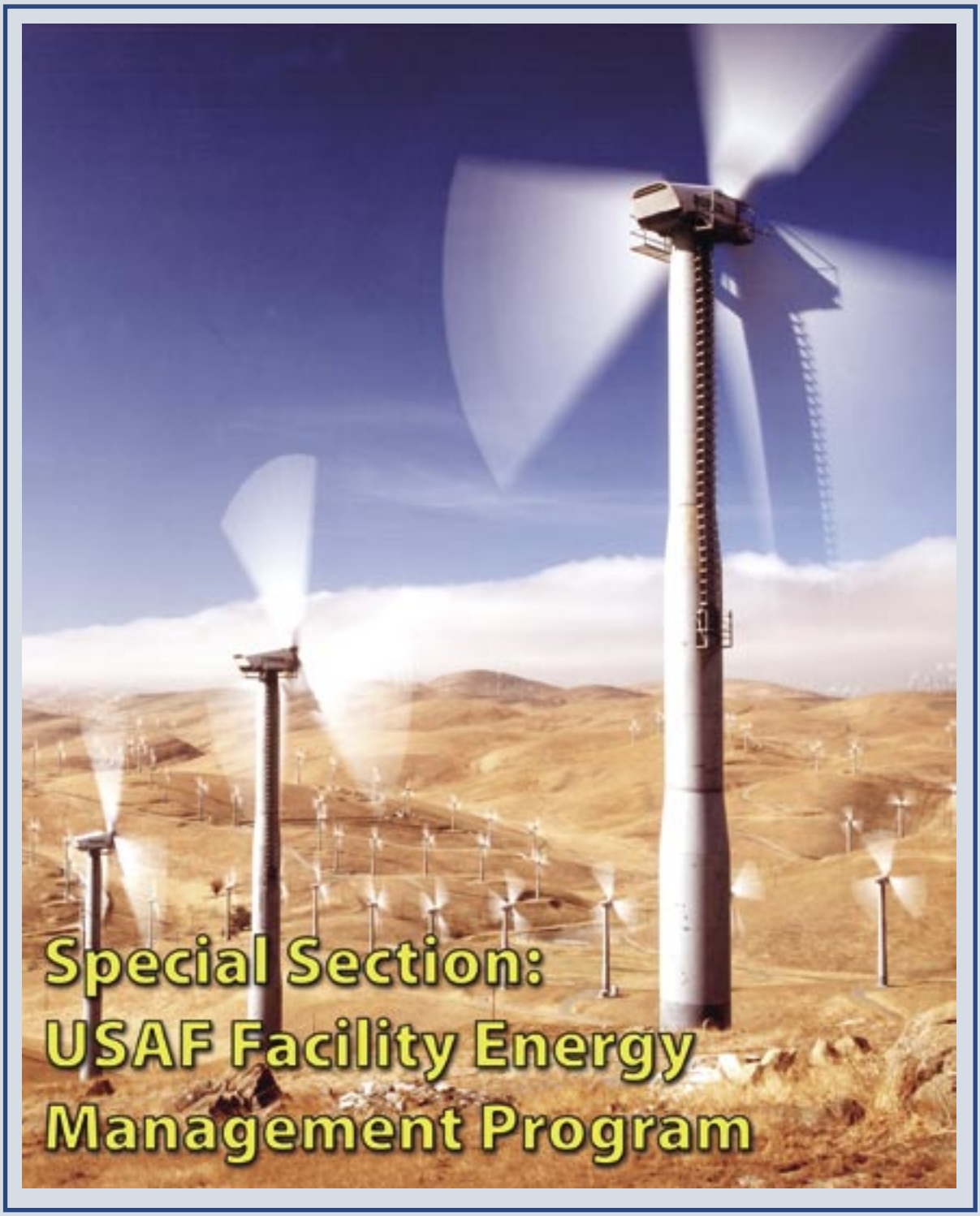
Air Force
CIVIL ENGINEER
Volume 12 • No. 2 • 2004



Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
2004		**00-00-2004 to 00-00-2004**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Special Section: USAF Facility Energy Management Program. (Air Force Civil Engineer, Volume 12, Number 02, 2004)	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Air Force Civil Engineer (AFCESA/PCT),139 Barnes Drive, Suite 1,Tyndall AFB,FL,32403-5319**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**Same as Report (SAR)**	**40**	

photo by Keith Fred

From the Top

A Rewarding Year

It's hard to believe that I've had the privilege of leading the finest engineers in the world for just over a year—without a doubt the most rewarding year of my career to date!

At the peak of the Global War on Terrorism and Operation Iraqi Freedom, over 4,500 Active Duty, Guard and Reserve Engineers were deployed. You established and maintained 38 bases and executed $445M in contingency military construction funds. Today almost 2,500 Civil Engineers maintain 16 bases and support U.S. Army operations throughout the area of responsibility.

Many "firsts" were accomplished: planning and design using geospatial data; a beddown on Russian-built airfields; and the creation and use of an air-droppable engineering unit (three teams have already been air-inserted to support forward basing). The first integration of Army and Air Force engineers since World War II was also achieved.

We have become even more committed to taking care of our people. Our quality-of-life projects support our Airmen and their families, allowing our deployed troops to focus on the Air Force's and our nation's tasks. With FY04 funding we continue to improve family housing ($1.5B) and dormitories ($128M+). We will invest in more than 10,000 housing units and move closer to eliminating inadequate housing by 2007 (overseas by 2009). We're also on track to eliminate the dormitory requirements shortfall by providing 1,104 rooms in the U.S. and overseas this year.

Unlike other services, the Air Force fights from its bases. We recognize that investing in our facilities and supporting infrastructure is important to the mission, and so do our senior leaders. Our FY04 $1.645B total force military construction program is the largest in 14 years. It covers the range of new mission beddowns, current mission needs, quality-of-life improvements and projects required to bring the Air Force into compliance with environmental laws and regulations. We also continue the upward trend in our operation and maintenance sustainment, restoration, and modernization funding. The 2005 President's Budget requests over $2B to "keep good facilities good."

Each and every one of you plays a key role in our Air Force mission and no one in the world can do it better. You have made my first year a memorable one… Thank You! As my travels continue, I look forward to seeing as many of you in action as I can.

I also want to remind all of you to be safe as you enjoy the end of summer and the start of fall with family and friends. It's also the end of the season for personnel moves and all the excitement associated with new jobs and locations. As you settle in to your new homes and jobs, please be sure to familiarize yourself with your new surroundings well. Let's all make sure we continue to keep safety at the forefront!

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

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

Air Force Civil Engineer

Volume 12, No. 2, 2004

Air Force Civil Engineer
Volume 12 • Number 02 • 2004

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

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On the cover: Windmills similar to these are providing electricity for several Air Force installations in the U.S. and overseas. (The windmills actually turn very slowly; the cover image was taken with a slow shutter speed.) (photo courtesy Dept. of Energy)

Command Focus United States Air Forces in Europe

Dr. Ronald B. Hartzer
HQ AFCESA/PC

An assignment to Europe is a career highlight for most civil engineers, despite significant differences from CONUS commands. Varying rules and customs in the host nations, NATO standards, language barriers, currency fluctuations and the metric system are just a few pieces of the puzzle. In this challenging environment, USAFE CEs are helping their command transform into a smaller organization focused on providing essential mission capabilities for the future.

Transformation, a term bandied about for the past few years in the Department of Defense, can mean many different things to different people. USAFE has been transforming for more than a decade, and it hasn't been easy. No other command has downsized more since the Cold War ended—from 25 main operating bases (MOBs) and 400 geographically separated units (GSUs) supporting more than 140,000 people to 5 MOBs and 100 GSUs supporting 76,000 people.

"We compressed and consolidated in places like Ramstein, Spangdahlem, RAF Lakenheath and RAF Mildenhall," said Col Jon Verlinde, former USAFE Civil Engineer. "A lot of things were jammed into these places without adequate funding."

That's quite an understatement. The command received almost no MILCON funding during the mid nineties. Now, years of perseverance and lobbying by Col Verlinde, his predecessors, and USAFE commanders have finally paid off: U.S. funds have begun arriving to replace and renovate USAFE's inadequate facilities.

"We've averaged about $100M a year since 2002, but that doesn't include NATO investment at places like Aviano, or the Rhein-Main transition program investment (see article on page 6), both of which have been huge," said Col Verlinde.

During the lean period of the nineties, USAFE relied on the NATO Infrastructure Program to support both the NATO mission and wartime facilities for U.S. forces. Since 1995, NATO has helped fund more than $800M worth of projects at USAFE bases, including recent runway reconstruction at RAF Mildenhall and RAF Fairford and much of "Aviano 2000's" $540M transformation program. "When it comes to airfield operations with runways and taxiways or hangars, we look to NATO first," Col Verlinde commented. "And we've been very successful with their program, which lets us stretch our MILCON and O&M dollars to other critical requirements."

During the nineties, lack of Sustainment, Restoration, and Modernization (SRM) money contributed to years of benign neglect for the command's infrastructure. However, the FY02, 03 and 04 SRM programs have been three of the largest in the Command's history, funding major items such as Lakenheath's water distribution system and north parking apron, and Ramstein's dormitories and community center.

The Combat Proud initiative, an integral piece of USAFE commander Gen Robert H. Foglesong's Combat and Special Interest Programs, gets everyone involved on local levels. The program fosters pride and productivity by energizing the command's workforce and residents to help improve base appearance. Civil engineers play a major part at every base but, as Colonel Verlinde notes, "CE on its own will not transform a base. It takes everybody in the wing working together to make things better."

Col Verlinde has great hopes of transforming family housing in USAFE. Over the past 20–25 years, hundreds of mid-rise, apartment-like stairwell housing units have been renovated to provide laundry rooms and addi-

tional living space. But the fact remains that they're still stairwell apartments, averaging 44 years old—12 years more than the Air Force average. The command will soon replace stairwell housing with modern duplexes and townhouses. The net result will be reduced population density, ground-level entrances and dramatically increased quality of life, for only 10–15% more than simple stairwell unit renovations.

Together, the FY03 program ($51M) and the FY04 program ($62M) are providing 351 military families with new housing. The command's $57.7M FY05 program will build 144 additional new units for Kaiserslautern Military Community families; a similar initiative is planned for Spangdahlem AB in FY06. In the United Kingdom and Italy, the command is pursuing aggressive build-lease programs to provide modern housing and eliminate deficits and inadequate units with no up-front cost to the Air Force; 811 design-award-winning units have already been built at RAF Lakenheath and Aviano. The command is pursuing authority for 170 additional units at Aviano and 600 units at Lakenheath.

Environmental stewardship continues to be an important part of USAFE's metamorphosis. Mr. Edwin Worth, headquarters environmental chief, explained, "We partner with NATO allies through annual USEUCOM Partnership for Peace environmental conferences co-hosted with eastern European nations. Our participation has been invaluable for keeping current with changing European Union regulations and sharing environmental training among service components."

USAFE engineers do more than just transform their installations; they are at the forefront in the Global War on Terrorism. "I don't think anyone really realizes how big a role USAFE and its European partners have played in our success in Southwest Asia," said Col Verlinde. "USAFE has transformed itself into a huge logistics support area for that part of the world, and that has never been more apparent than during Operations Iraqi Freedom and Enduring Freedom."

En-route support provided by USAFE installations from Moron AB and RAF Fairford to Rhein-Main and Inçirlik enabled thousands of sorties in TRANSCOM's air bridge, which brought troops, equipment and supplies to the fight. Engineers led the required beddown and infrastructure expansion while maintaining aged airfields exposed to unprecedented wear and tear.

After OIF plans for a northern front in Turkey fell through, USAFE engineers executed $4.5M in beddown efforts in numerous European and Mediterranean locations, supporting air bridge, logistics and direct combat operations.

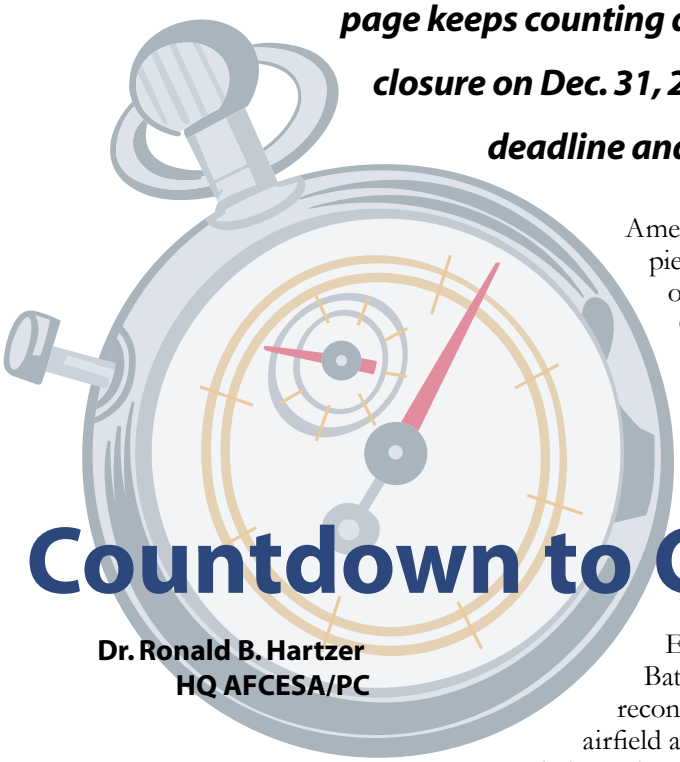
USAFE's beddown capability has recently made great strides thanks to the GeoBase/GeoReach programs. The command prepared the forces programmed to deploy to Turkey during OIF using lessons learned from Kosovo. According to Ms. Jane Goldberg, chief of the GeoBase/GeoReach office, her staff was just unpacking their equipment as OIF planning began to heat up, but when USAFE's site survey teams visited potential beddown locations, they carried with them pertinent and useful maps generated by the GeoReach office. The office has subsequently developed the Expeditionary Site Planning tool that includes more than 100 site maps in 35 different countries. "We try to anticipate requirements so that when a site survey team goes out, it's a validation effort, not a data-gathering effort," Ms. Goldberg said.

To better prepare for deployments, USAFE has expanded its Silver Flag Exercise program during the past year, adding other combat support functions such as personnel, security forces, communications, contracting and medical, much like Eagle Flag exercises. "We received rave reviews from our first exercise last October," said Lt Col Donald Gleason, Readiness Division chief.

All of this is rewarding for USAFE's civil engineers because their work is so visible. "I'm able to really see how we're improving and transforming USAFE," Col Verlinde said. "Being able to influence and impact the built environment on base is special to me. That's what CEs do. We make things better for our people."

Col Jon D. Verlinde retired as The USAFE Civil Engineer, Headquarters United States Air Forces in Europe, Ramstein Air Base, Germany in August 2004 after serving in that position for two years. Col Dave C. Howe succeeded him as the USAFE Civil Engineer. Col Howe previously served as BCE at Grand Forks AFB, N.D., and Andrews AFB, Md., and was commander of the 305th Mission Support Group, McGuire AFB, N.J., just prior to assuming his position at HQ USAFE. He is a graduate of the University of Kansas and more recently the Industrial College of the Armed Forces.

Tick, tick, tick... The clock on the Rhein-Main Transition Program Web page keeps counting down the seconds until Rhein-Main AB's closure on Dec. 31, 2005—a constant reminder of the impending deadline and the pressure to finish on time.



Countdown to Closure

Dr. Ronald B. Hartzer
HQ AFCESA/PC

Americans first occupied Rhein-Main, once home to the Graf Zeppelin and the Hindenburg airships, in March 1945. The next month, the 826th Engineer Aviation Battalion began reconstruction of the airfield and buildings. Rhein-Main served as the main western base for the round-the clock Berlin Airlift operations until September 1949. In response to the end of the Cold War, a smaller American military presence in Europe, and increased pressure from the Frankfurt Airport to expand its operation, the U.S. and German governments agreed in 1999 to close and transfer Rhein-Main, which has been the "Gateway to Europe" for most military members, to the host nation by the end of 2005.

Thanks to teamwork, hard work, and some good fortune, the complex program is right on target. "If you had told me four years ago that by now we would be on schedule and under budget, I would have said it was impossible," said Mr. John Thompson, the Rhein-Main Transition Program Manager. "We started out two years behind schedule and $70M over budget."

Mr. Thompson, a long-time civil engineer at USAFE, heads the 25-person Program Management Office (PMO), part of the A5R division of USAFE's Plans and Programs directorate. The PMO is responsible for transferring Rhein-Main AB to the Frankfurt Flughafen (Airport) and German government, and for transitioning Rhein-Main's strategic airlift capabilities to two other German installations, Ramstein and Spangdahlem Air Bases. Ramstein will become the primary European reception hub for Air Mobility Command's strategic and tactical airlift operations, and Spangdahlem will become a joint fighter/strategic airlift base.

This is one of the largest construction programs in the Air Force. The United States, NATO, the German federal government, two German state governments, and the Frankfurt Airport authority will spend more than $500M to complete 63 projects on the two bases.

At Ramstein, major projects include constructing a new runway by widening and lengthening the existing taxiway; demolishing the existing 123,000 square-meter ramp and taxiway; and constructing a 149,000 square-meter ramp to provide additional parking for four wide-body and six narrow-body aircraft.

Plans also include constructing a replacement hot cargo pad capable of holding two wide-body or three narrow-body aircraft, installing a hydrant refueling system with four hydrant pits; building a new replacement in-transit munitions facility; and building a new 19,754 square-meter air

freight terminal with a $10M state-of-the art material management and handling system.

Central to Ramstein's transformation is the new Kaiserslautern Military Community Center. Although not a part of the PMO's charter, work on the complex has a major impact on the program and will dramatically change the west end of the base. (See KMCC story on page 20.)

At Spangdahlem, significant projects include building a 209,000 square-meter parking ramp for 11 wide-body aircraft; constructing a 30,000 square-meter hot cargo pad capable of holding two wide-body aircraft; widening the connecting taxiways; lowering and reconstructing the parallel taxiway; and hardening the overruns (hammerheads) at the ends of each runway.

To accomodate the runway expansion, engineers from the Civil Engineering directorate had to acquire additional real estate, not an easy task in a foreign country. Approximately 544 acres were acquired at Ramstein, mainly for vegetation control easements. More than 240 acres were acquired at Spangdahlem, mostly to facilitate the construction of the new parking ramp on the south side of the runway.

"Land acquisition hasn't taken as long as we thought," Mr. Thompson said. "That is a major success story for USAFE civil engineering. Normally it's an eight-year process in Germany to acquire land."

The project got another healthy dose of good fortune last summer when favorable weather prevailed in an area not known for its good weather.

The transition is also coming in under budget due in large part to stiff competition for work in an area with high unemployment. At Spangdahlem, the bids were more than 20% below the government estimate.

And, to keep matters interesting, flying operations at the bases did not stop while work progressed. This meant working at night and working around operations, which was particularly complicated because much of the construction work was being done near the runways.

Although the PMO manages the transition project, they rely on a matrix of experts from Spangdahlem, Ramstein, Rhein-Main, HQ USAFE and HQ Air Mobility Command. They work closely with people from various backgrounds including communications, civil engineering, security forces, logistics, air traffic control, safety, legal, and other career fields.

Construction crews don't let flight operations stop work on the runways at Ramstein AB (far left) or Spangdahlem AB (below) during the Rhein Main Transition Program.
(photo far left by the author; photo below by TSgt Joe Springfield)

While the transition effort has been a tremendous success so far, the RMTP staff knows there's a lot of work still to be done and less than 18 months to complete it. With a deadline like that, no one could blame them for being clock-watchers. Tick, tick, tick….

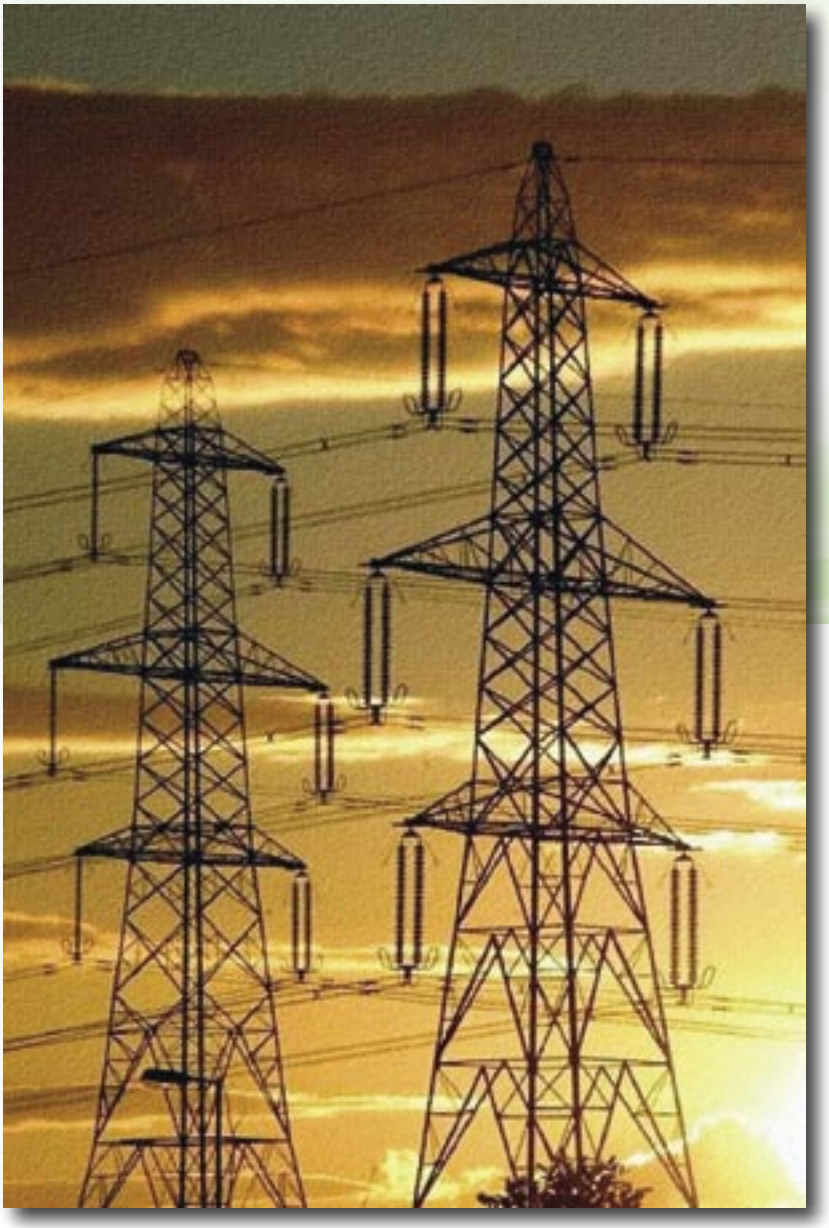
Dr. Hartzer is chief of Professional Communications at HQ AFCESA, Tyndall AFB, Fla.

Going Green:

Mr. Pat Mumme
HQ AFCESA/CES

The Air Force Energy Program has a single objective: to meet the energy efficiency improvement goals of Executive Order 13123 (Greening the Government Through Efficient Energy Management, June 3, 1999). This Executive Order directs a reduction in energy use of 30% and 35% by FY05 and FY10, respectively (using a 1985 baseline).

We can achieve these goals in three ways: by using energy-efficient buildings and equipment, by reducing overall energy consumption, and by using renewable (non-fossil fuel) sources of energy. The facility energy management program, an important component of the Air Force's overall energy program that focuses on energy usage at bases and other facilities, uses all of these methods.



The Air Force Civil Engineer oversees the facility energy management program; AFCESA's Energy Team is a key resource, serving as a focal point for activities relating to facility energy. The Energy Team comprises experts in contracting, finance, energy awareness, energy audits, training, and renewable energy.

Increasing energy awareness is vital to achieving energy-conservation goals. An aggressive energy awareness program with top-down emphasis can reduce energy use anywhere from 3% to 13%. Targeted awareness programs can also let facility managers know what can be done to make buildings and equipment more energy-efficient. AFCESA's Energy Team can help facility commanders and civil engineers plan and implement such programs.

Recognition programs also raise awareness. The Energy Star program (p. 13), which can be used to certify buildings as energy efficient, not only educates but rewards participants. The Department of Energy gives annual energy awards (p. 17) to recognize contributions by federal agencies. AFCESA serves as the contact point for Air Force nominations for these awards.

The Energy Team can help major commands and bases become more energy-efficient by assisting in the design and construction of energy-efficient buildings, and with the purchase of energy-efficient equipment or retrofitting existing equipment. Funding for these efforts can come from Energy Savings Performance Contracts (ESPCs), which use third-party funding (p. 14), Utility Energy Services Contracts (UESCs), or an Energy

AFCESA Facility Energy Program

Conservation Investment Program (ECIP) contract, which uses MILCON funding. Because ECIP funding is limited, ESPCs and UESCs are more prevalent.

Conserving energy isn't just turning off unused lights and equipment. Using ground- or water-source heat pumps (p. 10) to control temperatures reduces the energy used in HVAC systems.

The Energy Team can also help facilities move away from fossil fuel energy sources, such as heat and electricity generated by burning coal or petroleum products, and toward renewable sources. Renewable energy comes from sustainable sources such as biomass, the sun or the wind (p. 12). The Air Force has used ESPCs and ECIP contracts to fund major renewable energy projects such as the Ascension Island wind farm program. For a number of bases, such as Dyess, Edwards and Fairchild, all or most of their purchased power is generated by renewable resources, either in the form of actual power or as renewable energy credits, often called "green tags." Purchasing green tags allows users to support efforts to create and use renewable energy sources even though such energy isn't available from local suppliers

Some other ideas under consideration include the development of distance learning to cover ESPC training for engineers and contracting officers; building energy manager training for the over 3,000 building managers around the Air Force; a 'communities of practice' Web site that allows for interactive exchange of information as well as provides an archive of knowledge for all energy managers; AFCESA-funded base energy surveys on request by MAJCOMs; and an Air Force-wide program to instigate a grass roots interest in energy conservation.

With an overall reduction of 23.9% through March 2004, we have a lot of work remaining to meet the goals of reducing energy use 30% by FY2005 and 35% by FY2010.

Using alternative financing is a growing trend that allows bases to replace infrastructure without additional funding, as long as energy savings are sufficient to pay back the debt. For further information on energy saving technologies and alternative financing, contact Mr. Pat Mumme, a professional engineer at HQ AFCESA, Tyndall AFB, Fla., at DSN 523-6361 or commercial 850-283-6361.

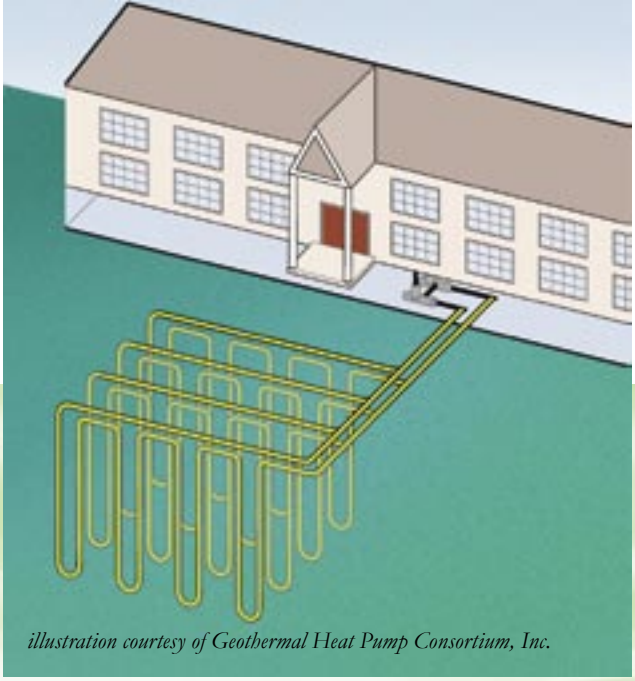


illustration courtesy of Geothermal Heat Pump Consortium, Inc.

Heat Pumps

Mr. Alvin Day
HQ AFCESA/CES

A water-source heat pump (WSHP) uses water rather than air as the medium for transferring energy (heat and cold) to or from the HVAC system during the refrigeration cycle. Water is piped to the compressor/condenser located inside the building. Because the water is maintained at a stable temperature, WSHPs work at high efficiency in any season, but especially in summer by providing free hot water for building use as a byproduct. In many applications, WSHPs can heat one part of a building while cooling another and can automatically switch back and forth.

Tired of 'uncontrollable' HVAC systems? There might be a simple solution: a water- or ground-source heat pump.

With conventional WSHPs, the water temperature is controlled using a cooling tower in the summer and a boiler or other heat source in the winter. During the winter, the heat pump in a large buildings with an inner core may be heating the area outside the core while cooling the interior, thus lessening the heat required from the boiler. In buildings with refrigeration equipment, such as a commissary, heat can be transferred from the compressors to warm the building.

A ground-source heat pump (GSHP), a highly efficient derivation of the WSHP, also uses water as the energy transfer medium. However, GSHPs take advantage of stable ground temperatures to keep the system's water temperature constant. GSHP configurations normally use an underground closed-loop water system, but the most popular uses an earth loop with one or more wells—typically 200'–300' deep—grouted with a material that enhances heat transfer. GSHP systems have all the benefits of WSHP systems, but the added advantages of no summer/winter changeover; no boiler or cooling tower; no exterior equipment with accompanying noise or pollution; a smaller utility room; and reduced maintenance.

GSHPs are being installed during military facility renovations throughout the United States. Many Air Force bases use them, including Little Rock, Charleston, Bolling, Tyndall, Offut, Langley and MacDill. The other services use them extensively. One of the largest retrofits ever just occurred at Ft. Monmouth, N.J., where a total of 2,000 tons of capacity were installed.

Most military heat pump applications have been in family housing, because of the systems' simplicity of control and improved indoor air quality. However, some of the most promising applications are in administrative buildings, shops, and retail facilities. With WSHP or GSHP systems, total building shutdown is a thing of the past. Multiple small WSHP units can be installed to condition building 'zones,' controlled by individual residential type thermostats. Night setback can be tailored to the zone occupants, and any failure affects only the specific zone. A dedicated fresh air system provides conditioned outside air throughout the building '24/7,' keeping building humidity under control and reducing the potential for mold development.

GSHPs are usually the most lifecycle cost-effective of the HVAC options; WSHPs are probably close behind. For new construction, there may be a 1%–3% project cost increase to cover the construction of the energy field, but the benefits are clear: energy savings of 25% or more, maintenance cost reductions of 25%–50%, improved indoor air quality, and increased equipment life.

Mr. Day is a professional engineer at HQ AFCESA, Tyndall AFB, Fla.

WSHP: Langley AFB

Mr. Alvin Day, HQ AFCESA/CES
Mr. Willis Barrow, ACC/CEOO

What do you do with eight large dormitories converted to offices that costs a fortune to heat and cool and is either too hot or too cold year round?

At Langley AFB, Va., the solution came in the form of a Utility Energy Service Contract (UESC) with Dominion Virginia Power, Langley's energy provider. Under a UESC, the energy provider teams with the base to identify energy-saving work, performs the work using their own funds and is repaid by the base, primarily from energy savings.

Along with with some water conservation measures, the project cost $10.8M to replace 1510-ton capacity air-cooled chiller packages with 598 water-source heat pumps (WSHPs) with a total cooling capacity of 1200 tons. The high number of small units made it possible to create an average of 75 individually controlled zones tied into a central management system to monitor and control night/weekend temperature setback.

Each WSHP unit has a closed, two-pipe water system loop to transfer energy to and from the unit. Controls on the loop operate to keep the water in the loop between 65 and 85 degrees. When the water temperature dips below 65 degrees, a small boiler in each building heats the loop. To keep water temperatures below 85 degrees, a secondary loop—connected to a large cooling tower— provides cooling to each primary building loop through a heat exchanger. The operation is invisible to building occupants.

Existing HVAC equipment and duct systems were removed, and energy-efficient lighting was installed when the ceiling was replaced. Wiring and piping for the WSHPs were installed with flexible ducting connecting to room diffusers in ceilings. Air return is through a ceiling plenum system.

Langley will realize over $1.1M in energy savings each year. Maintenance costs have dropped 20%–40%. Control system problems and related system operational degradation are nearly nonexistent. Lighting and room appearance improved, and outside space formerly occupied by noisy air-cooled chillers was converted to quiet courtyards.

GSHP: Offutt AFB

Mr. Alvin Day, HQ AFCESA/CES
Mr. Paul Rubin, 55th CES/CECEE

Offutt AFB, Neb., has joined the growing number of military installations using ground-source heat pumps (GSHPs) instead of traditional HVAC systems to heat and cool their facilities. A 50-year-old "new technology," GSHPs are currently used in eight of Offutt's buildings, and systems are under construction in three buildings. Bidding is underway to construct GSHP systems in three more buildings.

To date, the reduction in energy usage has been significant in several facilities, ranging from 30% in the Control Tower to 65% in the 38th Flying Squadron's briefing rooms.

For new construction, the costs are slightly higher than usual, but the additional costs are usually recovered in just a few years of operation. Although most of Offutt's projects have been or will be paid for using Utility Energy Service Contracts (UESCs) through their local utility, they have also used operations and maintenance, Energy Conservation Investment Program, and military construction dollars.

A horizontal ground-loop water system was installed as part of Offutt AFB's GSHP system. (U.S. Air Force photo)

Ascension Island Wind Farm

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45th CES
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INEEL

Ascension Island is not only the location of an Air Force remote tracking station—it's also the home of an award-winning Air Force energy project. In 1996, the first phase of the Ascension Wind Farm project was completed and soon after, it won a 1997 Small Group Renewable Energy Award from the Department of Energy.

The project's second phase became operational in September 2003 and has already won another award, the Air Force's 2004 Citation Award for Design Excellence. Today, Ascension's wind farm provides Air Force facilities on the remote island with 2.7MW of power and reduces carbon dioxide and nitrous oxide emissions associated with power production.

Detachment 1, 45th Space Wing, Patrick AFB, Fla., operates the Air Force's tracking system on Ascension Island. The island is located about 500 miles south of the equator, halfway between South America and Africa. Historically, the Air Force used fuel oil to operate their power generators and boilers for the desalination units. The island's remoteness meant high fuel transport costs and potential supply shortfalls.

An initial study showed great potential for installing wind-power turbines that would reduce the dependency on fuel oil with no impact on flying operations. With $3.1M in funds from the FY96 Energy Conservation Investment Program (ECIP), the wind farm's first phase began in September 1995. It included four three-bladed wind turbines, each producing a maximum of 225 kW. With an output of 3,150MWh per year, this first phase reduced fuel use by more 1.4M gallons, and has produced more than 20,000MWh to date at a savings of $2.5M. The system has a 97% availability rate with reduced emissions and diesel maintenance.

The second phase began in September 2002 and was completed a year later. Funded with $4.5M in FY01 ECIP monies, the project included two 900kW wind turbines and an electric boiler for the desalinization unit. This second project tripled the island's "green" wind power output to 9,500 MWh per year and transferred steam production from fuel boilers to wind-powered electric boilers.

Today the wind farm operates in parallel with three 1900 kW diesel generators to provide the Air Force installation with power and clean water. Annual savings have increased over those of the first project: fuel savings are projected to go from 250,000 gallons to over 700,000 gallons per year and dollar savings from $400,000 to $1M. The annual reduction in CO_2 and NO_2 emissions is projected to be 100,000 pounds and 98,000 pounds, respectively.

A tractor-trailer delivers a G-6 windmill to its assembly site on Ascension Island, where it will be used to generate electrical power. The recently installed windmill on the left generates as much power as all four of the windmills to the right. (U.S. Air Force photo)

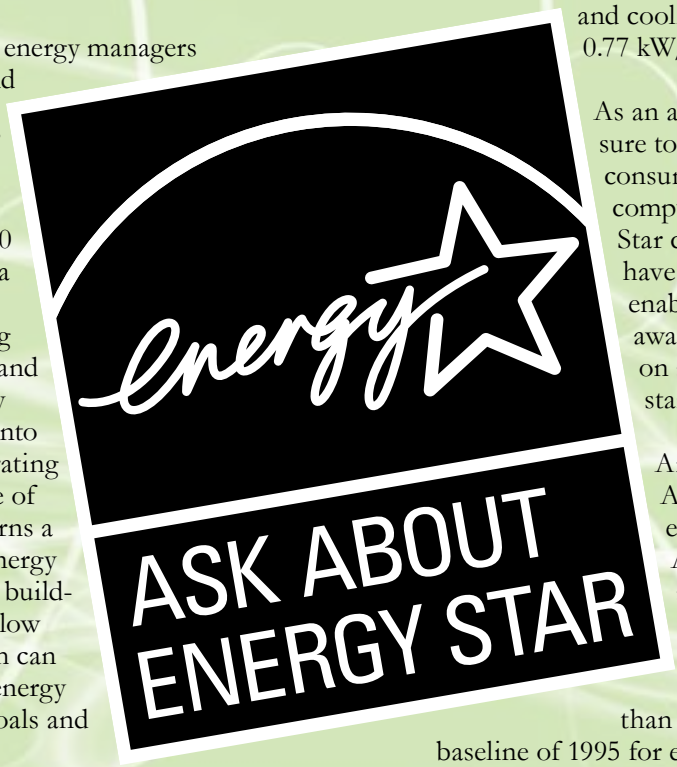
Mr. Clinchard is Chief, Downrange Facility Support, 45th CES/CECD, Patrick AFB, Fla. Mr. Seifert is the power systems program manager and Mr. West is a field engineer for Idaho National Engineering & Environmental Laboratory, Idaho Falls, Idaho. Mr. Miller is the Electrical Engineer/Energy Manager, AFSPC/CEPS, Peterson AFB, Colorado.

Become an Energy Star

Mr. Tim Adams
HQ AFCESA/CES

The Environmental Protection Agency (EPA) created the Energy Star initiative to help individuals, businesses and government agencies become better energy managers. Homes, buildings, and products can be evaluated for energy efficiency using EPA's Web-based Energy Star Program.

Base facility or energy managers can evaluate and benchmark their buildings' energy performance on a scale of 1 to 100 by entering data (physical attributes, operating characteristics and monthly energy consumption) into the program's rating system. A score of 75 or higher earns a building the Energy Star Label. For buildings scoring below 75, the program can be used to set energy performance goals and plan upgrades.



AFCESA's building at Tyndall AFB, Fla., underwent an interior upgrade that began in 1996 and lasted 18 months. The air flow system was monitored and adjusted for several years after completing the upgrade. In October 2003, AFCESA's building earned an Energy Star label, ranking in the top 25% for energy efficiency, compared to the established baseline for office buildings.

During the upgrade, AFCESA's building was basically gutted: all lighting; ceiling grids and tiles, walls, partitions, and carpet were removed and replaced. Occupancy sensors control the more-efficient lighting system (T-8 with electronic ballasts), and the number of fixtures went from 1,000 to 700. New task lighting uses 34W tubes rather than 40W tubes. Base civil engineers also replaced the 20-year-old, 1.2 kW chiller and cooling tower with a 0.77 kW/ton unit.

As an additional measure to reduce energy consumption, all new computers are Energy Star compliant and have the sleep mode enabled. Energy awareness tips appear on all computers at start-up.

And what did all of AFCESA's team efforts produce? AFCESA's annual energy consumption has been about 30%–40% less than the established baseline of 1995 for each year after completing the upgrade. Actual consumption has gone from 109,000 BTU/SF/YR to between 55,000-61,000 BTU/SF/YR and 50,870 BTU/SF/YR in FY03—a 53% reduction.

To get more info on the Energy Star Label program for your installation, please go to the Energy Star for Government Web site: http://208.254.22.7/index.cfm?c=government.bus_government

Mr. Adams is a Certified Energy Manager at HQ AFCESA, Tyndall AFB, Fla.

Energy Savings Performance Contracts

Mr. Kevin Wahlstrom
HQ AFCESA/CES

Federal agencies, some of the heaviest consumers of energy, have been given a mandate to "lose some weight." To help the process, Congress approved the use of Energy Savings Performance Contracts (ESPCs).

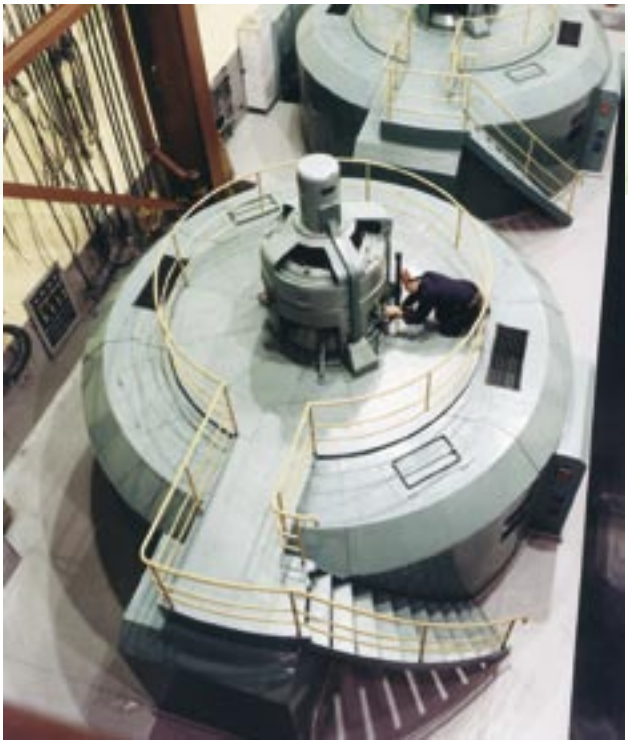
Under an ESPC, a private company invests time and money to help an agency become more energy efficient—with energy audits, new energy-efficient designs, or the purchase, installation and, in some cases, maintenance of updated equipment. The federal agency agrees to pay back the investment from savings created by energy-efficient improvements. If no savings result, no repayment is required.

Air Force installations have four primary vehicles for access to ESPCs.

Air Force Regional Energy Savings Performance Contracts (RESPC)

Six Indefinite Delivery/Indefinite Quantity (ID/IQ) contracts for ESPC services are available to all bases in their respective regions. AFCESA's energy staff provides management and administrative support to the regional contracting officer (RCO). Bases request ordering authority through AFCESA.

photo courtesy Department of Energy



Army Corps of Engineers Huntsville District RESPCs Full-Service Option

Under the full-service option, the COE does the contracting and engineering. The base places 1% of its energy budget in an escrow account for COE to charge against. Unused funds are returned before the end of each fiscal year and a new account is started for the next. A three-party memorandum of agreement is required.

Individual Base-Wide Contracts

Bases may pursue their own ESPC, and AFCESA will assist as resources permit. The normal lead-time for awarding an ESPC is nine months to one year. An RESPC can reduce start-up time to about one month because the solicitation, evaluation and award are completed up-front. No additional competition is required to use the RESPC contract.

Department of Energy Regional Super ESPCs and Technology-Specific ESPCs

AFCESA has entered into an Interagency Agreement with the Department of Energy that can ease access to DOE support services.

AFCESA's energy team can provide help, information or training with ESPCs—at any stage of the process. Because ESPCs can be complicated and come with extended obligations, they need to be negotiated wisely by base civil engineers and contracting officers. Most bases see only one or two ESPCs over a five-year period, so AFCESA's energy team serves as a continuum of expertise.

For more information on the Air Force ESPC contracts, go to http://www.afcesa.af.mil/ces/cesm/energy/cesm_espoc.asp.

Mr. Wahlstrom is part of the Energy Awareness Team at HQ AFCESA, Tyndall AFB, Fla.

Author's note: AFCESA is currently reviewing the ESPC guidance contained in ETL 02-05 to ensure that it contains any necessary statements of caution, but doesn't take over decision-making best left to major command and base managers.

'Effluency' in Water Conservation

Mr. Tom Denslow
7th CES/CEOEX

Water is a valuable resource in the west Texas area near Abilene, where Dyess AFB is located. Dyess uses over 300M gallons a year—5% of the city's annual potable water consumption—at a cost greater than $700K. In 2002, engineers from Dyess' 7th Civil Engineer Squadron used ingenuity and an Air Force energy contract to help the city with its goal of increasing potable water supply by using effluent water for irrigation.

Effluent water is essentially partially treated wastewater from community sewage or industry. Cleansed of major pollutants, it still contains enough trace amounts of salt, heavy metals and bacteria to render it undrinkable. In the past, it was usually dumped back into lakes and rivers, but now it's often used for irrigating heavy turfgrass areas, such as golf courses. The turfgrass's thatch layer actually cleanses the water of particulate matter before the water filters into lakes, streams and groundwater supplies.

Four years of rain shortfalls left Abilene's potable water supply at less than 30%; several small towns were almost out. In 2002, Abilene started using effluent water to irrigate the city's golf courses, rather than raw water (not yet potable) pulled from the area's reservoirs.

If Dyess did the same, Abilene's annual potable water usage would be reduced by 2%, a significant amount in this dry area. However, the effluent water line was on the other side of the city. To economically get the effluent water through the town to the base, the 7th CES engineers secured from an oil company the use of two pipelines that ran across town. "Slip-sleeving" a new 8" high-density polyethylene (HDPE) line inside the 10" line simplified the process. The engineers then turned the lines over to Abilene to construct a line to Dyess, and Dyess and Abilene signed a 10-year contract for effluent water.

At the same time, Dyess entered into an Energy Saving Performance Contract (ESPC) task order with the Air Force Region 6 contractor. This task order added a pair of 11M-gallon holding reservoirs, two pump stations capable of pumping over 2,000 gallons per minute and over three miles of fusion-welded HDPE distribution piping to connect the base irrigation system. The reservoirs were equipped with aeration fountains to help reduce algae growth.

The city of Abilene started construction in April 2002 and finished the three miles of slip lining and four miles of new line to the base in August 2002. The first reservoir on base was completed in July 2002. The pump station and part of the on-base irrigation system was finished in August 2002 and beneficial use of the effluent water began on August 15, 2002. The entire project infused over $3M into the infrastructure and saves over 160M gallons of potable water per year, which has had a profound impact on easing drought water restrictions.

Mr. Denslow works in 7th CES and is the base energy manager for Dyess AFB, Texas.

Using effluent water for golf course irrigation helps cut down on potable water usage. (Image provided courtesy of Rain Bird Corporation)

M&V Process Proves Savings Real

Mr. William B. Turner, PE
92nd CES/CEOE

"Our gas bill for December is $890,000! Can they do that?" asked the base civil engineer at Fairchild AFB, Wash., in 2000. The bill was valid, and it was nearly four times higher than the previous December's; the Defense Energy Supply Center buys natural gas on the spot market, charging the current market price.

Fairchild's civil engineers took it as a call to action and used an Energy Savings Performance Contract (ESPC) to replace a 60-year-old central steam plant with individual boilers in 78 buildings. Except for gas and electricity costs, the ESPC contractor assumed all individual boiler expenses in a fixed-price contract. Fairchild's measurement and verification (M&V) pro forma plan featured $1.5M in guaranteed savings in the first year, nearly $804K of it in combined natural gas and electricity costs.

Three years later, in the first operational year of the project, Fairchild AFB achieved an energy cost saving of $1.8M, $300K more than expected.

Measurement and verification (M&V) were key in ensuring that the savings were real. According to Dr. Charlie Culp, an M&V expert from Texas A&M University assisting Fairchild's engineers, "It's simple. You had a cost to operate the central steam plant. You'll have the cost to operate the individual boilers. The difference is your savings."

In performing M&V, gas consumption of the boilers was determined directly from gas meter readings for each building. Electricity used by the boilers was assumed to be offset by electricity no longer required to pump condensate from the individual buildings back to the steam plant. Nearly all of the central steam plant expenses came from actual records or meter reading data; very little was assumed or stipulated.

No savings were taken for avoided expenses for steam plant maintenance. Using the number of heating degree-days in each time period, the first year's gas consumption for the individual boilers was standardized to a year's gas consumption of the old steam plant and then compared to calculate natural gas savings.

One advantage of using metered data is that Fairchild can independently verify energy use reduction. Surprisingly, the boilers continued savings during the summer. Their metered gas consumption was 87% lower than the central steam plant's the previous summer.

Boiler thermal efficiences were measured during the first year to serve as target efficiencies for future M&V. If readings in the future are within 2% of the originals, energy savings will be proven once again.

Mr. Turner is a mechanical engineer with the 92nd CES, Fairchild AFB, Wash.

To save on energy costs, Fairchild AFB replaced a central steam plant with individual boilers, similar to the one below, in 78 buildings. (photo by Mr. Guy Ivie)

Department Of Energy Awards

Mr. Kevin Wahlstrom
HQ AFCESA/CES

The DOE's Federal Energy Management Program (FEMP) annually bestows these awards for outstanding contributions toward increased energy efficiency, renewable energy and water conservation within the federal sector.

Federal Energy and Water Management Awards

The DOE and the Federal Interagency Energy Policy Committee ("656" Committee) jointly sponsor these awards to honor individuals/organizations making significant contributions to the efficient use of energy and water resources in the federal government.

Process. DOE's criteria and guidelines are at http://www.eere.energy.gov/femp/services/awards_fewm.cfm. Nominations must be submitted through the agency contact point—for the Air Force it's the Facility Energy Program Manager, HQ AFCESA.

Recognition. Winners are honored in a by-invitation-only evening reception and awards luncheon every October.

Federal Energy Saver Showcase Award

The Showcase Award program helps federal agencies implement the goals of Executive Order 13123, which requires that agencies designate "exemplary new and existing facilities with significant public access and exposure as showcase facilities to highlight energy or water efficiency and renewable energy improvements."

Process. Criteria and guidelines are at http://www.eere.energy.gov/femp/services/awards_fedshowcase.cfm. AFCESA distributes the criteria and guidelines to MAJCOM Energy Managers and submits all nominations to FEMP by the due date.

Recognition. Each winner receives a plaque that notifies visitors they're entering a federal building that uses energy and water wisely and saves taxpayer dollars. The winners' project is also summarized in the Annual Federal Energy Saver Showcase booklet.

Presidential Awards for Leadership in Federal Energy Management

Executive Order 13123 states, "The Deputy Director for Management of OMB shall also select outstanding agency energy management team(s), from among candidates nominated by DOE, for a new annual Presidential award for energy efficiency."

Process. The FEMP criteria and guidelines and cover sheet are at http://www.eere.energy.gov/femp/services/awards_presidential.cfm. AFCESA distributes criteria and guidelines to the MAJCOM Energy Managers and submits the nominations to FEMP by the due date. Final determination of the Presidential Award winners is made by the Office of Management and Budget.

Recognition. This year, a combined, invitation-only ceremony in July was held for the Presidential Awards and the Office of the Federal Environmental Executive's Closing the Circle Awards.

"You Have the Power" Energy Champion

These awards recognize individuals from federal agencies and DoD branches for outstanding achievements in conservation/efficient use of energy. The Air Force selected Capt Harry W. Jackson of Laughlin AFB, Texas, as their awardee/nominee for 2004.

DOE FEMP published a poster of the USAF Energy Champion for distribution to major commands and bases for April's "Earth Day." Energy Champion Awardees are posted on the FEMP Web site (http://www.eere.energy.gov/femp/yhtp/champsagency.html).

For more information, contact Mr. Pat Mumme, Air Force Facility Energy Program Manager, at HQ AFCESA: e-mail, pat.mumme@tyndall.af.mil; phone, DSN 523-6361 or commercial (850) 283-6361.

Not Just Child's Play

Mr. Ray Hansen, PE
HQ AFCESA/CES

Much like children, child development centers deserve special attention

As an Air Force civil engineer, there's a possibility that sometime in your career the following scenario will apply to you.

Your base is building or renovating a child development center (CDC) and you've been tasked with overseeing the project. So far everything has gone like clockwork. The money was budgeted and the project was awarded to a contractor with experience building schools or childcare centers in the local community.

In front of you are the final plans, which meet all the base's needs and, according to your experienced contractor, all pertinent federal regulations. The Services folks seem happy. The Fire Department gave their okay. You can sign off on the plans, confident that every contingency's been accounted for. Right?

Well, maybe. Did you know that every CDC built, modified or renovated on an Air Force base has to meet not only the requirements of the building code but also some special fire protection and life safety requirements mandated by the Department of Defense (DoD)? And if those special requirements aren't met before construction is complete, you may find yourself asking the commander for some of the wing's precious operations and management (O&M) money to "repair" a just-completed facility.

Why do CDCs get special DoD attention? Because of the Military Child Care Act (PL 104-106; Section 568; USC, Title 10 Section 1794), all CDCs must precisely meet the Life Safety Code (LSC) of the National Fire Protection Association. The LSC calls for more staff than the Air Force or other services can reasonably afford *unless* extra building fire safety features are provided. The DoD has formally specified these additional features in Unified Facilities Criteria (UFC) 4-740-14, "Design: Child Development Centers" (see particularly Chapters 2 and 7).

Chances are good that the plans you have in front of you for approval already refer to the UFC. Chances are also very good that the contractor didn't read the UFC thoroughly enough but rather just skimmed it because of his "experience" with building in the local community.

How do you know if your plans include all the required DoD features? Has AFCESA performed their free review of the 95% designs, and have their comments been incorporated? If not, don't be surprised if you have to make urgent changes to the building.

Air Force Instruction 34-248, "Child Development Centers," requires that an AFCESA fire protection engineer visit all new or renovated CDCs to certify that they meet the minimum life safety/fire protection requirements. This visit occurs shortly after the facility opens in order to see how the occupants actually use the building. AFCESA

(U.S. Air Force photo)

offers free 35% and 95% design reviews to minimize unpleasant surprises that can occur during one of our visits (see "Top Ten Fire Protection Mistakes in CDC Designs").

If our engineer finds a life safety/fire protection deficiency, under PL 104-106 the base has three options: the discrepancy must be corrected within 90 days; a waiver from the Secretary of the Air Force must be approved within 90 days; or the facility must be shut down. This is the point where you might find yourself appealing to the wing commander for some O&M funds.

Are there any benefits to all of this, besides complying with the law? Yes. First, you'll be confident that you've minimized the possibility of a child's injury or death because of a fire in your CDC. Second, you can eliminate any difficulties with another inspector requiring additional building changes to meet their interpretation of the fire protection requirements. Third, you might actually save some money. We usually find that the contractor has included some non-required fire protection features in the design. Eliminating them might let you include other building features that you wanted.

In our experience, very few contractors get the CDC design right the first time (see "Top Ten Mistakes"). Remember, AFCESA offers a plan review at the 35% and 95% stages and can typically save you some money. In any case, don't be surprised by our fire certification visit to your facility soon after its completion.

Visit our AFCESA Youth Programs Web site at http://www.afcesa.af.mil/ces/cesm/fireeng/cesm_youthprogram.asp for more information. Send plans for review marked to the attention of Mr. Ray Hansen at the address provided on the Web. Arrange for site visits through the Services Child Development Specialist at your command. And please feel free to contact me with any questions or concerns at (850) 283-6318 or DSN 523-6317, or by e-mail at ray.hansen@tyndall.af.mil.

Mr. Hansen is a professional engineer at HQ AFCESA, Tyndall AFB, Fla.

Top Ten Fire Protection Mistakes in CDC Designs

1. Panic-hardware on exterior doors not full-width, push-pad type
2. Hold-open devices on exterior doors missing
3. No direct outside exit from the multipurpose or other child activity room
4. Incomplete smoke detection system
5. Magnetic hold-open device missing from the kitchen door
6. Outside pathways not completely paved
7. "Child-proof" electrical receptacles not used
8. Laundry room walls and door not designed for fire resistance
9. Design includes a dead-end corridor
10. Fire alarm system doesn't use "chimes" for audible notification

Editor's note: Look for a new UFC to be issued soon covering the design of youth centers. AFCESA was able to include text in this new UFC that should eliminate many of the common fire protection mistakes found in these facilities.

Ramstein AB, one of the largest, busiest military installations in the world, is about to become even busier

big project presents Big Challenges

Mr. Stephen Escude
Mr. Ben Roth
Capt Todd Rupright
HQ USAFE

In late 2005, the Department of Defense aerial mission at neighboring Rhein-Main AB in Frankfurt will be transferred to Ramstein. To accommodate the increased activity at Ramstein, an extensive $355 million construction and capital improvement plan is underway, which includes building a unique, 700,000 square foot facility called the Kaiserslautern Military Community Center (KMCC). This unique facility consolidates and balances both business and leisure activities into one large complex. Currently one of the largest construction projects in the DoD, the $150 million KMCC is funded primarily from non-appropriated funds, and collocates both Army and Air Force Exchange Services (AAFES) and Air Force Services activities under one roof.

The Ramstein improvement plan was developed in conjunction with the German government through the Rhein-Main Transition Program (RMTP) partnership and calls for several new facilities and significant upgrades to Ramstein's runways and aprons. In addition to the KMCC, other planned facilities include a state-of-the-art air freight terminal, a new passenger

Ramstein AB is part of the Kaiserslautern Military Community, a grouping of six installations surrounding Kaiserslautern, Germany. KMC supports over 44,000 military and civilian personnel in the area, the largest concentration of Americans outside the United States. Because of its central location in Germany and future status as the Gateway to Europe, Ramstein was selected as the site for the new KMCC shown in this artist's rendering.

terminal annex that doubles the capability of the existing facility, a 6,900 square meter C-5 capable hangar, an air mobility group facility, and a 24-hour flight kitchen, capable of preparing 30,000 meals each month.

On the business side of the house, it's a professionally outfitted visiting quarters (VQ), 10 stories tall with 350 rooms, including 242 standard rooms, eight business suites, a rooftop special events area and a central reservations area. On the leisure side, it's a 500,000-square-foot retail and entertainment facility, including the base exchange, a nine-venue food court, a national brand restaurant, four theaters with concession space, an outdoor recreation facility, and a sports lounge overlooking an indoor climbing wall.

Like the facility itself, the challenges in developing the KMCC are enormous. With limited availability of land, finding a suitable location for the KMCC had to be considered. It needed to be close to the flightline, but not too far away from family housing, and the impact on the local ecology had to be minimal. The ideal location contained a section of old growth forest, and HQ USAFE and 86th CEG worked closely with German regulators on the location and amount of land that could be cleared.

This artist's rendering shows off the facility's multi-story entrance and office tower. (rendering courtesy of JSK)

The size of the project meant local, state, and federal officials all had to be briefed and satisfied that the KMCC met all German codes and regulations.

There is also the logistical challenge of constructing the KMCC while avoiding impact on the increasing aerial mission or ground traffic flow to and from the existing passenger terminal; not an easy task. The KMCC location is essentially a construction site within a construction site, "smack-dab" in the middle of all the RMTP construction mentioned earlier, so a detailed construction-phasing plan is currently being coordinated and refined with all base and construction agencies.

Controlling potential storm water runoff is another concern to be addressed. When combined with other development in the area, the KMCC building would have reduced the precipitation absorption/infiltration area to the point that storm runoff would overwhelm a stream and cause problems. Three approaches have been used to solve the problem. First, hard surface areas have been effectively reduced by decreasing the size of both the site and the building footprint, and by providing multi-story parking rather than all surface parking as shown in the artist's rendering on the previous page. Second, an extensive "green roof" has been developed to serve as a retention basin to mitigate the hard surfaces of the single story building areas and some of the multistory areas—an ecologic compensation measure that uses low-lying, self-sustaining plants on approximately six inches of topsoil. Third, an additional 333-cubic-yard underground retention basin will collect rainwater runoff from the KMCC parking lots and release it at a specific rate so the local stream is not overwhelmed.

Building a VQ so close to a flightline also presents a few engineering hurdles to overcome. The 10-story building had to be worked within specific height restrictions. To make sure that weary travelers will be able to sleep through the noise of flying aircraft, the design team has consulted acoustic specialists and provided fixed, double-paned windows, extra exterior insulation, and a stone façade.

One of the biggest challenges facing the Air Force project managers is to open the KMCC as soon as possible to ease the impact of the Rhein-Main AB closure. Because of the compressed construction schedule, a system using pre-cast structural elements (e.g., walls, columns, etc.) that would be cost-efficient and quick to erect was selected. To further meet the time challenge, the Air Force plans to award several fast-track contracts. The first, a high-pressure sewer line and site-clearing contract, is already under way. The second contract involves site work to relocate both a natural gas line serving the western part of Germany and communications lines (Deutsche Telekom and base communications lines). It will result in a clean and cleared site ready for the facility and the utilities necessary for the project. The third fast-track contract will include all the structural work for the mall and VQ. The final contracts will include mechanical/electrical/plumbing and all finish-out and will result in a first-class facility.

Mr. Escude is the HQ USAFE Construction Chief, and Mr. Roth and Capt Rupright are Construction Project Managers, HQ USAFE, Ramstein AB, Germany.

"Movin' On Up" at Nellis AFB

More than 120 Airmen at Nellis AFB, Nev., received a quality-of-life improvement July 17 when they moved into the Air Force's first quad-style dormitory. "It's the new standard in the Air Force," said TSgt Mike Merlo, 57th Equipment Maintenance Squadron dorm manager.

SSgt Chris Stagner
AWC/PA

Each quad will be shared by four Airmen, and contains many items not seen in previous Air Force dorms.

"The first thing people might notice when they walk in the quad is the kitchenette area," said TSgt Merlo. "The kitchenettes provide each quad with a full-sized fridge, microwave, sink and stove top."

Another improvement is the addition of full-sized washers and dryers in every quad. A1C Trevor Powers, a 57th EMS aircraft structural maintenance specialist, said, "It's nice to not have to walk to the laundry room and wait while my laundry is being done, and not have to worry about someone leaving their clothes in the washer or dryer."

TSgt Merlo pointed out that each room also has a private bath with a full-size bathtub. "They're a lot more comfortable," A1C Powers said. "It's nice to be able to come home and take a bath."

Each quad also has a kitchen table in a small social area with a ceiling fan, a stereo and a private balcony.

"The goal in these dorms was to provide Airmen more privacy, but to also allow them to have a place to socialize," said Mr. Gary Faron, 99th Civil Engineer Squadron facility projects team chief. This is part of moving the dorms from their traditionally institutional design to a more residential feel.

"The new dorms make it feel like you have your own apartment," said A1C Brian Clement, a 57th EMS crew chief. "It's almost like living off-base."

The dorm will house 144 Airmen in 36 quads. It was built in 16 months and cost about $10 million.

SSgt Stagner is the NCO in charge of internal information at Nellis AFB, Nev.

A1C David Morsman, 57th EMS aircraft structural maintenance specialist, finds his new quad, with its kitchenette and laundry facilities, a welcome change from the old-style dorms. (photo by the author)

Quick Fix Under Fire

Capt Michael J. Zuhlsdorf
52 CES/CEOM

For AEF 7/8, 168 warfighters deployed to the 506th Expeditionary Civil Engineer Squadron at Kirkuk Regional Air Base in support of Operation Iraqi Freedom. During the team's 90-day rotation, the base was directly attacked more than 50 times, sustaining a significant number of rocket and mortar impacts—two of which required quick airfield damage repair and one of those while under repeated fire. This is a personal account of actions during one of these attacks.

I woke to the sound of explosions rattling my windows and my radio crackling to life with the three words, "Launch-Launch-Launch." I quickly put on my protective gear and left for the Survival Recovery Center (SRC) as the base alarms sounded "Alarm Red."

The "Alarm Red" also brought our CE base recovery machine to life. The engineering Airfield Damage and Assessment Team (ADAT) members began rolling to their staging area to marry up with the Explosive Ordnance Disposal (EOD) reconnaissance team and get ready to run the airfield to check for damage and unexploded ordnance (UXOs) the moment the base went to "Alarm Black." Base Damage Assessment Teams (BDATs) drove to their staging areas too, getting primed to eventually safe the base proper. Fire Protection troops scrambled to their trucks at the same time that the Readiness troops moved to the SRC to begin Command and Control operations.

By the time I arrived at the SRC, four rocket points of origin off-base and three points of impact (POIs) on-base had been identified. Initial reports indicated one rocket had struck the primary runway. Two planes were due to land in 30 minutes, but we couldn't respond until "Alarm Black" signaled the attack was over. When Base Defense Operations Center sounded "Alarm Black" at the 12-minute mark, the ADAT teams rolled out for that critical first look at our airfield.

The ADAT teams fed assessment information over the radio as we got grid coordinates for POIs from Security Forces on the phone. Before the Security Forces report was finished, confirmation was coming in over the radio from the ADATs: a 6'-long spall on the primary runway and UXO on the alternate runway. Now we had a problem—two birds incoming and no place to put them.

That's when another phone line rang: a rocket had hit the infield and started a grass fire. As EOD teams went out to safe the UXO on the alternate runway, firefighters were sent to handle the grass fire. As soon as an EOD team removed the rocket, the sweeper ensured that the runway was FOD-free. The "Fire Dawgs" were already putting the fire out, and five minutes later we'd recovered the birds safely.

With a two-hour window before the next aircraft mission, the base recovery focus switched to fixing the spall on the primary runway. As soon as the last BDATs reported no additional damage, we went to "Alarm Green." Every unit on base performed 100% accountability and the Airfield Damage Repair team began spall repair.

Heavy equipment personnel rolled in with concrete saws and jackhammers, and the sweeper crew ran out the vacuum attachment. Ten minutes later the cuts were done; after 15 minutes, the jackhammers had pounded out the spall and the vacuum had the area spotless. By the 45-minute mark, the quick-setting concrete had been poured and the team was waiting the necessary 60 minutes for it to set.

But my SRC job was far from over. Units continued to call in accountability even as Security Forces reported that they were engaging enemy forces in one sector. After the action finally subsided and the last of the units called in their accountability, I heard the thunder of the F-16s roaring down the primary runway and knew we'd done our job.

Capt Zuhlsdorf is the Chief of Maintenance Engineering for the 52nd CES, Spangdahlem AB, Germany. While deployed to Iraq, he served as the Engineering Flight Commander for the 506th ECES.

photo by CMSgt Nicholas Demko

Photos from the Field

SSgt Francis Tagalog catches his breath during an exercise for Eagle Falcon at Ahmed Al Jaber AB, Kuwait. SSgt Tagalog is a firefighter assigned to the 96th CEG at Eglin AFB, Fla. *(photo by SSgt Arian C. Nead)*

SSgt James Crosley uses a roller to pack down dirt before civil engineers pour a concrete foundation pad at Bagram AB, Afghanistan. Digging in the dirt here can be somewhat risky. In the past two months, the heavy-equipment team has found nearly a dozen old munitions, ranging from old fuses to rocket payloads and bombs. SSgt Crosley, on deployment from Kadena AB, Japan, is assigned to the 455th ESS. *(photo by MSgt Andrew Gates)*

'Cementing' a Friendship

MSgt Jeff Szczechowski
455th EOG/PA

Two old friends got together on the Bagram AB flightline in Afghanistan recently, and the result is an expanded strategic airlift ramp that will significantly enhance current operations and serve as a key enabler for a major airfield military construction, refurbishment and replacement project that will begin in the near future.

Pfc. Yi Dong Gon, an engineer with the 100th Korean Engineer Corps, puts the finishing touches on still-wet concrete on the Bagram flightline. (photo by the author)

The 455th Expeditionary Operations Group Civil Engineer Flight and the Korean Army's 100th Korean Engineer Corps teamed up to work on a project that increased parking space for wide-body aircraft. The added concrete surface will allow for uninterrupted critical aircraft arrivals and departures to continue while significant airfield construction occurs later this year.

For one month, American Airmen and Republic of Korea soldiers worked shoulder-to-shoulder, pouring, forming and finishing 76,000 square feet of concrete for what is dubbed the "Echo Octagon." TSgt Jason Kreutzer, 455th CEF noncommissioned officer in charge of airfield projects, said that ROK engineers were an invaluable force multiplier. "…the Korean Engineer Corps was a real key to making this project a success."

Capt. Yoon Hyun Ho, 100th Engineer Corps, 1st Company commander, said the joint project has given his unit a chance to demonstrate their technical and engineering skills to their American partners, while also giving his troops a chance to learn how to use some of the 455th CEF's construction equipment.

"We have the people, the skill and the desire," he said, "but sometimes, not all the equipment."

Though the Air Force CE flight and the ROK engineers have helped each other in the past, this is the first large-scale coalition enterprise that the two have accomplished together, and it has "been an amazing collaborative effort," said 1Lt Jason Riebel, 455th CEF commander.

Off the ramp, the two units have "struck up a great camaraderie," said TSgt Kreutzer. The 100th Engineering Corps has hosted the Air Force civil engineers for several meals at their Korean dining facility, and the two outfits have even squared off for a game of softball at the Korean compound.

"We are enjoying this," Sergeant Kim Jung Hwan, an interpreter with the 100th Engineer Corps commented during a break on working with the American allies. "Working with the U.S. Air Force is a good time."

Captain Yoon said that being a part of Operation Enduring Freedom is meaningful to him for several reasons.

"We are a friend of the United States, so we come here to help them," he said. "This effort will help to stop terrorism. Also, because of the situation in our own homeland, we can relate to the people being separated here, and we want to help keep Afghanistan unified."

MSgt Szczechowski was with the Public Affairs Office of the 455th EOG at Bagram AB, Afghanistan. He is now superintendent of Public Affairs for the 82nd TRW, Sheppard AFB, Texas.

From Hand to Horizon

Handheld tools shorten horizon survey time

TSgt Jody Root, 84th RADES
TSgt Joel Jones, 84th RADES

Many of the tasks under the province of Air Force civil engineers involve surveying, especially those undertaken in contingency situations. By integrating Trimble's GeoExplorer XT (GeoXT) —a handheld global positioning system (GPS) device— and Topcon Total Stations with proven radar line-of-sight surveying techniques and software, surveyors of the 84th Radar Evaluation Squadron (RADES) improved surveying accuracy and decreased the time needed to complete their tasks.

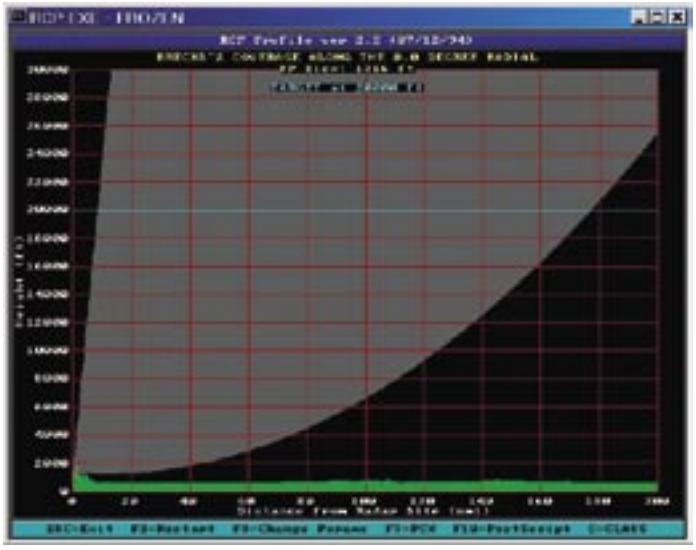
When radar equipment is installed, a surveying team determines the direction of true north for alignment purposes. They do this by taking solar observations, or "sunshots," with the Topcon Total Station and then performing azimuth calculations based on the site's location. In the past, they determined the site's location with a military Precision Lightweight GPS Receiver (PLGR), a heavy, expensive laptop computer running DOS-based sun location software, and then crunched numbers on a calculator. This process required a lot of operator intervention, and the equipment was prone to locking up.

Now, the GeoXT's onboard GPS feeds location data for azimuth calculations to SunPOS CE, a solar positioning package adapted to run on the GeoXT's Windows CE operating system. The GeoXT provides sub-meter (< 3´) positioning accuracy for the calculations, more than adequate for azimuth calculations when viewing the sun millions of miles away. Surveyors working on more traditional tasks could easily use the same techniques and software.

Radar signals are line-of-sight. Theoretically, that means a radar signal is good to the horizon. However, natural and man-made objects often obstruct the view to the horizon, which means less radar coverage in that direction. The National Geospatial Intelligence Agency (NGIA) maintains digital terrain elevation data (DTED) models, but don't include obstructions. Enter the surveyors, who perform radar horizon surveys to document the obstructions (see illustration).

During radar horizon surveys, 84th RADES surveyors use the Geo XT's SunPOS CE software to trace and store the azimuth and

(continued on next page)



Horizon surveys are critical to radar coverage planning. This "slice" shows radar coverage toward true north based solely on a DTED. The green stripe represents the earth. At 20,000 feet (the blue line), it appears that coverage extends out to 170 nautical miles.

This "slice" for the same radar unit includes horizon survey data. An obstruction near the radar could block the signal, limiting coverage at 20,000 feet to 45 nautical miles. (graphics courtesy of the authors)

For EOD, Segway Is 'Da Bomb'

Ms. Teresa Hood
HQ AFCESA/PCT

Explosive ordnance experts are looking at a new way to hurry *to* situations that send most folks scurrying *away*.

With top speeds slightly over 12 mph, Segway Human Transporters (HTs) allow explosive ordnance disposal (EOD) team members, wearing bomb suits that weigh almost 70 pounds, to get to potentially dangerous devices with less time and effort than if they were walking.

"Segways are issued as standard equipment for Navy EOD teams, but are considered a 'unit-buy' for Air Force teams," according to MSgt Douglas Cole, chief of the EOD Flight, 314 Civil Engineer Squadron, Little Rock AFB, Ark. "Only four Air Force EOD units have them, including ours."

Segway HTs self-balance using dynamic stabilization technology, which involves gyroscopes, tilt sensors, microprocessors, and several 2-hp motors all working together to make 100 small adjustments per second. Segways move and stop based on a rider's body position; lean to go, and stand upright to stop. They can maneuver over almost all surfaces—although deep sand is difficult—and are completely waterproof. Environmentally friendly, Segways are powered by two nickel metal hydride batteries, good for about 7 hours on one charge. Recent safety upgrades notify riders of low battery power with visible, audible, and vibrating alerts.

Most importantly for EOD teams, "Segways contain nothing that will set off an explosive device," said MSgt Cole. "The cost for a basic off-the-shelf model is about $5,400. The HT model we have is especially useful because it has saddlebags and will haul a trailer, so we can take along extra gear—up to 600 pounds—that we would normally have to carry by hand. Our Segway can get us, suit and all, where we need to be quicker and in better shape to deal with the situation."

Wearing a 60+ pound bomb suit, SSgt Maria Jarman takes a ride on a Segway HT 'tricked out' for EOD use. (photo by Mr. Guy Ivie)

From Hand to Horizon

(continued)

vertical angle, as well as the range to all obstructions on the horizon that may hinder the radar's line-of-sight. Advanced radar coverage prediction software merges these data points with the horizon data calculated from the DTEDs. 84th RADES surveyors use the the combined data to produce radar line-of-sight coverage diagrams, which radar maintenance technicians and engineers use to optimize the radar's target tracking capability.

This combination of survey and DTED yields much more accurate coverage prediction; in some cases, radar coverage based on actual horizon surveys is up to 50% less than predictions based on "bald earth" DTEDs only (see diagram). These coverage prediction tools could easily be used to help plan and evaluate any weapons system (e.g., radio- or microwave-based systems) limited by line-of-sight.

A recent test at a tactical radar site demonstrated how much better the new techniques really are: surveyors collected more than eight times more data points and documented the full skyline in four hours rather than eight. These improvements mean less radar downtime to conduct surveys and more accurate radar coverage modeling. Efficiencies such as these may be applicable to other Air Force civil engineering processes.

TSgt Root is the Section Chief of Radar Site Evaluation and TSgt Jones is the NCOIC of Radar Site Evaluation for the 84th RADES, Hill AFB, Utah.

We've Got It Down Cold

Mr. Peter M. Semen
Dr. Charles J. Korhonen
Dr. Raymond S. Rollings
U.S. Army ERDC

At Grand Forks AFB in North Dakota this February, engineers from the Army Corps of Engineers Cold Regions Research and Engineering Laboratory (CRREL) and the Air Force 319th Civil Engineering Squadron replaced a 24"-thick pavement slab at subfreezing temperatures using antifreeze admixture technology. In its first application on an airfield project, the concrete hardened properly at air temperatures of 25ºF and attained a compressive strength of 3,000 psi in four days without heat, even when placed directly on unthawed ground.

Little paving is done during winter. Standard practice currently dictates that concrete cannot be placed in conditions where its internal temperature may fall below 40ºF without thermal protection, for fear of freezing damage at early age. Conventional cold weather concreting methods are costly and typical measures to maintain temperatures—heated tents, insulation blankets, and glycol heating pads—are impractical for pavement applications.

Through extensive laboratory testing, CRREL has developed combinations of chemical admixtures that accelerate the hydration of portland cement in cold weather and protect the concrete from freezing down to internal temperatures of 23ºF. Appreciable strength gain can occur at that temperature, even though the ambient air may be much colder. Previous trials in much thinner slabs have withstood overnight lows of -20ºF.

The "antifreeze" qualities come from combining commercial admixtures already in use to enhance other concrete properties. Because these commonly available admixtures already meet industry-specified standards, the antifreeze formulations can be incorporated directly into practice with no further testing.

The idea of using chemicals to protect concrete is gaining industry support. The American Society for Testing and Materials recently began developing standards for cold weather admixtures and the American Concrete Institute is integrating the technology in rewriting its cold weather concrete guidance.

Antifreeze admixtures have potential application for both routine maintenance and contingency operations; they can cut cold-weather placement costs by more than half and allow operations to continue year round. The chemicals are added to plain portland cement concrete mixes, eliminating the need for special cements, which may be scarce and expensive. Concrete with antifreeze admixtures can be batched, mixed, transported, placed, and finished with conventional equipment, materials, and techniques.

At 25ºF it's too cold to place concrete; or is it? Members of the 319th CES help USACE researchers demonstrate a revolutionary cold weather paving technique at Grand Forks AFB. The team from left, clockwise: A1C Brandon Jordan, 1Lt Wayne Kinsel, Mr. Allan Jordan, Mr. Larry Wagner, and Mr. Rodney Hess. (photo by Ms. Janelle Zweifel)

Additional information is available online at http://www.crrel.usace.army.mil/concrete/Antifreeze_Admixtures.htm. Contact charles.j.korhonen@erdc.usace.army.mil or peter.m.semen@erdc.usace.army.mil at the USACE Cold Regions Research and Engineering Laboratory for more details.

Mr. Semen, Dr. Korhonen and Dr. Rollings are research civil engineers for the U.S. Army Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, N.H.

CEs Help 'Bail Out' Coast Guard

Capt Jerry Otto
124th CES

124th CES lends a hand with repairs at former Air Force base

Thirty-seven members of the 124th Civil Engineer Squadron, Idaho Air National Guard, augmented with two members of the Idaho ANG's communications flight, recently completed a two-week training deployment at Coast Guard Air Station Borinquen, located in the northwest corner of Puerto Rico. Deployment commander Capt Ken Williams led the unit to Borinquen to test the capabilities and skills of the CE personnel in a joint-service real world deployment situation.

The air station—the former Ramey AFB, whose gates closed in 1973—presents many challenges for the current tenants. The Coast Guard uses only one-fifth of the base, and 95% of these facilities are approaching or have passed their 50-year anniversary. Between a shortage of money and manpower, they've found themselves running behind on routine maintenance and many minor construction projects. Through the National Guard Bureau, the Coast Guard requested CE assistance with some of the maintenance and projects.

The 124th CES completed numerous projects such as the installation of new windows and electrical outlets in the station's child development center; demolition and construction of walls in a maintenance hangar; heating, ventilation, air conditioning and electrical installation, as well as recurring maintenance, in several facilities; construction of several concrete slabs; and removal of many large trees. These taskings also provided the CE troops cross-functional training experience by allowing tradesmen to work on multiple types of projects not normally within their realm of expertise.

124th Wing Command Chief Master Sergeant Don Carlock visited Borinquen for three days during the unit's deployment and acknowledged the hard work and pride in the accomplishments of the unit. "It was truly a 'one team, one fight' attitude displayed by everyone," he stated. "If something needed to be accomplished, someone was willing to get it done without being asked. It was great to see traditional members in lead roles on several projects. The officers and project managers took care of the projects, the first sergeant took care of the people and the people took care of the work. It doesn't get much better than that."

Capt Otto is the engineering officer for the 124th CES, Idaho ANG, Gowen Field, Idaho.

Left: MSgt Jess Ellis works on a base improvement project at the child development center at Coast Guard Air Station Borinquen, Puerto Rico. Right: MSgt Nyle Simpson hammers down a cinder block wall as part of a demolition and modification project at the former Ramey AFB hangar that now belongs to the Coast Guard. (photos by SSgt Brendan Smedick)

Building the Intangible

MSgt Mike McGuire
934th CES/CEO

CEs create more than improved facilities

Members of the 934th Civil Engineer Squadron performed a lot of construction tasks during their deployment to Saba, Honduras, with Joint Command Task Force Orengo, but not everthing they built was tangible. Good will was a large part of their mission. MSgt David Sowers of the 934th CES said that what he saw made him think about his life back home.

"The level of poverty there was a good example of how we should be thankful for what we have," MSgt Sowers said. "The Honduran locals around us didn't have much. It makes one appreciate the little things in life."

The 934th CES, a Reserve unit based at Minneapolis-St. Paul International Airport, Minn., participated in NEW HORIZONS 2004, an exercise focused on building local schools, medical clinics and providing medical support to local villages. The 934th CES made many improvements to the base camp where exercise participants lived and worked, and provided assistance to projects in local villages.

For many in the unit, it was their first trip to Honduras and from the bus ride to the camp and throughout the two-week deployment, it left a lasting impression on them. Arriving at camp, they met other U.S. soldiers, as well as Puerto Rican Army National Guard and Honduran soldiers.

"We were also greeted by high heat and humidity," said SMSgt Timothy Tamlyn, 934th CES. "The daily temperatures ranged from the low 70s to upper 90s. Every day brought with it a chance of rain, as well."

"With the roads already in rough shape when we got there, the constant rain made all the roads a muddy mess," MSgt Sowers said. "Mud was everywhere. Once our crews got the heavy machinery out and laid down gravel, the roads were greatly improved."

Besides fixing the roads, the Airmen constructed tents, installed airfield and perimeter lighting, and connected water pipes to the portable showers, latrines, water heaters and sinks. They also set up the site's power-distribution system.

They graded sidewalks and poured concrete pads at locations where humanitarian projects were under way. The Airmen also designed guard shacks, tables and steps, and worked on the air conditioners in the dehydration trailers and refrigeration coolers for the dining tents.

Some of the local children often watched the Airmen curiously from outside the camp's fence. On occasion, the Airmen gave them coloring books, crayons and school supplies. "If you could see the looks on those kids' faces after receiving something from us..." SMSgt Tamlyn said. "It was priceless."

MSgt McGuire is an operations manager for the 934th CES, Minneapolis-St. Paul Air Reserve Station, Minn.

Left: Members of the 934th CES assemble an outdoor light during their deployment to Saba, Honduras. Below: SSgt Bill Justin, of the unit's utilities shop, connects drain and vent piping to the shower and latrine trailers. (photos by the author)

Rising to the Top of the SEA

1Lt Jennifer B. Hufnagel
HQ AFCESA/PC

Ed. note: SMSgt Hatfield's photo was taken prior to his promotion to Senior Master Sergeant.

SMSgt Michael L. Hatfield, 18th Civil Engineering Squadron, Kadena AB, Japan, was one of 65 members in the U.S. Navy Senior Enlisted Academy (SEA) Class 111, to graduate May 6. An accomplishment in and of itself, SMSgt Hatfield also graduated at the very top of his class.

The Navy's SEA is located in Newport, R.I., where eight-week joint-service courses are conducted to prepare selected enlisted leaders in pay grades E-8 and E-9 for future challenges in leadership and management. Students attend classes in communication skills and national security affairs, as well as Navy programs and physical readiness.

SMSgt Hatfield, Chief of the Explosive Ordnance Disposal (EOD) Flight in Kadena, made a broad sweep of academic and performance awards in this joint-service course, including the top award: Honor Graduate with Commendation for Military Excellence. He achieved and maintained the highest academic average for the class and was selected by his peers as the Honor Graduate by demonstrating the highest standard of military excellence. He also made the Director's Dean List, and was made an Honorary Senior Chief Petty Officer in a presentation by the Master Chief Petty Officer of the Navy.

"Attending the Naval SNCOA was a truly rewarding experience," SMSgt Hatfield said. "It aided immeasurably my understanding of the joint environment and the challenges facing the sister services."

1Lt Hufnagel is an associate editor on the staff of Professional Communications at HQ AFCESA, Tyndall AFB, Fla.

SRM Moving to New Home

The Air Force Civil Engineer Support Agency (AFCESA) will soon expand its role in providing oversight for design and construction of projects at Air Force installations.

On Oct. 1, responsibility for managing and executing all civil engineer operations and maintenance sustainment, restoration and modernization (SRM) projects will shift from the Air Force Center for Environmental Excellence (AFCEE), Brooks AFB, Texas, to AFCESA, Tyndall AFB, Fla. The transition is part of the Air Force's continuing force restructuring process and the Air Force Civil Engineer's "Back-to-Bases" initiative.

"AFCEE has done a great job managing the SRM program, but the program is a more natural fit with the roles and mission of AFCESA," said Col. Gus Elliott Jr., AFCESA commander.

AFCESA will not be responsible for the entire program until October 2005. During the transition period, AFCESA will focus on CONUS major command SRM projects and AFCEE will handle overseas projects.

SRM will fall under a new directorate at AFCESA called Installation Support (CEI), which will have four divisions: POL/Fuels (CEIF), Vertical (CEIV), Pavements (CEIP) and Utilities (CEIU). The directorate staff will develop new design templates, tools and generic statements of work to help installations and AFCESA better monitor and manage construction quality, timeliness, and cost.

"AFCEE is involved with environmental and housing-type work, but it is not responsible for setting criteria and standards for Air Force infrastructure projects," said Myron Anderson, director of the new Installation Support Directorate. "AFCESA is, and that means the technical experts will be more closely involved with the O&M projects."

Both agencies will charge a service fee on all projects to cover administrative, travel, manpower, and logistical costs. Previously, AFCEE absorbed the cost.

"It's not a fee for service. It's a direct cost recovery," said Mr. Anderson. "Any excess funds will be returned."

Visit http://www.afcesa.af.mil for more information.

Luke CE is "Outstanding"

EOD team member named 1 of 12 Outstanding Airmen of the Year

1Lt Jeff Clark
56th FW/PA

SSgt Aaron Davenport, 56th Civil Engineer Squadron, Luke AFB, Az., was recently recognized as one of the 12 Outstanding Airmen of 2004, based on superior leadership, job performance and personal achievements.

"Sergeant Davenport is most deserving of this prestigious award," said Lt Col John Dewine, 56th CES commander. "He earned this recognition by always displaying tremendous professionalism here at Luke and, more importantly, superbly performing in his primary mission—deployed as a war fighter, this time in Iraq."

At home, SSgt Davenport helped clear ordnance from more than 90,000 acres of Luke's tactical bombing ranges.

While stationed in Iraq in support of Operation IRAQI FREEDOM, SSgt Davenport was on a team responsible for removing 77 bomblets from a Nasiriyah playground, ensuring the safety of 500 children.

He assisted a Marine nighttime raid on a surface-to-air missile battery, which destroyed seven missiles and increased the safety and security of coalition forces.

Six months earlier, SSgt Davenport was deployed in support of Operation ENDURING FREEDOM where he helped establish functional EOD capabilities within hours of arrival.

SSgt Davenport managed joint nation operations while responding to a Saudi Arabian F-15 mishap and helped train a Saudi Arabian EOD team.

He also used his training to remove seven suspected terrorist devices, ensuring the safety of 2,000 coalition forces.

"This is quite an honor," said SSgt Davenport. "There are many men and women throughout the EOD field who daily do outstanding work and are probably much more deserving than me."

SSgt Aaron Davenport gets checked out in an EOD 8 bomb suit during training. (photo by SSgt Aaron Marcus)

Selected for Promotion

Senior Master Sergeant

Alberto Alvarado-Vega
Michael D. Amacker
Donald D. Andreasen
Kevin W. Armstrong
Tony R. Arrington
Gary Balanay
Garry E. Berry II
Paul E. Blackwell
Izell B. Bowick
Dale J. Brocious
Charles E. Bryson
James M. Buehring
Richard P. Cavada
Dale A. Charles
James E. Clark
Willie J. Coleman
Barry J. Costello
Michael J. Daniel
Darrell Dantzler
Aller B. Delarosa
Richard W. Delong
Michael F. DeShon
Paul R. Dillon
Edward D. Dodds
Steven F. Dreskler
Frederich Dumaplin
Howard C. Durkee, Jr.
William D. Eaton
John G. Evalle
David M. Ewings II
Thomas B. Fisher
Steven J. Foster
William A. Gann
Malcolm D. Golson
David A. Gutschow
Jonathon Holbrook
John M. Holcomb
Steven D. Holman
Michael T. Irons
Martin J. Janssen
Daniel B. Jessup
Keith W. Jimmo
Gerald A. Johnson
David J. Kass
Steven C. Kaufman
Michael A. Lake
Terry E. Lanton
Susan O. Lasiter
Forest E. Lisner
Terry W. Masters
Joseph W. May, Jr.
Charles J. McDonald
Timothy D. McVay
Robert L. Mills
Michael Mitchell
Andre A. Morin
William L. Myers
Jeffrey A. Nabozny
Richard Nordstrom
Paul A. Olejniczak
Neil M. Orenich
Marty R. Overlin
Michael Palase
Kevin Y. Parker
James C. Patterson
Daniel P. Pattioay
Glen C. Paveglio
Richard K. Peck
Jeffery F. Ratcliff
Patrick Rodriguez
Salvador Rodriguez
Patrick A. Root
Patrick M. Ross
Scott D. Rudd
Alan C. Scherbarth
Robert J. Schmit
Tommy L. Schneeweis
Bryan C. Seifarth
Michael P. Shonka
Thomas A. Shumpert
Andrew A. Simmonds
Russell Sittenauer
Kerry L. Taylor
Mchudson Theodore
Ronald M. Tichota
John D. Turner
David A. Urdahl
Craton L. Williams
Glenn A.J. Williams
Shawn E. Witten

Key CE Personnel Changes

Col Dave C. Howe became The Civil Engineer, Headquarters United States Air Forces in Europe, replacing Col Jon D. Verlinde, who retired in August. Col Howe was previously the Commander, 305th Mission Support Group, McGuire AFB, N.J.

Col Steven W. Zander became The Civil Engineer, Headquarters United States Air Force Reserve Command, Robbins AFB, Ga., replacing Col David A. Sweat, who retired in May. Col Zander was previously the Commander, 4th Mission Support Group, Seymour Johnson AFB, N.C.

Col Mark D. Wright is now The Civil Engineer, Headquarters Air Force Special Operations Command, Hurlburt Field, Fla., replacing Col Edmond B. Keith, who is the new Commander, 96th Air Base Wing, Eglin AFB, Fla. Col Wright was formerly the Chief, Programs Division, Office of The

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Technical Publications

Available on the AFCESA Web site:
http://www.afcesa.af.mil/library/etl.asp?Category=Engineering%20Technical%20Letters

AFPAM 32-1125, Volume 1, Working in the Operations Management Field
ETL 04-2, Standard Airfield Pavement Marking Schemes
ETL 04-3, Design Criteria for Prevention of Mold in Air Force Facilities
ETL 04-4, Trenchless Technology (TT) for Crossing Air Force Pavements
ETL 04-7, C-130 and C-17 Landing Zone (LZ) Dimensional, Marking, and Lighting Criteria
ETL 04-9, Pavement Engineering Assessment (EA) Standards
ETL 04-10, Determining the Need for Runway Rubber Removal

Recent A-Grams

Available on the AFCESA Web site:
http://www.afcesa.af.mil/library/ (under the Periodicals link)

04-07 Air Force Small Business Program
04-08 MAAS Video Released Soon on DVD

Civil Engineer, Headquarters United States Air Force, Washington, D.C.

Col William Corson is the new Chief, Programs Division, Office of The Civil Engineer, Headquarters United States Air Force, Washington, D.C. Col Corson was previously the chief of the Programs and Analysis Branch within the Programs Division.

Col John Cawthorne is now the Chief, Environmental Division, Office of The Civil Engineer, Headquarters United States Air Force, Washington, D.C. Col Cawthorne was formerly a student at the Industrial College of the Armed Forces, Ft. McNair, Washington, D.C. and the Base Civil Engineer, Scott AFB, Ill.

Mr. Billy Webb is the new Chief, Civil Engineer Career Program, Randolph AFB, Texas. He was formerly the Deputy Base Civil Engineer, Kadena AB, Japan.

Nellis CE Gets the "Gold"

A Nellis AFB, Nev., staff sergeant received the Congressional Award Gold Medal on June 23 in Washington, D.C.

SSgt Cornelio Umali, 99th Civil Engineer Squadron utilities system craftsman, accepted the award from Nevada Senator Harry Reid and Nevada Congressman Jon Porter for his achievements in volunteering and public service, personal development, physical fitness, and expedition and exploration.

"Sergeant Umali is an NCO who motivates others to get involved with base and local activities," said TSgt Jesus Rodriguez, water shop NCOIC. "He's a magnet for others to emulate and has a personality that people want to be associated with."

SSgt Umali's personal achievements include earning his bachelor's degree in information technology and participating in various self-defense courses and unit physical fitness programs. He volunteered a lot of his time to his unit and community, participating in the American Cancer Society's Relay for Life, Family Advocacy Domestic Violence Month, andAirmen Against Drunk Driving. He also assisted at the base chapel.

"This award is a reflection of the positive influences that I've been associated with over the years," said SSgt Umali. "Anyone can make a difference, if they choose to."

Text by SSgt Cia Newman and photo by SrA Kenny Kennemer, AWFC/PA.

High Schoolers Put It Together

At the 5th annual Society of Military Engineers (SAME) Engineering and Construction Camp for high school students, which began on July 4, Alpha Flight took their concrete beam from drawing board to reality.

At the week-long camp, hosted by the Air Force Academy's Department of Civil and Environmental Engineering, participants built concrete beams, wood storage sheds, and catapults with little time spent on design and more energy focused on "learn-by-doing" construction.

The 60 students (9 girls and 51 boys), from 26 states plus Germany and Korea, were grouped into six competing flights led by cadets from the Air Force and Coast Guard academies. At the graduation ceremony, Charlie Flight was recognized as the top finisher and flight members were awarded their blue hardhats as prizes.

For the beam exercise, each flight was given three 16´ lengths of rebar and one-half cubic yard of concrete. They designed their beams in only fifteen minutes, then immediately began construction of adjustable forms and placed rebar according to their design—just minutes before the concrete truck arrived. On the final day, beams were load tested to failure; points were awarded for aesthetics and strength.

Three Air Force and two Army officers and seven civilian engineers served as mentors to the flights. "I wish I had an opportunity to do something like this when I was a high school student," said mentor 1Lt James Freeman, USAF. "It's great to see the campers' enthusiasm and be a part of this unique learning experience."

Text by Capt Christopher Senseney (Alpha Flight Mentor) and Capt Michelle Harwood (Echo Flight Mentor), AFIT/CIGW; U.S. Air Force photo.

Energy Team Nets Presidential Award

MSgt Michael A. Ward
HQ AFCESA/PA

Air Force blue honored for going green

The Air Force's Renewable Energy team received the 2004 Presidential Award for Leadership in Federal Energy Management July 15 for its efforts to increase renewable power use at Air Force installations.

In 2003, the Air Force—the largest purchaser of renewable energy in the nation—purchased more than 200M kilowatt hours of wind energy.

"That's enough to power 320,000 average-sized homes," said Mr. Al Day, chief of the Air Force Civil Engineer Support Agency's (AFCESA) Mechanical/Electrical Engineering Division. "This year, we expect to purchase more than 300M kilowatt hours."

Air Force facilities consume about 78 trillion BTUs annually at a cost of about $800 million.

"In the 80's and 90's, we took care of most of the easy fixes such as turning down thermostats and using energy-efficient lighting," said Mr. Mike Santoro, an electrical engineer with AFCESA. "But to meet newer and more stringent federal energy goals, we started bringing renewable energy sources into the overall strategy."

Two bases, Dyess AFB, Texas, and Fairchild AFB, Wash., now receive 100% of their energy from wind or other renewable power sources, and wind farm projects are being developed at F.E. Warren AFB, Wyo., and Vandenberg AFB, Calif. A 900-kilowatt wind farm on Ascension Island was expanded last year to produce 2.7 megawatts.

"Renewables were relatively prohibitive in the past because of their high cost," said Mr. Day. "New technologies have significantly reduced the cost so that in many areas, it's competitive with commercial power. The key for companies is to have a customer, and it's our plan to be a customer."

While wind power is the largest contributor so far in the Air Force's renewable energy plan, the service's portfolio also includes other renewable sources such as biomass and solar energy, as well as gases from landfills and treated sewage.

"Renewables are a smart way of doing business," said Mr. Day. "It allows us to protect the environment while meeting mission requirements and providing quality working and living conditions for our people."

The team included Mr. Santoro, Mr. Day, and Maj Allen Erickson, AFCESA, Tyndall AFB, Fla.; Mr. George Denslow, Dyess AFB, Texas; Mr. Willis Barrow, HQ ACC, Langley AFB, Va.; Mr. Garland Scott, HQ AETC, Randolph AFB, Texas; Mr. Leo Paul Weaver, Edwards AFB, Calif.; Mr. Craig Miller, HQ AFSPC, Peterson AFB, Colo.; Ms. Gueta Mezzetti, Pentagon; Mr. Michael Warwick, Pacific Northwest National Labs and Mr. Gary Seifert, Idaho National Labs.

On behalf of the Renewable Energy Team, Mr. Al Day accepted the award from Mr. Clay Johnson, Deputy Director of Management at OMB. (photo by Mr. Kevin Wilson)

This "Pocket" Book Is a Must-Read

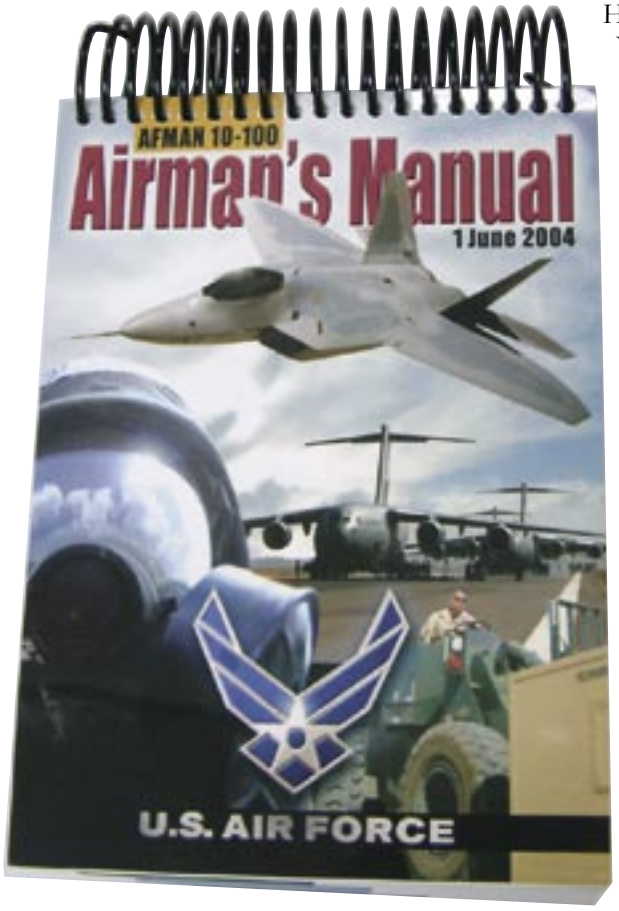
MSgt Michael A. Ward
HQ AFCESA/PA

CEs help turn updated Airman's Manual into a "best-seller"

Civil engineers build things, and one of the most important things they helped build recently might have been a consensus on the new Airman's Manual, AF-MAN 10-100.

The manual, which contains information on almost everything an Airman needs to know in a wartime, exercise or emergency environment, was developed by committee. The original draft contained several hundred pages; impressive, but impractical, especially during the heat of battle.

The original Airman's Manual, published in 1999, had only about 175 pages, but it became outmoded after the September 11th terrorist attacks. In 2003, Air Force leaders decided to update the manual, drawing heavily on lessons learned in Iraq and Afghanistan, said Mr. Steve Prier, project manager for the manual. Officials also wanted the manual to include most of Air Force Handbook 32-4014, Volume 4, USAF Ability to Survive and Operate Procedures in a Nuclear, Biological, and Chemical Environment.



The Air Force Civil Engineer Support Agency volunteered to take on the update. "We felt a sense of responsibility to take the lead because about 70% of the material involves expertise the civil engineer community traditionally provides to the Air Force," said SMSgt Martin Janssen, Full Spectrum Threat Response publications manager.

Subject-matter experts from a cross-section of Air Force specialties provided their take on what an Airman should know in a contingency setting.

In February 2004, basic training graduates at Lackland AFB, Texas "field tested" a draft of the manual. "We wanted to be sure even the least experienced Airman could easily apply the material in the book," said SMSgt Janssen. "We received great feedback and made some key changes based on their comments."

By March 2004, the working group had a solid draft, but it was still too large. The handbook was supposed to fit easily in the cargo pocket on battle dress uniform pants, so group members were asked to pare down their inputs.

"Of course, everybody feels their information is important, and it is," said SMSgt Janssen. "But, we were building this for someone in the field and we not only had to make sure the information was correct, but that it was the right amount of information and the right level of information for a contingency environment. Not every decision was unanimous, but in the end it was a group consensus."

The result is a 250-page manual that, while a little bulky, still fits in the pocket. It contains information on a variety of topics, such as packing for deployments, pre-deployment medical requirements, rules of engagement, force protection, protective equipment use, and anti-terrorism.

The manual also contains a new quick-reference section with tips such as clearing a jammed weapon, performing self-aid and buddy care, identifying unexploded ordnance and post-attack actions.

"A copy will be given to every active-duty member, Reservist and Guardsman," said Mr. David Epstein, training and publications manager for the Air Force Civil Engineer Readiness Branch. An electronic version is also available on the Air Force portal.

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

AFIT

Wright-Patterson AFB OH

Course No.	Title	Off.	Start Dates	Grad Dates
ENV 020 (S)	Environmental Compliance Assessment	05A	18-Oct	21-Oct
ENV 101	Intro to Environmental Mgmt Flight	05A	01-Nov	05-Nov
ENV 222 (S)	Hazardous Mat'l Mgmt Process (HMMP)	05A	07-Dec	09-Dec
ENV 418	Environmental Contracting	05A	25-Oct	05-Nov
ENV 419	Envir Planning, Programming & Budgeting	05A	16-Nov	18-Nov
MGT 412	Financial Management	05A	18-Oct	29-Oct
MGT 570	Civil Engineer Superintendent	05A	06-Dec	17-Dec
ESS 010 (W)	Hazardous Waste Accumulation	O5A	06-Dec	10-Dec
ESS 030 (W)	Stormwater Management	05A	15-Nov	19-Nov
ESS 090 (S)	Environmental Management	05A	19-Oct	19-Oct
			09-Dec	09-Dec

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

366th Training Squadron

Eglin AFB FL

Course No.	Title	Start Dates	End Dates
J3ACP3E871 - 000	EOD Craftsman	18-Oct/29-Nov 2004	29-Oct/10-Dec 2004

Sheppard AFB TX

J3ARR3E453 - 002	Pest Mgmt Recertification	4-Oct/15-Nov/06-Dec	08-Oct/19-Nov/10-Dec
J3AZR3E472 - 000	Liquid Fuels Storage Tank Supvr.	04-Oct	15-Oct
J3AZR3E051 - 003	Cathodic Protection Maint.	01-Oct/25-Oct/08-Nov/29-Nov	15-Oct/05-Nov/22-Nov/10-Dec
J3AZR3E051 - 008	Electronic Distribution Sys. Maint.	01-Oct/01-Nov/01-Dec	29-Oct/3- Nov/05-Jan 2005
J3AZR3E051 – 010	BARE Base Electrical Systems	01-Oct/08-Nov	15-Oct/22-Nov
J3AZR3E051 – 012	Fire Alarm Systems Maint.	01-Oct/28-Oct/24-Nov	27-Oct/23-Nov/ 20-Dec
J3AZR3E051 – 013	Intrusion Detection Sys. I&M	04-Oct/04-Nov	22-Oct/24-Nov
J3AZR3E052 – 013	CE Adv. Electronics	25-Oct/23-Nov	22-Nov/21-Dec
J3AZR3E071 - 001	CE Adv. Electrical Troubleshooting	01-Oct/01-Nov	29-Oct/30-Nov
J3AZR3E072 – 002	Troubleshooting Elec. Power Equip.	01-Oct/26-Oct	25-Oct/17-Nov
J3AZR3E072 – 113	BARE Base Power (Diesel)	13-Oct/09-Nov	08-Nov/03-Dec
J3AZR3E151 – 013	HVAC/R Control Systems	18-Oct	22-Nov
J3AZR3E151 – 014	HVAC/R Direct Expansion System	13-Oct/17-Nov	15-Nov/20-Dec
J3AZR3E151 – 015	HVAC/R Indirect Expansion Systems	04-Oct/01-Nov	22-Oct/19-Nov
J3AZR3E451 – 004	Fire Suppression Sys.Maint.	05-Oct/28-Oct/29-Nov	26-Oct/18-Nov/17-Dec
J3AZR3E453 – 003	Pest Mgmt Certification	13-Oct	09-Nov
J3AZR3E471 – 101	BARE Base H2O P&D Sys.	04-Oct/18-Oct/01-Nov/30-Nov	14-Oct/27-Oct/10-Nov/09-Dec

Gulfport MS

J3AZP3E351 – 001	Low Slope Roofing M&R	18-Oct/06-Dec	28-Oct/16-Dec
J3AZP3E351 – 002	Fabricating Welded Pipe Joints	04-Oct/08-Nov	18-Oct/22-Nov
J3AZP3E351 – 003	Metals Layout, Fabrication and Welding	19-Oct/30-Nov	05-Nov/17-Dec
J3AZP3E571 - 003	Engineering Design	18-Oct/29-Nov	29-Oct/10-Dec

Ft. Leonard Wood MO

J3AZP3E971 – 003	Adv. Readiness	13-Dec	17-Dec
J3AZP3E971 – 005	NBC Cell Operation	15-Nov	19-Nov

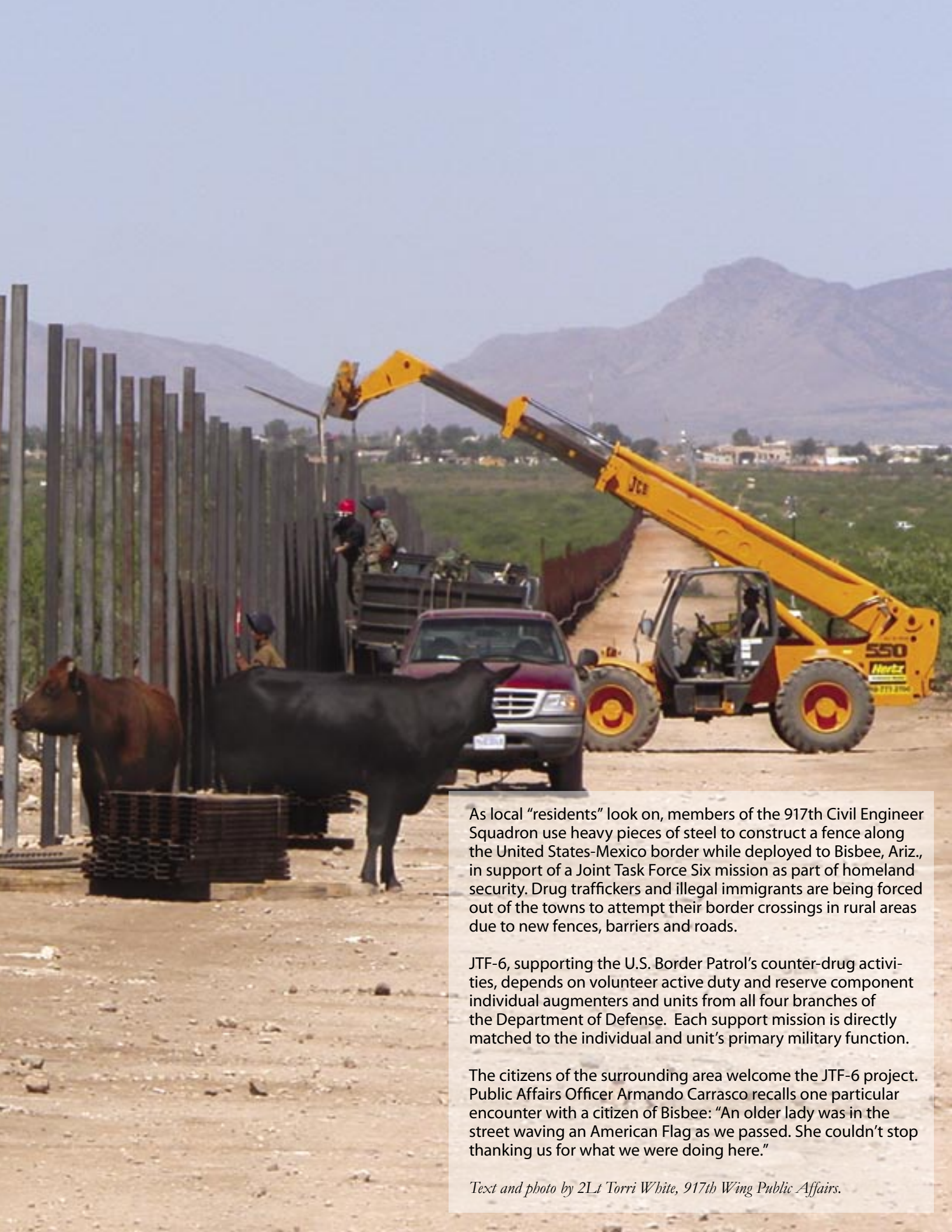
Ft. Lee NJ

J5AZA3E251 – 000	Sling Load Inspector Cert.	04-Oct/15-Nov/13-Dec 2004	08-Oct/19-Nov/17-Dec 2004

Indian Head MD

J5AZN3E871 – 001	Adv. Access and Disablement	04-Oct/25-Oct/29-Nov 2004	15-Oct/05-Nov/10-Dec 2004

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.



As local "residents" look on, members of the 917th Civil Engineer Squadron use heavy pieces of steel to construct a fence along the United States-Mexico border while deployed to Bisbee, Ariz., in support of a Joint Task Force Six mission as part of homeland security. Drug traffickers and illegal immigrants are being forced out of the towns to attempt their border crossings in rural areas due to new fences, barriers and roads.

JTF-6, supporting the U.S. Border Patrol's counter-drug activities, depends on volunteer active duty and reserve component individual augmenters and units from all four branches of the Department of Defense. Each support mission is directly matched to the individual and unit's primary military function.

The citizens of the surrounding area welcome the JTF-6 project. Public Affairs Officer Armando Carrasco recalls one particular encounter with a citizen of Bisbee: "An older lady was in the street waving an American Flag as we passed. She couldn't stop thanking us for what we were doing here."

Text and photo by 2Lt Torri White, 917th Wing Public Affairs.