ramstein AB, Germany

Small Unit

314th CES, Little Rock AFB, Ark.

437th CES, Charleston AFB, S.C.

Air Reserve Component

94th MSG/CE, Dobbins ARB, Ga.

188th CES, Fort Smith, Ark.

Brigadier General Michael A. McAuliffe Award (Housing Flight)

435th CES, Ramstein AB, Germany

62nd CES, McChord AFB, Wash.

Major General Robert C. Thompson Award (Resources Flight)

347th CES, Moody AFB, Ga.

99th CES, Nellis AFB, Nev.

Brigadier General Archie S. Mayes Award (Engineering Flight)

8th CES, Kunsan AB, Republic of Korea

347th CES, Moody AFB, Ga.

Major General Clifton D. Wright Award (Operations Flight)

796th CES, Eglin AFB, Fla.

2nd CES, Barksdale AFB, La.

Chief Master Sergeant Ralph E. Sanborn Award (Fire Protection Flight)

30th CES, Vandenberg AFB, Calif.

36th CES, Andersen AFB, Guam

Senior Master Sergeant Gerald J. Stryzak Award (Explosive Ordnance Disposal Flight)

35th CES, Misawa AB, Japan

56th CES, Luke AFB, Ariz.

Colonel Frederick J. Riemer Award (Readiness Flight)

Active duty

305th CES, McGuire AFB, N.J.

35th CES, Misawa AB, Japan

Air Reserve Component

913th CES, Willow Grove ARS, Pa.

102nd CES, Otis ANGB, Mass.

Environmental Flight Award

56th CES, Luke AFB, Ariz.

3rd CES, Elmendorf AFB, Alaska

Major General Joseph A. Ahearn Enlisted Leadership Award

CMSgt Gary A. Gentz, 18th CEG/CEM, Kadena AB, Japan

CMSgt David W. Williamson, 775th CES/CED, Hill AFB, Utah

Major General William D. Gilbert Award (Staff Action Officer)

Officer

Capt Patrick J. Obruba, HQ ACC/A7XO, Langley AFB, Va.

Lt Col Robert T. Germann, HQ AFMC/MSEOM, Wright-Patterson AFB, Ohio

Enlisted

MSgt James E. Brewster, HQ USAFE/A7XE, Ramstein AB, Germany

SMSgt William M. Hancock, HQ PACAF/A7PB, Hickam AFB, Hawaii

Civilian

Mr. Richard D. Peppers, HQ AMC/A7PD, Scott AFB, Ill.

Mr. Thomas E. Wahl, HQ AFSOC/A7CZ, Hurlburt Field, Fla.

The Harry P. Rietman Award (Senior Civilian Manager)

Mr. Udo Stuermer, 52nd CES/CD, Spangdahlem AB, Germany

Mr. Kenneth M. Cable, 27th CES/CEO, Cannon AFB, N.M.

Outstanding Civil Engineer Senior Military Manager

Maj Anthony J. Davit, 56th CES/CEO, Luke AFB, Ariz.

Lt Col Scott A. Hartford, 78th CES/CC, Robins AFB, Ga.

Major General Eugene A. Lupia Award

Military Manager

Capt Aaron D. Altwies, HQ USAF/ILEVQ, Washington, D.C.

Capt Adam S. Roberts, 611th CES/CECC, Elmendorf AFB, Alaska

Military Technician

SrA David J. Besse, 347th CES/CED, Moody AFB, Ga.

TSgt Eric A. Dumpert, 18th CES/CEOIU, Kadena AB, Japan

Chief Master Sergeant Larry R. Daniels Award (Military Superintendent)

SMSgt Mark A. Hepner, HQ AETC/CEOX, Randolph AFB, Texas

SMSgt Steven D. Kelly, 3rd CES/CEF, Elmendorf AFB, Alaska

Outstanding Civil Engineer Civilian Manager

Mr. James A. Copeland, Jr., 437th CES/CEF, Charleston AFB, S.C.

Mr. Timothy L. Collins, HQ AFCESA/CEMR, Tyndall AFB, Fla.

Outstanding Civil Engineer Civilian Supervisor

Mr. Mark A. Johnson, 437th CES/CEFO, Charleston AFB, S.C.

Mr. Gary P. Lamb, 347th CES/CEOHH, Moody AFB, Ga.

Outstanding Civil Engineer Civilian Technician

Mr. In Ho Han, 51st CES/CEOIU, Osan AB, Rep. of Korea

Mr. Michael D. Witt, 375th CES/CEOFC, Scott AFB, Ill.

Civil Engineer Awards

Outstanding Civil Engineer Manager (Air Reserve Component)

Officer manager

Lt Col Michael J. Rocchetti, 11th CES/CEO, Bolling AFB, Washington D.C.

Maj Judah C. Bradley, 919th CES/CEO, Eglin AFB, Fla.

Senior NCO manager

CMSgt Joseph W. Rivera, HQ AFCESA/CEXF, Tyndall AFB, Fla.

MSgt Jeffrey G. Smith, 917th CES/CED, Barksdale AFB, La.

NCO manager

TSgt Willie B. Clemmons Jr., 315th CES/CED, Charleston AFB, S.C.

TSgt Stephen J. Burns, HQ AFCESA/CEMR, Tyndall AFB, Fla.

Major General Augustus M. Minton Award (outstanding *Air Force Civil Engineer* magazine article)

Maj Donald R. Ohlemacher, ACSC student, Maxwell AFB, Ala.

Capt Patrick C. Suermann, USAFA/DFCE, Air Force Academy, Colo.

Dr. James B. Pocock, USAFA/DFCE, Air Force Academy, Colo.

Lt Col Jeffrey A. Vinger, HQ ACC/A7XO, Langley AFB, Va.

Outstanding Community Planner

Ms. Heidi R. Nelson, 319th CES/CEC, Grand Forks AFB, N.D.

Mr. Jonathan Linquist, 14th CES/CEC, Columbus AFB, Miss.

Major General James B. Newman Medal (Society of American Military Engineers)

Col Gus G. Elliott Jr., HQ AFCESA/CC, Tyndall, AFB, Fla.

Col Josuelito Worrell, US CENTAF/CMO, Al Udeid AB, Qatar

Major General Guy H. Goddard Medal (Society of American Military Engineers)

Active Duty

MSgt Mark D. Bartlett, 52nd CES/CEOM, Spangdahlem AB, Germany

MSgt James W. Cupp, 305th CES/CEO, McGuire AFB, N.J.

Air Reserves

CMSgt Bobby G. Moore, HQ AFRC/CEE, Dobbins ARB, Ga.

MSgt Harvey Bert Clark, HQ AETC/CEOX, Randolph AFB, Texas

Air National Guard

SMSgt Mark E. Robertson, 179th CES, Mansfield, Ohio

National Society Of Professional Engineers Federal Engineer Of the Year

Military

Capt David B. Novy, HQ PACAF/CEOG, Hickam AFB, Hawaii

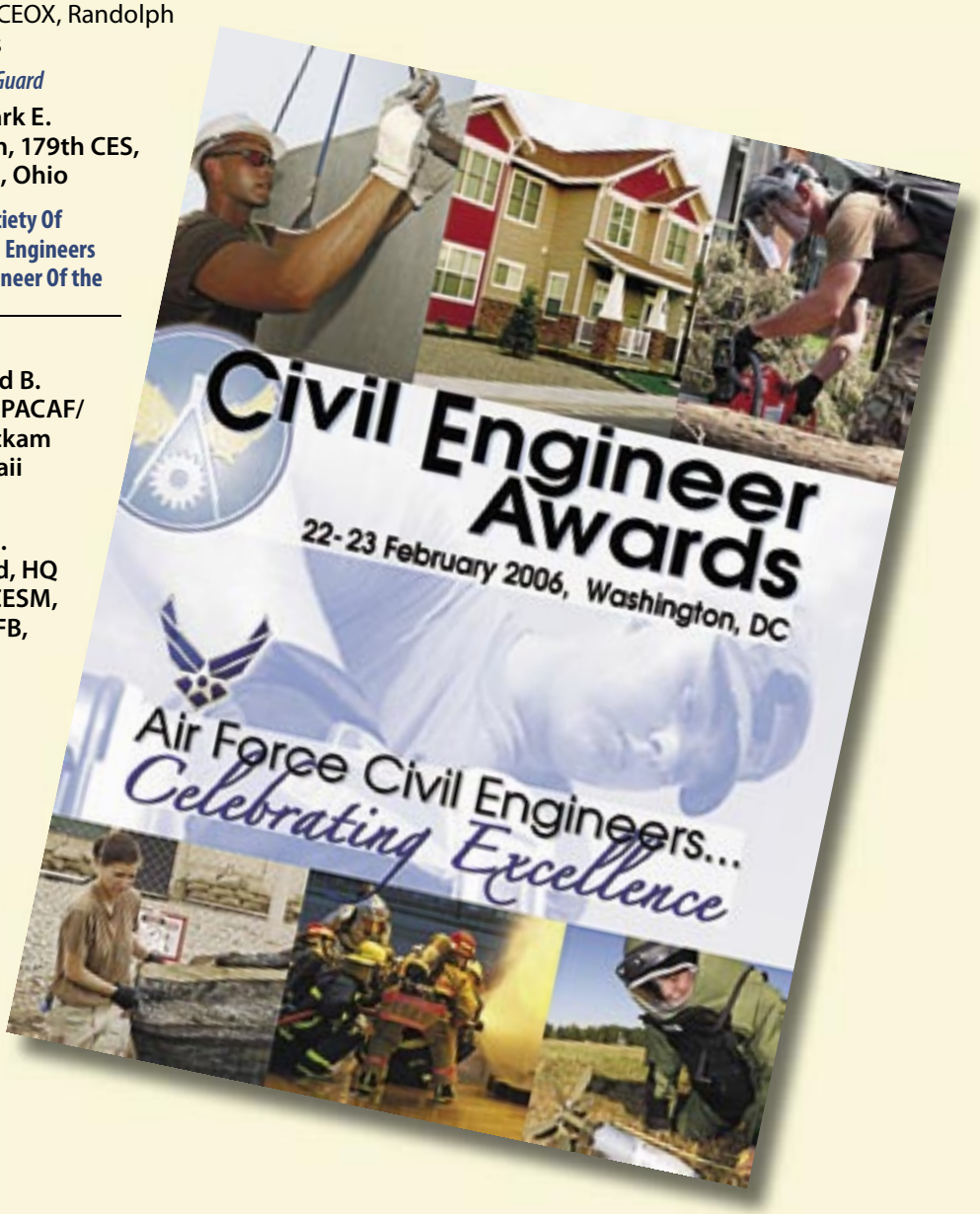
Civilian

Dr. Daryl I. Hammond, HQ AFCESA/CESM, Tyndall AFB, Fla.

Balchen/Post Award (awarded by the Northeast Chapter of the American Association of Airport Executives for best snow and ice removal unit)

35th CES, Misawa AB, Japan

92 CES, Fairchild AFB, Wash.



Air Force Blue Stays Green

MSgt Michael A. Ward
HQ AFCESA/PA

The Air Force purchased more renewable energy than any other member of the Environmental Protection Agency's green power partnership last year, according to a report released by the EPA in January.

The partnership consists of U.S. companies and organizations that purchase significant amounts of renewable energy. This is the second year in a row the Air Force has topped the list.

Last year, the Air Force purchased 1,066,397 MWh of renewable energy. That represents 11% of all electrical usage by the Air Force in 2005.

As well as being the biggest purchaser in the green power partnership, the Air Force is also the leading purchaser of renewable energy in the federal government, accounting for nearly 50% of all the government's green power purchases.

Windmills are just one of the alternate energy souces that the Air Force uses to stay green. (photo courtesy DOE)

"We've been very aggressive in pursuing renewable energy because it makes economic sense," said Mr. Jim Snook, Air Force renewable energy program manager. "Industry has seen that we are committed to renewable energy and they are bringing ideas and projects to us and making more renewable purchasing opportunities available."

Dyess AFB, Texas, and Fairchild AFB, Wash., now receive 100% of their energy from wind or other renewable power sources provided by local utility companies. The Air Force also has begun generating its own renewable power; it operates a 2.4 MW wind farm on Ascension Island and a 1.3 MW wind farm at F.E. Warren AFB, Wyo. Wind farms are being considered at several other bases.

While wind power is the largest contributor so far in the Air Force's renewable energy plan, the portfolio also includes the use of biomass at Hill AFB, Utah, and the installation of more than 3,500 ground source heat pumps at various installations. Energy management officials said they are also trying to increase the use of solar energy, which in the past was considered cost-prohibitive.

"New technologies have significantly reduced the price of renewables, so that in many areas it's competitive with commercial power," said Mr. Jerry Doddington, chief of the Air Force energy management team. "The key for companies is to have a customer, and it's our plan to be a customer."

For the complete green power partnership ranking go to http://www.epa.gov/greenpower/partners/top25.htm.

Continuing Education

AFIT

Wright-Patterson AFB OH

Course No.	*Title*	*Off.*	*Start Dates*	*End Dates*
ENV 021	Intro to IRP	06A	05-Jun	09-Jun
ENV 531	Air Quality Management	06B	05-Jun	09-Jun
MGT 420	Engineering Flight Commander	06A	05-Jun	09-Jun
MGT 430	Operations Flight Commander	06A	05-Jun	09-Jun
ENG 470 (S)	Electrical Systems for Managers	06A	12-Jun	16-Jun
ENV 417	Environmental Restoration Project Mgmt	06A	12-Jun	16-Jun
ENV 541	Water Quality Management	06B	12-Jun	16-Jun
MGT 484	Reserve Forces Air Base Combat Eng'ing.	06B	12-Jun	23-Jun
ENV 419	Enviro. Planning, Prog. & Budgeting	06C	20-Jun	22-Jun
MGT 426 (S)	SABER Management	06A	20-Jun	22-Jun
ENV 020 (S)	ESOH Compliance Assessment	06C	26-Jun	29-Jun
ESS 010 (W)	Hazardous Waste Accumulation	06C	10-Jul	14-Jul
ESS 030 (W)	Stormwater Management	06C	10-Jul	14-Jul
MGT 570	CE Superintendent	06C	10 Jul	21-Jul
MGT 101	Intro BCE Organization	06C	11-Jul	25-Aug
ESS 070 (S)	Hazardous Material Management	06C	18-Jul	18-Jul
ENG 520 (W)	Comprehensive Planning Development	06A	24-Jul	11-Aug
MGT 421 (S)	Contracting for CE	06B	24-Jul	04-Aug
ENV 521 (S)	Hazardous Waste Management	06B	31-Jul	4-Aug

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. Visit the CESS Web site at http://www.afit.edu (under Continuing Education) for satellite and Web classes.

366th Training Squadron

Sheppard AFB TX

J3AWR3E453-01AA	Pest Management Recertification	12-Jun/19-Jun/24-Jul	16-Jun/23-Jun/28-Jul
J3AZR3E051-003	Cathodic Protection Maintenance	12-Jun/21Jul	23-Jun/03-Aug
J3AZR3E451-004	Fire Suppression Systems Maintenance	21-Jun/13-Jul	12-Jul/02-Aug
J3AZR3E051-007	Airfield Lighting Systems	17-Jul	26-Jul
J3AZR3E051-008	High Voltage Systems Maintenance	10-Jul	04-Aug
J3AZR3E051-010	Bare Base Electrical Systems	05-Jun	16-Jun
J3AZR3E071-001	CE Advanced Electrical Troubleshooting	07-Jun/06-Jul	05-Jul/02-Aug
J3AZR3E072-113	Bare Base Power Generation (Diesel)	05-Jun/10-Jul	29-Jun/03-Aug
J3AZR3E151-013	HVAC-R Control Systems	05-Jun	10-Jul
J3AZR3E151-014	HVAC-R Direct Control Systems	11-Jul	10-Aug
J3AZR3E453-02AA	Pest Management Certification	05-Jun	30-Jun
J3AZR3E471-101	Bare Base Water Pur. & Distr. Sys. Maint.	05-Jun/21-Jun/10-Jul/26-Jul	14-Jun/30-Jun/19-Jul/04-Aug
J3AZR3E472-01AA	Liquid Fuels Maintenance Technician	05-Jun/10-Jul/31-Jul	16-Jun/21-Jul/11-Aug

Gulfport MS

JCAZP3E351-01AA	Roof Installation, Maint., Insp. & Repair	06-Jun	16-Jun
JCAZP3E351-02AA	Metals Layout, Fabrication & Welding	01-Jun/21-Jun/25-Jul	20-Jun/11-Jul/11-Aug

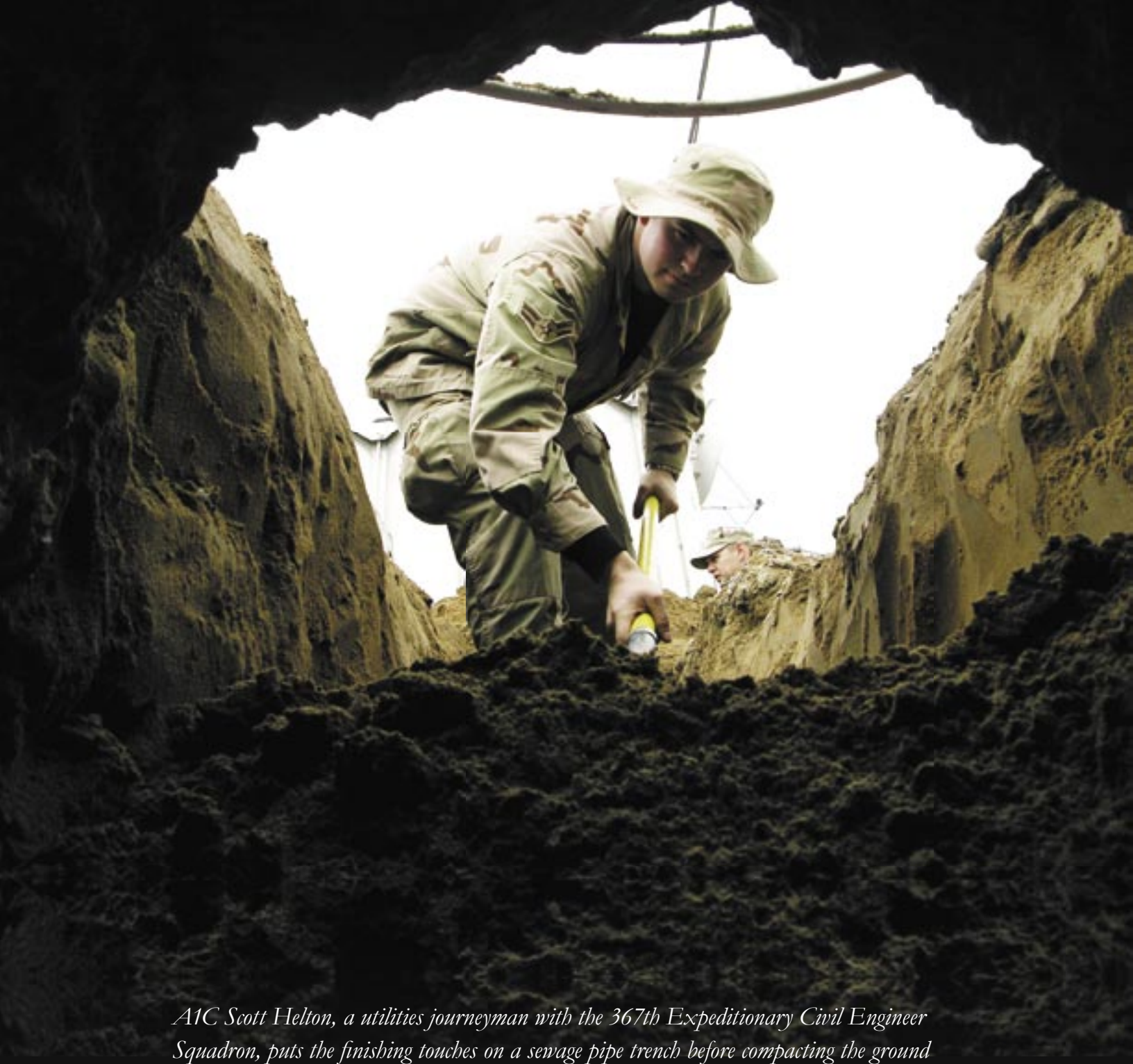
Ft. Leonard Wood MO

JCAZP3E571-01AA	Construction Surveying	19-Jun/10-Jul/24-Jul	30-Jun/21-Jul/04-Aug
J3AZP3E971-003	Advanced Readiness	26-Jun/17-Jul	30-Jun/21-Jul
J3AZP3E971-005	NBC Cell	19-Jun/10-Jul/24-Jul	23-Jun/14-Jul/28-Jul

Ft. Sam Houston TX

J5AWA3E453-03AA	DoD Pest Management Recertification	10-Jul	14-Jul

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.



A1C Scott Helton, a utilities journeyman with the 367th Expeditionary Civil Engineer Squadron, puts the finishing touches on a sewage pipe trench before compacting the ground during the renovation of the 367th AEW headquarters building at Manas AB, Kyrgyzstan. The reconstruction, originally slated to cost $250,000, is being done for $50,000 because the Airmen of the 367th ECES are doing the work. Although it will be barely noticeable from the outside, the building's interior will be completely refurbished, housing two levels of offices and featuring indoor bathrooms, a rarity for buildings on the base. A1C Helton is deployed from Whiteman AFB, Mo. and is a native of Hemet, Calif.

(text and photo by Capt James Bressendorff)