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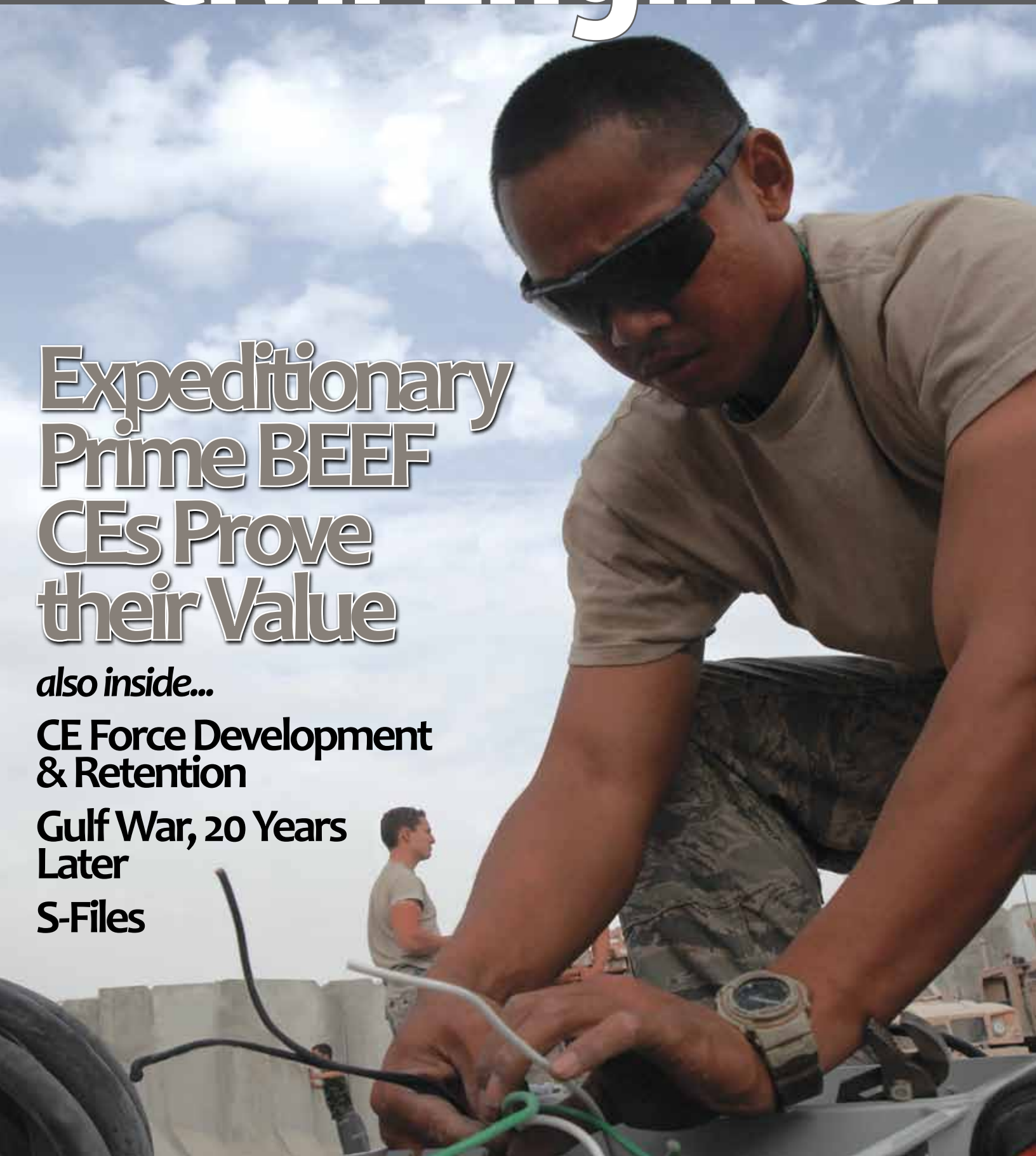

Expeditionary Prime BEEF CEs Prove their Value

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SSgt Dan De Leon, 777 EPBS, begins setting up a distribution box which will become part of an electrical supply system to Force Provider tents located at an Access Control Station in Kandahar City, Afghanistan. (photo by SMSgt Samuel V. Ameen)

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20/20 by 2020 Prepares Us for Today's, Tomorrow's Budget Challenges

Secretary of Defense Robert M. Gates recently directed the DOD to look at its programs, functions, and activities to find cost savings to reduce spending by two to three percent. This follows earlier direction from President Barack Obama's administration directing all federal agencies to reduce their costs by identifying programs that are least critical to agency missions.

Air Force Civil Engineering is not immune to these fiscal challenges, but the good news is that we have been on the path toward efficiency and cost savings well before the recent cost-cutting directives were issued. In our "Build Sustainable Installations" goal, a major focus area is "20/20 by 2020." Our 20/20 by 2020 vision aims to rightsize the Air Force's real property footprint and to optimize how we manage installations to support the warfighting mission. We will achieve this through a number of initiatives, including optimizing space usage, demolishing obsolete and excess facilities, incorporating energy and sustainability in all we do, and leveraging private industry through utility and housing privatization and enhanced use leases.

Earlier this year, we briefed Air Force Vice Chief of Staff Gen Carroll H. Chandler, about our efforts and gave a demonstration of the Space Utilization File (S-File), an asset management tool used to track our progress toward 20/20 by 2020. With the defensible data we presented, Gen Chandler came away with an understanding of what it would take in terms of resources to achieve 20/20 by 2020.

This is just one of many 20/20 by 2020 success stories made possible by our asset management approach to installation management, and highlights the immediate value that new tools such as the S-File are providing. We continue to prove the S-File's effectiveness at installations with our successes in optimizing space usage through consolidation. I go into deeper detail about the S-File and its successes in an article in this issue (pp. 4-5).

Asset Management will continue to play a key role in our 20/20 by 2020 efforts. Bridging IT tools, such as the S-File, will become more important in our aggressive approaches toward consolidation and demolition as new Air Force missions are identified. These will go hand-in-hand with our facility energy efforts, which are also intended to yield cost savings and efficiencies.

All civil engineers have a part to play in this endeavor. I challenge everyone to continue embracing the asset management approach and advocate it to your colleagues. Continue to use the S-File and other tools when making decisions relating to construction and demolition. Keep your data current to ensure we have the clearest, most accurate picture of our installations. Asset management has worked well for us, and I intend to continue our progress in defending our requirements with this system.

As additional budget challenges await us down the road, we'll be prepared to address them with the help of our asset management approach and our 20/20 by 2020 vision while we "Build Sustainable Installations." Let's keep going and continue these efforts to "Build to Last … Lead the Change!"

Timothy A. Byers
Major General, USAF
The Civil Engineer

S-FILE
KEY TO 20/20 BY 2020 SUCCESS

Maj Gen Timothy A. Byers

Air Force civil engineers are facing a daunting challenge: They are currently responsible for the operation and maintenance of more than 40,000 facilities at Air Force installations worldwide.

But, they are also charged with "Building Sustainable Installations" and carrying out the "20/20 by 2020" strategic vision, which calls for a 20-percent reduction in the Air Force's physical plant that requires funds by 2020. Working from a FY06 baseline of 401 million square feet, this equates to a reduction of 80 million square feet. To put this in perspective, if the average size of an Air Force installation is 4.8 million square feet, we would need to reduce our footprint by an equivalent of 16 installations! We must rightsize our installations to support today's mission; in effect we are "shrinking from within."

In briefings given earlier this year to Air Force Vice Chief of Staff Gen Carroll H. Chandler, representatives from The Civil Engineer's office used the S-File to present clearly the funding required to meet the 20/20 by 2020 goal by showing a real-world consolidation and demolition scenario. With the S-File, a tool used to manage the Air Force's space utilization process at the installation level, we used your information to help us tell and sell our story. Displaying S-File data alongside operational costs and facility conditions demonstrated how leadership can use this information to make informed decisions in support of the 20/20 by 2020 strategic vision.

The positive feedback received from Gen Chandler marks one of many 20/20 by 2020 success stories made possible by improvements in space and process management resulting from the S-File tool.

Figure 1. *Civil engineer personnel can view the S-File's space use data on their desktops in the form of detailed floor plans that provide information on each room within a specific facility. The software's dashboard displays key performance indicators, such as space utilization rates and ENERGY STAR ratings. (U.S. Air Force graphic)*

What is the S-File?

The S-File itself is an electronic database, viewer-accessed and manipulated by workstation software. Civil engineer personnel can view space-use data on their desktop in the form of detailed floor plans that give information on the organization, personnel, and space-type assignment of each room within a specific facility. The software also provides a dashboard to display key performance indicators, which include space utilization rates, ENERGY STAR rating, and a Mission Dependency Index. It allows civil engineers to see how organizations are spread across an installation in order to improve proximity planning and assist in planning for smart demolition and consolidation.

Development of the S-File began two years ago as part of Air Force Civil Engineering's 20/20 by 2020 vision to build sustainable, right-sized installations. Members of Civil Engineering's Transformation "Corps of Discovery" initiative conducted extensive research of industry best practices and

among other findings, identified the need for a tool to view, store, analyze, and benchmark space utilization data.

While the S-File itself is only a bridge tool, the space utilization database will transfer directly to NexGen IT, which will ultimately provide space, cost, and condition data in one centralized software solution.

Space Utilization Strategy

The driving factor behind the 20/20 by 2020 vision is the need to reduce the cost to operate facilities by building sustainable installations. This will be accomplished by consolidation of personnel into sustainable facilities, while removing those facilities with high operational cost and poor condition from the inventory.

To identify the best candidates for consolidation and demolition, engineers must take into account operational costs and facility condition in addition to space utilization data. Both age and size contribute heavily to the sustainability of each facility. At 32.5 years, the average age of an Air Force facility mirrors the industry average. However, when facility size is compared, the Air Force averages only 12,000 square feet to industry's 250,000 square feet per facility. The Air Force also manages 20 times the number of facilities than does industry. This drives higher sustainment costs, since each facility has its own HVAC, plumbing, roofs, and other features. By consolidating personnel to newer and larger buildings, while divesting older and smaller facilities, the Air Force can both reduce operating costs and improve the average condition of its facilities.

Since 2006, the Air Force has disposed of 23 million square feet of physical plant. However, new construction during the same timeframe has resulted in a net reduction of only 16 million square feet. In order to curb organizational sprawl and reduce the requirement for new MILCON, the Air Force has adopted GSA's space utilization standard of 200 "usable" square feet per person for administrative space. Combining space utilization data from the S-File tool with operational costs and facility condition, engineers can now counter the mindset that "new mission/realignment equals new building" by presenting cost-effective alternatives to MILCON.

S-File in Action: The Beddown of Air Force Global Strike Command

The activation of Air Force Global Strike Command (AFGSC) at Barksdale AFB, La., provided a unique opportunity to prove the value of the S-File. Originally, a new headquarters facility for AFGSC was planned through a $125M MILCON project. However, using the S-File, civil engineers were able to look at space utilization across the entire base for consolidation options. It yielded a new plan to consolidate an existing Barksdale mission into a $34M MILCON facility and renovate the buildings vacated by the existing mission for AFGSC's offices.

The new plan yielded a number of benefits, including a less expensive MILCON project (savings of $95M) and a 22-percent reduction in new infrastructure footprint (savings of $334,000 annually on maintenance, energy and water usage costs). The new plan meets base comprehensive planning constraints created by Barksdale's designated historical buildings, allowing limited land to be used effectively while still meeting increased mission needs.

Looking Ahead

We've seen the value of the S-File at both the base level, as demonstrated at Barksdale AFB, and at the air staff level, in briefings to Gen Chandler. These are just the first steps; there is much more on the horizon for this valuable tool.

MAJCOMs have collected over 165 million square feet in the S-File since the beginning of FY09, with a primary focus on administrative facilities. Administrative space was chosen first because it has one of the highest costs to operate and is most easily benchmarked with industry. We will continue by accumulating data for industrial and storage and eventually all remaining space categories to identify opportunities and inform decisions in support of 20/20 by 2020.

The S-File is a powerful tool that will yield important benefits not only for Civil Engineering but also for the Air Force. As budget challenges loom on the horizon, the S-File will put us ahead of the game by planning for better space utilization and helping us "Build Sustainable Installations."

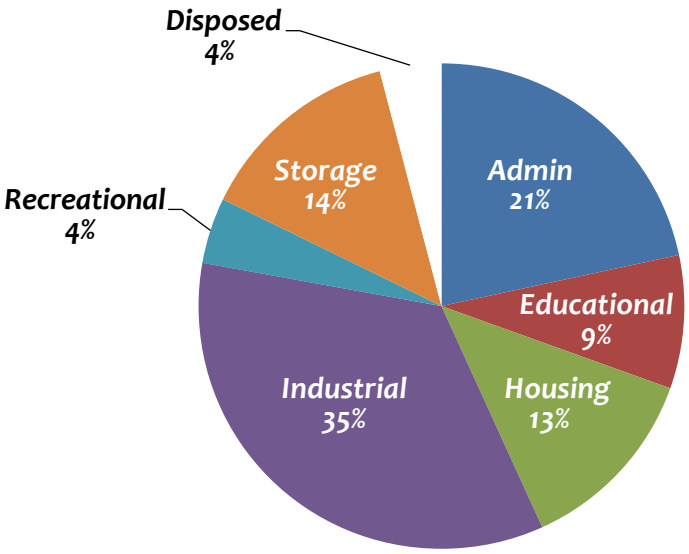


Figure 2. *Progress towards the 20% reduction goal and breakout of general space types. S-File initial data focused on administractive space; additional data will be collected for industrial and storage, and eventually all remaining space categories. (U.S. Air Force graphic)*

CE Officer Force Development

Capt Shamekia Toliver
AFPC/CCX

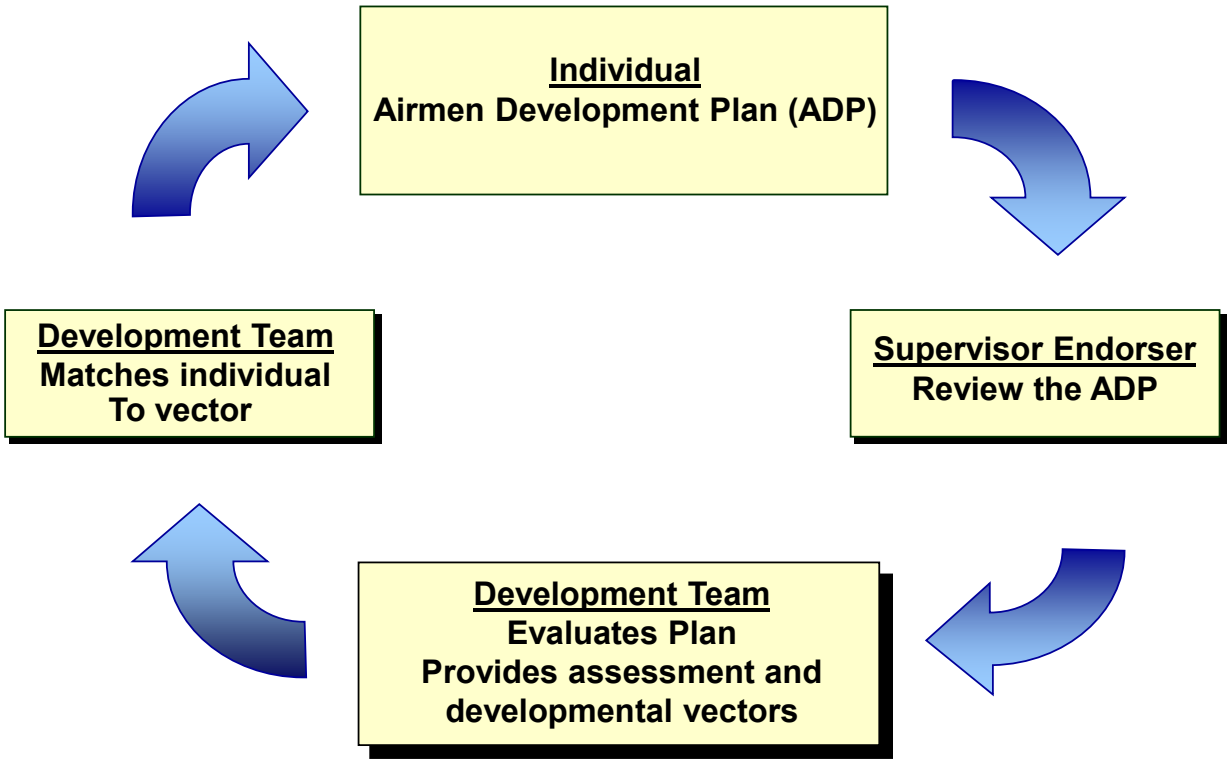
Force development is at the core of the Air Force structure, outlined in Air Force doctrine document AFDD1-1, *Leadership and Force Development*, and executed through policy and guidelines managed by the Air Force Manpower and Personnel functional (AF/A1). The intent of force development is to "optimize the capabilities of the individual, the unit, and the Air Force, while balancing personal needs with mission mandates" (AFDD 1-1). While force development embraces the Total Force concept, including officer, enlisted, civilian, Reserve, and Guard components, each one executes it in a different manner. The focus of this article is officer force development within the Civil Engineer career field.

There are several key players in this process: development teams, functional managers, the career field manager (CFM), an officer assignment team , senior raters, commanders, supervisors, and individual officers.

Key Players

Development teams (DTs) serve as the link between formal Air Force development systems, including requirements and policy directives, and individual officers (see Figure 1). Composed of a group of senior leaders, DTs meet to decide specific officer development policy for the career field, determine vectors for individual officers, and identify education, training, and assignment experiences based on current and future requirements. In accordance with AFI 36-2640, *Executing Total Force Development*, DTs are chaired by general officers or Senior Executive Service members; voting members may include the CFM, key force development stakeholders such as air staff directors or subject matter experts, and MAJCOM-level functional leaders. The AF/A1 provides guidance on areas and programs of interest within force development. For active duty components, DTs are required to meet at least two times per year and, unlike promotion boards, are able to conduct open forum group discussions when determining specific vectors for individual officers.

Figure 1. The force development process



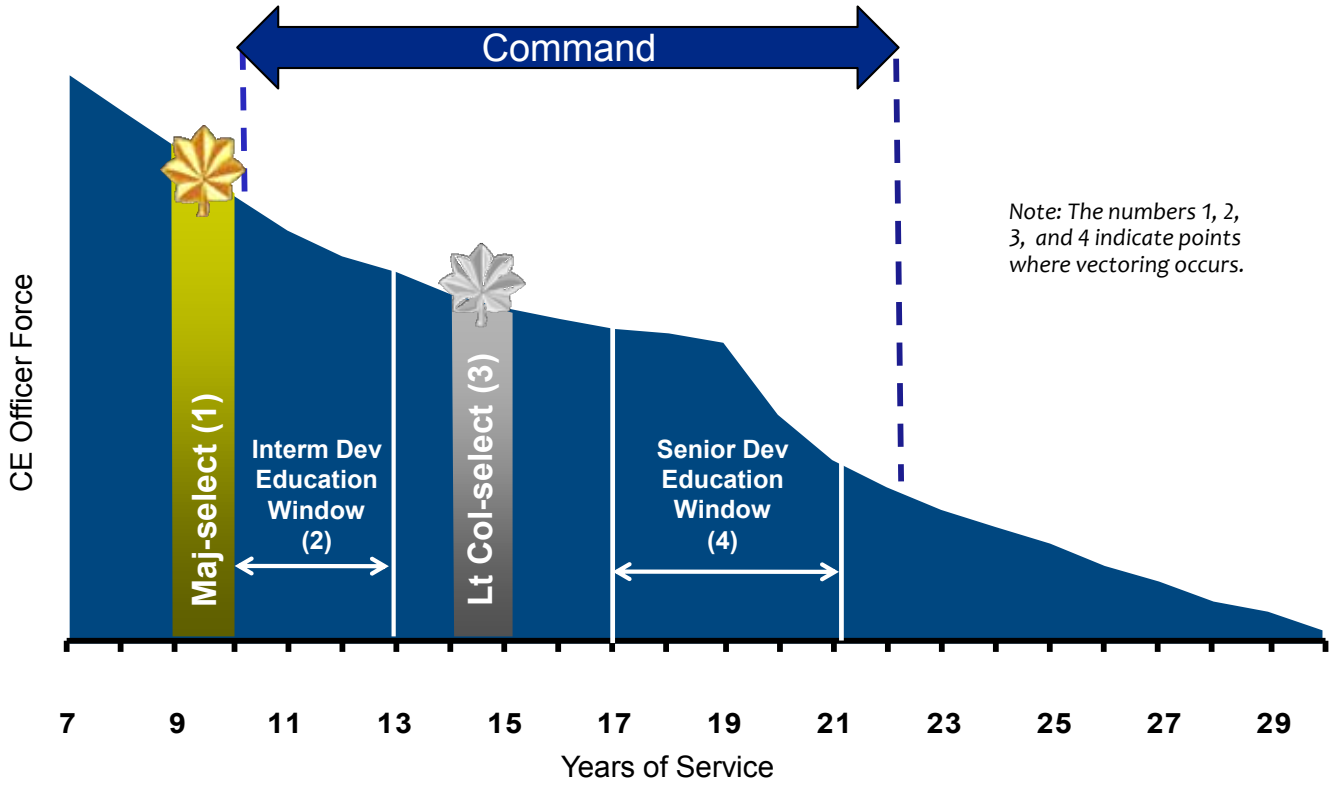
The Civil Engineer DTs meet during the summer and fall of each year and voting members are the MAJCOM Civil Engineers and FOA and DRU commanders (summer), and the MAJCOM/CEOs (fall). The summer DT meeting agenda includes the command screening board for both major and lieutenant colonel squadron command, selections for intermediate and senior developmental education, steady state vectors for promotion selectees to the rank of major and lieutenant colonel (see Figure 2) as well as graduating squadron commanders and developmental education graduates for the following year. Trigger point vectors may also be decided. (Vectors are recommendations for the next one to two assignments over three to five years; they are types of assignments, not specific jobs or locations; steady state refers to those vectors relating to a career milestone or an expected event; trigger point refers to those vectors resulting from an unusual occurrence). The fall DT meeting agenda includes advanced academic degree selection board (both for Air Force Institute of Technology and civilian institutions), regional affairs strategist selection, and steady state vectors for captain-selects.

Functional managers (FMs) are senior leaders responsible for specific functional communities who provide corporate level oversight and ensure that individuals are trained, equipped, and developed for the Air Force mission. The Civil Engineer FM is the Air Force Civil Engineer, who serves as the non-voting chair of the summer DT meeting, with the role of facilitating and providing guidance to the voting members and resolving any disagreements or ties.

Career field managers (CFMs) are appointed by the FM and provide daily operational oversight of the career field. CFMs are also the technical experts for a respective career field, defining all specific training requirements and managing the force with respect to personnel actions. The appointed Civil Engineer CFM is the AFCESA Operations and Programs Support Division Chief. Unique to the Civil Engineering career field are the roles played by both the FM and CFM: When dealing with personnel actions for field grade officers the FM receives input from the CFM or other stakeholders but remains the decision maker. For company grade officers, this role is fulfilled by the CFM, who serves as the chair during the fall DT meeting.

Officer assignment teams (OATs) serve as the execution arm of the force development process. Composed of members of a respective functional community, they are liaisons between those "in the field" and the personnel community. The Civil Engineering OAT resides at the Air Force Personnel Center at Randolph AFB, Texas, and is composed of one field grade and one company grade officer. For each DT meeting, the OAT determines the officers who will be meeting the board and conveys this information to the officer and their MAJCOM DT

Figure 2. Steady state vectoring for majors and lieutenant colonels



representative. The OAT compiles each officer's electronic record of performance, Airman development plan (ADP), and the single unit retrieval format (i.e., SURF), and performs an initial screening and quality review of this documentation. The team also prepares for open discussion with senior leaders on each officer meeting a respective board.

Senior raters, commanders, supervisors, and individual officers are at the forefront of professional development, providing critical input through ADPs for senior leaders to make an informed decision. The ADP is used to communicate assignment preferences; command, leadership, and career-broadening opportunities; and personal individual considerations for officers (second lieutenant through lieutenant colonel).

Updates from the Summer DT Meeting

Held Aug. 9-13, 2010, the most recent summer Civil Engineer DT meeting was a unique event, where military and civilian senior leaders met concurrently to convene their specific boards. Items discussed included career field health, officer mentoring, deployment operations, AFIT Distance Learning Programs, a proposal for a Civil Engineering Memorial, and revalidation of the Civil Engineer officer non-rated prioritization plan. The civilian board selected 12 individuals for developmental education; 7 for the Civilian Strategic Leadership Program and vectored 4 program graduates for their next assignment opportunities. The military boards selected 13 officers for intermediate developmental education, recommended granting in-residence credit to 5, selected 6 for senior developmental education, and selected 66 for squadron command (14 for major and 52 for lieutenant colonel). Steady state vectors were provided for 54 major-selects, 28 lieutenant colonel-selects, 43 graduating squadron commanders, and 12 squadron commander non-selects.

Keeping ADPs, E-records, and Education Up-to-date

To create an ADP, members can log in through the Air Force Portal, Virtual Personnel Service Center. This information is then transferred electronically to the Assignment Management System (AMS), also accessed through the Portal. After a DT meeting, feedback and vectors are loaded for each individual in AMS.

A main item reviewed and discussed at DT meetings is a member's electronic personnel record (e-record). Two sets of official personnel records are maintained for officers throughout their career. Hard copy records are used by promotion boards and are kept at AFPC by the Promotion Board Secretariat. E-records are used by DTs and come from the Automated Records Management System (ARMS). Members can access their ARMS record via the Air Force Portal; to request copies of official promotion board selection records, officers must send a signed letter via mail or e-mail to the following addresses: AFPC/PB, 550 C Street West Suite 5, Randolph AFB TX 78150-4707 or records.review@randolph.af.mil. The request must include name, SSN, address and reason for the request and must have an original signature (i.e., not an electronic signature).

Lt Col Arno Bischoff (right) assumed command of the 21 CES at Peterson AFB, Colo., after being vectored for squadron command at the previous year's Civil Engineering summer development team meeting. The 21 MSG commander, Col Emily Buckman (left), passed the 21 CES guidon to Lt Col Bischoff during the change of command ceremony. (photo by Mr. Larry Hulst)

Overall, the boards that recently convened were extremely competitive. In order to compete well, officers should ensure that their records are accurate, their ADPs are current and pushed to AFPC with their intentions included, and that they have continued to progress in line with their peers by completing advanced academic degrees and the appropriate level of professional military education.

For more information, visit the AFPC web site, AFI 36-2640 and the CE OAT web page at http://gum.afpc.randolph.af.mil/cgi-bin/askafpc.cfg/php/enduser/home.php. Once on the page select "Secure Apps" and log in, then select "My DP"; under the "Experience" heading, select "Assignments," then select the "My Career Field" tab; review related documents or attachments for updated information.

Capt Toliver is a graduated 32E OAT member and is currently an action officer for the Commander's Action Group, AFPC, Randolph AFB, Texas.

Building Ready Engineers

In-Garrison Construction Training Ensures Contingency Skills

CMSgt Rian Peaceman
HQ AFCESA/CEX

Air Force civil engineers organize and train to meet all contingency construction requirements, which have been in high demand since the buildup of forces in Southeast Asia in the 1960s. Prime BEEF teams were organized and equipped to respond within hours to worldwide emergencies and to support Air Force missions. At the same time, military civil engineers at many major Air Force bases provide a peacetime real property maintenance capability.

While the other services have chosen to use civilians or contractors to maintain real property and infrastructure, the Air Force has kept this peacetime military focus to maintain an organic construction capability. Essentially, we maintain our facilities and infrastructure to continue to hone our most critical skills. During Operations Desert Storm, Enduring Freedom, and Iraqi Freedom, the skill and effectiveness of Air Force engineers became obvious and we became known as the "installation civil engineer experts" to other services. Despite a shift to using civilian employees and contract vehicles, such as SABER, a solid core of senior enlisted members has been able to translate their peacetime construction experience into on-the-job contingency construction.

Civil Engineer leaders have recognized that the shift to use civilians and contractors will eventually degrade our ability to present our civil engineer forces as prescribed in joint doctrine. We must maintain our skills with in-garrison construction projects.

Section A2.1.1. of the "Prime BEEF Home Station Training (HST)" training table (see below) addresses the use of in-garrison construction projects to maintain our most critical civil engineering skills and prepare our Airmen for any emergency or contingency. (Training tables for AFI 10-210, *Prime Base Engineer Emergency Force (BEEF) Program*, are currently located on the Portal, but will be incorporated into AFI 10-210 in its next revision.)

The Air Force Civil Engineer's number one priority is "To Build Ready Engineers," and the multi-skilled construction project is the Base Civil Engineer's primary tool to ensure we build ready engineers. To ensure this tool is utilized, since December 2009, the requirement is reportable under the Status of Resources and Training System, or SORTS, and tracked in ACES-PR, as explained in the updated A2.1.1. table (see below).

CMSgt Peaceman is the Air Force Expeditionary Engineering Manager, HQ AFCESA, Tyndall AFB, Fla.

A2.1.1. Contingency Construction Training. HST for officer and enlisted personnel will include construction skills. Training will include routine operations; planning/design, horizontal/vertical construction; and construction management to enhance wartime construction skills. A unit must perform a minimum of two multi-trade construction projects every 20 months for active duty and 40 months for ARC. These projects must involve 32E3s, 3E5X1s, 3E6X1s and shall include at least three of the following six specialties: 3E0X1, 3E0X2, 3E1X1, 3E2X1, 3E3X1, and 3E4X1. Additionally, each listed specialty must be involved with at least one of these projects every 20 months for active duty and 40 months for ARC. A typical training project would be any small scale renovation/construction project of at least 500-1000 hours and meets the above noted AFS requirements. To support the tracking of the two required training projects, there have been two training requirements loaded into ACES PR (named "Contingency Construction" and "Contingency Construction 1"). To receive training credit for these projects in ACES PR, you input your 1st project completion date into "Contingency Construction" and the 2nd project completion date into "Contingency Construction 1." ACES will calculate [statistics] separately for Contingency Construction and Contingency Construction 1. The requirements will be loaded against the unit commander. This will provide SORTS data accurately for the progress of each requirement. Contracted/civil service flights are exempt from this training requirement.

SHOULD I STAY OR SHOULD I GO?

A report of Civil Engineering CGOs' deployment attitudes and intentions to remain in or leave the Air Force

Capt Kevin C. Riddel
3 CES/CEAO

Dr. Daniel T. Holt
Mississippi State University

Today's civil engineers are engaged in a dizzying array of missions, from rebuilding the infrastructure in austere places like Afghanistan and Iraq, to assisting in the response to natural disasters, to maintaining Air Force installations around the world. To fulfill these and future missions takes a dedicated force of officers and enlisted civil engineers and there are few areas within the Air Force that receive as much attention as the subject of retention. To help leaders of all organizations with retention, researchers have published more than 1,500 studies on the topic. Generally, research has concluded that decisions to leave any organization, including the Air Force, revolve around a person's current job satisfaction, commitment to his or her organization, and perceptions regarding other employment opportunities. Essentially, thoughts of quitting tend to arise when a person experiences dissatisfaction, triggering a comparison between the current job and alternatives (perceived and real). If this evaluation is favorable toward the organization, in this case the Air Force, thoughts of quitting tend to subside. Otherwise, they increase and individuals more actively search for other jobs and leave.

With this framework in mind, we examined the attitudes of our civil engineer company grade officers (CGOs), focusing on key attitudes that have been shown to trigger the process that individuals go through as they decide to leave the service. We invited civil engineer CGOs to complete a comprehensive questionnaire in January and February 2010. The table summarizes the study briefly. Of particular interest was the influence that deployment tempo has had, given that Civil Engineering officers were among the Air Force career fields with the highest deployment rates. As such, we focus this article on our findings regarding this issue.

Our analysis, which was based on responses from 432 CGOs (approximately 63 percent of civil engineer CGOs), revealed some unexpected findings. Like many, we hypothesized that CGOs would often plan to leave the service as their deployments rose. Indeed, a small fraction of officers (20 officers, or 5.5 percent of participants) made open-ended remarks explaining how the operations tempo was, or would become, a primary factor in their decision to leave the service. For example, one officer stated "While I have no problem going where the Air Force needs me, the tempo, if it continues to pick up to a 1:1 dwell ratio, will be very hard on my family. And, [if that is the case], I will not stay in any longer than my commitment." An overwhelming number of officers, however, viewed deployments favorably, indicating that deployment experiences actually encouraged them to stay in the service. Surprised by this, we went on to analyze the relationship between the number of deployments an officer reported and his or her turnover intentions, and observed no relationship. This suggests that in the worst case, deployments generally did not play a role in an officers' decision to leave the service and, in the best case, encouraged them to stay.

To help us better understand this finding, we compared the CGOs' satisfaction with their in-garrison job to their satisfaction with their deployed jobs. By a wide margin, officers found their deployed jobs more meaningful and, not surprisingly, viewed them as a chance to apply both leadership and engineering skills. One officer's comment describing his home station job was particularly salient: "I graduated … with a 'world class' education and I find that I'm in a programs office doing a job a high school dropout could masterfully perform." In contrast, officers typically said things like, "Deployments are arguably the best part of this career field" and "I enjoy the deployments because that is where we have the greatest impact on the mission."

Clearly, this suggests that leaders at all levels should examine the challenges that are presented to our junior officers while they are in garrison and between deployments. This presents real challenges as the deployment pace influences the CGOs ability to completely reintegrate into longer-term home-station projects. [ed. note: the following article (pp. 12-13), gives one BCE's perspective on challenging CGOs]

Still, we offer some general guidance that should be considered as base level jobs are given to CGOs. First, tasks should demand the use of several skills (e.g., technical and leadership skills) to be completed successfully. Along these same lines, jobs should help officers develop leadership skills by giving them the latitude to decide the methods used to accomplish tasks; consider using a delegate-and-disappear approach with the appropriate follow-up. Third, the task should be a whole and meaningful piece of work (i.e., the boundaries of the job are identified). Fourth, the outcomes of the work should have significance (i.e., make a difference to others inside or outside the organization). Finally, there should be some mechanism, ideally from the work itself, which conveys how the officer has performed (e.g., feedback). Most would recognize these characteristics in their deployment jobs, helping us understand why officers seem to enjoy deployments. But, leaders can easily examine CGOs' home station jobs and make every effort to ensure that these continue to meet the professional development needs of civil engineers.

Capt Kevin C. Riddel is deployed from the 673 CEG to Southwest Asia as an engineering officer. Dr. Daniel T. Holt, a retired Air Force civil engineer, is currently an assistant professor of management at Mississippi State University. This article is based on Capt Riddel's Master's degree thesis research at the Air Force Institute of Technology, where Dr. Holt was his advisor.

Table. Summary of the study and the questionnaire

Participants

The link to a 118-item web questionnaire was sent directly to e-mail addresses of 729 civil engineer CGO officers (42 messages returned as undeliverable) and we made every attempt to reach each CGO. We received responses from 432 CGOs. We tested whether our findings would be influenced by a systematic response bias and found that the sample represented the civil engineer CGO population accurately. For instance, the proportion of captains in our sample (47.5 percent) did not significantly differ from the proportion of captains that made up the list of officers invited to participate (49.8 percent).

Measures

We only included items in the questionnaire that research indicated reflected the attitude we were trying to measure. Unless noted, officers responded to items using a 7-point scale (1=strongly disagree, 2=disagree, 3=slightly disagree, 4=neither agree nor disagree, 5=slightly agree, 6=agree, 7=strongly agree).

Specific Attitudes Measured

Attitude	Definition	Example Questionnaire Item
Turnover intentions	Extent to which members intend to stay in the Air Force	"I am thinking of leaving the Air Force when my commitment is up."
Job satisfaction	Extent to which people like or dislike their jobs	"My job is enjoyable."
Organizational commitment	Extent to which members are attached to the Air Force	"This organization deserves my loyalty."
Civilian labor market perceptions	Perceptions regarding job alternatives	"There really aren't very many jobs for people like me in today's job market."
Deployment attitudes	Perceptions regarding deployment number, length, and frequency	"Overall, how satisfied are you with your deployment experience (i.e., consider the number, length, and frequency)?" [Participants indicated level of satisfaction from 1 to 7]
Work-family conflict	Extent to which members feel there are conflicts between work and family life	"The demands of my work interfere with my home and family life."
Perceived organizational support	Extent to which members feel Air Force cares about their well being	"This organization cares about my opinions."
Quality of life	Extent to which members are satisfied with several dimensions of Air Force life (outside of work)	Residence , schools, health care support, recreational facilities, and support
Individual characteristics	Demographic information	Education, marital status, children

A Challenge to BCEs: Challenge your CGOs

Col David C. Piech
HQ AFCESA/CEX

Base civil engineers face numerous and diverse challenges every day, from managing millions of precious dollars to ensuring the health, well-being, and development of every member of their squadron. But, there is no greater feeling of success I've experienced than commanding three different squadrons, each with its own unique personality.

Although the structure of a civil engineer squadron varies slightly, the core of any unit is the people that make it tick. From the career civilians to the newest airman basic, the BCE and squadron leadership team must accomplish monumental tasks involved in keeping a base running, such as keeping deteriorating infrastructure operational, complying with environmental laws, and ensuring custodial and landscaping work occurs and is done correctly.

On top of these daily challenges, BCEs must ensure that their people are challenged, trained and equipped. All too often, commanders can unintentionally ignore or dismiss the basic needs of their company grade officers (CGOs). I can recall being a young second lieutenant on a Strategic Air Command base and questioning severely how measuring the height of street signs and spray painting the bottom of sign posts where the weed whips tore up the paint could possibly help me become a leader and someday, a BCE. Now, as I look back I understand better that any opportunity to lead — even a six-person "Project Windshield" team spray painting the backs of signs and sign posts "Creech Brown" — set me on a path to succeed not only as an Air Force officer but as a person.

Deployments offer many opportunities to accomplish projects from design to ribbon-cutting, as well as interaction with other government and service organizations. In 2006, the 92 CES's deployment to Operation Iraqi Freedom was our chance to put our expeditionary skills to work. My lead team included three CGOs (a captain and two second lieutenants) and a majority of my SNCO leadership, including my chief enlisted manager and first sergeant. My captain had deployed once before but her in-garrison work had been primarily in environmental compliance and neither of the lieutenants had any ops experience. To them the chief was a crusty old guy who had no time for them. Having the ideal opportunity to deploy as a squadron, I challenged my CGOs with duties and tasks they had never experienced before with the only recommendation being, "if you don't know, find someone who does and learn." The desired outcome was presented clearly but the method to accomplish was solely placed on their shoulders. My SNCO corps was more than a little nervous, but it wasn't long before the CGOs and SNCOs developed into a superior team and tasks and projects were being executed like a well-oiled machine.

During the Officer Education Course (OFE) at the Silver Flag Exercise Site, Tyndall AFB, Fla., a second lieutenant learns how to utilize heavy equipment to construct an earthen berm containment system for POL bladders. All new civil engineer officers are required to take AFIT's WMGT 1010 (Air Force Civil Engineer Basic Course), which concludes with a week-long OFE course. (photo by Ms. Teresa Hood)

The opportunities for CGOs to lead a team at home station can be limited.

I know firsthand that as a BCE, all too often it's easier to assign an NCO a duty such as being the representative for the Combined Federal Campaign (CFC) or Air Force Assistance Fund (AFAF) in order to "knock it out" quickly. But, I argue the contrary: any opportunity that teams a CGO with the enlisted force affords a lesson that will benefit the future of our Air Force. While being the lead for the CFC, AFAF, or a change of command or retirement ceremony isn't covered in college courses, some of the most valuable leadership lessons are learned in accomplishing these tasks. With the current requirement to accomplish two complete in-house work orders as SORTS reportable [see article, p. 9], our CGOs now have the opportunities to develop, plan, and execute a complete project and learn not only how to pull off a project but how to become a leader through delegation and accountability.

There is no question that most gratifying experiences of putting our book knowledge to work and seeing it rise up out of the ground before our eyes are earned through the challenges of executing our expeditionary mission. Most of us become engineers because we enjoy a chance to think on our feet and get dirt under our fingernails; we enjoy the challenges. The real task is how to keep them coming.

Leadership owes it to our future leaders to keep the challenges fresh, whether they're Physical Training Leader duties, developing and executing a work order, executing base-wide cleanup, running the squadron Exercise Evaluation Team, or even collecting donations for the CFC. We cannot use the excuses that ops tempo or schools for our young CGOs prevent them from being able to take ownership of a program or process or that it's quicker to rely on the experience of our civilians and SNCOs.

We as leadership cannot take our eye off of the future of our profession. In between the endless meetings, hundreds of emails, and endless "drive-by" taskers, take the time to challenge your CGOs. After all, we were them once and the question of "Why is this important?" is asked today just as much as we asked it 20 years ago.

Col Piech is the Chief, Readiness Support Division, AFCESA, Tyndall AFB, Fla.

New civil engineer officers conduct a turbidity test on a ROWPU system as part of an OFE class at Tyndall AFB's Silver Flag Exercise Site. The OFE classes provides hands-on training in force beddown, rapid runway repair, disaster preparedness, services, fire rescue, bare base assets, and command and control. (photo by Ms. Teresa Hood)

Some tips that worked for a graduated BCE:

- Always assign a CGO and NCO to a task no matter how insignificant it may seem; the lessons learned by each are invaluable.
- Never let opportunities go by to showcase the diverse talents of your people; expose them to senior leadership early and often.
- State the expected outcome and let the team determine the process; provide guidance but don't over steer the ship.
- Be an "option picker" not a process dictator.
- Challenge your SNCOs to assist in a CGO's development. Simply asking, "What does the chief or shop foreman think?" provides the opportunity for a mentoring moment, no matter how simple the task.
- Put your CGOs in the shops to benefit them and the troops. A CGO's in-garrison duties are important, but give them the time to learn to climb a pole, fight a fire, drive a bulldozer, or even frame a building. If you keep them behind a desk you are not doing them, your unit, or the Air Force any good.

Reserve Options for Prior Service Enlisted Airmen

CMSGT Trevor Shattuck
HQ AFCESA/CFM IMA

An article in a previous issue of the *Air Force Civil Engineer* magazine examined mentoring active duty officers into the Air Reserve Component ("Strengthening the Total Force," Vol. 18, No. 2). While much of the information in that article holds true for the enlisted force as well, there are some differences, which are discussed here.

Considering Reserve Component Programs

The Air Force Reserve Command (AFRC) has a long history of utilizing prior active duty enlisted as a corps for the Reserve components. As the percentage of non-prior service accessions has increased from 11.7 percent in 1995 to 42.7 percent in 2010 (see figure), the need for trained enlisted leaders in the Air Force Reserve grows. For active duty enlisted, the Air Reserve Component (ARC) is a viable option: they can continue to serve their country while utilizing their active duty training and experience. With current factors such as reduction in active duty end strength numbers and economic conditions, staying a member of the Air Force's Total Force family makes financial sense, too.

Air Force Reserve Programs for Enlisted

There are several part-time and full-time AFRC programs to consider for enlisted Airmen leaving active duty. The part-time programs available are Traditional Reserve (TR) and Individual Mobilization Augmentee (IMA). The TR program is the more popular for prior service Airmen, offering a good part-time income while requiring a commitment of only 15 days of active duty for annual training and one weekend a month for organized unit training assembly. The IMA program allows more flexibility; IMA members support active duty components and typically do 24-36 days per year (combination of individual and active duty training days). For active duty enlisted Airmen affected by high year of tenure (HYT), the part-time Air Force Reserve programs offer a HYT of 33 years from initial enlisted pay date.

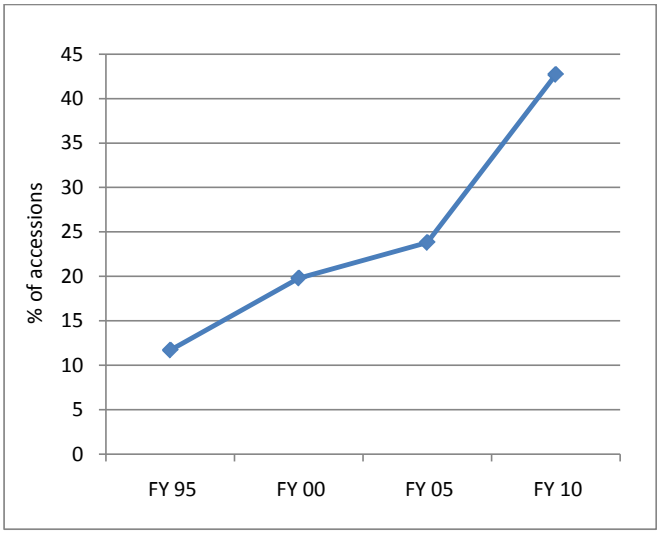


Figure: *AFRC non-prior service accessions*

The full-time programs available are Air Reserve Technician (ART) and Active Guard and Reserve (AGR). The ART program merges a full-time civil service position with a part-time TR position, and provides continuity for the Reserve Command. Units typically have a junior enlisted and senior enlisted ART, who oversee day-to-day operations. The ART program gives service members the possibility of achieving a reserve as well as a civil service retirement. Some enlisted members in the ART program can serve up to age 60.

The AGR member's position is similar to that of an active duty counterpart, with the exception of the permanent change of station aspect; AGR positions can be 3- to 4-year commitments. Enlisted AGR positions conduct day-to-day operations and are located throughout AFRC, at training venues as well as wing and headquarters levels. Both the ART and AGR programs offer a degree of full-time income stability not guaranteed in the TR and IMA programs.

Enlisted Force Development within the AFRC

As part of the Reserve Command's enlisted force development, each AFRC enlisted career field manager will conduct annual development team reviews for their functional areas for staff sergeants through master sergeants, with major participation from wing-level senior NCOs. Prior enlisted Airmen can apply their Enlisted Development Plan to the Reserve Enlisted Development Plan, or R-EDP, continuing to develop their military career and serve their country.

Airmen considering a reserve military career after active duty should talk to a recruiter *before* leaving active service.

CMSgt Shattuck, a member of the Air Force Reserve, is the individual mobilization augmentee to the Civil Engineer Career Field Manager, HQ AFCESA, Tyndall AFB, Fla.

Common Operational Picture for Installations' Emergency Response

Maj Matthew Beverly
HQ USAF/A7CXR

Mr. Rand Singleton
HQ AFCESA/CEXR

For several years, the Air Force has been looking for a standard installation-level emergency response common operational picture (COP) to provide commanders reliable, accurate, and dynamic situational awareness for response, management, and recovery. In June 2007, AFSPC led the first formal Air Force effort to review existing commercial emergency management software. This meeting resulted in nine recommendations and several findings, including two important ones: 1) end-to-end requirements had not been defined and 2) no software met all of the needs evaluated.

Incorporating the recommendations, AFCESA's Emergency Services section headed an integrated process team (IPT) to define the data requirements for a COP. Senior leaders from Security Forces, Fire, Emergency Services, Medical, Emergency Management, and the Command Post met to identify and categorize a standardized list of requirements:

- Usability/enhance mission
- Create/manage additional incident specific data
- Access/import existing geographical data
- Create/manage geographical information
- System information/netcentric
- Shared information/data
- Interaction with other authoritative sources
- Accept/display streaming video
- System Support/Sustainment
- Create records (history/reports)

The IPT came up with 42 needed capabilities and 2 mandatory compliance capabilities to meet the requirements identified by the field. An Emergency Response Operations Data Requirements Team then began evaluating existing systems with a focus on government-off-the-shelf (GOTS) capabilities.

The team reviewed 14 Air Force installation-level tool sets and 6 county and 3 state emergency operations center tool sets and processes, refining and validating requirements during the process. The team quickly found that what was most important varied widely among regions and functional communities. To better qualify the needs of the Emergency Response Operations Community of Interest (ERO-COI), a standard scoring analysis was created. A data call was put out to all MAJCOMs asking that every emergency support function rate the list of capabilities. AFSPC led the analysis and, in August 2008, provided a report, "USAF Emergency and Incident Management Systems: A Systematic Analysis of Functional Requirements."

Although the common assumption was that geographic information systems would be the best platform to provide a COP solution, the report findings clearly did not support this. The systems have the ability to integrate a wide range of data, implement models, and display information as maps; however, they lack the ability to produce a multiple event log, a requirement that was ranked either one or two by all organizations.

Also in 2008, the Air Force's Force Protection Steering Group (FPSG) officially tasked the Security Forces and Civil Engineering (Air Force lead for EM) communities to lead a cross-functional team from Headquarters Air Force, MAJCOMS, and installations to provide a recommendation for the Air Force standard emergency response COP. The team worked directly with the ERO-COI developed capabilities and reviewed countless systems.

Within a short period of time, two GOTS systems that incorporated a majority of the requirements rose to the top: the Unit Level /Unit Command and Control w/ Integrated Information Management System (UL/UC2w/ IIMS) and the Integrated Defense Command and Control Common Operational Picture (IDC2COP). IIMS is the mapping component of UL/UC2.

ACC is the lead command for UL/UC2 operations and manages IIMS; UL/UC2w/IIMS was already scheduled to be installed at installations with combat missions by the end of 2010. IDC2 is managed by the Air Force Security Forces Center and has already been installed at Spangdahlem AB, Germany, as part of the Joint Force Protection Advanced Security System Joint Capability Technology Demonstration. Individually, these systems met over 90 percent of the team's capability requirements. Combining the programs would meet all requirements as defined by the ERO-COI, including eliminating dual data entry.

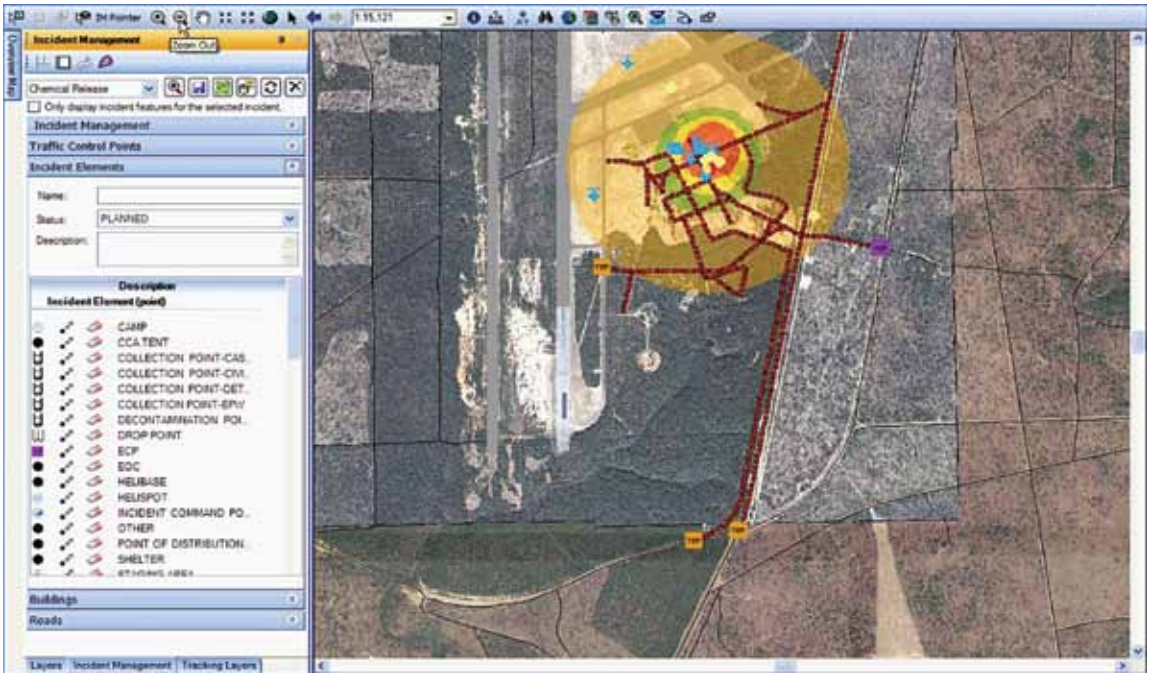
This recommendation was presented to the FPSG through a tactical demonstration. T he FPSG senior leadership directed that IDC2COP's tactical capabilities be integrated with UL/UC2's mission-based, operational reporting capabilities to field one system. On June 4, 2010, the FPSG approved the system selection.

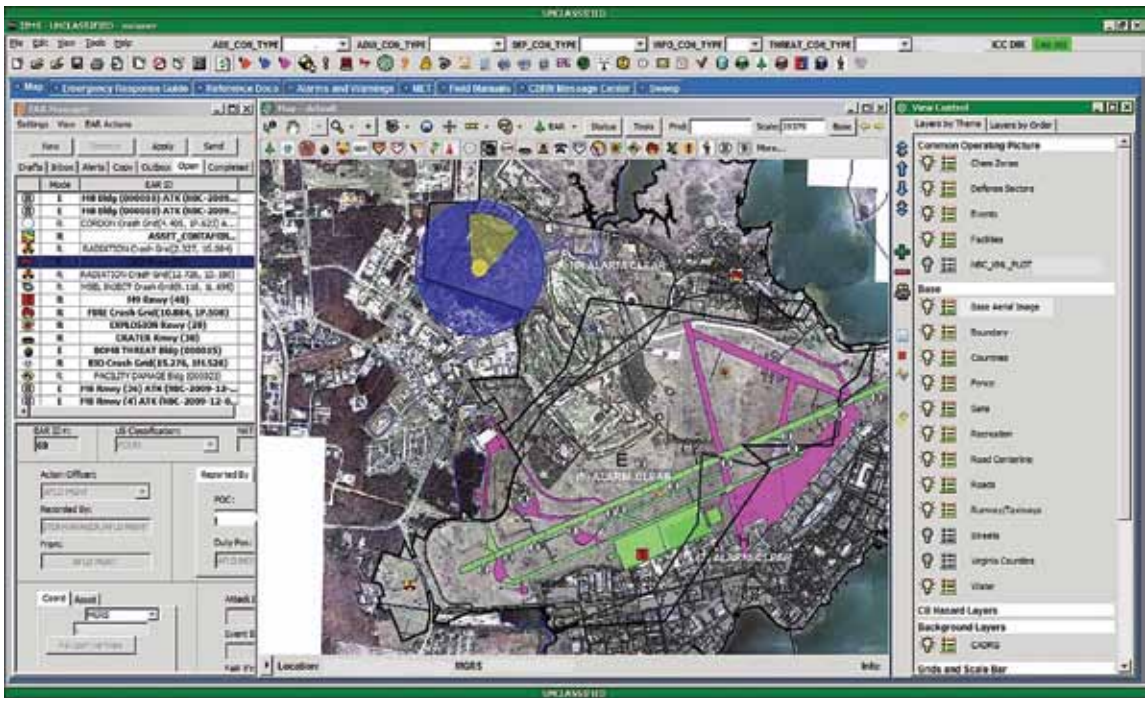
Fielding expected to be completed by end of 2015. Cross functional, Air Force-wide support for this initiative is vital, as it will ensure significant efficiencies are realized and emergency response operations capabilities are maximized.

Until the Air Force solution is fielded, installations are expected to continue using existing information technology capabilities. For example, PACAF has developed and currently uses a program they call Air Force Incident Manager (see article p. 17).

Virtual Operations Center (VOC) is provided by the Air Force as an interim solution and is currently used at over 50 bases. VOC utilizes SharePoint and specifically designed templates that can be modified for installations needs, and other than manhours, it's free to the user.

Maj Beverly is Emergency Management section chief, Office of The Air Force Civil Engineer, Washington, D.C.; and Mr. Singleton is a contractor providing support as the manager of the COP and VOC programs in the Emergency Management Branch, AFCESA, Tyndall AFB, Fla.





Top: *Screen shot of the Installation Defense Command and Control common operational picture utilized by first responders. (U.S. Air Force graphic courtesy of Maj Aaron Guill)*

Bottom: *Screen shot of the Integrated Information Management System within Unit Level Unit Command and Control system being displayed at EOC and leadership levels. (U.S. Air Force graphic courtesy Mr. Rob Liles)*

PACAF's Air Force Incident Manager

TSgt John Spence, 374 CES/CEPT
Jeffrey LaRocque, PACAF/A7RT
Michael Broten, 647 CES/CECD
Peter Kloehn, 8 CES/CEPT

Over the past four years, several PACAF bases have configured a plug-in to their web-based dynamic mapping software (ESRI's ArcIMS) to give emergency and contingency responders customized NIPRnet map services during base-wide exercises and real world events. In early 2010, PACAF integrated the various main operating base configurations (notably Yokota and Misawa ABs, Japan; Kunsan AB, Korea; and Hickam AFB, Hawaii) into a standardized solution — the Air Force Incident Manager (AFIM).

PACAF added simple editing tools to Geocortex Internet Mapping Framework (IMF), an extension to ArcIMS, to allow for quick plotting of incident events, cordons, stand-off distances, emergency response vehicles, vehicle routing, traffic/entry control points, and installation sector alarm and MOPP conditions.

As part of PACAF's ongoing GeoBase development effort, the IMF extension has routinely and successfully been employed to provide highly customizable user-friendly, browser-based map services. In fact, because of its flexibility and cost effectiveness, the same ArcIMS/IMF solution has been chosen to provide initial operating capability for the planned standard Air Force "GeoBase Viewer."

The resulting AFIM interface and map services provide quick access to all relevant GeoBase hosted layers and allow authorized emergency support functions (ESFs) to plot dynamic events through their respective interfaces. Any authorized NIPRnet user can access an AFIM map service to view active events and gain situational awareness. CAC-based user access controls allow differential access.

IMF and AFIM are designed to be intuitive and easy to learn. An AFIM user can become proficient at leveraging the various capabilities with minimal training within minutes rather than hours. GeoBase offices typically provide 15- to 30-minute of training for various ESF functions.

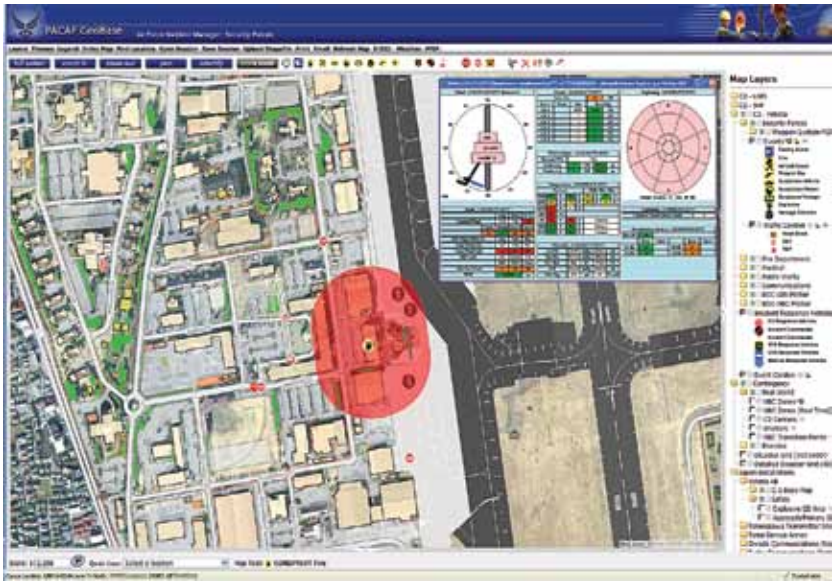
AFIM has already been successfully used during several exercises and real world events, especially at Yokota AB. During a 2009 operational readiness inspection, inspectors disabled the Theater Battle Management Core Systems-Unit Level (i.e., the common operational picture). Within minutes, the AFIM interface was used successfully to track real world and exercise events. In July 2010, AFIM played an important role in mitigation and recovery during a flash flood event. In both instances, ESFs could efficiently leverage their interface jointly with their unit command centers.

While AFIM is considered an interim solution, it has firmly established itself as a highly reliable contingency capability within PACAF. Where other systems require frequent manual updates from multiple data sources, AFIM leverages the GeoBase enterprise system to provide a current picture of the installation and its infrastructure. Automatic daily downloads of ACES real property and facility manager information are quickly accessed.

PACAF installations continue to lean forward, refining interfaces to further enhance each ESF's mission and capabilities. Future improvements to AFIM will include better database extensibility; enhancements to the facility locator, traffic routing, plotting, and event-tracking tools; refinements to wind direction and speed displays; and development of an overall incident tracking and archiving capability.

For more information regarding AFIM and it capabilities contact PACAF/A7RT at DSN 448-2885 or DSN 226-5049.

TSgt Spence is the Chief of Programs Technical Support, 374 CES, Yokata AB, Japan; Mr. LaRocque is the PACAF Technical Architect, HQ PACAF, Hickam AFB, Hawaii; Mr. Broten is the GeoBase Administrator, 647 CES, Hickam AFB; and Mr. Kloehn is the GeoBase Administrator, 8 CES, Kunsan AB, Korea.



Base Defense Operation Center managers can quickly assess and support on-scene commanders with information regarding optimal ECP and TCP placements, scale of the incident, coordination of support units, and facility real property data, as well as continuous live weather data. (U.S. Air Force graphic courtesy of TSgt John Spence)

the PROOF is in the

Expeditionary Prime BEEF Squadrons in Afghanistan reinforce their concept with hard work and know-how

PRODUCT

Capt Ben Carlson
Lt Col Randy Whitecotton
Lt Col J.D. Brands
777 EPBS

Maj Eric Sosa
877 EPBS

Air Force civil engineers have consistently been in high demand to satisfy CENTCOM requests for forces in support of ground operations in Afghanistan. In the past, civil engineers were most often deployed as members of Facility Engineer Teams (FETs), under the operational control of specific sister service units at specific forward operating bases (FOBs). Because of their accomplishments, the demand for Air Force engineers threatened to outpace the availability of the manpower to sustain them, yet Air Force senior leaders had no authority to balance FET manning to address differences in workload or changes in operational missions.

The Air Force Civil Engineering community envisioned a new approach focused on theater and regional priorities, with Airmen working for Airmen having the flexibility to move among FOBs and across regions to satisfy the most pressing operational requirements of the ground force commanders. Thus, the concept of the Expeditionary Prime BEEF Group was born.

Established at Bagram Airfield on Sept. 18, 2009 — coincidentally the Air Force's birthday — the 577th Expeditionary Prime BEEF Group (EPBG) was given operational and tactical control of two subordinate squadrons: the 577 EPBS at Bagram and the 777 EPBS at Kandahar Airfield. Following the announcement of further U.S. force expansion, in March 2010 a third unit, the 877 EPBS, was established at Mazar-e-Sharif. Each EPBS was organized to provide master planning, programming, design, surveying, contract construction management, and light vertical construction.

Supporting Hamkari Baraye Kandahar

In February 2010, an early "proof of concept" opportunity arrived with a tasking to expand five existing, but undersized, FOBs in support of Hamkari Baraye Kandahar (Cooperation for Kandahar). This Afghan partnering initiative reinforces the counter-insurgency tenets of securing the local populace and aiding the Afghan government's ability to care for and govern the citizenry of this key city. Engineers from the 777th moved forward to assess the FOBs, then returned to Kandahar Airfield to master plan, program, and design all construction activities for the force expansion ahead of surge forces.

U.S. Army 1st Lt. Steven Reis surveys the area beyond the walls of Access Control Station 2, Kandahar City, Afghanistan. Civil engineers from the 777 EPBS helped build and fortify the guard station. (photo by MSgt Samuel V. Ameen)

An Afghan child sits with an elder while their village in Afghanistan receives humanitarian aid from the Afghan Border Police and Afghan elders as part of Hamkari Baraye Kandahar, an Afghan government-led initiative. (photo by TSgt Michele A. Desrochers)

Using this "hub and spoke" approach allowed the engineers to simultaneously plan the five (later nine) FOB expansions with a consistency of approach and standardization of design. Squadron craftsmen used the same approach to provide light vertical construction talent. Small teams of experts flew out to FOBs, directed construction and beddown activities, and served as a force multiplier by coaching infantry soldiers to erect their own tent cities.

The heart of the Hamkari Baraye counter-insurgency effort is helping the Afghan government connect with Kandahar's people, to listen and respond to their needs and deliver improved security, governance, and economic opportunity. This requires safe facilities for Afghan security forces and ministerial civil servants within Kandahar's communities. In the spring of 2010, the International Security Assistance Force (ISAF) Joint Command identified Hamkari Baraye as the number one theater priority, and U.S. military engineers were enlisted to deliver the Afghan vision for a Security Ring Protection Force around the city, located at critical entry points, and upgrade key government ministry facilities.

In May, the 577 EPBG realigned engineers from the 877 EPBS to augment the 777th's Hamkari effort. Working with their Army and Navy counterparts in Task Force Alliance (TF-A), these Prime BEEF engineers conducted site reconnaissance and assessments at dozens of police traffic checkpoints and substations throughout Kandahar. Most locations were little more than a dilapidated building and a small compound surrounded by deteriorating sandbags, gabions, and concertina wire. The teams recorded, measured, and scoped numerous site and force protection improvements. Multiple survey-grade GPS "rovers" enabled engineers to quickly capture precise data at each site while under the watchful eye of U.S. or Canadian military police security details. Executing EPBS design with TF-A troop labor, the first security stations were upgraded and expanded within weeks of reconnaissance.

Prime BEEF engineers also convoyed to numerous government facilities to assess force protection measures and recommend enhancements. Mindful of the effect of a community building walled off from the citizens it serves, EPBS engineers and planners avoided using the gabion barriers and stark concrete T-walls common in "war-zone" designs and incorporated force protection features such as landscaped berms, architectural stone and screening walls, bollards, blast-resistant glazing, and other less obtrusive elements.

Prime BEEF Muscle Seals the Deal

While the squadron juggled the engineering demands of Hamkari, Triple-Seven troop labor earned a reputation as Regional Command-South's premier beddown assistance team after bedding down more than 3,000 2nd Brigade 101st Airborne Division (2/101) personnel in less than three weeks. Craftsmen from the 777th traveled to combat outposts and provided technical expertise to the 2/101 and the 864th Engineer Battalion, Naval Mobile Construction Battalion. More than $28M in war reserve materiel assets were inventoried and soldiers and sailors were taught tent deck construction, small shelter system, and TEMPER tent erection, and electrical and utility distribution, as well as proper preventative

maintenance and inspection of generators. Structures craftsmen pre-cut almost 240 trusses for Southwest Asia huts to house the 2/101 at a forward combat location, then Prime BEEF from every trade deployed to this location for more than a month to complete the largest vertical construction project the 777 EPBS has seen to date.

The 777th also took on efforts to beddown personnel of the 1st Battalion of the 71st Cavalry Regiment (1-71 CAV) in direct support of Hamkari Baraye Kandahar. Deploying south of Kandahar City, the Engineering Flight validated the master plans before turning the project over to the Operations Flight. A separate team traveled to four additional 1-71 CAV strong point locations to conduct life, health, and safety (LHS) repairs and electrical upgrades. As of mid-September, the 777 EPBS had assessed, repaired, and improved LHS at 47 FOBs, supporting 10 separate combat units within 7 separate task forces and a total of nearly 25,000 Soldiers, Marines, Sailors, and Airmen.

As the Kandahar City Hamkari security ring reached initial operational capability, 777 EPBS troop labor played a key role in the beddown of ISAF and Afghan National Civil Order Police forces. Personnel traveled to staging areas at FOBs in Kandahar City to test power generation systems and small teams of skilled craftsmen deployed forward to construct tents, place electrical and power generation assets, and install utility systems.

Acclaim and Fame for Squadron and Group

In late-May, a team of 777 EPBS craftsmen was presented on-the-spot Army Achievement Medals by a grateful 2nd Army regiment commander at a combat outpost. In five days, the six-person team completed major electrical repairs that the customer had been trying to accomplish for five months.

The leadership of the 22nd Naval Construction Regiment, the lead unit of TF-A, has called the 777 EPBS "Afghanistan's 9-1-1 Engineer Force," for their outstanding engineering support across the TF-A area of operations.

The successes of the 777 EPBS in Southern Afghanistan exemplify the impact of the 577 EPBG as a whole. The group and its squadrons have provided significant support to Afghanistan's commands. Prime BEEF engineers have made a difference in the lives of U.S. military personnel at more than 80 FOBs, combat outposts, camps, and strong points and ensured the safety of the Afghan government and its citizens at scores of police facilities and government buildings. While there never seems to be enough engineers to meet every demand, the Expeditionary Prime BEEF construct has emphasized that when it comes to providing contingency engineering support there's a good way, and then there's better.

Capt Carlson is the Operations Flight Chief, Lt Col Whitecotton is the Deputy Commander, and Lt Col Brands is the Commander, 777 EPBS; Maj Sosa serves as the 777 EPBS Hamkari Planning Cell OIC.

Photo left: *A member of the 777 EPBS records GPS coordinates while surveying a location near Kandahar. (U.S. Air Force photo);* ***Photo center:*** *At Access Control Station 2, Kandahar City, Afghanistan, SSgt Joel Carrera, left, and TSgt Mathew Bashaw, both utilities technicians assigned to the 777 EPBS cut trusses for a medical aid station.* ***Photo right:*** *777 EPBS Airmen build a medical aid station. (photos by MSgt Samuel V. Ameen)*

energy initiatives expeditionary

Mr. Rod Fisher
Mr. Richard Peck
Maj Paul Sand
HQ AFCESA/CEXX

Leading the way in energy conservation is nothing new to the Air Force. A majority of installations have successful programs in place that increase renewable energy use and reduce overall energy demand. The same cannot be said for our expeditionary bases, but that may soon change. Initiatives are now underway to make the Air Force's most fundamental contingency base support program — BEAR — more energy efficient using newer technology. In a contingency setting decreased energy use equates to increased security: fewer requirements for resources, manpower, and convoys.

The BEAR — Basic Expeditionary Airfield Resources — Program provides expeditionary base facilities and equipment for beddown in austere locations. The initiatives discussed here target energy efficiency in both facilities and equipment used by BEAR.

AFCESA and the Air Force Research Laboratory at Tyndall AFB, Fla., began evaluating solar flys installed over typical tent shelter type structures in 2008; they tested regular, heat-shielding flys as well as flys covered with photovoltaic (PV) solar panels that generate power. Results were encouraging: the PV flys generated a peak of over 3kW of power and provided a 26-percent reduction in energy demand by reducing solar loading.

Based on these results, in 2009, BEAR provided funding for Air Force participation in the Net Zero Plus Joint Capability Technology Demonstration (JCTD) located at Ft. Irwin, Calif. With participation by the Army, Marines, and Air Force, the JCTD's objective is to reduce fuel consumption at forward operating bases and expeditionary bases.

The Air Force has four instrumented shelters to test different combinations of regular solar flys, solar flys with PV panels, and insulated liners to determine the best combination for improving the thermal performance of the shelters. The Army has seven shelters and the Marines have three shelters to test various liner and solar shade combinations. Solar power generation will provide additional energy savings, as will improved efficiency of environmental control units (ECUs). Different ECUs are also being evaluated to compare output and energy efficiencies.

Photos (left to right) *Example of a Solar Integrated Powered Shelter System using an Utilis shelter. Inside of an Utilis shelter with an insulated liner and air conditioning plenum. An Alaskan shelter with a new solar fly that reduces thermal loading. (U. S. Air Force photos)*

for bases

Testing data and analysis are being shared among the Services. The Air Force's main goal is to develop a Solar Integrated Powered Shelter System (SIPSS) that improves energy efficiency by 50 percent and generates at least 3kW of solar power. One objective with the SIPSS is to cool two tent shelters with one ECU compared to our current one-on-one. This could result in a 50-percent reduction in the number of ECUs at an expeditionary base, with a potential energy savings of up to 2.25 megawatts at some of our large expeditionary bases — potentially enough to power a 600-person camp.

The BEAR program office has also funded an initiative called the Integrated Smart BEAR Power System (ISBPS). It will essentially be a smart micro-grid, integrating renewable energy sources into our current BEAR electrical grid while providing technicians the capability to effectively manage power. When the power demand on an expeditionary base exceeds the power plant's capability, civil engineer technicians have to scramble to execute load shedding plans before the entire BEAR power grid fails. With the ISBPS, automatic load shedding can be preprogrammed into the BEAR power system, ensuring uninterrupted operation of critical facilities and allowing technicians to implement other corrective measures to prevent a catastrophic base power failure.

Another program on the horizon to improve energy efficiency is the BEAR Power Unit (BPU), which is the replacement to the current and less fuel efficient MEP-12 750Kw generator. The BEAR Weapon Systems Office awarded the BPU contract earlier this year and our Power Production technicians have been working with them to guarantee a quality product. The BPU, an 800kW Prime Power-rated generator, has the most advanced power generation technology used in today's power generation systems and uses an electronic computer-controlled fuel injection system.

When deployed into our future BEAR bases, all of these systems will significantly reduce the total energy demand. This will reduce fuel requirements, which will reduce convoys, and which, ultimately, will reduce the risks to our most valuable resource — people, including Service members and support personnel.

Mr. Fisher and Mr. Peck provide contract support as the BEAR Modernization Program manager and a BEAR Program analyst, respectively, and Maj Sand is the Chief, Expeditionary Engineering Programs at AFCESA, Tyndall AFB, Fla.

Insulated Concrete Forms Are a Quick and Green Construction Alternative

1Lt Carlos Nixon
451 ECES/CEP

When the requirement came down for new administrative space at Camp Davis to support Kandahar Air Field's flying operations, the winning bidder decided to use an unusual construction method — insulated concrete forms (ICFs).

ICFs would provide quality construction while still meeting DOD environmental standards, but for us, they offered benefits beyond their biggest claims of simplicity and speed. Like the rest of Kandahar Air Field (KAF), Camp Davis is dusty, windy, loud, and hot. The blast protection, near R40 insulation, and sound-proofing furnished by ICFs made them an excellent choice for our mission requirements, and their "green" attributes a wise choice for our environmental goals.

Working with ICFs: Simplicity and Speed

Imagine a small I-beam section with the center flange or rib made of black plastic and a white expandable polystyrene (EPS) or Styrofoam block on either end. Now imagine snapping one I-beam section on top of another creating a tall skinny segment and then placing two segments together to build your wall. Sounds a lot like playing with Lego® building sets as a kid, and if it weren't for the Afghan summer sun and the occasional rocket attack our construction with ICFs would essentially be just that: grownups playing with grown-up Lego blocks.

ICFs are simple to assemble. All you do is grab a plastic rib and attach a white EPS panel on each end, making sure that the top-and-bottom interlocking sections are going in the right direction. Once the foundation is laid, with the appropriate rebar sticking out, you bolt down a metal rail and start stacking the blocks. The real time savings, though, is after the concrete is set and you tear down the forms. Since the EPS is the form, you just remove the supports and walk away until you want to give the wall its finish. Fewer forms means less wood, less wood means less clutter, less clutter means time saved and smaller construction footprint.

Protection, Insulation, and Soundproofing

At the Force Protection Equipment Demonstration (FPED) IV at Quantico Marine Corps Base in 2003, ICFs were put to the test by being subjected to blasts from a 50-pound TNT equivalent charge at distances ranging from 6 to 40 feet. The ICF test specimens were designed as three 8-by-8 foot walls arranged in a U-shape with 6-inch thick concrete slabs and roofs. The fourth side, or back, was left open to allow for post-blast inspection of the interior. Although ICF walls are typically finished with stucco, brick, or wood siding, no exterior cladding was used so that the walls were exposed to the full brunt of the explosive charge. Evaluation after each blast determined that none of the specimens experienced catastrophic failure; in fact, all the assemblies were readily lifted by the crane after the demonstration. As pointed out by the well-known adage, "mechanical engineers build weapons, civil engineers build targets," no construction method ensures indestructibility, but the FPED IV results showed that ICFs build very sturdy targets.

The ICF walls themselves perform similar to a wood-framed wall with R30 insulation, but when air infiltration is taken into account the actual R-value is higher, near R40. ICF walls eliminate air leakage, which can represent 20 to 40 percent of the heat load requirements of a typical wood frame

Similar to LEGO® building blocks, the ICFs snap together one on top of the other, with each segment adhered to the other with glue, to make a wall. (U.S. Air Force photo)

building. The most notable effect of the near R40 insulating value of ICFs is in the reduced size of the required HVAC units. A one-ton unit will suffice where a four-ton unit would usually be required, saving on purchase and operating costs and increasing options in an environment where HVAC systems are in high demand. However, the insulating properties of ICFs provide benefits even before the occupants turn on the air conditioning. The foam creates a thermal barrier that allows the builder to pour concrete at any time of day, providing valuable flexibility to stay on cost and on schedule at contingency locations.

Jet noise is called the sound of freedom by some and a nuisance by others. Either way, love it or hate it, on KAF, jet noise is the theme music running in the background. With a sound transmission class rating over 50, ICFs provide refuge from the KAF "soundtrack" but still let the Giant Voice be heard.

Green Value

On the environmental front, ICFs can be considered green when certain elements are taken into account. The EPS and the plastic ribs must be made of recycled plastic. Transportation adds to their carbon footprint but this is offset because they are lightweight and require much less use of wood, which is in short supply in Afghanistan. Because ICFs contain no nutritional value to pests or vermin, and are filled with concrete, their useful life – and the time to accumulate energy savings – is much greater than wood buildings.

Pros and Cons

ICFs have many advantages, some are unique and some are shared with other concrete construction methods, but they also have some disadvantages. Afghanistan does not currently have the capability to produce ICFs, so they must be shipped in from the United States or Europe. ICFs are not as common as cinder blocks or wood but they create buildings as durable as cinder block and as easily as wood. They provide a defensive shield, a thermal shield, and an acoustical shield with speed and ease. They provide cost saving in the short- and long-term and with proper product selection, they provide a green alternative in a difficult environment.

1Lt Nixon is currently deployed as the MILCON Program Manager for the 451 ECES.

Because of their light weight and compactness, ICFs create a small construction footprint, making them ideal to use for tight construction sites. (U.S. Air Force photo)

The adage "a picture is worth a thousand words" has everything to do with how we approve installation site plans.

Decision Making Using 3D Mode

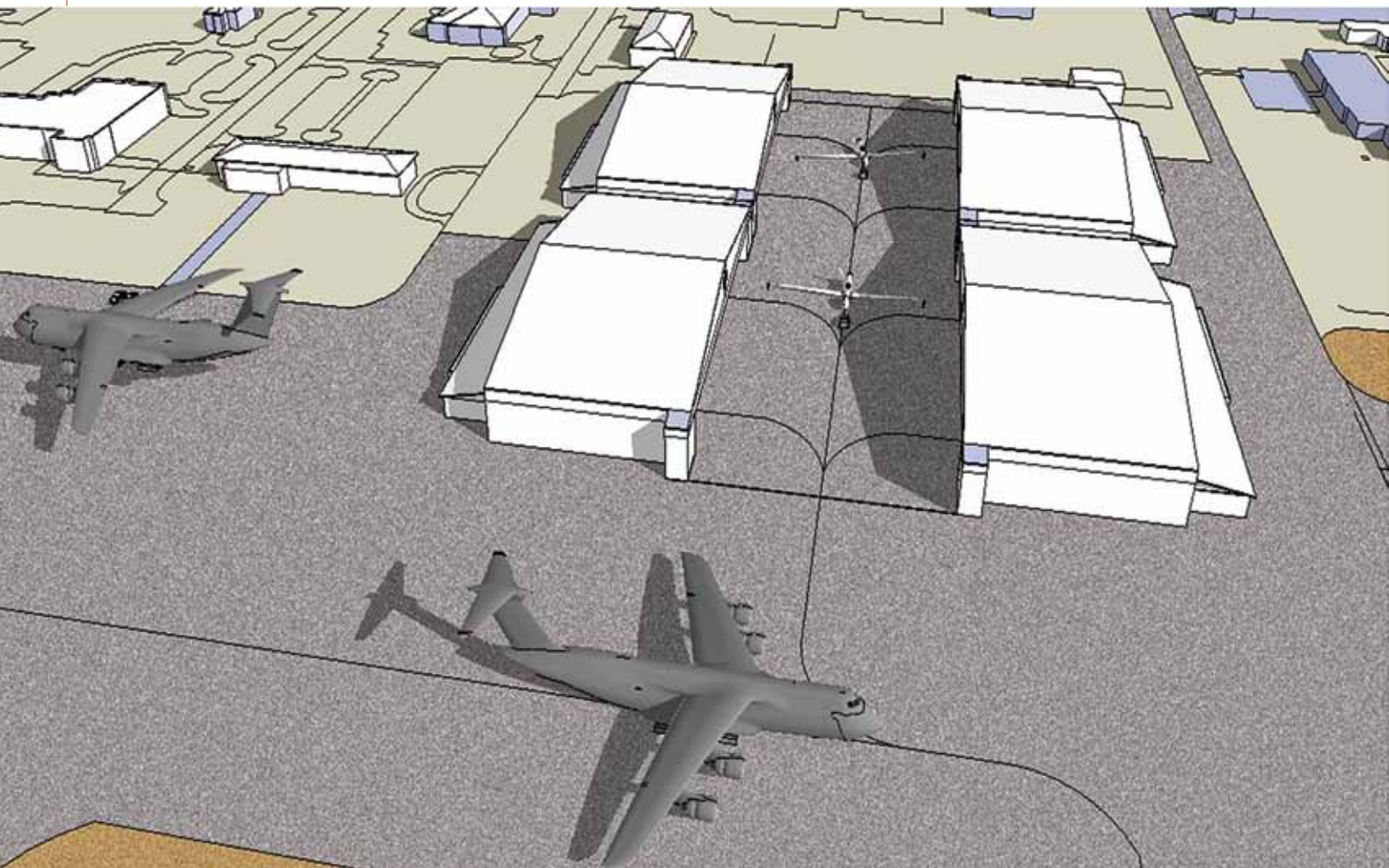
Maj Peter P. Feng, Ph.D., P.E.
AFIT/ENV

Mr. Nicholas Y. Dirosario
99 CES/OL-A

A major responsibility of base civil engineers is to properly plan for facility construction, and getting site location approval is an important step in the process. Before approval, wing leadership wants to know the size, location, height, exterior appearance of the facility, as well any obstructions created or anti-terrorism, force protection concerns. In today's limited resources environment, 3-D models are one way to easily convey this information to leadership.

Wing leadership has become accustomed to full motion video and 3D images. 3D models have existed since relief cartography maps were made in the early 1600s, but the ability to create them has significantly improved. Although the "masses" were introduced to 3D technology in the early 1980s, creating models required intensive software training and a great deal of effort. Today, software that can easily create 3D models is readily available and users can become proficient in less than a day.

Figure 1. Simple 3D model of concept for RPA hangar. (U.S. Air Force graphic courtesy of AFCEE)



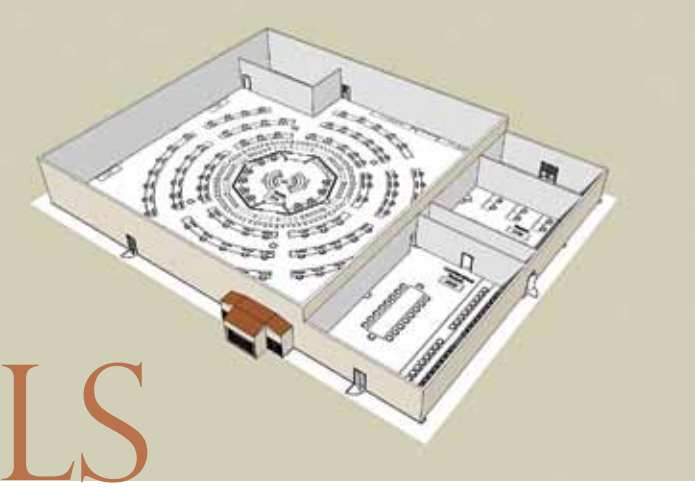


Figure 2 (left). 3D model of potential interior layout of RPA operations facility. Figure 3 (right). Simple 3D model of proposed parking lot, sited with existing facilities. (U.S. Air Force graphics)

The continued growth of many Air Force installations can limit the number of suitable construction sites. Wing leadership relies on the site approval process to ensure the remaining space is well utilized.

A site approval package includes two parts: a defined set of user requirements and the construction location. Typically, various installation organizations coordinate on the approval package so that everyone is aware of future construction and can voice any concerns. This can be a lengthy process. Air Force community planners have found that creating a proposed 3D image of a facility (Figure 1) has improved base organizations' decision-making capability. Following are two examples.

In the first scenario, planners were tasked to develop a concept for a remotely piloted aircraft (RPA) mission that integrates facility maintenance with current operations. The growing RPA mission spans commands in many geographic locations, such as EUCOM, CENTCOM, NORTHCOM, SOUTHCOM, and PACOM. These DOD facilities are critical to information collection, interpretation, and dissemination that flows from the growing use of RPAs. The facility's location had to work well with local flight operations and maintenance and force protection concerns had to be considered. A 3D model showed not only the proposed facility's location, but also how it interfaced with current infrastructure.

There were other questions that 2D site plans could not answer, such as "Will there be interference with existing infrastructure?" or "What is the conceptual floor plan and what is its orientation, and is it possible to place video displays in the facility?" These questions are above and beyond the typical site location questions asked of engineers, but answering them facilitates the decision making process. For example, a major concern with any RPA facility is how to incorporate human factor engineering — gaining efficiencies by reducing personnel movement while enhancing information flow. Producing a potential layout of the facility (Figure 2) can address these concerns and will improve the ability to create a statement of work for design and construction and to communicate requirements.

The second scenario involved siting a parking lot requirement and showing how it would impact the surrounding facilities. A base image was procured from the internet and the existing facility extruded to form a 3D shape (Figure 3). For planning purposes, images of vehicles were downloaded free of charge from a large database of pre-made images. The vehicle images were appropriately scaled, showing that the area can easily hold eight vehicles and not interfere with the traffic flow. Placing a proposed facility next to an existing object of known size also helps "approvers" grasp relative facility size. These two scenarios show the power of simple 3D models, but this process does have limitations.

These types of 3D models are not "smart," which means they are not integrated with the installation's geographic information system. For proposed facilities, they cannot display the size of associated HVAC systems, roof conditions, or how they tie into the overall base infrastructure. However, these simple 3D models are only used in the preliminary planning process to aid leadership's decision making. They are not meant to replace the Air Force's extensive GeoBase system, where locations have been established using survey data and facility specifications and conditions can be assigned. GeoBase can be used to create 3D site plans, but is a more time intensive process.

For a relatively small investment of funds in software and time in training, an Air Force civil engineer planning shop can facilitate site plan decision making with simple 3D models. Civil engineers at other installations may want to investigate this "simpler and better" way of meeting the responsibilities for infrastructure planning.

Maj Feng is an assistant professor of Engineering Management, Air Force Institute of Technology, Wright-Patterson AFB, Ohio, and Mr. Dirosario is an Air Force community planner, Nellis AFB, Nev.

Authors' note: The software used to create the examples in this article is Google Sketchup Pro, which cost less than $500 for a single license. Google Sketchup Pro is an Air Force-approved software package (on the Transitional Air Force Evaluated/Approved Products List); the freeware version of Google Sketchup is not.

Alaska CEs Use State-of-the-Art Technology to Renew Water Mains

Mr. Hazim K. Yunis, P.E.
673 CES/CEPM

The water infrastructure at Joint Base Elmendorf-Richardson (JBER), Alaska, is over 70 years old and, like that at many other bases and cities in the country, is in great need of repair and renewal. A sizeable portion of the base's 350,000 feet of water mains is deteriorated. Although the base has worked over the years on replacing some of the old water distribution piping, breaks and leaks — and water shutdowns — occur regularly.

Many breaks are due to the old age of the pipes, regular ground movement, or ground heave due to frost or small earthquakes. Others are due to the water mains freezing in the winter. Complaints of low flows or pressures and red water (caused by rust) are common.

The breaks and leaks, and the shutdowns and repairs, all have a negative impact on the base's mission, its population of 18,000 (7,000 living on base), and the local traffic. Water shutdowns can last up to 12 hours, property landscape is destroyed, and street or driveway access is generally blocked.

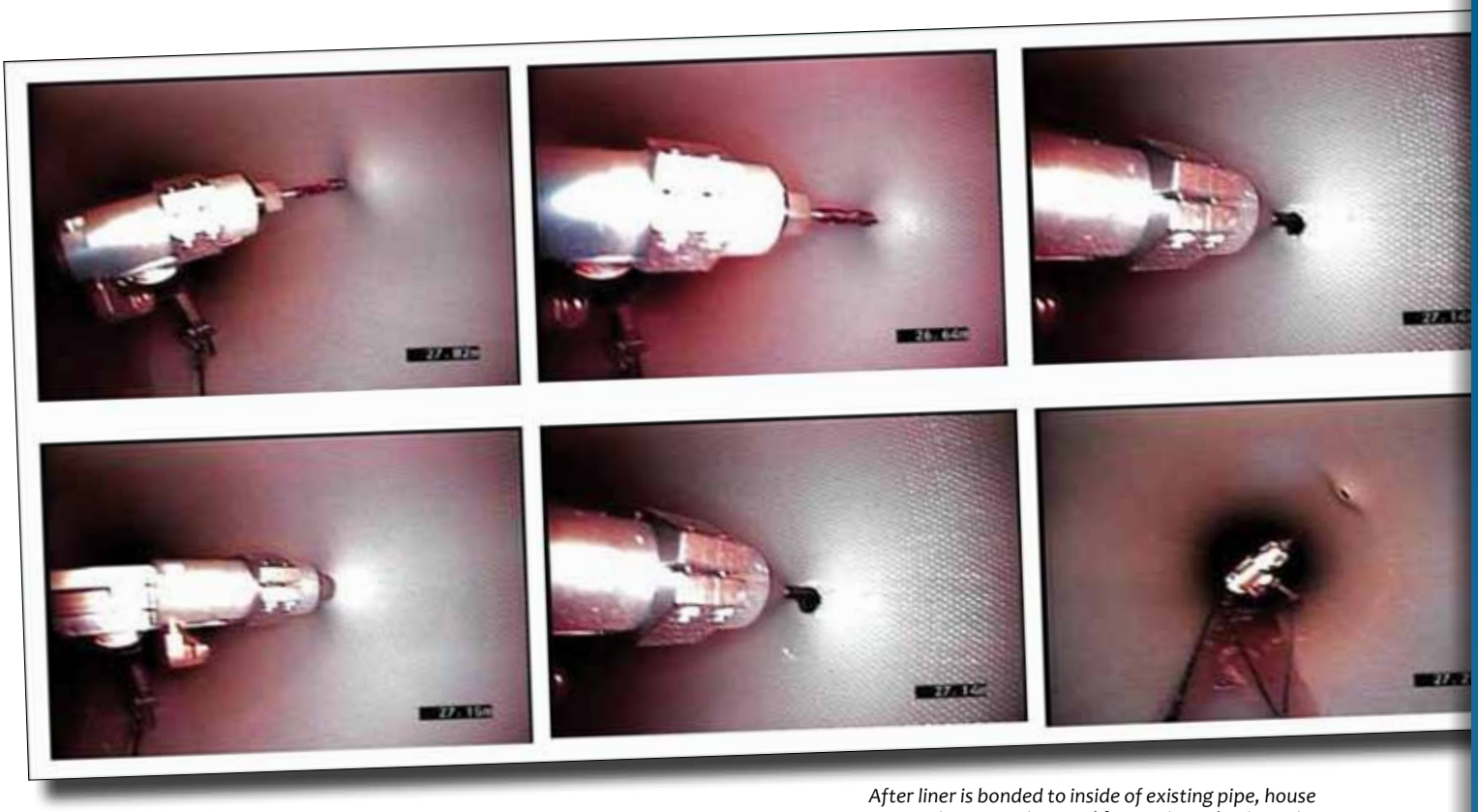
Repairs also come with high financial costs, for several reasons. Alaska has a short construction period. Pipes have to be buried 10 feet, so the trenches are generally deep and wide (up to 40 feet). Breaks and leaks often happen during the winter when the ground is frozen or at night or on weekends, requiring heavier equipment or more labor and overtime hours.

The effects on the base's mission and populace, coupled with the technical and financial issues weighed heavily in the choice of trenchless technology for the renewal of a water main in 2008 at one of JBER's housing areas. Base engineers had turned to the technology before, using it successfully in 1995 to renew deteriorated sewer mains. (Elmendorf AFB was actually the first to use trenchless technologies in the state of Alaska.)

This choice was made possible by a trenchless technology product called Aqua-Pipe® developed in 1997 by Sanexen Environmental Services specifically to rehabilitate small diameter water mains and also reinstate the small house connections from inside the pipe with the use of special robotic equipment. Certified to NSF/ANSI Standard 61, Aqua-Pipe® eliminates the need for trenches by installing a resin-impregnated flexible tube within the existing pipe to create a hard, impermeable, corrosion-resistant liner or "pipe-within-a-pipe." The liner can withstand all dead and live loads as well as internal pressures (including vacuum) without the help of the residual strength of the existing pipe.

No previous technology could line small diameter water mains and also reinstate the house connections from inside the pipe. Other trenchless technologies, such as slip-

Replacing pipes using traditional (non-trenchless) methods requires 40-wide excavation (left). During pipe repair at JBER using trenchless technology, a flexible liner is impregnated with expoxy (right), then pulled into existing pipe (center). (U.S. Air Force photos)



After liner is bonded to inside of existing pipe, house connections are reinstated from using robotic equipment. (courtesy photo)

lining, allowed for the renewal of the pipe but required an excavation at each house connection with the added disadvantage of greatly reducing the inside diameter and the flow within the existing pipe. All these small excavations defeated the purpose of using a low-dig solution to renew the existing water main.

In September 2008, JBER (then Elmendorf AFB) awarded a $0.75M delivery order against a multiyear water/sewer/storm requirements contract to a state-certified installer of this technology for the structural renewal of 3,460 feet of 6-inch diameter cast iron and transite water mains in the housing area. Due to winter shutdown, work was carried out in the fall of 2008 and in the spring of 2009.

In order to continuously supply people with water, a temporary aboveground water bypass was installed. Access to the pipe was achieved by excavating small pits at strategic locations, approximately 400 feet apart. After cleaning the pipe, a closed circuit TV camera was inserted in the pipe to assure that it was cleaned to manufacturer specifications. The camera also recorded the location of every house (service) connection and a special robot inserted a plug in the connections to avoid the migration of resin into them.

Using the access pits, a liner was inserted (pulled) into the existing pipe. This flexible liner consists of two concentric, tubular, woven polyester jackets with a watertight polymer membrane bonded to the interior. The liner is impregnated with a resin epoxy that bonds to the interior of the existing pipe under applied heat. A foam pig pushed through the liner using water pressure shaped the liner, and then hot water was circulated through the liner to cure the resin into a hard, impermeable pipe and bond it to the existing water main. After pressure testing the liner, existing valves and hydrants were replaced with new ones and 34 service connections were reinstated from inside the pipe using special robotic equipment.

The project successfully restored the old pipe's structural integrity, giving it a new, greater than 50-year life. The project produced a 26-percent direct cost savings over using the open cut method, and construction was quicker. Although the indirect "savings" to the mission and base personnel can't be quantified, complaints can and the 673 CES received zero.

Mr. Yunis is a civil engineer with the 673 CES, Joint Base Elmendorf-Richardson, Alaska.

GULF WAR, TWEN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Dr. Ronald B. Hartzer
HQ AFCESA/CEBH

Twenty years ago Air Force civil engineers responded to the crisis in Southwest Asia (SWA) as Iraq invaded and occupied Kuwait. Prime BEEF teams and RED HORSE squadrons provided crucial support to Operations Desert Shield and Desert Storm. Little did they know that some of the engineers who deployed in 1990 would still be deploying to the region in 2010.

Operation Desert Shield

Air Force civil engineers were one of the most important combat support elements of Operation Desert Shield. They played a critical role in preparing and sustaining the network of air bases that supported the application of air power. Thanks to Air Force civil engineers, Lt Gen Charles A. Horner, commander of U.S. Central Command Air Forces, could plan and direct the air campaign from multiple bases with confidence and flexibility.

The unexpected deployment was on an expedited timetable. To meet the primary goal of deterring Iraqi aggression against Saudi Arabia, aircraft and crews deployed to the region first, and the support tail had to catch up. Engineers began deploying on August 7, 1990, some with little notice. Once on the ground, they scrambled to bring facilities on line as quickly as possible.

Their first tasks were to prepare runways, runway lighting, and arresting barriers; establish fire protection and basic utilities; plan where facilities would be sited; and provide latrines. Next on the agenda was erecting living and working facilities, preparing ammunition storage areas, and erecting aircraft revetments, followed by environmental and sanitation concerns, facility hardening, and road construction.

Desert Shield saw the first real-world use of Harvest Falcon assets, mobility basing sets developed in the 1980s that gave the Air Force the capability to deploy to bases and establish flying operations within 72 hours. This ambitious mobility concept presented unique challenges to engineers, planners, and developers.

Most engineers had never trained on the equipment because Harvest Falcon was a new program and training assets were not yet available. When TEMPER tents and utility systems began appearing, many without technical orders, engineers were uncertain of what constituted a complete set, how they were to be assembled, or how to repair the equipment. But, they quickly laid out the pieces, determined what went where, and began putting up tents.

The harsh environment made it nearly impossible to do heavy work during the day. Nighttime work shifts permitted troops to be as productive as possible, still get their rest, and avoid the midday heat, which often reached 120°F.

Electricity was critical to Air Force operations, but only a few sites had adequate commercial power and most required generators. Initially, small 60- or 100-kW

NTY YEARS LATER

Photos 1-3: *Expandable Personnel Shelters at a deployed location.* ***Photo 4:*** *A Prime BEEF member assists in the assembly of a TEMPER Tent. (U.S. Air Force photos)*

low voltage mobile electric power (MEP) emergency generators were used to power tent cities, aircraft maintenance shops, and logistical areas. They were prone to failure from continuous use in the harsh environment and their roar was almost deafening to tent occupants. The solution was to install more efficient high-voltage MEP-12, 750-kW generators and cables so power plants could be placed greater distances from cantonment areas.

Power distribution to end users required industrial-grade distribution equipment. The Air Force was in the midst of a transition from the contactor control cubicle to the primary distribution center (PDC). Only three PDCs and no contactor control cubicles were available in SWA. In one month, CEMIRT technicians designed, built, and shipped 35 simple and reliable PDCs using off-the-shelf components.

Firefighters provided crash-fire rescue and structural fire protection services at most sites in the region. They often integrated with host nation firefighters, sharing equipment and working areas. In-flight and ground emergencies kept them constantly busy, while the high number of patrol and training sorties generated thousands of hot refueling standbys.

In November 1990, President Bush ordered additional forces (Phase II buildup) to the Persian Gulf region to provide an offensive capability. This meant another push to bed down deploying forces, but this time engineering personnel were already in place and prepared before aircraft and troops arrived. The presence of 823rd, 820th, and 7319th RED HORSE personnel in theater provided additional capability to undertake major beddown tasks at existing or new sites.

From October to March, a combined 435-person RED HORSE squadron was involved in more than 25 major projects, valued at $14.6M. These included beddown of the largest air base in theater (in terms of number of aircraft) at Al Kharj AB. RED HORSE engineers constructed aircraft hardstands and taxiways at Shaikh Isa AB, Bahrain; a theater munitions storage depot at Al Kharj; aircraft parking ramps at Al Minhad and Al Dhafra ABs, UAE; and integrated combat turn pads at King Khalid Military City.

Al Kharj, one of the sites selected to receive Phase II aircraft, was a classic bare base location. It had been programmed as a massive Saudi military installation, but only basic pavements had been constructed. RED HORSE, augmented by the 4 CES from Seymour Johnson AFB, N.C. and contract personnel, set up a tent city, six K-span structures, four kitchens, an air transportable hospital, and support facilities. They built munitions storage areas and bladder berms, completed utility distribution systems, and installed mobile aircraft arresting systems. The base was ready for aircraft in early January and by the beginning of the air war on Jan. 17, 1991 was home to nearly 5,000 Air Force personnel.

In December 1990, civil engineers from Europe began deploying to bases in Turkey as the coalition opened a second front to monitor and contain Iraq. Engineers planned and executed the buildup for Joint Task Force Proven Force. At Incirlik they constructed "Tornado Town" and helped bed down deployed personnel. A 50-person Prime BEEF team from Bitburg AB, Germany, also deployed to Batman AB, Turkey, to support search and rescue operations.

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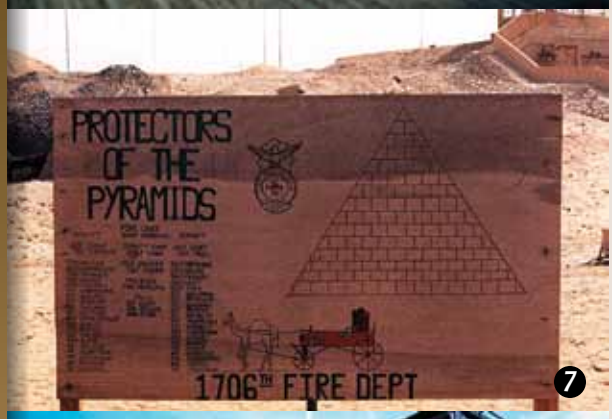

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Aside from Southwest Asia, civil engineers deployed to Spain, England, Germany, France, Italy, Greece, and Diego Garcia. They constructed tent cities at transit bases, supported Strategic Air Command tanker and bomber forces at multiple sites, and helped open contingency hospitals and aeromedical staging facilities across Europe.

Operation Desert Storm

At the sites across the theater, civil engineers were ready for operations to begin — forces were bedded down, equipment and materiel were dispersed, and personal and structural protection was completed. Many went out to watch the aircraft launch on their first missions. Firefighters started working full-throttle. Integrated combat turns with hot pit refueling operations required continuous fire protection. As combat sorties increased, so did in-flight and ground emergencies, barrier engagements, and explosive ordnance disposal (EOD) response to malfunctioning ordnance. At King Khalid Military City, firefighters responded to 157 in-flight emergencies and 785 integrated combat turn standbys.

RED HORSE personnel constructed security berms for the U.S. Army Patriot batteries at Riyadh AB, King Khalid International Airport, and near Eskan Village. They also rigged front-end loaders help reload the batteries, reducing the reload time from forty-five to five minutes. In mid-January, RED HORSE formed bomb damage repair teams capable of responding from Riyadh within four hours notice.

In February, Lt Gen Horner tasked RED HORSE to deny two air bases in southeastern Iraq to returning Iraqi forces, and complete the work before the signing of a cease fire agreement. Working with EOD personnel, two teams of engineers completed the job within four days. At Tallil AB, RED HORSE used approximately 40 tons of explosives to make cuts in the runway and taxiway every 2,000 feet. At Jalibah AB, engineers denied a concrete runway and two parallel asphalt taxiways with 72 craters up to 40-feet wide and 12-feet deep.

In summary, civil engineers played a crucial role in Operations Desert Shield and Desert Storm. Prime BEEF and RED HORSE Airmen performed beddown operations for 55,000 people and more than 1,500 aircraft at 25 sites throughout SWA as well as at bases in Europe and Diego Garcia. Overall, within a period of 7 months nearly 100 projects valued at $78M were completed at American deployment locations in SWA through troop or contract labor. Air Force civil engineers demonstrated once again that air base availability and performance are critical factors in a commander's ability to employ aerospace power.

Photo 5: *A Prime BEEF team uses a device to quickly fill sandbags.* ***Photo 6:*** *Firefighters stand ready on a Desert Storm base flightline.* ***Photo 7:*** *This sign was erected to recognize the fire deparment at Cairo West AB, Egypt.* ***Photo 8:*** *A piece of RED HORSE heavy equipment ready for shipment to Southwest Asia. (U.S. Air Force photos)*

Mr. Dennis Firman Retires

Mr. Dennis Firman, Director of the Air Force Center for Engineering and the Environment, retired Oct. 1, 2010, following 36 years of civil service.

Mr. Firman started his federal service in 1974, working with the Navy for a about a year before accepting a position at Langley AFB, Va., as a design engineer. He went on to serve as the deputy BCE at Misawa AB, Japan (1983-1985) and was the Air Force's roofing SME in the late 1980s. Mr. Firman served in many supervisory positions, such as the executive director of AFCESA in the late 1990s, and chief of the Construction Division at the Civil Engineer Directorate at HQ ACC (2000-2007). In 2007, he was appointed AFCEE's fifth director, just after the organization underwent a major mission expansion.

"It isn't the awards, the decorations, the recognitions, the positions I've held … it isn't any of that," Mr. Firman said at his retirement ceremony. "It's all in the relationships I've experienced along the way."

His retirement plans include returning to the small fishing village in Virginia where he grew up and spending more time with his family. *(Contributed by Jennifer Schneider, AFCEE/PA)*

Maj Gen Timothy Byers, The Air Force Civil Engineer, presents a Certificate of Service to Mr. Dennis Firman during his retirement ceremony. (U.S. Air Force photo)

Chargin' Charlie Meets a Racing Red Horse

Air Force RED HORSE's "Chargin' Charlie" emblem was front and center on the hood of Red Horse Racing's Toyota Tundra, when it raced at Las Vegas Motor Speedway on Sept. 25, 2010, as part of the NASCAR Camping World Truck Series. In a sense, Air Force RED HORSE was driving the truck as well.

The day before the race, the Red Horse Racing team became honorary RED HORSE members during a visit to the 820 RHS at Nellis AFB, Nev., where they learned about the RH mission, and saw demonstrations of equipment and capabilities, including an explosive demolition/quarry blast.

At Las Vegas Motor Speedway on Sept. 25, 2010, Red Horse Racing's entry in the NASCAR truck series race sported Air Force RED HORSE's "Chargin' Charlie" emblem (photo courtesy of LVMS)

The Red Horse Racing team manager, Mr. Kevin Ray, returned the favor: RED HORSE engineers from 820 RHS and MSgt Joe Hajik, the RED HORSE program manager at AFCESA, were made honorary pit/crew team members for the race and got to witness up close the power of a different "horse."

"Because of its name, the Red Horse Racing team has drawn attention and curiosity in the Air Force civil engineer community for several years," said MSgt Hajik. "We finally found an opportunity for this unique meet-and-greet."

"RED HORSE is very similar to our race team," Mr. Ray said. "We're both a very tight-knit family." The success of this event has already secured a re-meet in Las Vegas in October 2011.

Air Force EOD Civil Engineer

SrA MICHAEL J. BURAS

SrA Michael A. Buras (U.S. Air Force photo)

On Sept. 27, 2010, SrA Michael Buras, an explosive ordnance disposal technician, was posthumously awarded the Bronze Star Medal with valor device at a memorial service for him at Kandahar Airfield, Afghanistan. He was killed Sept. 21, 2010, when an improvised explosive device detonated during operations in Afghanistan. Two other EOD civil engineers were injured in the same explosion.

SrA Buras, 23, was on his third deployment from the 99 CES, Nellis AFB, Nev., his first and only duty station since joining the Air Force in April 2006. During his four years of service, SrA Buras' dedication and accomplishments as an EOD Airman earned him recognition and many awards, in addition to the Bronze Star: Purple Heart with one oak leaf cluster, Joint Service Commendation Medal, Air Force Commendation Medal, an Army Commendation Medal with one oak leaf cluster and one with the valor device, Air Force Combat Action Medal, the Army Combat Action Badge, NATO Medal, and Afghanistan Campaign Medal (second award).

SrA Buras arrived at Dover AFB, Del. the morning of Sept. 23, where he was met by his family for the Dignified Transfer Ceremony. Also present were Maj Gen Timothy Byers, The Air Force Civil Engineer; Brig Gen Dave Howe, ACC's Director of Installations and Mission Support; CMSgt Pat Abbott, the Civil Engineering Chief of Enlisted Matters; and TSgt John Roskom, the 99th's EOD supervisor.

"Like the other 12 EOD Airmen we've lost in OIF and OEF, SrA Buras' legacy of dedication, teamwork, and professionalism seems nearly impossible to match," said Maj Gen Byers. "By all accounts — from Michael's parents, supervisors, and colleagues — he was the kind of Airman I joined the Air Force hoping to serve alongside and it was an honor to preside at today's ceremony."

The funeral for SrA Buras was held Oct. 6 in his hometown of Fitzgerald, Ga., followed by burial at Andersonville National Cemetery with full military honors. He is survived by a daughter and his parents, brother, sisters, and grandparents.

This article was compiled with information from Air Force news releases, the Fitzgerald, Ga. News-Leader, and sources within the EOD community.

rs Honored and Remembered

SrA DANIEL J. JOHNSON

SrA Daniel Johnson was killed Oct. 5, 2010, when an improvised explosive device detonated during operations in Afghanistan. The explosion seriously wounded his team leader and six Soldiers.

Two memorial services — more than 7,000 miles apart — were held for SrA Johnson and in some ways, each service represented two of the responsibilities he embraced as an EOD technician.

On Oct. 13, a memorial was held at Vandenberg AFB, Calif., where he was a member of the 30 CES's EOD team. At Vandenberg, he prepared his team for war, constructing a training program and developing scenarios to challenge even the most skilled EOD operators.

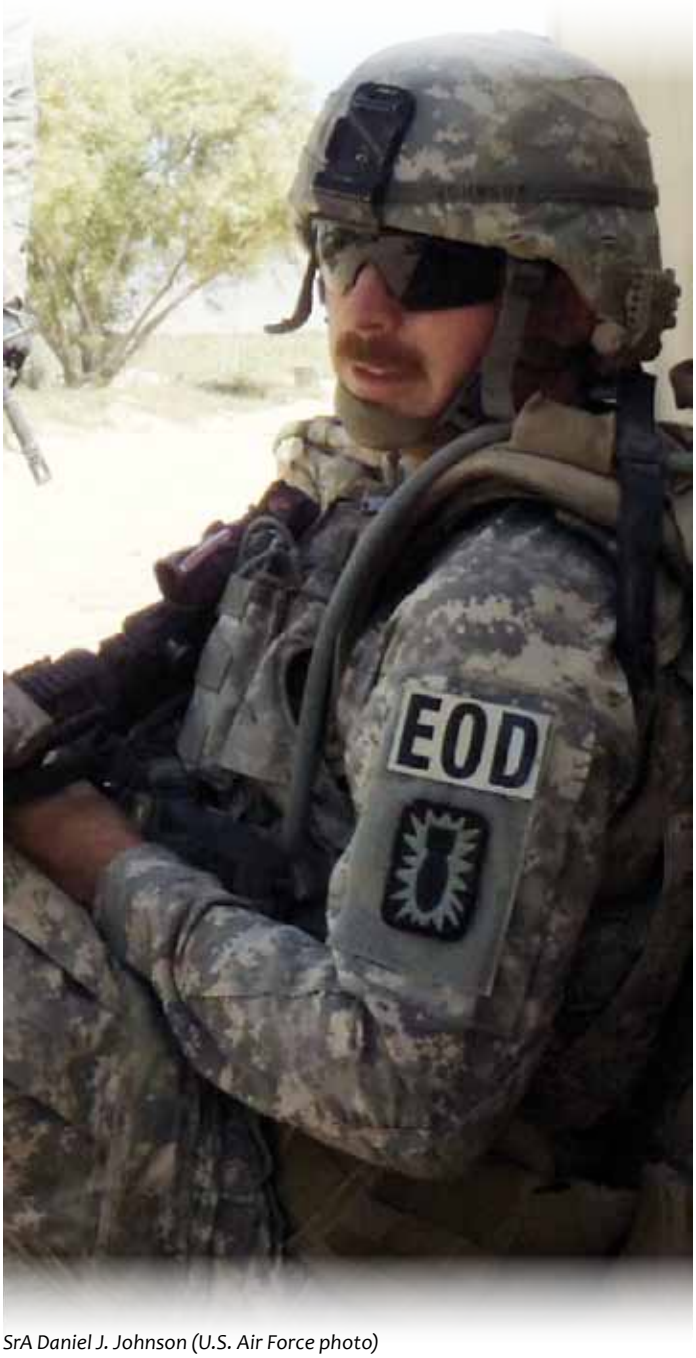
Days before, on Oct. 9, a memorial was held for SrA Johnson at Kandahar Airfield, Afghanistan, where he lived and worked as a warrior, on his second deployment as a member of an EOD team. In giving the eulogy, his EOD flight commander, Capt Thomas Eckel, explained how much SrA Johnson loved his country by pointing out what he carried when dismounted, when "ounces equal pounds and pounds equal pain."

"… Dan carried with him the symbol of his country [and] not in a small Velcro patch on the front of his body armor or on his sleeve," said Capt Eckel. "He was fully invested and committed: he carried not one, but two 3-by-5 foot American flags, fore and aft in his body armor, next to his heart —one for his wife and one for his mother. It was worth the pain."

SrA Johnson, 23, joined the Air Force in November 2006. After basic training and EOD school, he was assigned to the 30 CES at Vandenberg, his first and only duty station. He was an honor graduate of the U.S. Army Mountain Warfare School. His list of decorations includes the Bronze Start Medal with valor device, a Purple Heart, an Air Force Combat Action Medal, and an Army Commendation Medal.

SrA Daniel Johnson was buried Oct. 14, 2010, in California. He is survived by his wife, parents, and brothers.

This article was compiled with information from an Air Force News article by SrA Steve Bauer, Air Force news releases, and sources within the EOD community.



SrA Daniel J. Johnson (U.S. Air Force photo)

Morning with Daddy

TSgt Daniel Hubbard gets "help" from his children as he prepares to go to work as Prime BEEF manager for the 27 SOCES, at Cannon AFB, N.M. "Morning with Daddy," by Mrs. Andrea Hubbard, won first place in the MyAirForceLife.com photo contest, earning her new camera equipment and the honor of displaying her photo at the Pentagon. (photo by Mrs. Andrea Hubbard, used with permission)