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New Mission, New Infrastructure

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From The Top

photo by Keith Fred

Maj Gen L. Dean Fox

HAPPY NEW YEAR!

Well, here we are in the heart of winter…for some of you that means snow removal operations and nonstop service calls in order to keep our bases operating. Sallie and I hope that your holidays were safe and filled with good will and cheer. As we all settle into the winter season, we must be even more observant of our actions and surroundings. It's easy for us to let our guard down in the dark and chilly months of winter; therefore, I'm asking each of you to be extra cautious when working and playing during the winter months.

Our Back to Bases Task Force finished up their base visits and had tremendous praise for all the hard work and dedication they witnessed at each base. I want to personally thank the participating squadrons for providing the team with outstanding support and candid inputs. The results from the task force demonstrated—as expected—that we, your headquarters elements, have some work to do to better support the bases. In December, we briefed the Civil Engineer Senior Leaders on the results and we've already taken steps to address the "issues" brought up by you and the task force. We've tasked the major commands and field operating agencies with organizing and focusing support to their bases using the "gaps" identified during the task force visits.

Among the issues we're addressing are restructuring the format and content of our Base General Plans; updating as-built drawings; reviewing vehicle authorizations and how we execute the Pri Buy program; civilian professional development and retention; ACES connectivity and usability problems; and providing assistance in updating real property records. You and the team identified 57 individual issues, each of which has been assigned an OPR. We are tracking each issue to resolution and the major commands and field operating agencies will report back during the Programmer's Conference in February; we'll keep you posted on our progress.

This fall, I was fortunate to attend the Major Command Base Civil Engineer Conferences and, I must say, was impressed with all the initiatives and the progress each of you are making. Thanks to all who made my visits so informative and productive. From our Guard, Reserve, and active duty bases, to our contingency bases throughout Southwest Asia, your drive and dedication to executing the mission is unparalleled and you all truly contribute to ensuring we have a superior TOTAL FORCE. As my travels continue, I hope to be able to get "Back to Bases" myself, to witness firsthand all the marvelous work you all do each and every day.

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

Features

Departments

On the cover ...

A1C David Moses, crew chief of the 509th Aircraft Maintenance Squadron, Whiteman AFB, Mo., marshals the "Spirit of Missouri" on March 31, 2003. Whiteman AFB was revitalized when B2 bombers replaced ICBMs as the base's primary mission.

(photo by TSgt Michael R. Nixon)

Please send story ideas, articles, photos, comments and suggestions to
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The Civil Engineer
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Organizational restructuring at Air Mobility Command Headquarters recently unified the Civil Engineering and Services Directorates into a new A7 Installations & Mission Support Directorate. Entrusted with leading the pioneer directorate, Brigadier General Del Eulberg is focusing efforts on training, organizing and equipping AMC's people for...

AFCE: Air Mobility Command has gone through a great deal of reorganization both at the headquarters and numbered air force levels. What prompted the HQ AMC restructuring and how did it change HQ AMC? What future changes are envisioned?

Brig Gen Eulberg: What is changing at AMC is really a reflection of what is happening across the Department of Defense as we "re-look" at the traditional warfighting headquarters organizations. The objective is to organize in peacetime as close as we can to how we will be organized when we go to war. Reorganizing on "day one of the war" is not the best way to prepare for future conflicts…especially when we face a small, highly mobile enemy—global terrorists. We need to streamline our headquarters functions so we can quickly adapt and provide maximum support to the joint warfighter.

It is also important to understand that this "re-look" is not new. Since becoming a separate service, the Air Force has taken pride in our ability to adapt to constantly changing threats, as well as adapt our tactics, techniques and procedures as a result of new technologies. We must ensure that we are organized, trained and equipped to maximize our combat effectiveness (as well as how we provide critical command and control). For example, based on lessons learned in the Gulf War, the Air Force made significant and bold changes in how we are organized, trained and equipped. Right after the conflict, the Air Force Major Commands were reorganized: Strategic Air Command, Tactical Air Command and Military Airlift Command stood down and Air Combat Command and Air Mobility Command were established. This "streamlining" was key to how we present forces to the Combatant Theater Commander. We also changed how we train our warfighters. The Air Force began training in an "integrated fashion." We now have an Air Force Weapons School instead of a Fighter Weapons School at Nellis AFB. We also have integrated training at Red Flag on the Nellis Range. It's not training for fighter pilots alone—the training now involves all weapon systems in an integrated fashion, just like we fight. The next critical area that changed was how we provide command and control of our operational forces. This important element can be seen with the establishment of the combined aerospace operations centers as a weapon system. The CAOC provides the Joint Forces Air Component Commander with all the disciplines necessary to conduct air operations, such as intelligence on potential targets, time-critical targeting, allocation of air assets,

and finally, bomb damage assessments. An entire air war, from beginning to end, can be seen from a CAOC. We have been streamlining and evolving the operational side for some time.

What's happening today at HQ AMC is a continuation of this evolution. Gen John Handy [Commander, AMC] stood down two numbered air forces, Fifteenth and Twenty-First, and combined them into a single numbered air force—Eighteenth Air Force. This will provide a more streamlined operational chain of command for AMC's 12 wings. Gen Handy also made a number of changes to the AMC A-staff headquarters structure. One of the most significant changes occurred on Oct. 1, when we stood up the A7 (Directorate of Installations & Mission Support). Gen Handy's vision was to create a directorate that integrated combat support—not just "contained" traditional combat support functions. This integration is an essential element in streamlining combat support at the headquarters level, just like we have done on the operational side.

AFCE: How did this reorganization change the headquarters? You mentioned the A7. What makes that up?

Brig Gen Eulberg: The change at the headquarters in some ways mirrors what the Air Force accomplished when we went to the combat wing organization a few years ago. One significant driving force for the combat wing organization was having the Mission Support Group Commander command all the combat support functions that they would need to set up an expeditionary air base (i.e., organize like we fight). Gen Handy's vision was to create a "Mission Support Group Directorate" at the headquarters. The new A7 Directorate will be organized at the major command level to provide the same degree of focus that exists at the combat wing organization; that focus must be combat support. To accomplish this objective, we started with a clean sheet of paper, knowing the organization would grow in the future. It wasn't simply the integration of CE and Services—this was just the first step in integrating combat support at the headquarters level. The new A7 Directorate reorganization had two primary objectives: first, integrate the Civil Engineering and Services Directorates, and second, create a new capability—stand up the Expeditionary Combat Support Division.

To meet our first objective, we avoided the "easy answer." We did not want to just add a new management layer on top of the two organizations—we wanted to truly integrate CE and Services. The first task was to identify those areas that were common to most headquarters staffs. We identified and integrated three common areas: resources (funds management), readiness and plans/programs. So we now have a Readiness Operations Division that includes oversight/management of all CE and Services contingency operations, Prime BEEF and Prime RIBS management, and Explosive Ordnance Disposal and Fire. We expanded the role of the Plans and Programs Division by adding non-appropriated funds planning and programming, as well as moving the environmental planning function into this division. We fully integrated CE and Services funds management into one Resources Division. We also identified each organization's core competencies because we wanted to make sure we kept functional expertise intact and maintained clear career paths. For example, we established a Services Operations Division with three branches: 1) community support, 2) force support, and 3) business support.

Our second objective was to create a new division that would provide the capability to fully embrace Expeditionary Combat Support at the headquarters. The new division will play a lead role in working the combat support concept of operations, as well as formalizing combat support tactics, techniques and procedures in conjunction with the Air Mobility Warfare Center. We'll also work other cross-functional issues such as installation excellence and force protection and we'll be the staff advocate for base operating support.

AFCE: Is the integration the main difference between what you have now and what the old engineering and services directorate would have looked like?

Brig Gen Eulberg: There are several differences. The biggest difference has been the change in the Services career field since the early 1990s; Services now includes all traditional Morale, Welfare and Recreations functions. Another difference is how we have organized the new Directorate with an emphasis on integration in the areas of readiness, resources, and plans and programs.

AFCE: What is your role? Do you see yourself as an advocate for the MSG Commander?

Brig Gen Eulberg: Gen Handy designated the Director of Installations & Mission Support, the A7, to be the single point of contact and advocate for MSG commanders in AMC. This has already paid dividends for our command. In October, I had the opportunity to travel to five AMC bases in five days with all the AMC MSG commanders. The focus of the trip was installation excellence. We had an opportunity to see five initiatives at each base that had potential to be benchmarked across AMC. This "Installation Excellence Orientation" trip gave new MSG commanders the opportunity to travel with more experienced commanders to benchmark selected MSG programs, to teach and help each other and to institutionalize established best practices. We also now have monthly video teleconferences with the MSG/CCs that last no more than an hour and are open to the entire A-Staff as a means to open communication between the headquarters and the field commanders.

AFCE: In the future, are other functions going to be rolled into A7, and do you see the AMC structure as a model for other commands?

Brig Gen Eulberg: Gen Handy has a clear vision, articulated in the Global Mobility CONOPS, which the Air Force has designated the lead CONOPS for expeditionary combat support. The new A7, as it was established on Oct. 1, is the first step. In the next year, additional combat support functions will be realigned under the Directorate of Installations & Mission Support, following the same philosophy that we used to integrate CE and Services. It will not just be another layer, but a real integration of like functions, so we can maximize support for the warfighter. Gen Handy has a deliberate timetable in mind, so you'll see additional changes in the not-too-distant future. Air Force leadership is also focused on changes at the headquarters level in terms of combat support. This topic was specifically discussed at the last four-star CORONA meeting in October.

AFCE: The establishment of Expeditionary Mobility Task Forces has changed how AMC conducts its mission. What will this mean for combat support forces?

Brig Gen Eulberg: The EMTFs will provide greater focus for the Global Mobility CONOPS in support of Combatant Commanders. The EMTFs report directly to Eighteenth Air Force, which is commanded by a three-star general here at Scott AFB. The EMTFs will provide additional support to the two Air Mobility Operations Groups located at Travis and McGuire AFBs, as well as the two AMOGs located in the Pacific and Europe, working air mobility en route infrastructure. The two continental U.S. AMOGs will provide the initial assessment and laydown capability for contingency operations at a forward base, just like we did in Operations ENDURING FREEDOM and IRAQI FREEDOM.

AFCE: I understand Eagle Flag will be an important part of Expeditionary Combat Support in the future. What is Eagle Flag and what is the A7's role in it? Who will go to Eagle Flag?

Brig Gen Eulberg: Eagle Flag is a new integrated training program for key and essential expeditionary combat support leaders. The training will be tied to our Air Expeditionary Force, or AEF, buckets and will be located at McGuire AFB under the Air Mobility Warfare Center. Eagle Flag is to combat support what Red Flag at Nellis AFB is to the operators. This training will not duplicate skills proficiency training we receive at home station and at Silver Flag.

Members of the 615th Air Mobility Squadron, Travis AFB, Calif., and a C-130 aircrew from the 34th Combat Training Squadron, Little Rock AFB, Ark., perform an engine-running onload/offload at night on Naval Air Engineering Station Lakehurst, N.J., during the Air Force's newest contingency exercise, Eagle Flag. *(photo by SSgt Jerry Morrison, Jr.)*

The training will focus on the integration required to support the initial force modules: open the airfield, set up command and control, and establish the air base. The idea is to ensure we incorporate "Lessons Learned" in OEF and OIF into our training plan. We want our warriors ready to deploy anywhere in the world in support of any mission after they finish at Eagle Flag. They will know what each functional brings to the fight and won't have to learn it on day one of the war.

AFCE: What toll has the ongoing Global War on Terrorism taken on AMC bases and Civil Engineer personnel?

Brig Gen Eulberg: Having spent the last five years at base level, I saw firsthand the OIF and OEF demands that were placed across all combat support functions. Our priority was clearly on operations in the war zone. To be successful in OEF and OIF, we needed to deploy not only Active Duty, but also Guard and Reserve Combat Support forces and it did have an impact on home station. The operations tempo was increased across all functions. Like all commanders of Air Force bases, our commanders had to redefine the level of service we were going to provide the people back at home station—whether they're active duty or retired or family members. How many hours was the gym or the dining hall going to be open? In CE, how many work orders could we support? Under the Chief of Staff's guidance, we would "break the base," if necessary, to support the warfighter. The challenge for everyone was not to break the back of combat support functions back at home station in trying to keep the same level of pre-contingency services. Identifying the "right" level is probably worth further study as a number of bases did it differently.

AFCE: You spoke of the Reserves. AMC relies heavily on the Total Force for its flying mission. Is the same true for civil engineering? How important are the Guard and Reserve components to the AMC Civil Engineer mission?

Brig Gen Eulberg: The Guard and Reserve civil engineering support is vital to our ability to perform our mission here. Our Military Personnel Authorization volunteer support reached 28,000 man-days in FY03. The Guard and Reserves who were volunteers brought expertise from their civilian jobs that proved invaluable. One of the great things about the Guard and Reserve working alongside Active Duty is that there is no detectable difference; they are completely interchangeable and totally integrated, particularly at the base and headquarters levels. Although we are working hard to demobilize most of the Guard and Reserve members, we will still depend heavily on their support as AMC MPA man-day volunteers. I think a future challenge for all of us in combat support, especially after OEF and OIF, is to look at all areas and make sure we have the right balance between Active Duty, Guard and Reserve forces. Do we have the right capabilities in all three components? Are we organized for war, do we train appropriately, and do we execute according to our plan?

"One of the great things about the Guard and Reserve working alongside Active Duty is that there is no detectable difference; they are completely interchangeable and totally integrated..."

AFCE: Given your previous assignments as a support group commander and wing commander, coupled with your new role as the A7, has your perspective of civil engineering changed?

Brig Gen Eulberg: One of the most exciting things about serving in our great Air Force is the opportunity to work with great Americans dedicated to something larger than themselves. The dedication I saw everyday as a commander was truly amazing. Every career field brings a unique capability to the fight, as well as its own set of limitations. But, everyone worked hard for the same thing—to make sure we remained the most powerful aerospace force in the world. As a support group commander and a wing commander, I had the opportunity every day to see how we all work together, in both peace and war. We all rely on each other as we bring our own specialties to the fight. There is no doubt in any commander's mind that civil engineering is a key member of the team. However, when we grow future leaders, the larger the combat support "lens" we give our team and the earlier we can give it to them in their careers, the greater their contributions will be to our Air Force and to our nation.

AMC Implements A7 Proposal

by Lt Col Mike Hutchison, HQ AMC/A7IP

The new construct creates a HQ AMC organizational structure … establishing an "A7" Installations & Mission Support Directorate (consolidating AMC/CE and AMC/SV into the A7 Installations & Mission Support Directorate), … [and] provides a single focal point … for Mission Support Group/CCs to vet their mission support issues. ***HQ AMC Programming Plan 03-07, 15 Sep 03***

When Air Mobility Command began its reorganization in February 2002, Gen John Handy, Commander, AMC, saw inconsistencies between the organizational structures at wing-level and that at major command headquarters. As the U.S. Air Force Combat Wing Organization refined the base-level Mission Support Group organization, the major command structure lagged behind and further complicated combat support. Drafted in Spring 2003, HQ AMC Programming Plan 03-07 contained guidance from Gen Handy on reducing the headquarters' organizational inconsistencies.

An A7 organizational proposal by Brig Gen Del Eulberg applied Gen Handy's guidance and centered on a theme of integration. It was readily cleared for implementation in July 2003. The proposed A7 organization included two types of integration—internal and external.

The internal integration was a rejoining of an old partnership, "Engineering and Services." Rather than merely combining the CE and SV directorates with minimal interface, the proposed A7 organization united them by preserving functionally unique, core business processes, and merging similar readiness, programming and resources functions. Internal objectives seek to enhance CE and SV functional excellence and promote an integrated emphasis on installations and quality of life throughout A7 and AMC, in areas such as Dorm Management and Non-Appropriated Funds Construction, for example.

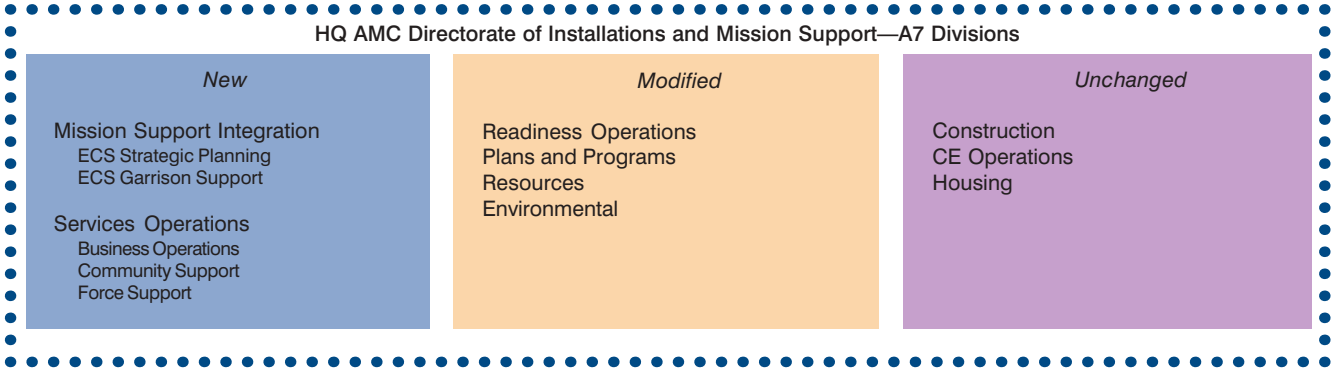
The A7 organization was also designed for external integration—to be the single point of contact for the MSG commander and Expeditionary Combat Support issues. An ECS Division was chartered for A7; this integral new division consolidates efforts to converge ECS functional programs and processes.

AMC's ECS Division intends to develop synergistic solutions for both expeditionary and peacetime environments. The ECS Division will handle areas where the Global Mobility mission interfaces with Air Force ECS initiatives for strategic planning, operational in-garrison matters, and Air Expeditionary Force/Functional Area Manager issues. One branch of the division will work with Air Force combat support agencies to develop several articles: ECS concepts of operations; procedural teamwork integration with ECS tactics, techniques and procedures; comprehensive command and control systems; integrated equipment modernization priorities; and cross-functional training/exercising, such as Eagle Flag. Another ECS branch will champion garrison issues for such things as MSG and Base Operating Support resource requirements, Force Protection Integration, and managing MSG integration of readiness training, equipping and reporting.

Importantly, the new division will ultimately be staffed with experienced officers, senior enlisted and civilians from a variety of functional areas, to focus on combat support synergy in doctrine/TTPs, organization, training/education, materiel, leadership, and personnel. Integrating the 22 functional areas in combat support under a common framework is an exciting step for the division whose motto is "Closing Seams and Building Teams."

In the past, functional excellence has not necessarily translated into successful results for the whole MSG or ECS team. The AMC A7 organizational plan applies the "single focal point" charter as a means of integrating goals and procedures to overcome persistent barriers, closing cross-functional seams and breaking new ground for combat support teamwork and results.

Lt Col Mike Hutchison is chief of the ECS Strategic Planning Branch, HQ AMC/A7IP, Scott AFB, Ill. He initially researched and authored a paper on integrating Combat Support functional areas and led the AMC A7 Reorganization Tiger Team.



A Flag of Their Own

New combat support exercise preps commanders for battle

Air Force Combat Support professionals now have their own "flag" exercise—Eagle Flag. As the Air Force's newest flag-level exercise, Eagle Flag is designed to test the skills of expeditionary combat support personnel to the maximum extent in a dynamic setting. The exercise is managed by its creator, the Air Mobility Warfare Center's 421st Training Squadron at Fort Dix, N.J.

Applying some lessons learned from operations around the world, including Operations Enduring Freedom and Iraqi Freedom, Eagle Flag challenges ECS personnel from across the Air Force to open and establish a bare base to an initial operating capability, regardless of mission or aircraft type, using the force module concept.

During a seminar at the 35th Airlift/Tanker Association convention on Nov. 1, Col Joan Cunningham described Eagle Flag as "an opportunity —what I call a dress rehearsal—prior to actually having to perform that actual (ECS) mission."

Col Cunningham, special assistant to the AMWC commander for Eagle Flag, presented an overview of the exercise and gave a glimpse of how Eagle Flag will evolve in the coming years.

According to Col Cunningham, three key force modules—open an air base, set up initial command and control, and establish the air base—are necessary to get an austere airfield to initial operating capability, ready to launch and recover military air missions. All three modules take place within 72 hours of the word "go."

Eagle Flag is important so that those who provide ECS support can practice their unique functional skill sets in a coordinated, realistic manner. The time to practice this isn't "when bullets are flying over your head, so to speak," she said.

The inaugural Eagle Flag, which took place at the Naval Air Engineering Station, Lakehurst, N.J., over 10 days this past October, is just a start, said Col Cunningham. "We have a potential to increase the events in (Fiscal 2005); expand it to more ECS functions ... integrate flying operations into the exercise. We'd like to expand the number of scenarios," she said.

Also in the works is to take Eagle Flag on the road, to different climates and operating locations. "I'm not sure that we could ever get a simulated desert environment there at New Jersey," Col Cunningham said. They'd also like to pair Eagle Flag with other flying exercises, including Red Flag, to add to the realism.

During the inaugural exercise, Air Force Chief of Staff Gen John P. Jumper said, "The whole idea behind the expeditionary Air Force is to be able to plan and execute air and space power anywhere on the globe, and [Eagle Flag] allows us to do it in the way we train. Now that we are in a different world, it's time to start training our mission support elements that get us to where we need to go, that set up in distant places and keep [the Air Force] operating."

Compiled from Air Force News stories by 1Lt Jeffrey M. Bishop and MSgt Paul Fazzini, AMC/PA, Scott AFB, Ill.

Above: Members of the 615th Air Mobility Squadron, Travis AFB, Calif., erect tents on Naval Air Engineering Station Lakehurst, N.J., during the first Eagle Flag exercise. *(photo by SSgt Jerry Morrison, Jr.)*

Special Efforts

by Capt Michael Dunlap, 90th CES
SMSgt Charles A. Dewar,16th CES
MSgt Robert Stewart, 16th CES

Air Force Special Operations CEs respond quickly and expertly to OIF missions

Given short notice for a big task in a U.S. Central Command area of responsibility, a team of Air Force Special Operations engineers got the job done ahead of schedule and then quickly redeployed to Turkey as part of a bigger task in support of Operation IRAQI FREEDOM.

Requested by name for the job, the 16th Civil Engineer Squadron, Hurlburt Field, Fla., sent a team to the AOR to build an Air Operations Center for the Combined Joint Special Operations Area Command three days after notice of the tasking.

On January 8, 2003, a 13-member team from the 16th CES arrived to start building the AOC to be used by coalition forces during OIF. Given three weeks for the task, the CE team took only 17 days to finish the job: 5,000 square feet of office space and a 4,100 square-foot, 5-level theater with stadium seating, a work area and a 1,400 square-foot screen—all completely finished and carpeted. A 14-member communications team from the 16th Special Operations Wing flew over with the civil engineers and installed all the technical equipment and wiring for the theater.

With the job at the primary location still in progress, preliminary work began on a bigger task given to the 16th CES—constructing a special operations site at an existing air base in Diyarbakir, Turkey. SMSgt Chuck Dewar, chief of the 16th CES heavy repair section, left the rest of the team in early February to meet with Lt Col Jeffrey Pitchford, commander of the 16th CES, at Aviano AB, Italy. Both were members of the advance on-site team sent to Diyarbakir to do initial site surveys and evaluations for needed equipment and manpower.

Plans for Diyarbakir were for a beddown of 7,700 soldiers to provide northern support for OIF. Based on site characteristics, plans were made for three tent cities. The 16th CES was tasked to be the lead CE team and given responsibility for the basic expeditionary airfield resources. Plans called for two 25-person CE teams from Langley AFB, Va. and Little Rock AFB, Ark., to join the 16th CES at Diyarbakir.

Leaving four members behind at the primary deployment site, eight members of the original 13-person team from the 16th CES joined Lt Col Pitchford and SMSgt Dewar in Diyarbakir. They were the first CE forces at the Diyarbakir site, arriving in mid-February to begin their mission. A joint team composed of the 16th CES crew, Brig Gen Mike Worden (the deployed base commander) and 11 members of his staff, began initial work at the site. The Air Rapid Response Kit, or ARRK (see sidebar), was used for the first time for the command and control area and part of the beddown.

Meanwhile, back home at Hurlburt Field, the 16th CES was coordinating people, equipment and supplies in order to send the rest of the lead CE team to Diyarbakir for the mission. Stringent clearance

A1C Dan Thompson trimmed molding at the CAOC.

When push came to shove, everyone at Diyarbakir, Turkey, pitched in, including Col Thomas Griffith, Commandant and Dean, SAAS, Maxwell AFB, Ala., who deployed as MSG Commander.

procedures created some difficulties for quick movement of people and equipment. Traveling on commercial aircraft and carrying whatever tools they could fit in their A-3 bags, the team from Langley AFB and 20 members of the 16th CES large team finally arrived in mid-March. Although the new arrivals reinforced the team already on site, a complete team never materialized.

The expanded CE teams continued work on the air base site, including preparing land for the anticipated additional 7,000-plus soldiers and handling all readiness responsibilities and most of the services tasks. The base eventually included 77 TEMPER tents with wood floors and environmental control units, a 750-kilowatt power plant and distribution systems, two shower and two latrine units, and a field kitchen. Personnel had begun to arrive and only one services member was on the site, but CEs pitched in to provide at least one hot meal—a real boost to morale.

Because local policies did not allow bringing in heavy equipment, plans for well and ramp construction by RED HORSE teams were changed. Much of the equipment, supplies and labor had to be contracted out locally; the Air Force Contract Augmentation Program was used to provide any assets that could not be brought into the country. Some problems occurred when contracted assets arrived before they could be used.

Before work on the base at Diyarbakir could be finished, the Turkish Parliament voted to refuse the United States permission to base OIF forces in Turkey. But before leaving Diyarbakir, CE teams had to "un-do" all of their previous hard work—the new facilities were torn down and reconstituted in less than seven days. Events prevented the mission from being completed as planned, but didn't stop the 16th CES commando engineers from demonstrating their capability and flexibility in a contingency situation.

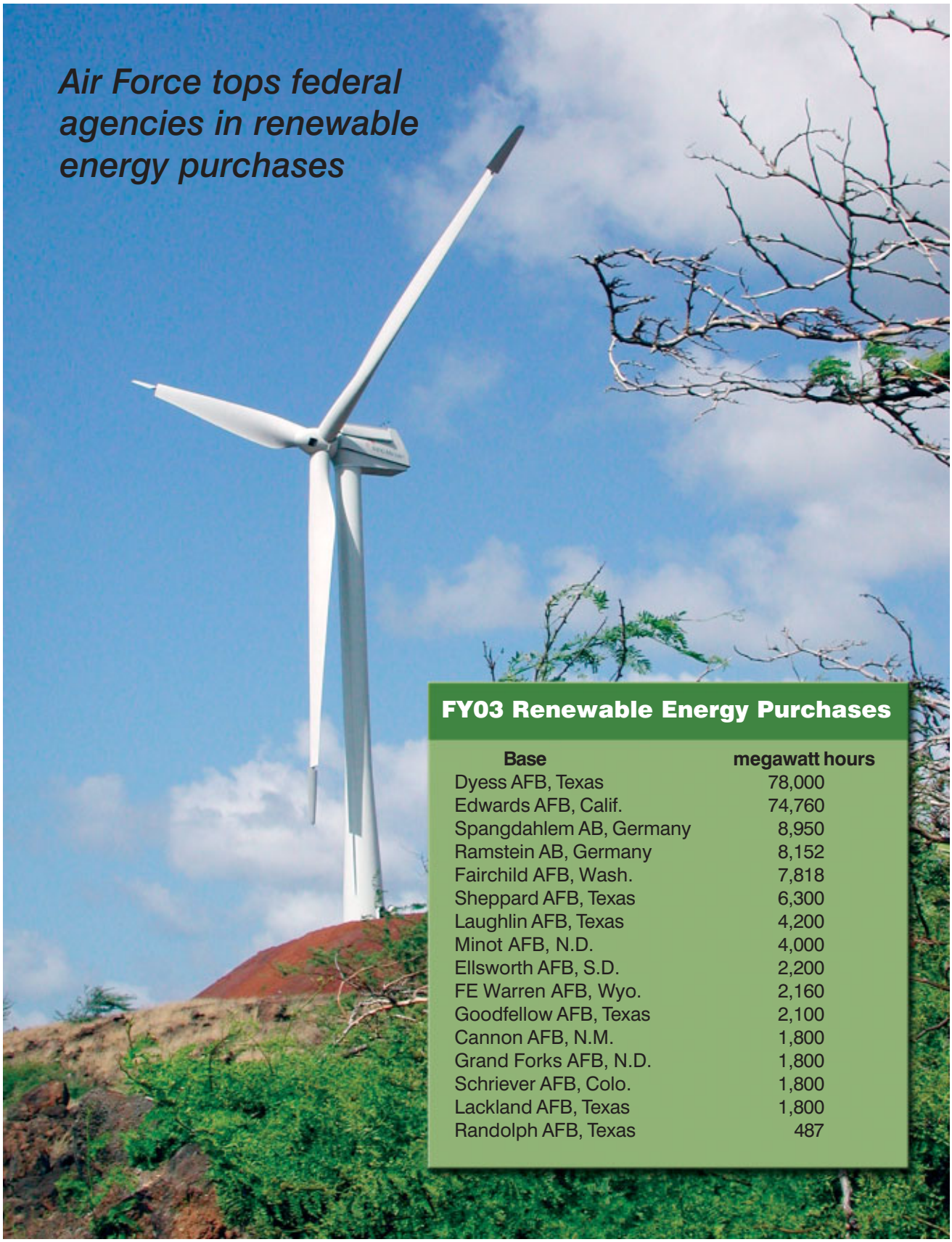
Capt Michael Dunlap is chief of Maintenance Engineering, 90th CES, F.E. Warren AFB, Wyo. SMSgt Chuck Dewar is chief of Heavy Repair, and MSgt Robert Stewart is superintendent of Heavy Vertical Repair, 16th CES, Hurlburt Field, Fla. The authors were members of the 16th CES EA team deployed to Diyarbakir during OIF.

The Air Rapid Response Kit, or ARRK, gives Air Force Special Operations Command a light, lean and clean, ready-to-go kit for beddown and three- to four-week sustainment capability. The ARRK provides interim, minimum shelter and sanitation assets for up to 100 "first in" deployers, bridging the gap between initial force arrival and arrival of Air Force Harvest Eagle or Harvest Falcon assets or Army Force Provider kits.

The ARRK is a hybrid of military assets and commercial off-the-shelf items. It consists of military tents; a commercial shower/shave unit; a water bladder; a diesel water heater; generators; expeditionary latrines; and ancillary assets such as housekeeping items, fire extinguishers, and smoke detectors. The ARRK package can be evenly dispersed among three or fewer pallets, excluding water and rations. A tailored support team of two to 13 people is needed to set up the system, depending on the mission.

Renewable Energy—An Investment

by Mike Santoro, HQ AFCESA/CESM



Air Force tops federal agencies in renewable energy purchases

FY03 Renewable Energy Purchases

Base	megawatt hours
Dyess AFB, Texas	78,000
Edwards AFB, Calif.	74,760
Spangdahlem AB, Germany	8,950
Ramstein AB, Germany	8,152
Fairchild AFB, Wash.	7,818
Sheppard AFB, Texas	6,300
Laughlin AFB, Texas	4,200
Minot AFB, N.D.	4,000
Ellsworth AFB, S.D.	2,200
FE Warren AFB, Wyo.	2,160
Goodfellow AFB, Texas	2,100
Cannon AFB, N.M.	1,800
Grand Forks AFB, N.D.	1,800
Schriever AFB, Colo.	1,800
Lackland AFB, Texas	1,800
Randolph AFB, Texas	487

in Our Future

In July 2001, with the help of the Air Force Civil Engineer Support Agency's Utility Rates Management Team, Edwards AFB made the Air Force's first major purchase of renewable energy (33 gigawatt-hours). Air Force bases now make more than half of the U.S. government's renewable energy purchases (207 gigawatt-hours). By doing so, they are hedging against energy price volatility, enhancing energy security and investing in our nation's future by encouraging further development of non-polluting energy sources. Because of its reputation as a leader, the Air Force is sought out by the renewable industry and offered ever-decreasing prices.

Renewable power purchases help the Air Force meet federal directives to increase the use of renewable energy (2.5 percent renewable use by 2005) and to reduce total energy usage (35 percent reduction by 2010). Renewable power purchases net a one-for-one credit in achieving energy usage goals.

What is renewable energy? It is power derived from sustainable resources; the most popular sources are wind, biomass (e.g., landfill gas, wood chips, agricultural and animal waste), geothermal and solar. Energy from renewable sources offers a feasible alternative to power generated from fossil fuels, which is the single largest industrial source of air pollution in the United States.

Who are the Air Force's renewable energy leaders? For FY03, Dyess AFB, Texas, topped the list (see box) with purchases of 78 gigawatt-hours, which is 100 percent of the base load. However, by July 2005, this amount will be dwarfed when Edwards AFB, Calif., will be buying 132 gigawatt-hours (60 percent of the base load; the other 40 percent is Western Power Administration hydropower). This will be the largest purchase of renewable electricity in North America and will save up to $46 million over five years.

How can renewable energy be purchased? There are two major ways to purchase renewable electricity: 1) generation from the source and 2) renewable energy credits or "green tags" attributed to the power generation.

Purchasing generation is preferred because it encourages development directly on or near military installations. Purchase of renewable generation can depend on several factors, including the availability of transmission equipment or lines for power delivery, the inherent variability of the energy supply (i.e., wind and solar are intermittent), and any ancillary services needed, such as shaping of the power using supplemental sources to meet base load characteristics.

Purchasing power generation is also dependent on whether a state's electric utility structure is deregulated. In regulated states, renewable energy generation must be purchased from the local utility company having the franchise right to serve the base—a problem in some states where generation is available from third-party developers. Currently, only 16 states are deregulated.

Purchasing green tags provides many of the same benefits but eliminates the need for power delivery, supplemental power and ancillary services. A green tag certifies that the purchased energy was generated from renewable or "green" sources. One green tag is equal to 1 kilowatt-hour of renewable energy. Green tags can be purchased from a local utility company with an established green power program or from any third-party supplier or marketer. In the latter case, the purchase must comply with the government's competition-in-contracting rules.

What is the Air Force's current strategy for purchasing renewable energy? Starting in FY04, AFCESA's Utility Rates Management Team began developing a new purchasing strategy. Instead of purchasing just for one or a few interested Air Force bases at a time, the URMT will now join with the other services to aggregate loads by region, and then advertise for a single, regional contract. Twenty regions have been established and prioritized.

The URMT's goal is to purchase generation at a cost comparable to current electrical costs (first choice) or to purchase green tags at little or no premium by taking advantage of the aggregated loads and better load profiles. In FY04, the URMT hopes to increase purchases by an additional 674 gigawatt-hours at 22 additional bases.

This new strategy requires coordination and agreement between all of the DoD installations, coordination between several utility transmission grids, and a multi-service contract that allows for transfer of funds between services. Not an easy task, but one the URMT thinks can be accomplished. The Air Force has been very successful in purchasing renewable power and will continue aggressively when possible and feasible.

Contact the author for more information on renewable energy:

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BEAR Necessities

by 1Lt Michael E. Crosse, 49th MMS

The mission of the 49th Materiel Maintenance Group is to advise, assist and train deployed units on how to set up, operate, maintain and tear down Basic Expeditionary Airfield Resources Base sites. While the primary responsibility for this lies with civil engineer units, the 49th MMG is the only Air Force unit tasked on a daily basis with BEAR Base beddown mission support. We store, maintain, deploy, repair and reconstitute all of the BEAR assets (e.g., Harvest Eagle and Harvest Falcon sets) for Air Combat Command.

In the past 10 years our mission has spanned the globe with deployments to support numerous operations. We have deployed well over 850 people with more than 5,400 tons of equipment to help establish expeditionary camps in 27 different countries.

Roles and Responsibilities

The 49th MMG has two separate, yet equally important, squadrons. The 49th Materiel Maintenance Squadron comprises CE and aerospace ground equipment and aircraft structural maintenance specialists, who do routine maintenance and repair on BEAR assets. The 49th Materiel Maintenance Support Squadron is composed primarily of logistics readiness personnel, who manage procurement, receipt, storage and deployment of the individual HE and HF set assets.

As BEAR asset specialists, the 49th MMG frequently provides technical expertise and training on the setup, maintenance and operation of BEAR Base assets to units deploying to remote locations. We also ensure that BEAR Base assets remain current by testing and evaluating new equipment.

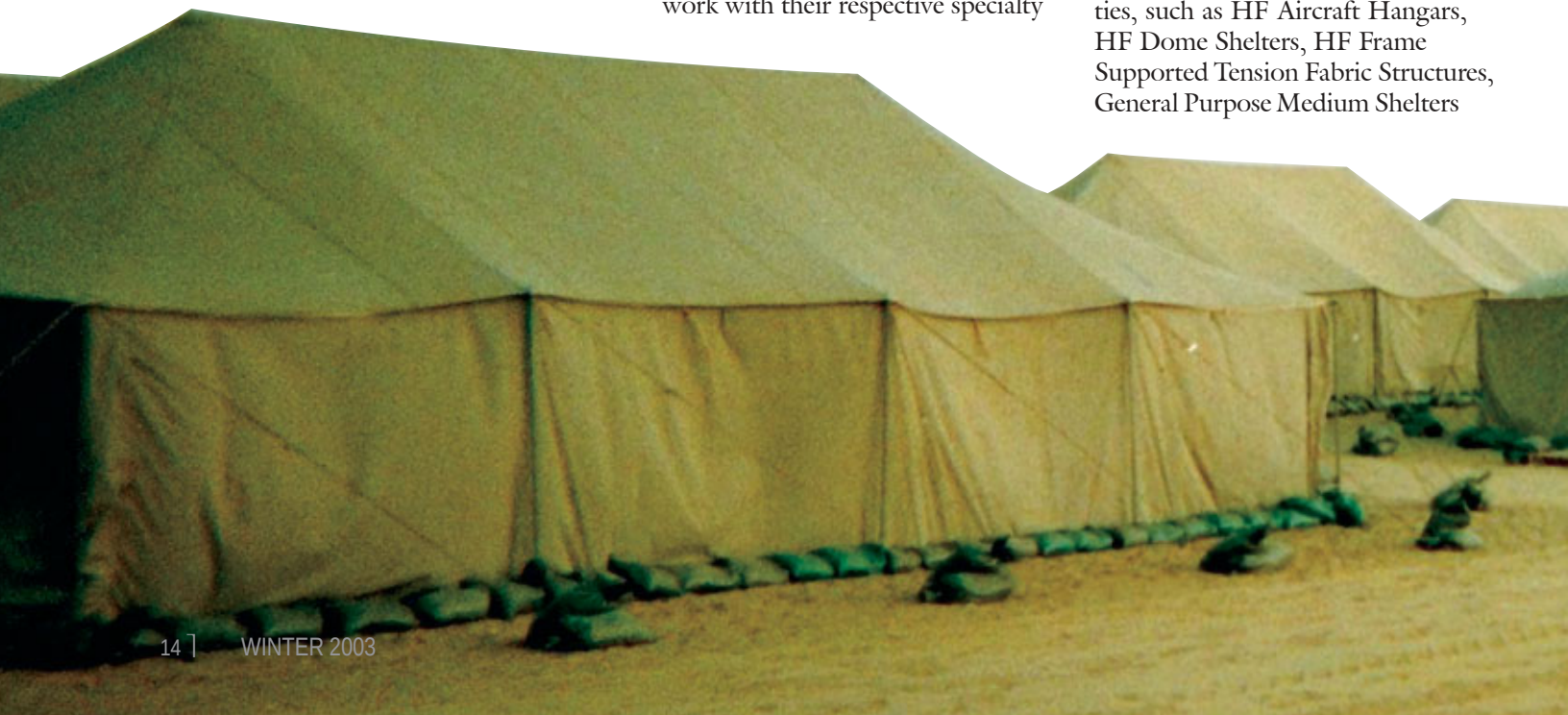
The 49th MMG has other special tasks: We store and deploy Twelfth Air Force counter-drug sets and Special Operations Command sets. Should the Space Shuttle land at its alternate site, White Sands Missile Range, we provide recovery support. The 49th MMG has also supported the President of the United States on trips to austere locations abroad, by providing, for example, a Dome Shelter for the emergency evacuation helicopter.

Role in a Beddown

To achieve our primary mission—helping expeditionary forces establish individual tent cities—technicians from our primary setup/maintenance teams break out and work with their respective specialty counterparts, helping them set up various components of a BEAR Base's infrastructure. The 49th MMG's primary teams consist of two power production technicians; two heating, ventilation, air conditioning and refrigeration technicians; two utility technicians; two electrical technicians; six structural specialists; one air-ground equipment technician; one logistical support specialist; and a team chief. In addition to their specific trades, each team member is fully trained on construction of the various flightline and industrial operations facilities.

We establish power plants and electrical grids, remote-area lighting systems, and water systems and plants. Because our specialists work and train daily with the different systems that make up a fully integrated BEAR Base, they are able to provide excellent guidance on how to best set up each system and avoid pitfalls. Once the main tent city is under way, structural experts from our primary team begin working with CE structure personnel to guide layout and placement of the large flightline and industrial operations assets.

The rest of our team members then begin to set up the large facilities, such as HF Aircraft Hangars, HF Dome Shelters, HF Frame Supported Tension Fabric Structures, General Purpose Medium Shelters



49th MMG brings home comforts to the field

and California Medium Shelters. As we construct these different facilities, we train the expeditionary CE personnel, advising them on construction techniques and, more importantly, on the sustainment and inspection requirements necessary to ensure that the facilities can endure months or years standing and remain safe. Once these tasks are completed and the mission is into sustainment, the team chief coordinates with the CE commander and U.S. Central Command Air Forces and the team moves forward to the next beddown mission.

Contingency Support

Our contingency support in Southwest Asia has been ongoing since the start of Operation Desert Shield, but with the shocking events of Sept. 11, 2001, the deployment tempo increased significantly. In support of Operation Enduring Freedom, we deployed eight teams to three different countries in the SWA area of operations. The BEAR Base beddown lessons learned there were invaluable for the successful buildup of bases used in OIF.

In direct support of OIF, the 49th MMG deployed a total of 16 teams. CENTAF set priorities and coordinated intra-theater airlift for our teams. One of our biggest challenges was helping to establish camps that sustained, on average, more than 3,000 U.S. and coalition personnel. For the first six bases, we averaged 20 days per beddown. From the expeditionary air bases that we helped establish, coalition forces flew direct interdiction missions against Iraqi forces and provided support for conventional forces and Army and Marine Special Operations forces.

I had the privilege of leading the first BEAR Base team into Iraq shortly before the conflict ended. We worked with the 407th Expeditionary Civil Engineer Squadron, establishing the first operational joint combat air base in Iraq at Tallil AB. CMSgt Reuben Gomez led the second team forward—they were first on the ground at Baghdad International Airport, Iraq, with the 447th ECES, successfully securing and reestablishing air operations. Baghdad International was a crucial air hub for transiting C-5s, C-17s, C-141s and heavy commercial transport aircraft to support both the ongoing war and the growing humanitarian efforts. During OIF, our two teams were deployed in the AOR for more than 150 consecutive days, to four separate countries, where we set up an unprecedented eight separate BEAR Base camps.

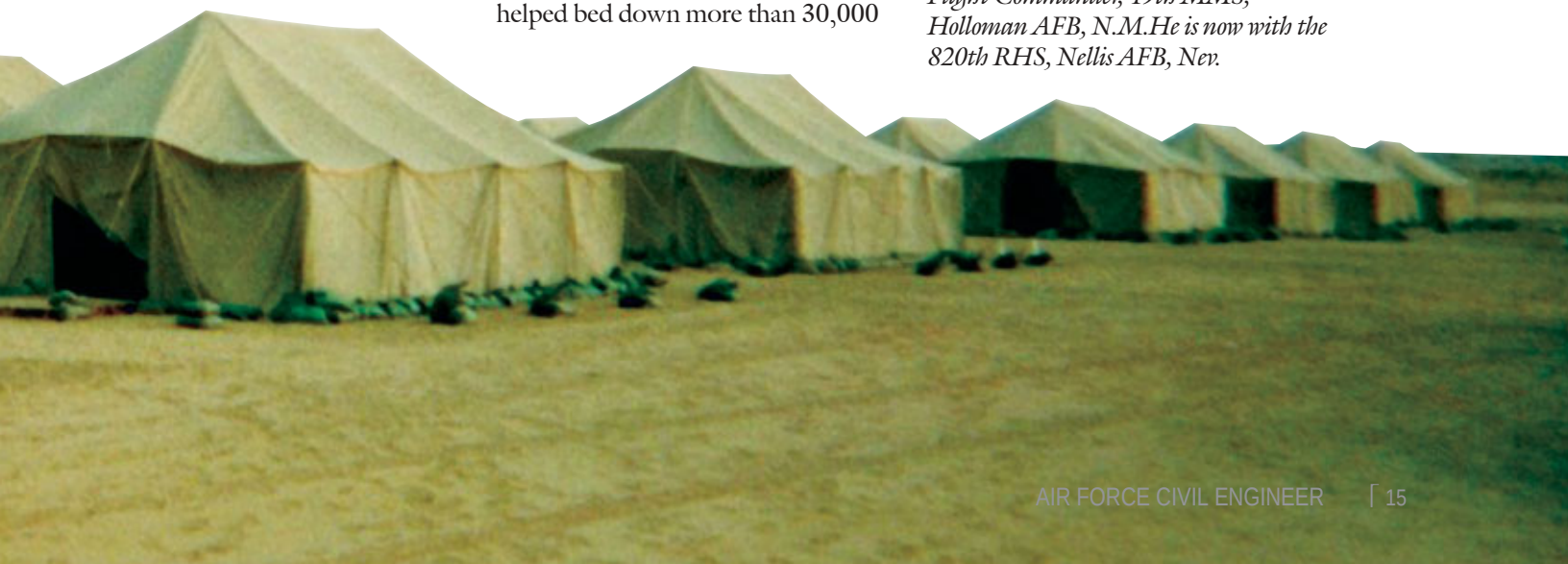
Another BEAR Base team, lead by 1Lt Ryan Anderson helped establish beddown operations at Kirkuk AB, Iraq, a joint combat air base critical to providing close air support for U.S. and coalition ground forces. In total, the 49th MMG teams helped bed down more than 30,000 U.S. and coalition forces, set up more than $250 million in HE and HF assets, and supported multiple F-16, F-15, A-10 and C-130 squadrons that flew more than 12,000 combat sorties.

Was it exciting work? The best! Each beddown presented new and diverse challenges, from preparing the different areas for the tent city and operations and maintenance towns, to working with the range of CE personnel, contractors and other military service professionals needed to make an operation of this magnitude work. The job was grueling at times—fighting dust storms, and living in extreme heat conditions and in open K-spans with more than 400 people all around us. We primarily survived off Meals, Ready-to-Eat, because about the time the dining facility was finally established, we had orders to move on to the next beddown site.

What Keeps Us Motivated?

Knowing that the value our warriors add to the fight is absolutely critical and necessary to accomplish BEAR Base beddowns quickly and efficiently. It's exhilarating to be one of the first teams to arrive at a BEAR Base site, having nothing more than a runway and potable water source and creating a fully integrated air base, capable of sustained air operations of all sizes and scopes.

1Lt Michael E. Crosse was Electrical Flight Commander, 49th MMS, Holloman AFB, N.M.He is now with the 820th RHS, Nellis AFB, Nev.



PACAF Programs Cover All Bases

by Maj Gregory J. Rosenmerkel, HQ PACAF/CEOO

In keeping with AF/ILE's vision and Maj Gen L. Dean Fox's personal challenge to get "Back to Bases," the Headquarters Pacific Air Forces Civil Engineer is working on several initiatives. "Because of the unique locations, climates, and short tours associated with many of our bases, this headquarters is often the source of continuity and is looked to for help with training," said Lt Col Dave Funk, PACAF/CE Operations Support Branch Chief and member of AF/ILE's Back to Bases Integrated Process Team. Three key programs— Infrastructure Assessments, the Civil Engineer Management Assistance Team, or CEMAT, and the Vendor Training Program— form the backbone of PACAF CE's direct support to their bases and provide that continuity.

Infrastructure Assessment Program

In the mid-90s, PACAF sought a solution to the command's problems of failing, 50-year-old infrastructure systems combined with a small budget, problems which were affecting mission readiness and quality of life on its bases. As a first step toward creating a strategic improvement plan, the PACAF created the CE Infrastructure Assessment team to identify and rank problems. The team moved quickly; in only one year, it assessed all nine main operating bases.

PACAF's IA team continues to focus on key infrastructure systems that have direct mission impact: airfield pavements and lighting; fuel storage and dispensing; primary electrical power; water; wastewater; and central heating and cooling systems. By sticking to this original charter, the team is able to compare system conditions and funding requirements over time and between bases. Other infrastructure areas, such as storm water, roofing, roads and fire protection, are now added on request but are treated as special interest areas.

The team's primary duties have remained the same: assessing conditions and validating and prioritizing project requirements so that funds are directed to the most pressing needs. Its assessments provide the PACAF Commander, Gen William Begert, with get-well or stay-well road maps, programming and funding strategies, and the justification needed to defend command budgets and advocate for additional resources. "General Begert has made infrastructure one of his top PACAF focus areas, and that sure helps us in our pursuit of improvements," said Col Tim Byers, PACAF Civil Engineer.

As it has since 1995, the IA team pairs expert engineers from PACAF's Engineering Division with the Operations Division's experienced shop technicians in each functional area to get a balanced assessment of the conditions and problems at each base, as well as the projects needed to fix them. Programmers have been added to the team so that all requirements are captured in the Automated Civil Engineering System, or ACES, and programming documents for top priority projects can be developed. PACAF's Logistics Directorate has included its petroleum, oil and lubricants facilities' manager on every team to evaluate POL systems. Today's team size ranges from four to 20, depending on the assessment scope and expertise required. If necessary, the team is augmented with CE personnel from Det. 1 –554th RED HORSE, other PACAF CE squadrons, the Air Force Civil Engineer Support Agency, or the Guard and Reserves.

Much time with base personnel is devoted to troubleshooting problems and ensuring that they are solved using the right technologies, emphasizing sustainability and reliability. Because PACAF is a diverse command stretching from frigid Alaska to the sweltering tropics, what works well at one base is not always right for another and the "right" technology may not always be the newest or least expensive. Serving as a command continu-

PACAF 'dirt boys' get crane operator certification training at Osan AB.

ity tool, the team also crossfeeds "lessons learned" and innovations among the bases, looks for areas where bases may need assistance, and provides vector checks for the HQ PACAF staff on issues of manpower, training, equipment, new mission beddowns, military and host nation construction, readiness, and contingency planning.

CE Management Assistance Team

In 2000, HQ PACAF resurrected and renamed the old Civil Engineer and Services Management Evaluation Team program. The CEMAT was designed to support all CE flights, but mainly the operations and engineering flights. Some problems were identified with the new program. For example, teams were too large and tried to cover too many items in one visit; training and assistance were hampered.

After working to identify problems and improve the program, HQ PACAF is testing a new concept of operations beginning this year with visits to the Korean Colocated Operating Bases; Osan and Kunsan ABs, ROK; Yokota AB, Japan; and Eielson and Elmendorf AFBs in Alaska. The CEMAT visits are now on an 18-month cycle, arranged opposite the IA schedule for consistent headquarters visibility, less disruption and better follow-up.

Although the team is available to help with all CE operations, during the week team members focus on two or three main areas, and can actually make improvements in these areas while on site. "Now we're *really* there to help and we'll follow up with the tools or resources for the bases to fix their most pressing issues." said Col Byers. The team publishes a report of items that could be improved, items the headquarters needs to deliver in the future, and like the IA team, provides a crossfeed of the successes and "benchmarks" for other bases throughout the command to emulate.

PACAF structures troops learn how to erect K-span facilities during vendor training at Osan AB, Republic of Korea.

Vendor Training Program

PACAF's unique Vendor Training Program, begun in 1995, fills the void between technical school training and the needs of PACAF's craftsmen in the field, who were overwhelmed with new technologies and tasks, but had few specialized technical training opportunities or instructions. Lack of commercial training support in the local economy and foreign-manufactured systems and equipment also posed problems.

Although additional schoolhouse training slots were made available to PACAF, temporary duty costs and extended travel distances and times proved prohibitive, especially for troops in Korea. For the price of six student TDYs back to the continental United States, a commercial vendor could come to the theater and teach up to twenty-five students. With statistics and rationale in hand, PACAF was able to garner dollars for commercial vendor training from an incredibly tight FY95 budget, and the rest, as they say, is history.

PACAF's Vendor Training Program belongs to the bases, and base input to improve the program has been critical to success. The program's students now include civilian employees, both U.S. and local nationals, an important factor during frequent military personnel absences. For FY04, PACAF has created a Web-based, comprehensive, five-year training plan that will enable the base civil engineer to plan classes around deployments, inspections and planned exercises, and give predictability for future training.

Force Multipliers

PACAF's Infrastructure Assessment Team, CEMAT and Vendor Training Programs have been real force multipliers. Moreover, in a command where personnel turnovers are high and technical expertise is often not easily accessible outside the gate, the HQ provides continuity for its bases and delivers expert assistance right to their doorsteps. Col Byers is justifiably excited about these programs: "We are proud of these initiatives and the statement they make about our commitment to our units in the field."

Visit the PACAF CE website for information on any of these programs:
Infrastructure assessments—https://www.hqpacaf.af.mil/ce/cecindx/CECI/ceci_new_index.htm
CEMAT and Vendor Training—https://www.hqpacaf.af.mil/ce/ceoindx/ceoo/ceoo_index.htm

Maj Gregory J. Rosenmerkel is Chief, Infrastructure Support Branch, HQ PACAF/CEOO, Hickam AFB, Hawaii.

Back in Style

Base planners fashion new look for Whiteman AFB

By MSgt Michael A. Ward, HQ AFCESA/PA

It doesn't take much prodding for members of Whiteman AFB's base planning team to admit that, just a few years ago, the installation was seriously in need of a major makeover.

Whiteman, it seems, was still wearing a Cold War–era look, long after that style had gone out of fashion.

It took 15 years and almost a billion dollars, but the makeover is almost complete. Instead of settling for "off-the-rack," designers created a customized look that not only brought the base up-to-date, but made it a fashion leader.

Like most Air Force bases, Whiteman was built during World War II. Wooden barracks and hangars that were only supposed to last about 10 years got a new lease on life as that war ended and the United States settled into a cold war with the Soviet Union.

"Those old wooden shacks were meant to be temporary, and they were still here after 50 years," said Fred Peters, chief of facility managers, 509th Civil Engineer Squadron.

Whiteman, a Strategic Air Command base, got money for a new look in 1961 when it transitioned from a B-47 bomber mission to a nuclear missile mission. Millions of dollars poured into the western Missouri base, but the bulk of it went to build and maintain the Minuteman missile launch facilities that would dot the midwestern countryside.

"The missile sites were maintained in perfect condition," said Sara Kelchner, Whiteman real estate officer. "But on base nothing changed, everything was old."

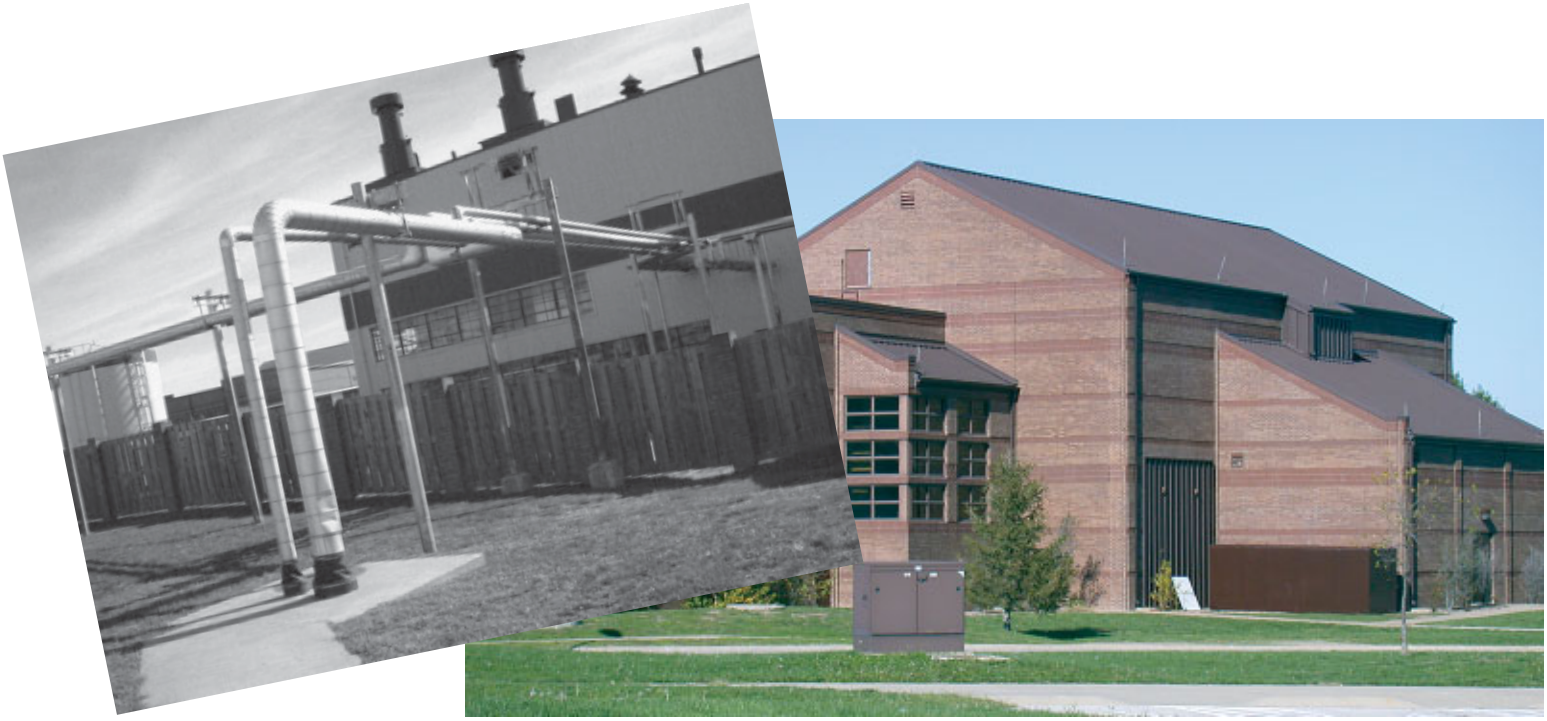
Whiteman was responsible for 150 Minuteman missile silos buried in 14 counties throughout Missouri. Most of the missile crews, security police, missile maintenance, logistics and other support functions worked in a missile field that covered more than 10,000 square miles throughout the state.

"When you talk about visual-audio stimulus, well, when you came on base there was none," said Tony Muelmeister, interior designer and base architect. "It was almost like a deserted base. You would drive on and you really didn't see anybody."

With mission focus aimed squarely outside the base, the core of the installation continued to age and deteriorate. Renovations kept buildings functional, but paint and siding were just extra layers of makeup on facilities long past their prime.

"When I got here in 1988 the thing they had most in the self-help store was ceiling tile," said Eldon Hix, deputy base civil engineer. "That was the roofing management program. Every time it rained, they gave everybody ceiling tiles. That's what they had money for."

Whiteman was in danger of becoming irrelevant. Poor facilities, an upcoming round of base closure studies and a thaw in the Cold War threatened the base's viability.



" 'The steam pipes were everywhere...' " but now the base has a "campus look with buildings that [are] modern, stylish and functional..."

In 1987, Missouri Rep. Ike Skelton pushed for, and won, a new mission for the base. In addition to its missiles, Whiteman would be the exclusive home to the newest aircraft in the Air Force inventory—the B-2 bomber.

"Let's face it, with the age of the facilities we had and the condition of the infrastructure, Whiteman probably would have been a BRAC closure base had it not been for the B-2 mission," said Ed Lenz, deputy chief of operations, 509th CES. "So, as a civilian living in the area and working here, it certainly didn't hurt my feelings to see the new mission."

Whiteman began preparations for a dual mission, but just three years later, the United States and the Soviet Union signed the Strategic Arms Reduction Treaty and both nations began significantly reducing the number of ICBMs in their inventories. For Whiteman, that meant the end of its missile mission.

With attention now focused inward on the B-2 mission, base officials were forced to take a hard look at what they had. In addition to becoming old, the base had taken on a cold, industrial look. It had concrete alert facilities from the early Cold War days, a hodgepodge of building designs, power lines everywhere and a spider web of aboveground steam lines that stretched around the base and over roadways.

"The steam pipes where everywhere. That really was our landscaping at the time," said Muelmeister.

The newest and most unique aircraft in the Air Force was due to arrive in 1993. Planners knew it would draw lots of attention and visitors to the base. They also knew it would bring military construction dollars. Instead of dressing up old facilities, they decided to start fresh. Almost every building and facility on base would be torn down and replaced over the next 10 years.

"You can't get everything at once, and you can't afford everything at once," said Hix. But he added, "It's always easier to get money than to execute it. So basically we had to build a team that could actually execute money and execute it smartly and in a timely fashion."

Whiteman's Military Construction budget averaged $3-4 million before the B-2 announcement in 1987. The year after, it skyrocketed to about $40 million and averaged $40-60 million for about 10 years.

With funding secured, planners began developing a master plan to turn Whiteman into a premier base with a premier mission. But coming up with a look everyone could agree on was easier said than done. In addition to base-planning committee members, input was provided by the air staff, the Army Corps of Engineers, SAC and Air Combat Command after it succeeded SAC in 1992.

"It was kind of tough initially because everybody had an opinion," said Hix. "A good example was coming up with curbs. We didn't have any curbs on the base at all, but there are a lot of curb shapes you can go with. For

something that seems relatively mundane now, we probably spent 20 hours debating the right angle of attack for the snowplow."

By 1989 the master plan was completed. Whiteman would have a campus look with buildings that were modern, stylish and functional, but at the same time easy to maintain.

"I bought into what they were planning because I had spent enough time fixing things that needed to be fixed a long time ago," said Peters. "I could see where this thing was going. We could all see where this thing was going."

That year, the makeover of Whiteman began. Construction started on the north end of the base and moved south in block-by-block increments, focusing first on the mission, then on the infrastructure.

Most of the flightline area was redone and all but one hangar was torn down and replaced by new ones built to house and support the fleet of 21 bat-wing bombers. Fortunately, Whiteman still had a viable runway, although it required $12 million in repairs.

On the main base, shabby chic was out and coordinated earth tones were in. "We certainly didn't want apples, oranges, lemons and limes stuck everywhere," said Muelmeister.

Buildings were constructed with brown and reddish-brown brick and metal roofs and trim. "Whoever made the decision about the brick and metal made it in the interest of maintenance," said Peters. "I think they made a good decision and that's coming from a maintenance guy."

Planners also cleaned up the overall look of the base by straightening roads to create long thoroughfares, planting trees and adding subtle landscaping.

"Once we started having some success and meeting and exceeding the customer's expectations, everyone started giving us more and more local jurisdiction," said Hix. "That allowed us to get more creative and execute even better."

Since 1988, more than $700 million has gone into Whiteman's makeover and about 99 percent of the facilities on base are new. The largest project remaining is a $100-million program to replace old base housing. Construction began in 2002 and should be completed by 2007. "The frosting on the cake is to get that finished," said Hix.

Now that Whiteman is sporting a brand new look, it gets plenty of attention. But planners may have done their job too well. "That's our main detractor in getting more money," said Hix. "They say we've got nothing here that's broke."

But they keep asking anyway because they know firsthand what will happen if facilities aren't kept up. "If we do our job in expressing that to the command and maintaining our credibility, we won't let this infrastructure and these facilities deteriorate to the point where you have to spend millions," said Lenz.

Fashions are fickle, but the Whiteman team is confident they have a look that will stay in vogue for a long time.

MSgt Michael A. Ward is the Chief of Public Affairs for HQ AFCESA, Tyndall AFB, Fla.

Above: A representative of the base's new mission, the B-2 bomber "Spirit of Alaska" sits in its hangar at Whiteman AFB, Mo. Inset: This award sign for the 351st Missile Wing stands in testimony to Whiteman's previous mission.

A Vision of "One Installation...One Map":

Air Force basing operations continue to rely on civil engineers, especially when missions call for maps. And, as they have since the early 1950s, when the "Installation Engineer" role was created, CEs continue to rely on surveying and mapping as key tools to manage complex installation infrastructures. Now, with the Air Force GeoBase Program, the traditional processes for surveying and mapping have been transformed into invaluable information resources for larger, home- and deployed-installation missions.

What is GeoBase?

GeoBase is a very different and surprisingly practical capability that allows Air Force organizations to make long-term, shared use of geospatial information or digital maps for basing missions. It integrates new information with existing knowledge bases to develop one comprehensive, coherent geospatial information resource that details installations worldwide and can be used by multiple mission sectors at all installations (see "The Three Domains of GeoBase" on p. 24).

It is important to note that GeoBase is not a packaged, purchasable information technology system. Rather, it is an innovative program with an opportune arrival, given the rapidly expanding demands for situational awareness within and around operations on Air Force bases following the events of 9/11.

The Path to GeoBase

A number of factors have contributed to the creation and progression of GeoBase. Its modern concept owes much to advances in surveying and mapping methods over the past 20 years. In 1996, a change in IT management policy gave a logical framework for its creation. Most importantly, academic research in the late 1990s showed the rationality of a strategy joining the new technology with the new IT management framework.

In the mid-1980s, computer-aided design and drafting tools replaced manual drafting techniques in both military and civilian architecture and engineering offices. Following close on the heels of CADD came Geographic Information System software, which lent more artificial "intelligence" to the CADD data. GIS was able to more precisely answer three important questions: What is it? Where is it? What's around it? GIS also allowed data to be quickly overlaid on georeferenced photographs or images.

Mapping technology also began advancing above the earth during the 1980s. Cameras and sensors in airplanes and in commercial satellites collected exceptional images in the microwave, infrared and visible light bands. The constellation of satellites known as the Global Positioning System was circling the earth, feeding information to anyone with a handheld GPS receiver.

In 1996, the Information Technology Management Reform Act was passed after billions of taxpayer dollars were poorly spent on information technology under the tenet of "buy it and they will come." The act required federal agencies and military services to appoint chief information officers to regulate IT investments—all purchases had to be strategically planned and linked to specific mission goals. Databases, hardware and software became the "information resources" in an organization's IT portfolio.

In the late 1990s, researchers at the U.S. Air Force Academy conducted a three-year study into why so many groups had invested in the new GIS systems only to abandon them shortly thereafter. Sponsored by the Tri-Services CADD/GIS Technology Center, the study's key finding was simply that organizations had unrealistic expectations of how easy it would be to put GIS/GPS tools to effective use, underestimating the time and effort needed for organizations to adopt new information behaviors.

Based on the study's findings, a strategy incorporating new mapping tools with the new IT management mandates was proposed. It called for a mission-centered, practical, planned approach to acquiring geospatial information resources with balanced attention to both the IT and the organization (see "Building a Strong GeoBase Foundation" on p. 24)

Progress of GeoBase

In 1998, the concept of GeoBase was formalized at the USAFA's Institute for Information Technology Applications, headed by Gen James McCarthy (USAF, Ret). The IITA's charge was to find fast, new ways to integrate IT solutions with the Air Force mission. To prototype the new GeoBase system, representatives from IITA and the CADD/GIS Technology Center teamed

U.S. Air Force GeoBase

by Col Brian Cullis, HAF GIO

with public works officers and CEs on U.S. Marine Corps and Air Force installations in Japan.

Following two years of prototyping, Lt Gen Michael Zettler, Deputy Chief of Staff for Installations and Logistics, introduced the GeoBase strategy to senior Air Force leaders at the Fall 2000 CORONA conference. In 2001, prompted by the traditional role of CEs in base mapping, Lt Gen Zettler directed that the new Headquarters Air Force Geo Integration Office be aligned under The Air Force Civil Engineer at that time, Maj Gen Earnest O. Robbins III (USAF, Ret), who restructured his staff to accommodate the HAF GIO.

Now, two years later, the GeoBase program has become integral to Air Force basing. By endorsing the GeoBase IT architecture, concept of operations, and FY03 investment plan, the Air Force CIO, Mr. John Gilligan, joined Lt Gen Zettler in guiding GeoBase integration across the broad Air Force basing front. GeoBase capabilities were also included in the concepts of operations for homeland security and for global mobility.

GeoBase is now decentralized across all the major commands and six field operating agencies. The list of Air Force FOAs with new GIOs include the Air Force Civil Engineer Support Agency, the Air Force Center for Environmental Excellence, and those FOAs supporting security forces, communications, command and control, and safety missions; all benefit from reduced operating costs through shared use of the GeoBase common map. Ms. Kathy Ferguson, the Deputy Air Force Civil Engineer, was recently named as the new Air Force member on the Tri-Service CADD/GIS Technology Center's board of directors, where she can effectively advocate for the needs of not just the CE mission, but for those other missions that make up the new GeoBase community.

SSgt George Dollenger (above) and SSgt Juan Orozco (below left), both with 332nd ECES, obtain data from multiple GPS satellites to make a map of Tallil Air Base. *(photos by SSgt Chenzira Mallory)*

Civil Engineers Mapping the Way Forward

Because The Air Force Civil Engineer hosts the GIO, the CE mission has made first use of the GeoBase program for their garrison and expeditionary needs. For example, the AFCESA GIO has quickly integrated Expeditionary GeoBase Site Mapping tools at all three of the Silver Flag exercise sites and led efforts to add new GIS/GPS tools to all of the Prime BEEF 4F9EA Unit Type Code Equipment Supply Lists. The head of AFCESA's GIO, SMSgt Pat Abbott, has also guided the inclusion of GeoBase skills within the 3E5X31/3E5X51 Engineer Assistant technical training course at Fort Leonard Wood, Mo., where the HQ Air Force GIO helped build a GeoBase training facility. The Automated Civil Engineer System, or ACES, software suite will soon begin making use of the GeoBase map as well, thanks to a GeoBase presence in the AFCESA Information Systems Integration Division.

Requests for GeoBase support are now coming from other DoD agencies. The U.S. Northern Command will be incorporating all of the GeoBase installation maps to build their common operational picture for their homeland defense mission. The DoD Infrastructure Steering Group has directed the Air Force to extend the GeoBase strategy to lead all the services in building an installation visualization tool for the upcoming base realignment and closure activities. Finally, The Air Force Civil Engineer was recently appointed to the new Office of the Secretary of Defense Installations and Environment Domain Governance Board, which looks at new ways to transform I&E operations across the defense sector.

Col Brian Cullis is Chief of the Headquarters Air Force Geo Integration Office in Arlington, Va. For more information on the Air Force GeoBase program, please visit:

http://www.geobase.hq.af.mil

The Three Domains of GeoBase

Garrison GeoBase

The Air Force uses the term "Garrison GeoBase" to describe one of two modes of Air Force basing. Garrison GeoBase enhances command and control by providing a Common Installation Picture that securely delivers current situational awareness over a base network. The CIP is a high-quality picture that allows viewers to quickly see complex, built-up infrastructures from their desktop computers using "point-and-click" steps. The Air Force CIO approved the Garrison GeoBase IT architecture in October 2002, and current and emerging IT solutions across the civil engineer, command and control, security forces, weapons safety, environmental management, and communication sectors were able to make use of the common installation picture.

Expeditionary GeoBase (GeoReach)

Expeditionary GeoBase supports the second mode of Air Force basing. GeoReach is the name given to the expeditionary site mapping capability that shares classified and unclassified information of forward operating locations. Expeditionary GeoBase also uses a CIP, compiling all expeditionary site survey data into one view. Imagery is acquired from the National Geospatial Intelligence Agency and other branches of the military. Additional software tools aid logisticians and CEs with other force beddown requirements, such as aircraft parking, and fuel and munitions storage. Command GIOs work with operational planners in their areas of responsibility to optimize combat support and force deployment. Because of the GeoReach process, fewer airmen go forward prior to deployment, reducing the number of people exposed to potentially hostile conditions.

Strategic GeoBase

The Strategic GeoBase program was launched in 2002 as a practical means of using imagery and key data from Garrison GeoBase sources to satisfy strategic questions, such as proximity of installations and ranges to urban areas, national parks, and other areas of political interest. Strategic GeoBase is designed to serve as the single installation visualization tool by incorporating legacy Air Force geospatial information, such as the range database maintained in Airspace and Ranges (AF/XOO-RA). Strategic GeoBase will also blend with emerging mapping solutions tied to homeland defense, force protection and base realignments. Thanks to the Assistant Secretary of the Air Force for Installations, Environment and Logistics, the first Air Force-wide library of imagery acquired from commercial satellites will be lending situational awareness to senior leaders in early 2004.

Building A Strong GeoBase Foundation

In keeping with the Air Force's rapidly growing expectations for GeoBase, guidelines were developed to help organizations integrate GeoBase into their programs, through the areas of information architecture, financial management, policy and guidance, education and training, and people and workflow. Based on Department of Defense, Air Force or other federal directives, as well as accepted principles of information management, these guidelines include the following points and recommendations:

- Geospatial information resources are vital Air Force mission assets that warrant investment, marketing and exploitation; establish a full-time, skilled GeoBase team to identify, organize and apply these resources.
- Cultural change issues, such as users' understanding and acceptance, are more critical than any specific technology in securing the long-term success of GeoBase.
- Strategically plan the development and assessment of GeoBase investments, and make those investments in phases to reduce risk and allow for adaptation to new ideas and methods.
- Adhere to the Air Force-approved information technology and data standards, as outlined in the GeoBase technical architecture, and strive to operate GeoBase programs in the common Air Force Integration Framework and Air Force Portal.
- Use current data, metadata and quality assurance standards to maximize GeoBase program functions while minimizing costs.
- Avoid wasteful redundancies and costs by ensuring that inventories of GeoBase information are current, accurate and shared as much as possible; search existing geospatial data before collecting new data.
- Provide all mission elements with controlled, ready access to needed geo-referenced common installation pictures.
- Assign geospatial information stewards to maintain and protect their respective functional information.

Fast-Track Restoration

by Mr. Peter Smith
HQ USAFE

Engineers from USAFE and the United Kingdom complete airfield restoration in record time

Aerial view of restored RAF Fairford Airfield. ***(photo by 1Lt Jake Martinez,424 ABS/CCE)***

On May 29, 2000, the United States Air Forces in Europe handed the entire RAF Fairford airfield over to the United Kingdom to begin a NATO-funded, $80 million renovation that would take almost two years to complete. Engineers from the U.K.'s Defence Estates (see companion article on RCE-UK) and its contractor joined representatives from HQ USAFE, a construction management team and principal sub-contractors on an integrated project team to immediately begin the restoration work.

This project was the largest single airfield contract funded by NATO since the end of the Cold War and involved the upgrade of the 10,000-foot runway, the aprons and the taxiways with both rigid concrete pavement and flexible asphalt pavement. The entire airfield pavements, lighting, jet fuel system, drainage, and high voltage electrical feeds were refurbished during the 21-month project.

Construction Phases

To get back to operations quickly, first-phase construction included the main runway and northern taxiway, with associated airfield ground lighting and drainage work. The old runway friction course was removed and replaced with Marshall asphalt, then finished with new friction course. The concrete thresholds were removed and replaced with runway-strength concrete. After the main contractor satisfactorily completed all work, the Defence Estates formally handed the phase-one site over to USAFE on schedule, on June 7, 2001. The runway opened for aircraft operations on June 15, 2001.

The integrated project team then focused on completing the project's second phase, which included the construction of a jet-fuel storage installation, together with taxiways and aircraft hardstands in the southwestern area of the airfield. Handover of this phase was in December 2001. The third and final phase of the project comprised similar work in the southeastern area of the airfield and was finished in April 2002.

Construction Details

During the course of the restoration project, over 400,000 cubic meters of concrete was batched on-site and laid for pavement reconstruction. This amount equates to 1,000 tons of concrete every day for nearly six months or one truckload every 14 minutes, with coordinated aggregate deliveries every 90 seconds. At the project's peak, concrete placement reached 2,500 cubic meters each day, which is equivalent to paving 1 kilometer of highway. The contractor achieved this high volume using three huge slip-form paving machines capable of laying up to 475 millimeters, or 19 inches, of concrete in a single pass *(see photo below)*.

(photo by Philip Lane Company, Orpington, Kent, United Kingdom)

The main contractor, in consultation with the local highway authority, also assumed traffic management of the main access route to the site and ensured maintenance of the public right-of-ways. There were in excess of 45,000 deliveries of fill material to all sites. However, this figure is significantly less than the original estimates of 60,000 deliveries because of extensive on-site recycling and reuse of removed materials. Broken-out airfield concrete was crushed and screened for reuse in new concrete production and for backfill.

Potential problems with drainage of rainwater off the airfield were solved with 12 miles of slot-drainage and four miles of oversized pipes to store runoff, allowing controlled release of water that would otherwise overwhelm local streams. To ensure that the quality of discharge from 22 kilometers of surface water drainage to the main outfall is in accordance with current environmental standards, five large oil/water interceptors were constructed after extensive consultation with the U.K. Environment Agency

Additional fuel storage, filters and pump houses were also required. Five new bulk storage fuel tanks were constructed, increasing capacity by 20,000 cubic meters. The steel tanks were surrounded with concrete and partially buried. They now supply fuel to 29 new hardstand hydrants through six miles of pipe.

Environmental and Historical Challenges

Great crested newts, a European-protected species, were discovered in the construction area before the contract was awarded. After extensive liaison with the U.K. watchdog agency, English Nature, and the Department of Environment, Transport and Regions, a licensed handler relocated the colony to a specially created habitat at another location on base. The colony is now spawning successfully in their new home.

In keeping with the Defence Estates' policies, archeology specialists from the Museum of London extensively monitored the site throughout construction. Surprisingly, few items of significant historical interest were found: one skeleton dating to the Roman occupation and four others from the early Bronze Age.

Tight Schedules

The need to return the base to operational status as quickly as possible meant the integrated project team had tight schedules to meet. The team adopted the latest computerized design and planning techniques and held regular partnering workshops to foster effective communication and understanding to move the vast project ahead on schedule, despite construction during one of the wettest autumns on record.

Peter Smith is the senior British engineer, RCE-UK, HQ USAFE. He was lead project manager for the RAF Fairford Restoration Project.

Above right: Preparing reinforcement cage for 2,500-cubic-meter tank base. Below right: Welding steel sections of 5,000-cubic-meter tank. *(photos by Philip Lane Company, Orpington, Kent, United Kingdom)*

USAFE's CE in the UK

by Lt Col (USAF Retired) Martin D. Lewis, Ph.D., P.E.

The Regional Civil Engineer-United Kingdom is the U.S. Department of Defense's design and construction agent for the British Isles and is the single point of contact with the U.K.'s designated design and construction agent, the Defence Estates. The RCE-UK is collocated and works in close partnership with the Defence Estates-U.S. Forces, or DE-USF, business unit in Waterbeach near Cambridge.

The RCE-UK's staff of 20 provides the full spectrum of professional project management, from concept development through design and construction to financial completion. Professional engineers and architects at the RCE-UK are hand-selected from both the United States and the United Kingdom for specific expertise and experience.

Mission

The RCE-UK office oversees all U.S. military construction program-funded projects in the United Kingdom. U.S. public law and the Secretary of Defense give the RCE-UK its foundation and authority, which is delegated through directives of the DoD, HQ European Command and HQ United States Air Forces in Europe. More commonly known as USAFE's Civil Engineer in Waterbeach, or USAFE/CEW, the RCE-UK answers directly to USAFE's Command Civil Engineer.

Two prominent "customer-supplier" agreements have defined the RCE-UK's role over time: the North Atlantic Treaty Organization's 1951 Status of Forces Agreement and the 1973 Department of State-level "Cost-Sharing Arrangement." The 1973 arrangement delineates the relationship between the United States and the United Kingdom as it applies to land, facilities and construction and works services for U.S. visiting forces in the United Kingdom. All construction work proceeds through the DE-USF business unit as the designated authority of Her Majesty's Government for design, contracting, supervision and general execution of engineering works requested by the U.S. visiting forces.

NATO Security Role

The office of the RCE-UK has a unique role because of its presence in a NATO nation—the responsibility for overseeing the execution of the NATO Security Investment Program on behalf of the U.S. forces in the United Kingdom. The NSIP provides infrastructure needs to all visiting NATO forces, which include many U.S. visiting forces in Europe. As advocate and overseer of the program, the RCE-UK works with the NATO military commands and the U.K. Ministry of Defence to advocate for NSIP funding. Program administration for NSIP-funded projects differs from that of MILCON, but the combined RCE-UK and DE-USF management team ensures the results appear the same to customers.

Present and Future Works

The RCE-UK manages $938 million of construction: about 160 projects, either in design, construction or post-construction, or awaiting financial completion. About one-third of the projects are for USAFE military and family housing construction and renovation *(see photo below)*, one-third are for NATO, and the remaining third are for other DoD customers. The program has grown by 50 to 60 percent over the last four years for two reasons: 1) the post-Cold War stabilization of the U.S. overseas force structure in Europe, and 2) modernization and re-capitalization of installations where the United States and NATO anticipate a long-term presence.

The joint RCE-UK and DE-USF team was recognized by HQ U.S. Air Force as the top DoD/Host Nation Design and Construction Agent for 2002. When nominating the joint team for the USAF-level award, the former USAFE Command Civil Engineer, Col Glenn Haggstrom, stated, "This team epitomizes the true meaning of partnering between the United States and our host nations."

Renovated RAF Alconbury housing *(photo by David Spetch)*

Lt Col (USAF Retired) Martin D. Lewis, Ph.D., P.E., was the RCE-UK from July 1998 to October 2002. He now is the European Operations Manager for Parsons based in London.

Preventing Mold in Air Force Facilities

by Mr Gerald Doddington, HQ AFCESA/CESM

Mold, a type of fungus, has become a costly problem in public and private buildings across the country. Because molds can cause a range of effects on human health, mold growth must be prevented in Air Force facilities.

The factors and conditions that allow germination and growth—mold spores, moisture or high humidity, and an organic food source kept together for 48–72 hours—cannot be simultaneously controlled very easily. Mold spores move continuously through the air and are difficult to eliminate. Organic material—including fine dust particles—is present as a food source for mold on almost all surfaces. The only factors that can be effectively controlled are humidity and moisture: relative humidity should be kept below 60 percent and there should be adequate air movement to prevent condensation.

Prevention of mold must start during initial building construction. Specifications should include requirements to protect building materials from conditions leading to mold growth, not only during site storage but also during building contruction.

As construction materials and techniques changed over the decades, moisture and mold problems increased. Newer materials that are less permeable to water hinder drying of structural components. The new techniques and materials result in structures with a tighter envelope; the buildings are more energy-efficient, but moisture evaporates more slowly due to the decreased exchange of air with the outside atmosphere.

Whether new or old, buildings contain many sources of moisture and humidity: water leaks in the structure (roof/walls), plumbing leaks, moisture from water use (cooking/bathing), moisture in ventilation air from outside, and moisture vapor infiltration through the structure. Proper site drainage and sealing of penetrations and intersections of walls, roofs, floors, and foundation walls can help keep water out. Leaks should be repaired and wetted materials dried as quickly as possible.

Air-conditioning systems are critical to preventing mold growth. They must be designed, maintained and operated to perform two key functions—lower the moisture content of ventilation air and remove moisture generated inside buildings—not only seasonally, but throughout the year. AC systems have been traditionally designed to maintain comfortable indoor temperatures during peak outside temperatures. But, during off-peak conditions, moisture content in ventilation air may still be greater than designed for because outside temperatures are cooler but the air is still very humid. In many cases, a system's cooling capacity may be "oversized"—space temperatures are achieved quicker and the system cycles off before enough moisture is removed from the air.

In humid areas, off-peak conditions occur for longer periods during the year. If AC systems do not properly dehumidify during these periods, interior relative humidity will rise to well above 60 percent, creating poor indoor air quality and promoting mold growth. In non-arid locations (e.g., mid- to southern-Atlantic and Gulf Coast states), AC systems may work in all seasons to lower the moisture content in buildings.

Routine maintenance is essential to maintain AC system performance, dehumidification capability and good indoor air quality. Regular air filter replacement helps keep system components clean. Coils should periodically be cleaned of dust and dirt deposits, which reduce heat transfer, dehumidification capability and system efficiency. Cooling-coil-condensate drain-pans must be kept clean and must drain properly to prevent standing water. System ventilation airflow must be maintained to the quantities recommended by the American Society of Heating, Refrigerating and Air-Conditioning Engineers Standard 62.

Gerald Doddington is a mechanical engineer at HQ AFCESA, Tyndall AFB, Fla.

Design guidance for all Air Force facilities is in "Engineering Technical Letter 04-3: Design Criteria for Prevention of Mold in Air Force Facilities," which can be found on the AFCESA Web site at http://www.afcesa.af.mil/Publications/ETLs/ETL%2004-3.pdf.

Emphasis is given to dorms and other types of lodging because of significant mold problems in these Air Force facilities. For bases with mold problems within a building, remediation guidance is available in the reference "Mold Remediation in Schools and Commercial Buildings (EPA, 2001), available at http://www.epa.gov/iaq/molds/graphics/moldremediation.pdf.

For questions on mold-related issues, contact the AFCESA POC, Mr. Quinn Hart, DSN 523-6343 or Quinn.Hart@tyndall.af.mil. AFCESA also has mold specialists available through the Indefinite Delivery Indefinite Quantity contract. Bases are also advised to consult with their Bioenvironmental Engineer, or contact AFCESA for further assistance.

Funding a Joint Offensive Against Rust

by Ms Nancy Coleal, HQ AFCESA/CESM

Even during peacetime, military forces are under attack… by corrosion. The Department of Defense maintains infrastructure and equipment valued in the billions of dollars, much of it in environments where corrosion shortens its useful life and takes critical systems out of action, thus reducing mission readiness. Government-sponsored studies estimate the direct costs of corrosion at $10 to $20 billion dollars annually; it is one of the largest life-cycle costs for weapon systems. Lives are at stake: several Air Force F-16 aircraft went down due to corrosion of electrical contacts that control fuel valves, and corrosion contributed to landing gear failures in Navy F-14 and F-18 aircraft. Closer to home, jet fuel pipeline failures cause costly contamination of the soil and affect missions while natural gas line failures create dangerous situations.

Legislation

In December 2002, Congress passed a law requiring the Office of the Secretary of Defense to provide policy guidance and oversight throughout the DoD to fight this pervasive problem. In 2003, the Government Accounting Office published a study of DoD efforts against corrosion, and recommended the development of a DoD-wide strategic plan with clearly defined goals; measurable, outcome-oriented objectives; and performance measures.

Corrosion Team

Air Force representatives specializing in facilities; weapons and equipment; and research and development are members of the DoD Corrosion Prevention and Control Integrated Process Team. The CPCIPT provides strategy, policy and guidance to prevent and mitigate corrosion of equipment and infrastructure throughout the DoD. The CPCIPT has set up teams to focus on specific areas related to corrosion: policy and requirements; impact, metrics and sustainment; science and technology; communication and outreach; training and doctrine; facilities; and specifications/standards and production qualification.

Funds to be Provided

Funding is being budgeted for this program. Anticipated levels being budgeted for DoD facilities are $13.5 million in FY05 and $50 million each FY06-11. The Air Force will share a third of these dollars with the other services. There is also the promise of small amounts of funding for specific fast-payback corrosion prevention actions starting as early as FY04.

Planning Ahead for Funding

What does this mean at base level? First, there will be more visibility for your corrosion prevention program. If you don't have one, you need to start one. Second, you need to identify projects, both in-house and by contract, that are primarily for corrosion-related repairs or for corrosion prevention. Third, identify your program needs to your major command.

What You Should Already Be Doing

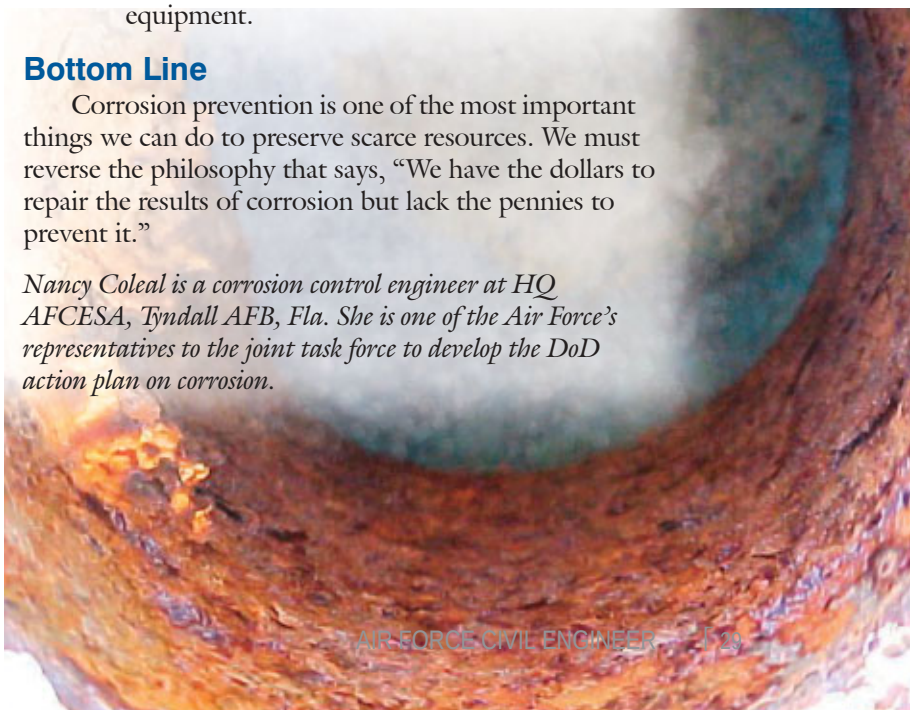
There are a few things you can and should already have in place:

- Steel underground tanks holding fuel or other hazardous substances are required to be tested every 60 days by certified cathodic protection technicians. (40 CFR 280)
- Cathodic protection sacrificial anode systems on bulk fuel storage tanks, underground metal pipelines, and other protected equipment should be tested annually.
- Establish a Base Corrosion Control Operating Instruction (see UFC 3-570-06 Appendix A) and a corrosion control committee to maintain emphasis on corrosion prevention and to use scarce manpower more effectively.
- Send your corrosion engineer and CP technician to courses offered throughout the year with NACE or M.C. Miller, or at the Appalachian Underground Short Course in Morgantown, W.Va., Sheppard AFB, and the Air Force Institute of Technology.
- Perform bi-annual boiler inspections in accordance with AFI 32-1068.
- Maintain industrial water treatment systems for boilers, cooling towers and equivalent equipment.

Bottom Line

Corrosion prevention is one of the most important things we can do to preserve scarce resources. We must reverse the philosophy that says, "We have the dollars to repair the results of corrosion but lack the pennies to prevent it."

Nancy Coleal is a corrosion control engineer at HQ AFCESA, Tyndall AFB, Fla. She is one of the Air Force's representatives to the joint task force to develop the DoD action plan on corrosion.



Corrosion occurs in pipe without cathodic protection. (photo courtesy of ACC/CEOI)

Solar Power Lights the Night

by Capt Derek Ferland, 100th CES

During Operation Iraqi Freedom, the 332nd Air Expeditionary Wing launched more than 6,000 sorties, with an average of 500 a day during peak periods. During night operations, coalition pilots probably didn't notice that the taxiway system lighting came from solar-powered light-emitting diode, or LED, lights.

The 332nd ECES was given the new taxiway project for the airfield in December 2002. War plans called for more than 150 coalition fighter aircraft to be based at the airfield, which had an established primary runway and an alternate, parallel runway used strictly as a taxiway. To safely support the projected sortie rate, both runways would have to be used as primaries and a new, parallel taxiway system built.

Airfield lighting was necessary to make the new airfield surfaces fully mission capable for night operations, but lighting was not included in the contract for two reasons. The project's urgency meant inadequate time to design a traditional airfield lighting system, let alone get it constructed and commissioned in time for OIF. Moreover, a traditional taxiway lighting system probably would have exceeded the $3 million funding approval level. "We simply had to push the airfield lighting portion of the project to the back burner because it was more important to get the paving started" said Mike Berkes, the contract project engineer.

Unable to obtain an Expeditionary Airfield Lighting System kit from the war reserve materiel inventory, the 332nd ECES explored a solution that was at first unsettling: using solar-powered LED lights on a wartime taxiway. These lights had been used successfully on civilian airfields, but never for such a large-scale military application in a situation with so much at stake.

The engineers conducted a demonstration for the 332nd Expeditionary Operations Group on an unlit road with two lights on the ground at distances of 60 and 120 meters. Lt Col Robert "Ricky" Ricarte, commander of the 332nd Expeditionary Operations Support Squadron, summed up the test's results, "We were impressed with the brightness and clarity of the lights, and surprised that a solar-powered light could be that effective."

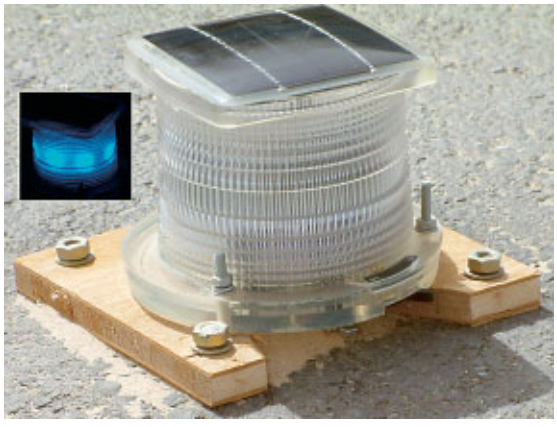
The 332nd ECES found two sources for solar-powered LED lights that met all relevant Federal Aviation Administration standards. Delivery from both companies was quick and 350 lights were completely installed five days after they arrived. The last light was installed approximately 20 hours prior to the start of OIF. Luckily, the 332nd ECES never had to use their backup plan—using fabricated plastic posts covered with highly reflective material.

The lights exceeded all expectations for use in this situation. During use of the airfield, only 20 lights had to be replaced because they malfunctioned or were crushed by emergency response vehicles. Because each LED light is an independent, self-contained unit, they were very easy for personnel to handle, install and maintain. The excess solar-powered lights were sent to support combat operations at Tallil and Kirkuk ABs after they were captured and converted into expeditionary airfields. The lights' small size and low weight made them ideal for transportation into Iraq.

The true testament of the lights' performance, however, came from the pilots. "We had zero ground safety incidents during the war largely because the taxiways were well lit. Our coalition pilots were able to keep their minds focused on the business at hand, which was to project lethal aerospace power," said Lt Col Ricarte.

Capt Derek Ferland is the Engineering Flight Commander for the 100th CES, RAF Mildenhall. He was the Engineering Flight Chief with the 332nd ECES.

Author's note: While the LED lights used in the setting described in this article are appropriate for use in some contingency situations, such as the one recounted in this article, they do not meet Air Force requirements for permanent fixed base operations.Should the need for blackout arise, the LED lights described in this article must be individually turned off and reactivated manually, using a magnetic device.



The photos above display the round (left) and flat (right) solar-powered LED lights employed in Iraq. The inset in each photo shows how the lights look after dark. *(large photo on left by Mike Berkes; all others by the author)*

Mr. Herman Griese adjusts the radar system for another session of bird-tracking. *(photo by SSgt David Donovan)*

Bird Scouting for Safer Skies

by Mr. Allen P. Richmond, 3rd CES/CEVP

While civil engineer squadrons routinely monitor and maintain safe conditions on the ground for aircraft operations at their bases, not everyone is aware that these responsibilities extend into the skies above the airfields. One of the less visible—but highly important—roles of CE Environmental Flights is conducting bird behavior studies in order to prevent bird strikes.

The importance of this role is well understood at Elmendorf AFB, Alaska, where bird strikes in 1995 caused an E-3 AWACS crash that killed 24 American and Canadian servicemen. Shortly after that tragedy, a study at Elmendorf evaluated the use of bird radars to reduce bird strikes. Radar was found only marginally useful for ground-based bird detection and dispersal activities, but held promise for providing real-time bird-hazard advisories and for development of a bird avoidance model.

In 2002, the Elmendorf conservation team successfully petitioned to become one of five DoD participants in a Navy bird radar project developed by Dr. Sid Gauthreaux at Clemson University, S.C.

The modified marine X-band radar first scanned the skies over Elmendorf in August 2003. The mobile system is contained in a small utility trailer. A revolving satellite dish, atop a wheeled cart and attached by a 100-foot umbilical cord, can be quickly set up outside the trailer. The technology inside enables Elmendorf's wildlife experts to observe patterns of bird activity.

According to the Base Wildlife Biologist, Herman Griese, the system can detect sparrow-size birds out to one-and-a-half miles and larger birds as far as three miles, allowing complete coverage of Elmendorf's immediate flightline air space. However, frequent rain during Alaska's fall bird migration has a negative impact on the system.

The system not only reinforced, but greatly expanded, previous information regarding bird migrations through Elmendorf's airspace. "In spite of weather conflicts this fall, we were able to observe much higher bird densities than those reported in 1996," said Griese, who collected data during many evenings and early mornings from Sept. 24 to Oct. 14, 2003. The number of bird targets peaked at around one hour after sunset and then declined by almost 40 percent within the next half hour. Bird densities generally declined throughout the night, and all but disappeared at sunrise.

According to Griese, the extrapolated number of birds in the air observed at peak densities should be a grave concern for pilots. "These numbers are a fraction of the actual numbers of birds in the air," said Griese. "The radar is designed to sample less than five percent of the airspace out to the limits of bird detection."

Griese plans to routinely collect information during spring and fall migrations. The goal is to have enough information to predict trends in bird migration patterns and create a bird-avoidance model, which will be useful in developing flight plans and in operations and exercise planning.

Capt. Nate Vogel, Elmendorf's Bird/Wildlife Aircraft Strike Hazard, or BASH, Officer in the 3rd Wing Safety Office, is encouraged by recent developments in bird radar. "Although we are in the early phase of incorporating the bird radar into our BASH program, it has already demonstrated great potential in helping to create a safer airfield environment for our aircrews and aircraft," said Capt Vogel. The information collected so far has been shared with the Bird Hazard Working Group and has already earned praise from flight operations personnel.

The current bird radar system can't detect birds lower than 100 feet above ground level and would not have prevented the 1995 AWACS tragedy. According to Griese, the immediate benefit to the flight safety is improved understanding of bird movement patterns; the improving technology could eventually provide real-time advisories to aviators. "The real strength of the current system lies in its ability to detect birds outside the visual detection zone," said Griese. "It will easily complement our current ground-based bird detection and dispersal activities, and ultimately enhance overall flight safety."

Allen P. Richmond is chief of Conservation and Environmental Planning, 3rd CES, Elmendorf AFB, Alaska.

Editor's note: Small mobile radar systems capable of providing real time pilot advisories are operational now. For more information, contact the Air Force Bird/Wildlife Aircraft Strike Hazard (BASH) program at HQ Air Force Safety Center at afsc.sefw@kirtland.af.mil *or* DSN 246-5679/5674.

Two CEs Win 2003 Sijan Awards

The Lance P. Sijan award annually recognizes senior and junior officers and enlisted members assigned to organizations at the wing level or below who demonstrate outstanding leadership abilities. The award was created in 1981 to honor the first Air Force Academy graduate to receive the Medal of Honor. Sijan was shot down over Vietnam in 1967, and successfully evaded capture for 45 days despite severe injuries. He died in 1968 while a prisoner of war, and was awarded the medal posthumously for his heroism.

Civil engineers recently received two of the four Lance P. Sijan U.S. Air Force Leadership Awards given in 2003. Lt Col Robert Moriarty, commander of the 314th Civil Engineer Squadron, Little Rock AFB, Ark., won in the senior officer category. MSgt Christopher May, superintendent of facilities maintenance for the 305th CES, McGuire AFB, won the junior enlisted category award.

From July 1, 2002, to June 30, 2003, Col Moriarty lead a 350-person CE squadron supporting an infrastructure for more than 1,900 base facilities and real property assets valued at 1.1 billion dollars for the world's largest wing of C-130s. Col Moriarty deployed as the 447th Air Expeditionary Group vice commander in support of Operation Iraqi Freedom. He successfully led the build-up and base operations for two bare bases. The first location supported more than 4,500 join forces/coalition personnel 34 miles from the Iraqi border. After tearing down this site, he led a 1,000-person group in setting up and running three camps in the second location, Baghdad International Airport.

"He applied career knowledge and experience of combat support at the right time, at the right place, where others would have failed," said Col Roger Bick, 314th MSG commander. "He is simply 'poetry in motion.' "

Lt Col Robert Moriarty

TSgt Jose Dicupe, HVAC NCOIC; TSgt Bradley Warren, Facility Maintenance NCOIC; and MSgt Christopher May, Superintendent of Facility Maintenance Element *(photo by Carlos Cintron)*

MSgt May led 43 military and civilian craftsmen in two work zones comprising heating, ventilation and air-conditioning/refrigeration, and also directed a base-wide preventive maintenance program. He successfully led a $95,000 project to install new HVAC units at base telephone centers, which prevented critical system failure. MSgt May also successfully planned and executed a five-year, predictive infrastructure repair plan for $500,000 in mechanical assets that enhanced quality of life in the dormitories.

"The biggest challenge of my job is managing time for personnel, customers and leaders, while the best aspect of my job is working with all those people and having the opportunity to mentor subordinates and future Air Force leaders," MSgt May said.

According to SMSgt William Ferenc, 305th CES Operations Flight superintendent, "MSgt May is an outstanding leader and manager. He works diligently to accomplish the mission and take care of his people. Without a doubt, he does an extraordinary job balancing both."

"My advice to my troops is to know your wartime and peacetime job inside and out," MSgt May said. "Learn everything you can, especially training that makes you a well-rounded Air Force warrior. Seek out opportunities to excel and have initiative to take on added responsibility; be a volunteer instead of being volunteered."

Compiled from articles by SrA Jason Neal, 314th Airlift Wing Public Affairs, Little Rock AFB, Ark., and A1C Ashley Casas, 305th Air Mobility Wing Public Affairs, McGuire AFB, N.J.

CE's Heroism Earns Airman's Medal

It was just another day in the life of an Explosive Ordnance Disposal technician when MSgt Joseph Bean grabbed up a 120-millimeter white phosphorus projectile that was on fire, then carried it to and submerged it in a nearby pond in Kirkuk, Iraq, on April 24, 2003.

"Every day, a hundred crazy things happened and this was just another one of them," he said.

For his quick action, MSgt Bean was awarded the Airman's Medal. Though he says he did what any other EOD technician would have done in his place.

"It's not uncommon in the EOD community to encounter risk-of-life situations," he said. "Everybody deserves a pat on the back because everybody takes the risk."

After removing unexploded ordnance from the airfield at Kirkuk to reopen it, MSgt Bean and his team began removing ordnance caches from the local areas. A munitions consolidation area was established on base to hold the large numbers of ordnance retrieved. During a survey of this holding area, a 120-millimeter white phosphorus projectile at MSgt Bean's feet began smoking.

"A team member yelled that a round near my feet was smoking," he said. "By the time I looked down it was already on fire. I remembered a pond nearby and grabbed it and ran over to the pond, lowering it into the water—it seemed to be the only thing to do at the time."

More than 19 years as an EOD technician had trained MSgt Bean for moments like this. He knew that the ordnance contained white phosphorous, which can liquefy in the hot sun and spontaneously ignite when exposed to air, causing an inadvertent explosion. By keeping the mortar round from exploding, MSgt Bean avoided a possible chain reaction of explosions.

"A detonation may have set off other surrounding munitions," he said. "It certainly would have killed us."

MSgt Bean leads an UXO sweep line, identifying and clearing ordnance from a field near the flightline at Kirkuk AB, Iraq.

MSgt Bean's quick action prevented the detonation of munitions in this CAHA at Kirkuk AB, Iraq.

MSgt Bean is retiring from the Air Force in a month. He would like to continue working with explosive ordnance in the civilian sector, either in research and development or in cleaning up old military ranges.

"I came into the military specifically to do this," he said. "I think what inspired me was the excitement and the element of danger. I enjoy the challenge of it. I can't say that I would want to do anything else in the Air Force. It's not for everybody. It takes a certain type-A personality to be a good EOD tech and I've thoroughly enjoyed it."

Jennifer Brugman, 60th Air Mobility Wing Public Affairs, Travis AFB, Calif.

Excerpts from the Citation to Accompany the Award of the Airman's Medal:

"Master Sergeant Joseph O. Bean III distinguished himself by heroism involving voluntary risk of life at Kirkuk Air Base, Iraq, on 24 April, 2003....Without Sergeant Bean's quick action, the [120-millimeter] round would have detonated, setting off the entire stockpile, including SA-2 surface-to-air missiles, high explosive mortar rounds, and rocket propelled grenades, causing serious injury, if not loss of life, to all of his team members and sixty United States Army and other non-governmental organization personnel working in the area....With a conservative estimate of a net explosive weight in excess of 300,000 pounds for the munitions stored in the stockpile, the significance of this selfless act cannot be overstated...."

Firefighters Up to Challenge

Fire instructors from the Department of Defense Fire Academy took the top U.S. spot at the 12th annual Firefighter World Challenge Nov. 4-8 in Ottawa, Ontario, Canada.

The team, composed of soldiers, sailors, airmen and Marines (known as the SAM Squad), won the Tums Grand National Championship awards for the best overall U.S. team and top U.S. relay team. SAM Squad member Eric Aker took home top honors in the U.S. individual male category. The SAM Squad received the awards by accumulating the most points during various regional firefighter competitions held throughout the year.

In the world competition, Dave Chiodo from the Travis AFB, Calif., team was named World Challenge Rookie of the Year and placed fourth in the individual male over-50 category.

Firefighter Challenge is known as "the fastest two minutes in sports." Competitors, dressed in full firefighting gear, rush through a series of physically demanding firefighting activities for a timed score.

Almost 200 fire departments from 31 states, Canada, Italy, Germany and England participated in the competition. In addition to Travis and the firefighter academy, 10 other military firefighter teams participated in the competition.

Ten military teams competed in the Streamlight Survivor Relay and made it to the final field of 64. The SAM Squad, Travis and Mildenhall made it to the elite eight and Mildenhall advanced to the final four, ultimately placing fourth overall.

In other world competition events, the Travis team placed fifth overall and Mike Melton, from Travis, finished sixth in the individual male category.

ESPN2 covered the firefighter challenge for broadcast in December and January (check local listings for possible repeats).

MSgt Michael A. Ward, HQ AFCESA/PA, Tyndall AFB, Fla.

Members of the RAF Mildenhall, UK, team rush through the relay event during the 12th annual Firefighter World Challenge. Pictured (L-R) are A1C Christopher T. Jones, SSgt Roderick D. Wiggin, SSgt Richard G. Henderson and SrA James Cook. *(photo by MSgt. Craig Hall)*

2003 Senior Leaders' Meeting

The 2003 Civil Engineer Senior Leaders' Meeting was held in December at Randolph AFB, Texas. Maj Gen L. Dean Fox, The Air Force Civil Engineer, presided over the annual meeting of major command and field operating agency Civil Engineers with representatives from the Air Staff. A major item discussed was the review of the "Back to Bases" taskforce, which visited civil engineering units at six bases to study the level of support the major commands give to their bases. Other discussion topics included homeland security and force protection, as well as updates on military construction, family housing, readiness, environmental programs, and operations and maintenance.
(Photo by Chuck Brewer)

CE Senior Officers and Civilians

General Officer

HQ USAF	Maj Gen Fox, L. Dean	Pentagon	The Air Force Civil Engineer
HQ ACC	Brig Gen Burns, Patrick A.	Langley AFB	Command Civil Engineer
HQ AMC	Brig Gen Eulberg, Del	Scott AFB	Director, Installations and Mission Support

Colonel

MD ANG	Albro, William P. (ANG)	Martin State Airport	Civil Engineering Staff Officer, 235 CEF
HQ AFCEE	Alston, Lavon	Brooks AFB	Executive Director
AETC	Amend, Joseph H. III	Wright-Patterson AFB	Vice Commandant, AFIT
ACC	Anderson, Benjamin	Hurlburt Field	Commander, 823 RHS
HQ ACC	Angel, Edward (AF Res)	Langley AFB	IMA to the Command Civil Engineer
AETC	Astin, Jared A.	Wright-Patterson AFB	Dean, CE and Services School, AFIT
HQ USAF	Barnum, Wayne J	Pentagon	IMA to Chief, Environmental Division
HQ AFSPC	Bartholomew, Richard	Peterson AFB	Commander, Civil Engineer Flight
HQ CENTAF	Baughman, James D.	Shaw AFB	CENTAF A7 Civil Engineer
HQ AFSPC	Bednar, Bryon J. (AF Res)	Peterson AFB	IMA to Commander, 30th CES
HQ AETC	Bird, David F. Jr.	Randolph AFB	Command Civil Engineer
HQ ACC	Borges, Scott K.	Langley AFB	Chief, Base Support Division
HQ AMC	Bousquet, Roy V. (AF Res)	Scott AFB	ARC Advisor to the Director, Installations & Missions Supt
AMC	Brackett, James S.	Andrews AFB	Commander, 89 MSG
ODUSD/I&E	Bradshaw, Joel C. III	Pentagon	Chief, Air Force Programs
61 ABG	Brendel, Lance C.	Los Angeles AFB	Base Civil Engineer
HQ AETC	Brewer, David C.	Randolph AFB	Chief, Programs Division
HQ PACAF	Bridges, Timothy K.	Hickam AFB	Chief, Programs Division
HQ AMC	Brittenham, Larry W.	Scott AFB	Chief, Planning and Programs Division
HQ PACAF	Byers, Timothy A.	Hickam AFB	Command Civil Engineer
AETC	Carter, Theresa C.	Maxwell AFB	Commander, 42 MSG
PACAF	Cassidy, Wilfred T.	Osan AB	Seventh Air Force Civil Engineer
ACC	Chisholm, Maryann H.	Minot AB	Commander, 5 MSG
AMC	Coker, Gregory W.	Pope AFB	Commander, 43 MSG
MO ANG	Cole, Larry (ANG)	Lambert IAP	Operations Branch, 231 CEF
PACAF	Correll, Mark A.	Yokota AB	Commander, 374 MSG
HQ USAF	Corson, William M.	Pentagon	Chief, Programs and Analysis Branch
OASD/RA	Coughlan, Michael (sel)	Pentagon	Deputy Director of Environmental Management
PACAF	Crummett, Thurlow E. Jr. “Terry”	Andersen AFB	Commander, 36 MSG
USAFE	Cruz-Gonzalez, Carlos R.	Ramstein AB	Commander, 435 CEG
HQ USAF	Daly, Patrick R. “Lou”	Pentagon	Chief, Environmental Division
ACC	Dinsmore, Raymond E.	Holloman AFB	Commander, 49 MSG
HQ AFCESA	Elliott, Gus G. Jr.	Tyndall AFB	Commander, AF Civil Engineer Support Agency
HQ USAF	Fadok, Faith H. (AF Res)	Pentagon	IMA to The Air Force Civil Engineer
AFMC	Falino, Michael	Hill AFB	Commander, 75 CEG
HQ AETC	Fink, Patrick T.	Randolph AFB	Chief, Environmental Division
MD ANG	Fischer, Kevin J. (ANG)	Martin State Airport	Civil Engineering Staff Officer, 235 CEF
HQ AFSPC	Fisher, Marvin N.	Peterson AFB	AFSPC Command Civil Engineer
CO ANG	Flood, Michael E. (ANG)	Buckley AFB	Commander, 240 CEF
HQ USAFE	Floyd, William R. “Randy”	Ramstein AB	Director of Staff
SAF/IEI	Formwalt, William A.	Pentagon	Director, Installation Policy
PACAF	Fryer, Richard A. Jr.	Elmendorf AFB	Commander, 3 CES
HQ AMC	Gaffney, Timothy P.	Scott AFB	Chief, Expeditionary Combat Support Division
CO ANG	Gann, Sharon M. (ANG)	Buckley AFB	Deputy Commander, Readiness, 240 CEF
HQ AETC	Green, Gordon S.	Randolph AFB	Chief, Operations Division
USAFE	Green, Timothy S.	Aviano AB	Base Civil Engineer
USAFE	Greenough, William T.	Spangdahlem AB	Commander, 52 MSG
HQ USAF	Griffin, Bobbie L. Jr.	Pentagon	Chief, Housing Division
AFRC	Groskreutz, Paul	Dobbins ARB	Commander, 622 RSG
OSD/RA	Hart, Thomas H. (AF Res)	Pentagon	ESGR Chief of Staff and Director Current Operations
HQ USAFE	Hartford, Stuart	Ramstein AB	Chief, Programs Division
USAFA	Hayden, Thomas F. III	USAF Academy	The Civil Engineer/Commander, 10 CES
AFRC	Hegler, Max	March ARB	Commander, 604 RSG
HQ ACC	Hicks, Otis L. Jr.	Langley AFB	Chief, Operations and Infrastructure Division
HQ PACAF	Hoarn, Steven E.	Hickam AFB	Chief, Operations Division
HQ PACAF	Holland, James P.	Hickam AFB	Deputy Civil Engineer
AMC	Howe, David C.	McGuire AFB	Commander, 305 MSG
HQ ACC	Howell, Richard C.	Langley AFB	Deputy Civil Engineer
HQ ACC	Ibanez, Juan Jr. (sel)	Langley AFB	Chief, Readiness Division
AFRC	Ippolito, Jeffery	Carswell ARS	Commander, 610 RSG
ACC	Jeter, Drew D.	Langley AFB	Commander, 1 MSG
HQ AFCESA	Johnson, Wilson III (AF Res)	Tyndall AFB	IMA to Director, Operations Support
HQ USAF	Kanno, Neil K.	Pentagon	Chief, Readiness & Installation Support Div.
HQ AFSOC	Keith, Edmond B.	Hurlburt Field	Command Civil Engineer
PACOM	Kirschbaum, Max E.	Yongsan Garrison	Deputy Assistant Chief of Staff, Engineer, CFC
PACAF	Knapp, Andrew Q.	Hickam AFB	Commander, 15 CES
SAF/IEI	Kohlhaas, Karen D. (AF Res)	Pentagon	IMA to the Ass’t Secretary of the Air Force, Installations

CE Senior Officers and Civilians

PACAF	Kopp, Robert D.	Osan AB	Commander, 51 MSG
HQ AFCEE	Korslund, Per A.	Brooks AFB	Assistant to Director for Special Projects
HQ AFCEE	Krnavek, Ronald (AF Res)	Brooks AFB	IMA to the Director
ACC	Kuhlmann, Bryan L.	Shaw AFB	Commander, 20 MSG
HQ AFCESA	Kuhns, James E. (AF Res)	Tyndall AFB	IMA to the Commander
HQ AMC	Lally, Brian J. (AF Res)	Scott AFB	IMA to the Director, Installations & Mission Support
HQ AETC	Lancaster, Louis K.	Randolph AFB	Chief of Engineering Division
AMC	Lee, Irvin B.	MacDill AFB	6 MSG Commander
HQ AFCESA	Leptrone, Jeffrey L.	Tyndall AFB	Director, Technical Support
HQ AFMC	Lifschitz, Gabriel (AF Res)	Wright-Patterson AFB	IMA to Chief, Operations Division
PACAF	Lillemon, Steven K.	Kadena AB	Commander, 18 CEG
HQ AFMC	Loomis, Paula J. (AF Res)	Wright-Patterson AFB	IMA to the Command Civil Engineer
HQ PACAF	Lyon, James D.	Hickam AFB	Chief, Readiness Division
AFRC	Mack, Francis	Scott AFB	Commander, 932 SPTG
AFMC	Macon, William P.	Eglin AFB	Commander, 96 CEG
HQ ACC	Macri, Charles L. (AF Res)	Langley AFB	IMA to Chief, Readiness Division
HQ ANG	Maida, Anthony T. II (ANG)	Andrews AFB	Chief, Readiness Division
HQ AMC	Martin, William H, Jr. (sel)	Scott AFB	Chief, Environmental Programs Division
AFELM DIA	McClellan, Richard G.	Bucharest, Romania	Air Attaché Romania
USAFE	McElhannon, Neal B.	RAF Lakenheath	Commander, 48 MSG
PACAF	Medeiros, John S.	Hickam AFB	Commander, 15 MSG
HQ AMC	Miller, Brian L.	Scott AFB	Deputy Director, Installations & Mission Support
PACAF	Moes, Steven J.	Elmendorf AFB	Eleventh Air Force Civil Engineer
CO ANG	North, Robert D. (ANG)	Buckley AFB	Operations Division Chief, 240 CEF/CEO
HQ AFCESA	Norton, William E	Tyndall AFB	Reserve/ANG Advisor
AMC	Patrick, Leonard A.	Travis AFB	Commander, 60 MSG
ANG	Perkins, Dewey	Camp Perry ANGS	Commander, 200 RHS
SAF/IEI	Pokora, Edward J.	Pentagon	Director for Facility Management
AFMC	Purvis, Quincy D.	Arnold AFB	Director of Support
HQ AFMC	Quinn, William R.	Wright-Patterson AFB	Chief, Engineering Division
AETC	Rojko, Paul M.	Cambridge, Mass.	Commander, AFROTC Northeast
AFMC	Romano,Sebastian V.	Hill AFB	Commander, 75 ABW
HQ ACC	Rumsey, Kevin E.	Langley AFB	Chief, Programs Division
AFRC	Russell, John P. Jr. (AF Res)	Lackland AFB	Commander, 307 RHS HQ
AFMC	Sanchez, Mark A. (AF Res)	Eglin AFB	IMA to Commander, 96 CES
HQ USAF	Saroni, Vincent M. (AF Res)	Pentagon	IMA to Readiness and Installation Support Division Chief
HQ AFMC	Saunders, William R.	Wright-Patterson AFB	Chief, E-Business Project Management
ACC	Schluckebier, Thomas J.	Offutt AFB	Commander, 55 MSG
HQ USAF	Scrafford, Andrew R.	Pentagon	Chief, Engineering Division
USAFA	Seely, Gregory E.	USAF Academy	Dept. Head, Civil Engineering
HQ USAF	Seitchek, Glenn D. (AF Res)	Pentagon	IMA to Chief, Housing Division
OSD	Selstrom, John P. Jr.	Pentagon	Special Assistant for UXO Matters
PACAF	Shelton, Kenneth P.	Yokota AB	Fifth Air Force Civil Engineer
ANG	Shick, Gary	Ft. Harrison USA Post	U.S. Property and Fiscal Officer
MO ANG	Sivewright, Sam (ANG)	Lambert IAP	Commander, 231 CEF
AMC	Smiley, Charles P.	Dover AFB	Commander, 436 MSG
ACC	Smith, Keith E.	Nellis AFB	Commander, 99 CES
MO ANG	Smith, Larry (ANG)	Lambert IAP	Deputy Commander, 231 CEF
AFSPC	Snyder, Cynthia G.	Peterson AFB	Commander, 21 MSG
HQ USAF	Snyder, Neil K. (AF Res)	Pentagon	IMA to Chief, Engineering Division
HQ PACAF	Sohotra, Joyce F.	Hickam AFB	Chief, Environmental Division
HQ AFMC	Somers, Paul W. “Wes”	Wright-Patterson AFB	Deputy Civil Engineer
HQ USAFE	Speake, Nancy L.	Ramstein AB	Deputy Civil Engineer
ACC	Staib, Robert J. (Sel)	Malmstrom AFB	Commander, 819 RHS
ACC	Stingham, Steven (AF Res)	Nellis AFB	IMA to Commander, 99 CES
HQ ANG	Strandell, William J. (ANG)	Andrews AFB	Deputy Civil Engineer
HQ ANG	Stritzinger, Janice M. (ANG)	Andrews AFB	Command Civil Engineer
HQ AFCEE	Strom, Randie A.	Brooks AFB	Director, Technical Directorate
HQ AFRC	Sweat, David A.	Robins AFB	Command Civil Engineer
HQ USAFE/XP	Thady, Randall J.	Ramstein AB	Chief, International Relations, Bases, and Forces Division
HQ AFCESA	Thorpe, York D.	Tyndall AFB	Director, Operations Support
ACC	Tinsley, Hal M.	Holloman AFB	Commander, 49 MMG
AFMC	Torchia, Linden J.	Robins AFB	Commander, 78 CEG
PACAF	Tucker, Douglas K.	Kunsan AFB	Commander, 8 MSG
ANG	Turlip, Thomas	Va. State ANG HQ	Director of Personnel
SAF/IEI	Vazquez, Luis A. (AF Res)	Pentagon	Assistant for Reserve Affairs
HQ USAFE	Verlinde, Jon D.	Ramstein AB	Command Civil Engineer
HQ AFMC	Wallington, Cary R.	Wright-Patterson AFB	Deputy Director of Mission Support
HQ PACAF	West, James D. (AF Res)	Osan AB	IMA to the PACAF Civil Engineer
AFRC	West, Robert G. (AF Res)	NAS/JRB, Texas	301 FW Office of the Inspector General
HQ AFSPC	Whalen, Daniel P. (AF Res)	Peterson AFB	IMA to the AFSPC Civil Engineer
AETC	White, Arvil E. III “Bobby”	Sheppard AFB	Commander, 782 Training Group
AFMC	White, Robert L. (AF Res)(sel)	Robins AFB	IMA to 78 CEG Commander
USCENTAF	Wilbur, Eric J. (sel)	Al Udeid AB	CENTAF-CMO

OASD	Willert, Carl R. (ANG)	Pentagon	Deputy Director, Construction
HQ AETC	Wilson, Robert C. (AF Res)	Randolph AFB	IMA to Command Civil Engineer
HQ AFCESA	Worrell, Josuelito	Tyndall AFB	Director, Contingency Support
HQ USAF	Wright, Mark D.	Pentagon	Chief, Programs Division
ACC	Zander, Steven W.	Seymour Johnson AFB	Commander, 4 MSG
HQ AFSPC	Zelenok, David S. (AF Res)	Schriever AFB	IMA to Commander, 50 Space Wing

Senior Executive Service

SAF/IEB	Aimone, Michael A.	Pentagon	DASAF (Basing and Infrastructure Analysis)
HQ USAF	Ferguson, Kathleen I.	Pentagon	The Deputy Air Force Civil Engineer
AFRPA	Lowas, Albert F. Jr.	Arlington, Va.	Director, Air Force Real Property Agency
HQ AFCEE	Parker, Paul A.	Brooks AFB	Director, Air Force Center for Environmental Excellence
HQ AFMC	Pennino, James R.	Wright-Patterson AFB	Command Civil Engineer
AFMC	Stephens, Eric L.	Brooks AFB	Dir., AF Inst. for Env., Safety and Occup Hlth Risk Analysis

GS/GM-15

HQ AFCESA	Anderson, Myron C.	Tyndall AFB	Chief, Civil and Pavements Division
AFRPA	Antwine, Adam	Kelly AFB	Senior Representative
HQ AFCEE	Bakunas, Edward J.	Brooks AFB	Chief, Program Support Division
HQ ACC	Barrett, Robert C. III	Langley AFB	Chief, Environmental Division
AFRPA	Beda, Carol Ann	Arlington, Va.	Program Manager
HQ AFMC	Bek, David J.	Wright-Patterson AFB	Chief, Programs Division
USSOCOM	Bosse, Harold	MacDill AFB	Command Civil Engineer
HQ AETC	Bratlien, Michael D.	Randolph AFB	Deputy Civil Engineer
AFRPA	Brunner, Paul G.	McClellan AFB	Director, Environmental Management
HQ AFCEE	Campbell, Darrell	Brooks AFB	Chief, Design Group Division
HQ AMC	Carron, Norman	Scott AFB	Chief, Engineering Division
AFMC	Clark, Michael J.	Eglin AFB	Deputy Base Civil Engineer
HQ ANG	Conte, Ralph	Andrews AFB	Chief, Programming Division
AFRPA	Corradetti, John J. Jr.	Arlington VA	Program Manager, Division A
AFMC	Coyle, Stephen	Robins AFB	Director, Environmental Management
HQ AFRC	Culpepper, Hilton F.	Robins AFB	Assistant Civil Engineer
CCDP	Daugherty, Patrick C.	Mons, Belgium	Senior Staff Engineer, HQ SHAPE
HQ AFCESA	Day, Alvin L.	Tyndall AFB	Chief, Mechanical/Electrical Engineering Division
SAF/AAF	Dittamo, Hector	Pentagon	Director, Facility Support
HQ USAF	Domm, Jeffrey	Pentagon	Chief, Quality Branch, Environmental Division
HQ USFK	Einwaechter, James R.	Yongsan Garrison	Deputy Assistant Chief of Staff, Engineer
HQ USAF	Eng, William	Pentagon	Chief, Plans and Policy Branch, Programs Division
HQ ACC	Firman, Dennis M.	Langley AFB	Chief, Engineering Division
AFMC	Gray, William G.	Arnold AFB	Technical Director
AFRPA	Halvorson, Kathryn M.	Arlington, Va.	Deputy Director, Air Force Real Property Agency
AFMC	Harstad, Richard D.	Wright-Patterson AFB	Chief, Acquisition ESH Division
AFMC	James, W. Robert	Hill AFB	Director, Environmental Management
AFRPA	Jenkins, Richard	Arlington, Va.	Chief, Real Estate Division
AFMC	Johnson, Gary K.	Wright-Patterson AFB	Director, Civil Engineer Directorate, 88 ABW
AFRPA	Johnson, Gerald A.	Pentagon	Chief, Environmental Division
AFRPA	Kempster, Thomas B.	McClellan AFB	Senior Representative
HQ AFCESA	Lally, Brian J.	Tyndall AFB	Executive Director
HQ AFCEE	Leighton, Bruce R.	Brooks AFB	Technical Ass't, MAJCOM & Installation Supt—Supt Cmds
AFMC	Lester, Ronald J.	Wright-Patterson AFB	Director, Environmental Management, 88 ABW
AFCEE	Lopez, Ed	Dallas, Texas	Director, Central Region Environmental Office
HQ AFSPC	Maher, Gary	Peterson AFB	Chief, Engineering Division
HQ USAF	Maldonado, Rita	Pentagon	Chief, Resources Division
SAF/IEE	McCann, Robert W.	Pentagon	Environmental Resource Manager
AFCEE	Mendelsohn, Clare	San Francisco, Calif.	Director, Western Region Environmental Office
HQ USAF	Moore, Robert M.	Pentagon	Chief, Program Management Branch, Housing Div.
HQ AFMC	Mundey, Karl J.	Wright-Patterson AFB	Chief, Environmental Division
HQ AFCEE	Noack, Ed	Brooks AFB	Director, Financial Management and Mission Support
HQ AMC	Potter, Perry D.	Scott AFB	Chief, Housing Division
AFMC	Preacher, Vicki	Tinker AFB	Director, Environmental Management
AFRPA	Reinertson, Kenneth	Arlington, Va.	Program Manager, Division D
AFRPA	Reynolds, Jean A.	Arlington, Va.	Base Realignment and Closure Officer
HQ AFCEE	Ritenour, Donald L.	Brooks AFB	Director, MAJCOM & Installation Supt—Combatant Cmds
HQ AFCEE	Russell, Thomas C.	Brooks AFB	Director, MAJCOM & Installation Support—Worldwide
HQ AFMC	Sculimbrene, Anthony F.	Wright-Patterson AFB	Exec. Director, Dayton Aviation Heritage Commission
HQ USAFE	Shebaro, Bassim D.	Ramstein AB	Chief, Engineering Division
AFCEE	Sims, Thomas D.	Atlanta, Ga.	Director, Eastern Region Environmental Office
AFMC	Sirmans, James D.	Eglin AFB	Director, Environmental Management
HQ AFCEE	Smith, Ian	Brooks AFB	Chief, Housing Privatization
SAF/IEI	Smith, John Edward B.	Pentagon	Deputy to the Deputy Assistant Secretary
HQ USAFE	Thompson, John D.	Ramstein AB	Program Manager, Rhein-Main Transition PMO
AFMC	Tuss, Margarita Q.	Wright-Patterson AFB	Chief, Engineering Division, 88 ABW
HQ ANG	VanGasbeck, David C.	Andrews AFB	Chief, Environmental Division
HQ ANG	Whitt, William B.	Andrews AFB	Chief, Engineering Division

Continuing Education

AFIT
Civil Engineer and Services School

Wright-Patterson AFB, OH

Course No.	Title	Off	Start Dates	Grad Dates
ENG 460 (S)	Mechanical Systems for Managers	04A	05 Apr	08 Apr
ENG 464	Energy Management Technology	04B	07 Jun	11 Jun
ENG 466	Energy Management Policy	04B	14 Jun	18 Jun
ENG 470 (S)	Electrical Systems for Managers	04A	21 Jun	25 Jun
ENG 520	Comprehensive Planning Dev.	04A	14 Jun	18 Jun
ENG 550	Airfield Pavement and Maintenance	04A	10 May	21 May
ENV 020 (S)	Environ. Compliance Assessment	04B	17 May	20 May
ENV 022 (S)	Pollution Prevention Program O&M	04B	07 Jun	11 Jun
ENV 220 (S)	Unit Environmental Coordinator.	04B	24 May	28 May
ENV 222	Hazardous Material Mgmt. Program	04B	11 May	13 May
ENV 418	Environmental Contracting	04B	03 May	14 May
ENV 521 (S)	Hazardous Waste Management	04B	21 Jun	25 Jun
ENV 531	Air Quality Management	04B	14 Jun	18 Jun
ENV 541	Water Quality Management	04B	12 Apr	16 Apr
MGT 400	CE Commander/Deputy	04A	26 Apr	07 May
MGT 412	Financial Management	04B	05 Apr	16 Apr
MGT 423 (S)	Project Programming	04B	03 May	14 May
MGT 426 (S)	SABER Management	04A	13 Apr	15 Apr
MGT 438 (S)	Logistics Management	04A	24 May	28 May
MGT 484	Reserve Forces AB Combat Eng.	04A	12 Apr	23 Apr
MGT 585	Contingency Engineer Command	04B	21 Jun	25 Jun

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

366 Training Squadron

Sheppard AFB, TX

Course No.	Title	Start Dates	Grad Dates
J3ARR3E453-002	Pest Management Re-Certification	26 Apr/10 May/07 Jun	30 Apr/14 May/11 Jun
J3AZR3E051-003	Cathodic Protection	05 Apr/06 May/07 Jun/28 Jun	16 Apr/19 May/18 Jun/12 Jul
J3AZR3E051-007	Airfield Lighting	15 Apr/16 Jun	26 Apr/25 Jun
J3AZR3E051-008	Electrical Distribution Sys. Maint.	19 Apr/21 May/25 Jun	14 May/18 Jun/23 Jul
J3AZR3E051-010	Bare Base Electrical Systems	23 Apr/02 Jun	06 May/15 Jun
J3AZR3E051-012	Fire Alarm Systems	12 Apr/06 May/02 Jun/28 Jun	05 May/01 Jun/25 Jun/22 Jul
J3AZR3E051-013	Intrusion Detection Systems (IDS)	23 Apr/02 Jun/12 Jul	12 May/21 Jun/29 Jul
J3AZR3E052-013	CE Advanced Electronics	26 Apr/07 Jun	21 May/02 Jul
J3AZR3E071-001	CE Adv. Elec. Troubleshooting	22 Apr/20 May/18 Jun	19 May/17 Jun/16 Jul
J3AZR3E072-002	Troubleshoot. Elec. Power Gen. Eq.	28 Apr/09 Jun	19 May/30 Jun
J3AZR3E072-113	Bare Base Power Generation	03 May/07 Jun	27 May/01 Jul
J3AZR3E151-013	HVAC/R Controls Systems	04 May/10 Jun	08 Jun/15 Jul
J3AZR3E151-014	Direct Expansion Systems	21 Apr/24 May	21 May/24 Jun
J3AZR3E151-015	Indirect Expansion Systems	12 Apr/07 Jul	29 Apr/26 Jul
J3AZR3E451-004	Fire Suppression Systems Maint.	12 Apr/03 May/25 May/21 Jun	30 Apr/21 May/15 Jun/12 Jul
J3AZR3E471-101	BB Water Purification & Distr. Sys.	07 Apr/21 Apr/05 May/02 Jun/16 Jun	16 Apr/30 Apr/14 May/11 Jun/25 Jun
J3AZR3E472-000	Liq. Fuels Storage Tank Entry Spvsr.	12 Apr/26 Apr	22 Apr/06 May
J3AZR3E472-001	Liq. Fuels Sys. Maintenance Tech.	17 May	28 May

Ft. Leonard Wood, MO

Course No.	Title	Start Dates	Grad Dates
J3AZP3E571-003	Engineering Design	05 Apr/07 Jun	16 Apr/18 Jun
J3AZP3E971-003	Advanced Readiness	03 May	07 May
J3AZP3E971-005	NBC Cell Operations	05 Apr/26 Apr/21 Jun	09 Apr/30 Apr/25 Jun

Indian Head, MD

Course No.	Title	Start Dates	Grad Dates
J5AZN3E871-001	Adv. Access and Disablement	19 Apr/10 May/02 Jun/21 Jun	30 Apr/21 May/11 Jun/02 Jul
J5AZN3E871-002	Advanced EOD Course	19 Apr/10 May/21 Jun	30 Apr/21 May/02 Jul

Gulfport, MS

Course No.	Title	Start Dates	Grad Dates
J3AZP3E351-001	Low Slope Maint. & Repair	05 Apr/26 Apr/17 May/07 Jun	15 Apr/06 May/27 May/17 Jun
J3AZP3E351-002	Fabrication Welded Pipe Joints	05 Apr/10 May/14 Jun	16 Apr/21 May/25 Jun
J3AZP3E351-003	Metals Layout Fab. & Welding	19 Apr/24 May	06 May/11 Jun

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.

305th Civil Engineer Squadron

Parent Unit:
305th Air Mobility Wing
Location:
McGuire AFB, N.J.
Commander:
Lt Col Mike J. Smietana
Assigned Personnel:
308 military and 142 civilians
Squadron Nickname:
Jersey Devils, Down & Dirty

The 305th CES sustains 13,700 personnel at McGuire AFB with support to the 305th Air Mobility Wing's C-141/KC-10 missions and numerous base tenant organizations, including the Air Mobility Warfare Center, the 21st Expeditionary Mobility Task Force, and the 621st Air Mobility Operations Group. The "Jersey Devils" provide a full suite of CE services for a $1.8 billion physical plant covering 3,660 acres, with over 1,000 facilities, 10 utility systems, and 3,045 housing units.

Recent Accomplishments: The 305th CES is working hard to transform McGuire AFB. Quality of Life funds—the only such funds awarded by Air Mobility Command—were used to renovate an old firehouse into an Airman's Center. Several other new facilities—a dining hall, visiting quarters, a golf course clubhouse, and a fire station—have recently opened, and a fitness center and a freight terminal will open next year. An $85 million Military Construction C-17 beddown program will also be completed in 2004.

During Operations Enduring Freedom and Iraqi Freedom, the 305th CES deployed 115 troops and supported the war in classified locations for six months. At home, as they do every year, the 305th CES managed Operation Stand Down in Philadelphia, Pa. for more than 300 veterans. As this year's "go to" squadron on McGuire, the Jersey Devils put on USO shows, a Chef Emeril Show, and a Comedy Central show, and the Readiness Flight warfare training troops were featured in a live MSNBC interview.

Recent Awards: The 305 CES garnered "Excellent" ratings for a back-to-back Nuclear Surety Inspection and a Unit Compliance Inspection in August—the first UCI inspection in 10 years. In 2003, the squadron also included an Air Force Lance P. Sijan Award winner *(see pg. 32)*, two AMC 12 Outstanding Airmen of the Year nominees and two John L. Levitow Award winners.

Individual flights also collected many honors in 2003. The AMC Community Planner Award winner and the AMC Military Manager Award runner-up are members of the Engineering Flight. Keeping McGuire AFB open during the worst winter in 30 years earned the Operations Flight the Air Force Balchen/Post Award. The Fire Protection Flight won McGuire's "Top Wheels" award for a third time. AMC's Inspector General team recognized 16 members of the Explosive Ordnance Flight as Exceptional Performers during the NSI/UCI, earning the flight an Excellent rating while having a high deployment rate of 650 man-days. The flight was also AMC's runner-up for the SMSgt Gerald J. Stryzak Award. The Environmental Flight's timely cleanup of a contaminated site planned for a hangar location kept the C-17 beddown on track. The flight was recognized as Outstanding by the Deputy Assistant Secretary of the Air Force for Environment, Safety and Occupational Health, Ms. Maureen Koetz.

Unit Spotlight

On a cool October morning in a Midwest field damp from early morning dew, four Air Force electrical instructors huddled to survey their equipment, their competition and the seemingly endless rows of poles that stood like oversized stalks of wheat.

They were in Bonner Springs, Mo., for the 20th annual International Lineman's Rodeo, an event that draws more than 1,000 linemen from around the world. Linemen compete in a series of timed events that test their skill, knowledge and dexterity.

"It usually takes us 10-15 seconds to climb a 40-foot pole, then do work most people would do standing at a bench," said MSgt Shaun Rohmiller, 366th Training Squadron, Sheppard AFB, Texas. "You've only got a quarter-inch of steel sticking into the pole and a thin leather strap between you and destiny."

But the biggest challenge for the Air Force team was not the climb to the top of the pole, but the climb toward parity with their civilian counterparts. Line work is not a full-time specialty for Air Force electricians, yet they compete against the cream of the crop from each municipality, company or utility.

"The guys that are here are not just everyday linemen, these are the best in the country," said MSgt Ted Roberts, 366th TRS. "Even being competitive with these guys speaks highly of our team."

"You can learn more out here in a day by competing and talking to other linemen than you can by sitting in a school for a month," said MSgt Rohmiller. "Not that the Air Force does things wrong. We do things differently. We do things that are driven by mission, and our mission is different than that in the private sector. But we use a lot of the lessons we learn here back at the schoolhouse."

The Air Force team scored higher than it had in the past, but was not in contention for any of the awards. Their prize came instead in knowing they had narrowed the gap. "We can actually say we were competitive this year and that's something I couldn't say the last two years," said MSgt Rohmiller.

Note: The Air Force will hold its own Lineman's Rodeo at Sheppard AFB, Texas, May 15.

Text and photo by MSgt Michael A. Ward, HQ AFCESA Public Affairs, Tyndall AFB, Fla.

A member of the Air Force team demonstrates his skill at personnel rescue with the aid of a dummy.