Air Force Civil Engineer
Vol. 20
No. 1
2012


# CAN DO. WILL DO.
# HAVE DONE.
## CEs Complete Mission in Iraq

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## Features



## Special Iraq Section



## Sections



## On the Cover

From the start of Operation Iraqi Freedom to the end of Operation New Dawn, over 18,000 Air Force civil engineers deployed to Iraq, many of them multiple times. Articles in this issue focus on their contributions and lessons learned. *(photo by Mr. Eddie Green)*



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# TRANSFORMATION

Welcome to this issue of *Air Force Civil Engineer* magazine! Once again, I am privileged to introduce this outstanding publication that informs and educates our Civil Engineer workforce. I take special pride in introducing this issue, which covers an important topic that affects all members of our community.

The current resource constrained environment brings a number of challenges that affect all branches of our government, and forces civil engineers to rethink and retool how we provide installation and expeditionary combat support. To meet these challenges, we are accelerating the transformation efforts we initiated in 2007. Through our Civil Engineer Transformation…Accelerated (CET-A) initiative, we will standardize and streamline processes, realign manpower and organizations, optimize support operations, and find innovative ways to reduce operating and lifecycle costs. Of course, we will continue focusing on accomplishing our key capabilities, priorities, and missions. In this issue of *Air Force Civil Engineer,* I'll talk about CET-A and share the "why and how" of this initiative.

Obviously, this transformation will be a time of significant change for all of us, as organizations and as individuals. We are committed to providing the most current and complete information possible throughout the process, as it happens and using multiple avenues of communication. Civil Engineering leaders are committed to keeping their workforces informed, and my office will continue to share information through e-mails and through new content on the CE Portal. Most importantly, we want your feedback. A "CET-A Feedback" button is available under the "Commanders' Corner" on the CE Portal to email us your questions or comments and "Ask the General" drop boxes are set up at many agencies to receive anonymous questions.

Remaining unchanged will be the quality of support we provide to the warfighter at home station and at deployed locations. In December, Air Force civil engineers helped close a chapter in our nation's history as the American military presence in Iraq drew to a close. Several articles in this issue recount the historic role played by civil engineers in the successful drawdown of forces and transition of U.S. installations in Iraq. Today, in Afghanistan, civil engineers continue to bring our unique brand of "can-do, will-do" support to the fight.

Lastly, this issue features the list of 2011 Civil Engineer Award winners. The 50th annual awards ceremony held in February was a celebration of half a century of engineers leading the way. These winners represent our legacy of meeting all challenges head-on and turning them into opportunities to excel.

This is an exciting time to be an Air Force civil engineer. Today's challenges provide us an opportunity to build an efficient and effective Civil Engineer enterprise capable of providing outstanding installation support at home station and around the world. We will address our challenges in true engineer fashion by continuing our focus on Building Ready Engineers, Building Great Leaders, and Building Sustainable Installations. Working together, we will continue our proud heritage, and continue building our Civil Engineer community to last!

**Timothy A. Byers**
Major General, USAF
The Civil Engineer

# Building a Promising Future Through TRANSFORM ...ACC

Maj Gen Timothy A. Byers
The Civil Engineer

It can be said that history has a habit of repeating itself, and this is especially true when it comes to federal funding. During times of economic stability, funds and resources are plentiful to support activities throughout the federal government. At other times, diminished resources require fiscal conservation and efficiencies. Today, our Department of Defense, as well as the entire federal government, find themselves in the latter situation.

Civil Engineering is no stranger to this budget cycle. In the mid- to late-1960s, our community, then led by Maj Gen Robert. H. Curtin, contended with austere funding challenges similar to those our community is experiencing today.

"Functioning in an 'era of scarcity' so-to-speak, has been a great challenge to our managerial as well as our technical and professional abilities," Maj Gen Curtin said in a 1968 issue of *Air Force Civil Engineer*.

Today's challenges seem daunting: Our nation faces a series of fiscal challenges that are reducing the size of future federal budgets. The DOD, including the Air Force, is operating in a more fiscally constrained environment. Yet, despite the reduced funding, the military must still focus on accomplishing its missions, core tasks, and key priorities. For civil engineers, this means a continued focus on providing expeditionary combat support and efficient installation support by Building Ready Engineers, Building Great Leaders, and Building Sustainable Installations.

Across the DOD, efficiency initiatives, manpower reductions, reduced weapon systems, and other efforts are underway to mitigate the effects of reduced budgets. The Air Force has already identified $33 billion in savings over the

***"Functioning in an 'era of scarcity' so-to-speak, has been a great challenge to our managerial as well as technical and professional abilities."***

***Maj Gen Robert H. Curtin, 1968***

***"Today's challenges seem daunting.... yet...the military must still focus on accomplishing its missions, core tasks, and key priorities."***

***Maj Gen Timothy A. Byers, 2012***

# ATION *ELERATED*

next five years to be applied to force structure, modernization, and readiness. Congress is also targeting $487 billion in defense savings over the next ten years, and the Air Force is required to cut 13,500 civilian positions by FY13. The Civil Engineering community must help the Air Force achieve these cost and manpower reduction targets by doing things smarter, faster, better, and cheaper.

Maj Gen Curtin knew that in order to operate in a period of austere funding, action must be taken. "Progress has and is being made at all levels by civil engineers everywhere in our renewed efforts to put 'first-things-first' and to get more mileage from every dollar of Air Force resources passing through our hands," he said.

Our efforts to adapt to today's fiscal challenges are similar to those led by Maj Gen Curtin decades ago. We already began doing our part by assuming $4 billion of the Air Force efficiency target through reduction of overhead, realigning and rightsizing manpower, and minimizing support operations. To achieve our full contribution, however, we must continue to use asset management principles to find new and innovative ways to cut costs and to conduct installation support more efficiently.

## CE Transformation…Accelerated

To meet our ambitious goals, we are accelerating the transformation efforts we initiated in 2007. These efforts will result in a significant shift in the way we do business that integrates expeditionary combat and installation support activities, ensuring civil engineers efficiently support our installations — the Air Force's three-dimensional weapon systems — while preparing for emergency response and contingencies.

Critical to this effort is the commitment to enterprise-wide advocacy and allocation of resources to reduce risks to mission and Airmen. We will achieve this through centralization, standardization, prioritization, and optimization of the way we deliver installation support. This includes preserving our focus on quality of life and mission by using asset management principles, common levels of service, and the best life-cycle value when maintaining and recapitalizing our facilities and infrastructure. To reduce operational costs, we'll leverage strategic sourcing, energy conservation, and renewable energy opportunities as well as lessons learned from industry, the public sector, and our sister services.

It's important to understand we are still committed to supporting the installation's commander and mission requirements. Civil engineer squadrons will continue to receive sustainment funds to maintain and operate their installations. However, limited funding for installation support requirements, including recapitalization, R&M, and MILCON, will have to be advocated for and will compete with other requirements across the Air Force.

## How CE Transformation Affects Us

To prepare ourselves to address current and future challenges, our community will transform through a deliberate four-spiral process with each spiral affecting a particular level of the enterprise. At times, the process will be difficult as the changes will involve organizational realignment and

personnel cuts. It will also present additional challenges in the level of service we are capable of providing at our installations, which will require installation civil engineer squadrons to seek technical reachback provided by a new Civil Engineer Field Operating Agency (FOA). Nevertheless, transformation is absolutely necessary if we are to continue providing the full spectrum of combat support capabilities and installation support, and I believe it provides us a great opportunity to shape the future of the Air Force.

**"Progress has and is being made at all levels by civil engineers everywhere in our renewed efforts to put 'first-things-first' and to get more mileage from every dollar of Air Force resources."**

A key outcome of transformation is the definition of a specific mission focus for each level of the enterprise that aligns with our strategic goals and objectives. For example, the Office of the Civil Engineer at Headquarters Air Force will transform to focus on providing policy, oversight, and resourcing for the entire Civil Engineering enterprise. Tasks not meeting this specific criteria will be accomplished elsewhere within the enterprise.

Likewise, installation civil engineer squadrons will refocus their efforts on core civil engineer capabilities, and work toward providing day-to-day facility sustainment operations at their installations, including providing recapitalization requirements to their MAJCOMs. They will use asset management principles, common levels of service, and other criteria to identify requirements necessary to support their installation commander and base's mission.

Civil engineer squadrons will also provide expeditionary combat support forces to operate, maintain, and protect sustainable installations through engineering and emergency response services. Key to supporting this capability is home station training. Squadrons will use their in-house military and civilian labor force to complete multicraft work orders to build and maintain the skills needed for expeditionary combat support. These projects will be substantial enough to ensure civil engineer craftsman are challenged and up-to-date on technology changes in systems such as HVAC and electrical distribution. Civil engineers will also sharpen their skill sets established by AETC initial and advance courses by utilizing comprehensive on-the-job training.

Because of the shift toward day-to-day installation support, some operations once carried out by civil engineer squadrons, including environmental compliance and real property management, will be centralized and executed at the new Civil Engineer FOA. Installation housing and resourcing capabilities will be streamlined to support the installation sustainment focus.

Changes will also occur for MAJCOM staffs, who will now primarily focus on prioritizing and advocating requirements at their installations. They will work with squadron personnel to identify requirements, which will be prioritized with those throughout the MAJCOM. They will then advocate for the requirements mitigating the greatest risk to our infrastructure, mission, and Airmen, and provide coordination to support efficient, sustainable installations worldwide. They will also continue providing component MAJCOM support and global force management.

Lastly, the three FOAs currently supporting our community — the Air Force Civil Engineer Support Agency, the Air Force Center for Engineering and the Environment, and the Air Force Real Property Agency — will merge into a single organization with a redefined mission. This Civil Engineering FOA will become a "service center," providing responsive, flexible full-spectrum engineering services to our installations and MAJCOMs, including facility investment and planning, design and construction services, recapitalization programs, and expeditionary doctrine and guidance. The new FOA will provide centralized oversight of environmental and real property operations for all Air Force installations, a task once accomplished by MAJCOM staffs. It will become a "Center of Excellence" in providing engineering services for our community.

**"Now, more than ever, civil engineers must not only be ready to respond but to lead whenever and wherever needed, to meet current and emerging Air Force and combatant commander requirements."**

## Looking Ahead

In the fiscally constrained environment of the 1960s, Maj Gen Curtin rallied the Civil Engineer community by calling for everyone to put "first-things-first" in order to maximize the value of limited resources. Today, our community must similarly focus on "getting back to basics" and efficient processes. Asset management principles and activity management planning processes must be applied to eliminate stovepipes and promote a portfolio-wide investment strategy. This will ensure consistency and transparency when it comes to planning, programming, and budgeting, as well as alignment with the Air Force's mission and corporate processes.

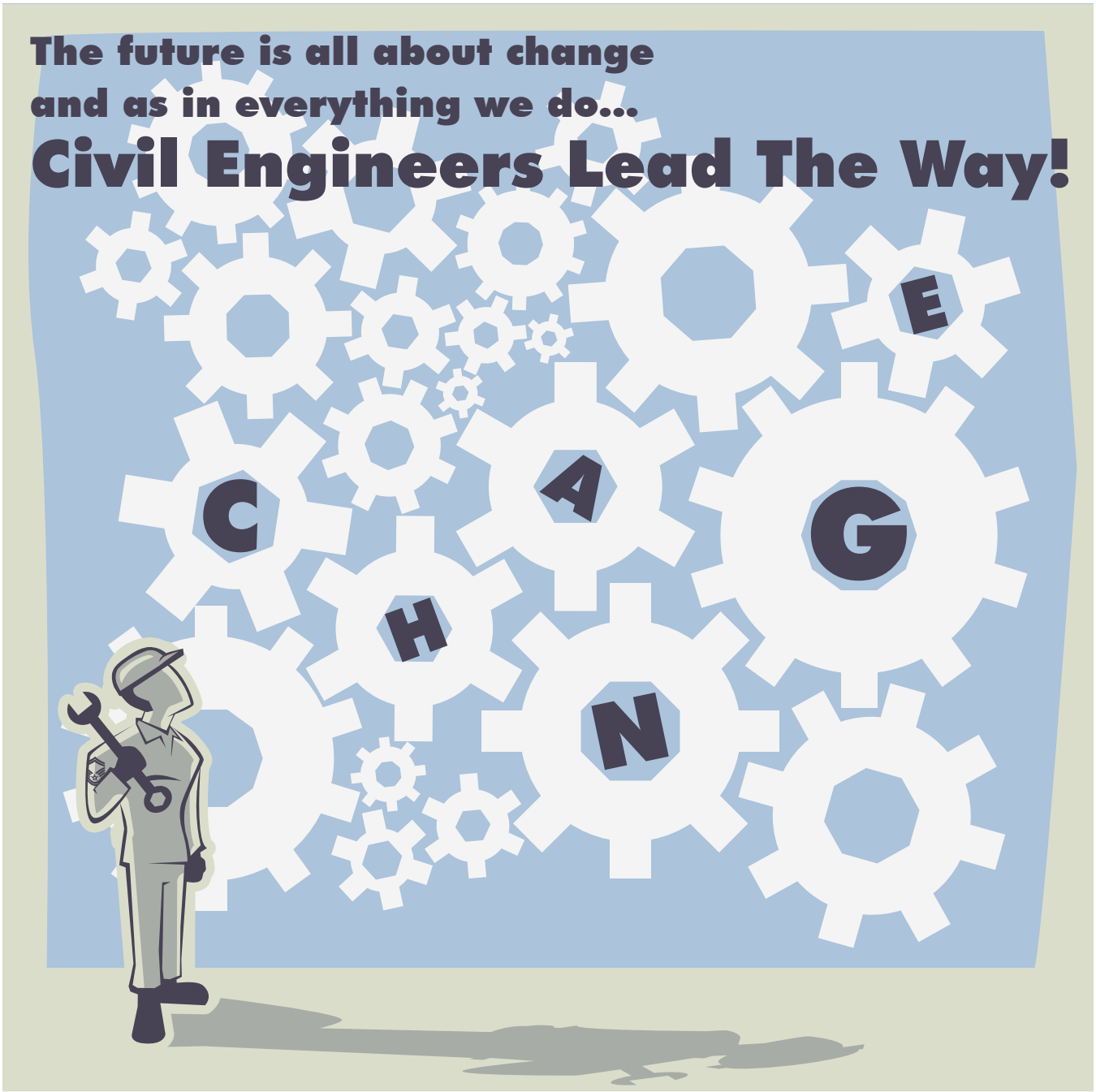
Civil engineers must also manage the expectations of customers, mission partners, and leaders. We must be transparent with regard to what we can and can't do, and work with stakeholders to identify and mitigate these issues.

Accelerated CE Transformation presents a difficult adjustment for our community. We've collaborated with subject matter experts at the FOAs, MAJCOMs, and bases to figure out how to mitigate these effects and best structure ourselves to meet the needs of the Air Force. There are many details to be finalized on this transition. As soon as more information becomes available, we will quickly share these through a variety of channels. Your civil engineer leadership, including military and civilian leaders, will provide details and keep you informed of these changes and their impacts to your respective organizations.

Looking ahead, we can take inspiration from Maj Gen Curtin, who said "No one can exactly say what the future holds. We can be certain, however, that change will be a prime aspect." Change is necessary to ensure Air Force Civil Engineering can continue to effectively support the Air Force mission. We must continue to stay focused on Building Ready Engineers, Building Great Leaders, and Building Sustainable Installations. We are still a nation at war. Now, more than ever, civil engineers must not only be ready to respond, but to lead whenever and wherever needed, to meet current and emerging Air Force and combatant commander requirements. Our Air Force, our joint partners, and our nation demand nothing less.

Accelerated transformation presents our community an opportunity to build a more efficient and effective Civil Engineer enterprise, one ready for a promising future. But in order to get there, we must be ready to meet our challenges head on, so that once all is said and done, we'll be ready to continue to Build to Last and Lead the Change!

***Editors Note:*** *The full text of Maj Gen Curtin's article, "The Director Says...The Impact of Austere Funding," (CE Magazine, Vol. 9, No. 1, 1968) can be read online at http://www.afcesa.af.mil/shared/media/document/AFD-120412-040.pdf*




Mr. T. Gene Gallogly, P.E.
HQ AFSPC/A4/7P

Change evokes mixed reactions from all of us. Some look forward to change while others resist leaving the familiar routines and roles they've work so hard to master. Most of us probably fall somewhere in the middle — we enjoy some variety and have thoughts about ways to do things better, but we'd prefer the changes to be gradual and well understood.

Civil Engineering transformation has never really been the "comfortable, measured change" that we can easily adjust to and embrace at our own pace. On the spectrum from small, evolutionary change to grand, revolutionary change, most of us would probably characterize our transformation as more on the revolutionary end of the scale. Managed risk, asset management, performance-based contracts, common levels of service, industry standards, NexGen IT, privatization — continuous process improvement and change have become the norm. I'm sure most have us have wondered if the changes are happening too fast: "Are we thinking through this or just reacting to the crisis de jour?" Having been on both the receiving as well as the giving end of this, I'd like to share a few thoughts of encouragement.

As The Air Force Civil Engineer, Maj Gen Timothy Byers, has shared throughout the journey, **this is really about accomplishing our key capabilities, priorities and missions in a more efficient and effective manner.** We are still the same great civil engineering force known for our ability to get the job done; we're just operating in a more resource constrained environment. We have to adapt to that environment and continually find smarter ways to get the job done. Even if we had all the resources we needed, we'd have found our way down this path. It's our engineering and service nature to root out inefficiency and waste.

"We have a lot of great people brainstorming and collaborating to ensure we're not only on the right track, but that we have the right foundation for change."

**We have a lot of great people brainstorming and collaborating to ensure we're not only on the right track, but that we have the right foundation for change.** Sure, we'd all like more time to perfect the changes before we have to implement them. But, the changes have been thoroughly researched and vetted through integrated process teams and the corporate council, board, and groups before they were approved. Senior leadership and subject matter experts accomplished a Corps of Discovery with large, leading industries known for excellence in managing diverse, geographically dispersed plants. They shared management strategies, steps, and pitfalls in their own transformation journeys, and the strengths and weaknesses of their approaches so we could link them to our own operating environment. Those icons of industry did so because they're great Americans who pull together for the good of our country. We also borrowed from other governments and agencies. For example, other than a few words that were spelled "funny," the asset management principles espoused by the government of New Zealand fit in nicely with our transformation needs. Many of your peers worked tirelessly on these efforts; from process mapping to laying out pros and cons to briefing our most senior leaders on alternative courses of action, it's been a team effort involving installation, MAJCOM, field operating agency, and headquarters staffs. Ideas were also shared with our customers, contractors, peers, sister services, and other stakeholders and their constructive criticisms incorporated into the plan.

Like you, I know the results won't be perfect. However, because we're civil engineers, I know that **our customers will believe we achieved the impossible yet again.** The reason I know it is **because we all still share the same core values and culture.** We embrace challenges and pull together with the "can-do, will-do" attitude Maj Gen Byers often cites with pride when describing his team. We'll execute the plan with integrity, doing what's right and working through the flaws even when we sense it will take a little more effort on our part. We'll put the Air Force and Civil Engineering first despite the possibility of personal hardship or inconvenience. Both individually and as a team, we'll also strive for excellence in all we do. We'll adopt the overarching constructs, share constructive comments, find ways to streamline, and innovate to create new means to be more effective.

Inquisitiveness, tenacity, and accountability are also engrained in our engineering culture. We'll want to understand why the changes will make us more efficient and effective, and we'll develop metrics to track the improvements over time and to understand the relationships among the different variables a little better. We won't be satisfied with the initial results even though we achieved the objective. There will be some start-up issues, but we'll sort out the anomalies from the systemic issues and will quickly get back on track. We'll also understand that **each and every one of us has a stake in the success**, and we won't accept less than our best or any excuses for letting a customer down.

Nobody understands the laws of nature better than a civil engineer, which is probably why we have such conviction in the belief that **what you get out of something is directly proportional to what you put into it.** We work hard and take great pride in what we bring to the fight.

I'm going to close on that thought because I think it's the cornerstone of our future success. We should all be excited for the future knowing the hard work our team has put into this and knowing what we're capable of achieving! Again, we know the results of Civil Engineer Transformation won't be perfect, but we'll have a well-engineered foundation to build upon as a synergistic team. And nobody builds like a civil engineer!

*Mr. Gallogly is the Chief of Plans and Programs, HQ AFSPC, Peterson AFB, Colo.*

Maj Dustin Richards
USAF/CV

I arrived at the Air Force House on Victory Base Complex surrounding Baghdad International Airport in April of 2011 with basic ideas of what my responsibilities would be as the final chief of installations for the 9th Air and Space Expeditionary Task Force-Iraq (9 AETF-I) and basing planner for the Air Component Coordination Element-Iraq (ACCE-I).

The 9 AETF-I was like a small numbered air force, with command authority over two air expeditionary wings, and my role was to advise the commander on civil engineer and basing topics and liaise with the AFCENT A7 staff to resolve issues. Under my basing planner hat I worked closely with the United States Forces-Iraq (USF-I) joint staff to synchronize planning efforts for the transition or closure of every installation in Iraq. Although my focus was on the five airfields where the Air Force was senior airfield authority (base operating support-integrator at two of the five), Air Force civil engineers were heavily involved in drawdown and closures throughout the theater. The Air Force had operated at these airfields since the beginning of Operation Iraqi Freedom (OIF) and now we were responsible for concluding Operation New Dawn.

As I went through the handover process, I realized that Air Force civil engineers were already engaged in the process of winding down operations in Iraq, and with great results. The finishing touches were being applied to the last of $497M of construction performed over the past eight years. All that remained was to finish planning and execute the withdrawal of over 5,000 Airmen in a responsible manner.

The transition of Joint Base Balad (JBB) is illustrative of the demanding environment in which the drawdown was conducted. Approximately 60 percent of the Airmen deployed to Iraq resided at JBB, one of the busiest airfields in the world at the height of OIF. As 2011 drew to a close, it remained the second largest installation in Iraq, home to over 3,000 Airmen, as well as thousands of Army personnel and contractors. Security and training operations continued even as the planning efforts for the withdrawal concluded and began to be executed. Transitioning the base to the Government of Iraq (GOI) was an enormous logistical challenge (see article on page 18), due in part to the complexity of the missions that operated from the base, but also because of the cultural sensitivity associated with it as the Iraqi Air Force's premier fighter base.

To facilitate JBB's transition, a team of professionals at the base and at AFCENT, as well as in the USF-I Engineer Directorate and on the 9 AETF-I staff worked together to catalogue over 700 facilities, real property, personal property, and other equipment worth over $100M for transfer to the GOI. The process was extremely detailed (see article on p. 12), with inventories compiled in English and Arabic for joint review by the USF-I staff and GOI Receivership Secretariat, the entity responsible for accepting transition of all U.S. installations in the country. The team's efforts culminated in the handover of Joint Base Balad to the GOI on Nov. 8, after eight years of U.S. presence.

During the fast-paced, high-ops tempo days and weeks leading up to the last Airman departing Iraq, two lessons crystallized that I believe will apply as much for civil engineers working in Afghanistan as they did to those of us in Iraq. First, officers and senior NCOs will need to understand

# Sunset on Operation New Dawn

their role and where they fit in the grand scheme. Second, they will need to focus on the relationships they build among their counterparts across staffs, at base level, and with higher headquarters elements.

The processes for concluding operations in Afghanistan are already in development, and by the time many of the Airmen who execute those operations arrive in country, these processes will be well established. They will dictate which offices work together to accomplish which tasks, how coordination must flow from the forward operating bases back to the staffs, and from there to higher headquarters. The importance of understanding the processes involved, and knowing the people who execute the day-to-day tasks cannot be overstated. It is important that each Airman understand his or her role in the process. In Iraq, we found that it only took one person not doing their job to create weeks of setbacks, resulting in additional work for everyone from base level to headquarters staff. Each position is truly "one-deep."

Everyone must take the initiative to ensure a common level of understanding across all echelons and to build the relationships that will lay a solid foundation for the work to be accomplished. Each Airman should make it a point to have a face-to-face meeting with the people who impact his or her job, and whose job he or she impacts, as soon as practical upon arrival. One must also strive for maximum situational awareness, and regularly touch base with his or her counterparts at every level.

Air Force civil engineers definitely made their mark in Iraq. Our Airmen were the acknowledged experts for installation engineering, a fact emphasized by the joint community's insatiable thirst for the capabilities provided by the Expeditionary Prime BEEF Squadron. EOD technicians executed over 36,000 missions and our firefighters and emergency management Airmen maintained the safety of personnel and equipment while providing invaluable training to our Iraqi partners.

Taking part in the drawdown of forces and transition of control of U.S. installations in Iraq to Iraqi hands was an experience with a lasting impact. I will carry the experiences and the knowledge imparted by my leadership, base-level counterparts, and senior NCOs for the rest of my life. I hope that others will learn from us, and continue to improve the processes as the withdrawal from Afghanistan intensifies.

*Maj Richards is the Assistant Executive Officer to the Air Force Vice Chief of Staff, the Pentagon, Washington, D.C.*

***(above right)*** 332 ECES Airmen take a T-wall down from JB Balad's hospital to ready the base for transition to the Iraqi government.

***(right)*** On Oct. 15, 2011, a team of 332 AEW Airmen organize and inventory all computer hardware turned in at JB Balad. More than 12,000 pieces of equipment were turned in during the base's final days of operation. (photos by MSgt Cecilio Ricardo)

# GOING TO ZERO

**As the sun set on Operation New Dawn, the transition of U.S. and partnered bases in Iraq was completed**

Maj Madeline Rivero
AFZA-AE-T-133, U.S. Army

Col Gregory Ottoman
USAF/A7CA

On Nov. 17, 2008, U.S. Ambassador to Iraq Ryan Crocker and Iraqi Foreign Minister Hoshyar Zebari signed what is commonly referred to as the U.S.-Iraq Status of Forces Agreement (SOFA). The SOFA outlined the provisions and requirements regulating the withdrawal of U.S. Forces from Iraq by Dec. 31, 2011, as well as their temporary presence and activities. Operation New Dawn began on Sept. 1, 2010, marking the official end to Operation Iraqi Freedom and the shift from combat operations to stability operations by United States Forces in Iraq (USF-I).

The U.S. military withdrawal from Iraq would be the largest since the Vietnam War. When the agreement took effect on Jan. 1, 2009, there were 341 U.S. bases in the Iraq Joint Operations Area (IJOA), housing over 239,000 U.S. military, 125,000 contractor personnel, 1.7 million pieces of equipment, 40,000 pieces of rolling stock, and approximately 60,000 containers, all requiring retrograde in concert with the transition of U.S. bases to Iraqi control. At the height of the 2008 troop surge in OIF, U.S. and Coalition Forces resided on 505 bases; under a "shrink and share" concept, the United States and Iraq transitioned 164 U.S. and partnered bases before the agreement took effect.

## Base Closure Smartbook

The initial base transition process established by Multinational Corps-Iraq and Multinational Force-Iraq continued to evolve under USF-I. Early transitions had many challenges, beginning with the lack of a formal documentation process and of a well-defined process to transfer real property and excess equipment. Each transition brought a new learning curve and complex coordination efforts with multiple U.S. and Government of Iraq (GOI) entities. Local commands coordinated base transitions directly with GoI ministries and private land owners, making accurate property owner identification difficult. Potential for corruption created by the lack of visibility and control of the inventory and transition process by the central government also concerned the GOI.

Although Iraq's prime minister assigned his chief of staff responsibility for final disposition of U.S.-vacated properties, challenges continued. Multiple government ministries often demonstrated interest in the same base and the GOI could not agree upon a single entity to take ownership. Rectifying the latter challenge, the Iraqi Receivership Cell was created on May 11, 2009, with a Receivership Secretariat (RS) responsible for receiving these properties.

Prior to the RS appointment, Multinational Corps-Iraq had tasked its engineers to develop an analytical base closure model for large, medium, and small bases. The Iraqi Base Management System (IBMS) enabled planners to identify the critical path and projected number of days required to close/return an individual base (for a single base closure/return scenario) as well as the required resources for a critical path (for a specific multiple base closure/return scenario). The final version of the process consisted of 101 tasks, with a closure duration of 126 days and a completion time of 132 days.

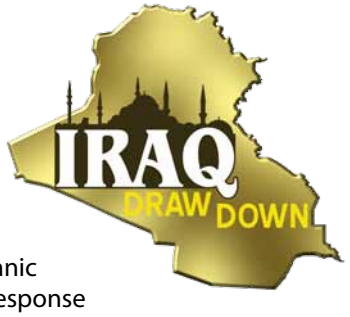
The "USF-I Base Closure Smartbook," published in February 2010, refined and codified the IBMS methodology and reduced the process to 86 tasks. In May 2011, a revision — the "USF-I Base Transition Smartbook Final Edition" — became the single-source quick reference guide for the base transition process in the IJOA. It consolidated the conditions-based transition process into 48 tasks taking 90 to 365 days to execute depending on three factors: size and complexity of the base, number of environmental actions to mitigate, and logistical considerations.

## Parallel Processes

The 48 tasks were divided into four parallel processes (i.e., transition lines of effort): 1) Real Estate Management; 2) Environmental Oversight; 3) Property Distribution, and 4) Contracting (see Figure).

### Real Estate Management

The Real Estate Management process determined property ownership and began with a deed verification request — executed by an Iraqi deed search contractor — for the land on which a base was located. There were often both government and private owners for land parcels inside the footprint of U.S. bases. Deed verification enabled the GoI to determine the final disposition of land as the RS accepted responsibility for the property. If appropriate, the U.S. Government made retroactive lease payments to private property owners.



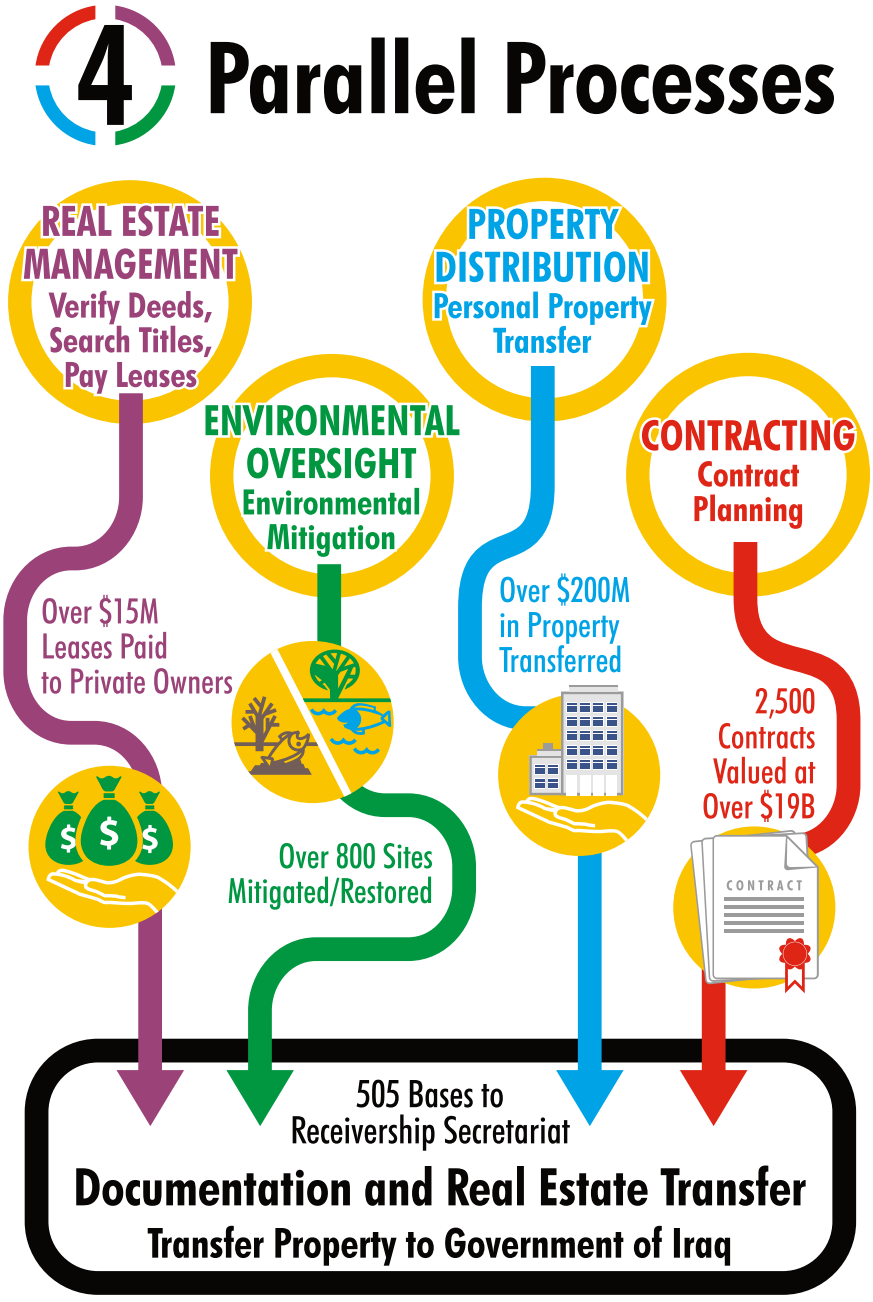

### Environmental Oversight

Environmental conditions and sites on bases were mitigated in accordance with USCENTCOM Regulation 200-2, "Contingency Environmental Guidance," as well as Article 8 of the 2008 SOFA, which stated "Both parties will implement this Agreement in a manner consistent with protecting the natural environment and human health and safety."

USF-I implemented the Environmental Site Closure Work Plan in July 2011, designed to identify, track, and accomplish 100 percent of the environmental site closures prior to base transitions. Every base required at least three environmental site closure surveys.

Environmental site closures and corrective actions were completed in one of four ways: 1) Base owners addressed and mitigated the majority of environmental sites using organic resources. 2) Contract environmental response and cleanup teams (ERCTs) provided external support for larger, more complex cleanup/closure activities. 3) Sites transferring to the GoI, the U.S. Department of State, or the Office of Security Council-Iraq were cleared without significant closure activities and transferred for continued like-use. 4) Contractor-operated sites on bases were closed using the contractor's own resources.

USF-I J7 identified 797 sites in July 2011: 362 were determined to be the responsibility of the base or unit; 206 were scheduled for transfer; 131 were to be contractor operated/closed; and the remaining 98 were assigned to ERCTs for mitigation.




### Property Distribution

The identification, accounting, disposition, and final transfer of real property and excess personal property (any U.S. Government property not considered real property) comprised a large and intense portion of the transition effort. Not surprisingly, this complex distribution process was one of the most contentious issues when coordinating with the GOI, given the susceptibility of personal property being "diverted" from the central GoI by local Iraqi units or looted if not properly inventoried and secured.

Property distribution started with an inventory. Unserviceable property went to the Defense Reutilization and Marketing Office, or DRMO. Serviceable property disposition took one of two routes. A portion went through the Foreign Excess Personal Property (FEPP) authority, a process which ended with the approved transfer of real and personal property to the GOI in conjunction with final transition. Property not transferred through FEPP authority was either transported out of Iraq, or otherwise disposed of through applicable service guidance.

Figure. The USF-I Base Transition Smartbook Final Edition divided the transition process into four parallel processes.

Real property was defined as land and permanent improvements to land, to include structures, buildings, incinerators, and utilities. Per the SOFA, Iraq owned all buildings, non-moveable structures, and assemblies connected to the soil, including those the United States used, constructed, altered, or improved. Departing U.S. forces transitioned facilities and other real property in a clean and orderly state. Unit memorials on bases such as street signs, plaques, and other reasonably transportable items were removed. Those not reasonably transportable (e.g., painted T-walls) were inventoried and sanitized/disassembled to prevent post-transition desecration and vandalism.

Key infrastructure, including bridges, electrical power generators, solid waste and medical incinerators, water treatment plants, hazardous waste treatment centers, and non-military reverse osmosis water purification units, or ROWPUs, were inventoried as personal and real property transfer items. Key infrastructure transfer also included training of GOI personnel on O&M for each item.

The GOI considered generators high value interest items, making their transfer important. The SOFA's requirement that all real property to be returned serviceable included power supply to real property. USF-I held a Power Summit in June 2011 to optimize the allocation of generators in the IJOA and to develop a theater power generation/distribution plan for enduring sites and non-enduring bases.

### Contracting

Contractors were a significant part of the support structure for U.S. forces in Iraq. Maintaining the proper level of contract support, while de-scoping unnecessary contracts, was central to keeping a base transition on schedule. A property change notification letter, which officially announced a base's change in status and estimated change date, initiated the 45-day cessation of contract services and development of contractor demobilization plans in support of base downsizing through transition. To give the USF-I commander maximum operational flexibility, the letter denoted the base life support reduction to a standard which was sustainable for a period of 45 days prior to transition.

To ensure critical accountability of contractor personnel and property throughout the transition process, USF-I established the web-based Contractor Demobilization Tracking System (CONtrax), through a fragmentary order. CONtrax allowed USF-I to manage, measure, assess, and report contractor demobilization milestones, by base and by contract, and ensure contractor owned and operated property was not abandoned, thereby delaying transition.

## Recording the Process

Documenting the base transition process verified proper completion of base transition actions and created a historical record. USF-I J7 developed a web-based Secret Internet Protocol Router Network knowledge management system where all base transition documents were posted and tracked, including final transition documents. There were 15 key documents used throughout the transition process. Two copies (Arabic and English) of the most important documents — the Record of Return, the Real Property Inventory (DD Form 1354), and the Joint Property Inventory — were signed by the U.S. and Iraq parties during the final transition events. The USF-I developed both U.S. and RS final packages, which contained an additional three signatories for GOI officers of the unit taking responsibility for the base. At the end of the transition, all documents were uploaded in the USF-I J7 basing portal for archives and record.

## Resulting Best Practices

The successful transition of 505 U.S. and partnered bases from January 2008 to December 2011 yielded the following five best practices useful in theaters of operation such as Afghanistan:

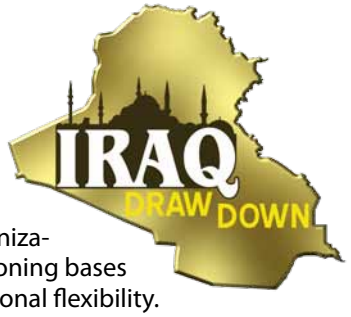
- **Executive management of large base transitions;**
- **Maximum use of partial transitions;**
- **Key leader engagement with host nation receivership designee and local military units;**
- **Effective synchronization of troop movements, contractors, and equipment; and**
- **Knowledge management and communication.**

### Large Base Transitions

USF-I established a monthly executive Large Base Transition Board (LBTB) to manage the transition of 12 large bases in Iraq (six contingency operating bases and six contingency operating locations). These transitions were the most complex and generally required at least 365 days to complete. The LBTB was the principal executive synchronization forum for USF-I to update, identify, and resolve issues and discuss future actions; its associated working group enabled sustainment of critical mission capabilities during re-posture efforts and drawdown. An LBTB portal page provided up-to-date information for each base and included a "base card" — a base map along with tables of relevant information. This common operating picture for large base transitions became the platform to facilitate and inform the LBTB.

### Partial Transitions

USF-I implemented "partial" transitions whereby U.S. Forces relinquished control of one or more portions of primarily large bases over time, leading up to the complete transition. With 35 separate parcels, Victory Base Complex




(VBC), the largest base in Iraq, made maximum use of this method. Consolidation of units, equipment, and functions in separate parcels enabled effective transition to multiple receivership entities within the GOI.

Partnerships with local Iraqi units also facilitated the transition process, primarily by avoiding the challenge of identifying the GOI receiver. There were 53 partnered bases when Operation New Dawn began. In some cases, as USF-I relinquished control of a base portion to Iraqi Security Forces, U.S. presence remained, using it as an operational platform in a partnered capacity. However, the low number of bases with the ability to partner limited this approach.

### Key Leader Engagement

Partnership with the GOI RS became a main factor for successful transition. Issues and concerns communicated as often as weekly during key leader engagements with the RS got efficiently resolved. In turn, the RS's communication with, and control of, the complex set of GoI entities involved with receiving control of bases was an essential element of the transition process.

Within the GOI, the roles and responsibilities among key leaders and ministries were not well defined or agreed upon. The key leader engagements enabled issues that would otherwise stall or halt the base transition process to be quickly and successfully resolved. The RS organized a Base Transition Committee that emulated USF-I Base Transition Teams, enabling USF-I to conduct working level synchronization forums with the GOI.

### Synchronizing Movement

There were over 50,000 U.S. troops in Iraq when USF-I commenced OPORD 11-01 Phase II "Reposture" in August 2011. This created a significant challenge in synchronizing movement of troops, contractors, and equipment in concert with the base transition timeline. In late October, when the president announced the withdrawal of troops from Iraq by the end of 2011, USF-I launched the "going to zero" strategy — transitioning bases, moving equipment out of theater, de-scoping contracts, and drawing down contractors to support the complete withdrawal.

By the end of October there were only 12 bases remaining to transition, but they were the largest, most complex bases in Iraq, left until the end to retain the capability required through end-of-mission. These were strategic logistic support bases and required particular attention to properly transition. The remaining bases were transitioned as quickly as practicable, while preserving operational requirements to support the final establishment of enduring sites in support of the Department of State and the Office Security Cooperation-Iraq and ensuring a responsible and deliberate withdrawal with maximum force protection.

### Knowledge Management and Communication

Knowledge management and synchronization tools were key enablers to transitioning bases while maintaining security and operational flexibility. Going to zero required bases to "thin and consolidate" and "mothball" areas to reduce security requirements and O&M levels. OPORD 11-01 required bases to conduct rehearsal of concept drills, stakeholder conferences, and monthly synchronization meetings for the four most complex bases in the IJOA (International Zone, Camp Adder, JB Balad, and VBC). USF-I established a Base Transition Conference Synchronization Matrix to track meetings, deconflict schedules, and ensure the right senior leader representation was on hand at the events. Bases used town hall meetings, flyers, electronic correspondence, and the web to inform base tenants and provide guidance regarding cessation of services. With limited capabilities of tactical communications, synchronization between division leadership, HQ USF-I, and base transition teams was essential.

## Final Transition

At the beginning of December 2011, USF-I had six bases remaining to transition, including five large bases and one enduring site, and had less than 12,000 troops remaining in Iraq. These bases were critical for the final withdrawal of troops, contractors, and equipment. In late December 2011, USF-I conducted a ceremony with the GOI Receivership Secretariat to commemorate the transition of all 505 U.S. bases to the Government of Iraq. A final memorandum for record was signed by both parties signifying the successful transition of all bases in Iraq as mandated by the 2008 SOFA.

The base transition and USF-I engineer mission in Iraq were successfully completed through inspired leadership, an enduring partnership with the GOI, and superior performance. A near nine-year operation in Iraq ultimately ended with Engineering Excellence! Honor and Success!

*Maj Rivero is currently assigned to the 133rd Construction Management Team, 20th Engineer Brigade, XVIII Airborne Corps, Fort Bragg, N.C. Col Ottoman is Deputy Chief of the Asset Management and Operations Division, Office of The Civil Engineer, the Pentagon, Washington, D.C. They were deployed as the deputy and chief, respectively, of USF-I J7 Basing, Facilities, and Environment Division.*

# part of history: an open letter to eod airmen who served in iraq

EOD Airmen,

In a rather quiet and subdued flight departing at 1834L, the last Air Force EOD operators left Iraqi air space on Dec. 9, 2011, marking the end of an eight-year war that took the lives of thousands of service members, including eight of our own EOD Airmen. Although there was little fanfare or public celebrations over this final flight, it marked the end to one of the most intense conflicts of our young program, where EOD operators were tasked with supporting everything from direct action units and SOF to route clearance elements to remove an entrenched insurgency and their weapon of choice, the improvised explosive device (IED). Most recently, we had been focused on partnering and training our Iraqi counterparts and empowering the Iraqi Army Bomb Disposal Companies to take the lead in securing their own country, hopefully for many years to come after our departure.

From the very first night of bombings on March 20, 2003, to this last flight out of country by MSgt Travis Hargitt and SSgt Gabriel Barnes, our EOD Airmen performed heroically. Operations Iraqi Freedom and New Dawn led to some of the most rapid changes in our Air Force EOD program since our very beginning in 1947. From the moment when President George W. Bush announced the invasion of Iraq, our EOD Airmen were on the ground in Iraq. Early missions included defeating IEDs on oil pipelines, destroying caches on the sides of roads and other locations, and securing airstrips for follow-on forces.

Names like the Bigg House, Camp Clemmons, The Walter Moss DFAC, Will and Tony's place, and many others are etched into our memories and will be forever. We lost some of our finest EOD Airmen in Iraq and it is fitting that we recognize them here:

***TSgt Walter Moss deployed from Mountain Home AFB***
***killed in action 29 March 2006***

***MSgt Brad Clemmons deployed from Eielson AFB***
***killed in action 21 August 2006***

***Capt Kermit Evans deployed from Cannon AFB***
***killed in action 3 December 2006***

***TSgt Timothy Weiner deployed from Hill AFB***
***killed in action 7 January 2007***

***SrA Elizabeth Loncki deployed from Hill AFB***
***killed in action 7 January 2007***

***SrA Daniel Miller deployed from Hill AFB***
***killed in action 7 January 2007***

***SrA William Newman deployed from Hickam AFB***
***killed in action 7 June 2007***

***TSgt Tony Capra deployed from Det 63***
***killed in action 9 April 2008***

Although there may be debates within political and military establishments on exactly what our mission and the overall outcome was in this conflict, what isn't in dispute are the significant achievements of our Airmen and the number of responses and operations our Airmen conducted.

From March 20, 2003 until Dec. 9, 2011, our EOD flights conducted over 36,000 missions with 13,400 of these being IED defeat operations. During this same period we helped clear airfields after 870 enemy attacks with indirect fire from rockets and mortars. These are enormous achievements through some of the most arduous and difficult times in our EOD program's history. Your actions saved countless coalition and civilian lives and enabled the full spectrum of operations, from combat missions to humanitarian support.

As each of us take a moment and reflect on our numerous deployments to Iraq, and some of the difficult operations we participated in, you should be proud of what you achieved. Our operations in Afghanistan will continue for the near future and many tough days lie ahead. However, we congratulate each of you for the part you played in liberating Iraq and truly accomplishing the mission. You are now part of history.

Very respectfully,

Maj Landon Phillips, EOD Program Director

CMSgt James Brewster, EOD Career Field Manager


*In March 2003, as one of the Airmen on a 14-person Joint EOD team, MSgt Joe Cross, ropes off a safe area in Iraq's Rumaylah oilfield. "The request for four Air Force EOD volunteers came March 17. Our mission was to clear a path to 700 oil wellheads in Iraq's … oilfields. Working within 50-75 feet of the fire … we used heat-resistant hoods … and carried sheet metal shields to protect ourselves …. On our part 52 unknown wells were located…. More than 5,000 ordnance items were found and destroyed." MSgt Joseph D. Cross II and TSgt Anthony Blackmon (from an article in CE Magazine, Summer 2003; U.S. Army photo by Spec. James P. Johnson)*

*In November 2005, SSgt Ron White directs volunteers on palletizing ordnance to transport to Ali AB for disposal by 407 ECES EOD Airmen, known as the "Smokin' Monkeys." SSgt Richard Dula was team chief for the disposal efforts, known as Operation Big Bang. In a July 2, 2003 Stars and Stripes article then SrA Richard Dula had this to say about ordnance clearing and disposal: "Lots of experience. A lot of stuff I haven't done before, and probably never will again." (U.S. Air Force photo)*

*SSgts Clay Sigler (left) and Robert Butler, 332 ECES EOD, unload a robot from the back of a Humvee at Balad AB. "It's vital that we have more than one [robot] in case the first one breaks down," said SSgt Butler. "It's a whole new game here in Iraq. Many senior noncommissioned officers have never come face to face with an IED. Now we're all facing them together." IED response was an important part of the mission in Iraq. For example, from January to May 2006, EOD at Sather AB (AOR of 500 square miles) responded more than 340 times to more than 250 IEDs.(photo by SrA Shaun Emery)*

*At FOB Cedar in 2009, SrA Kyle Gnuechtel, 407 ECES EOD, advises Iraqi Police EOD technicians as they inert a suicide bomber's vest during a training scenario as part of a six-week course. "Training the Iraqi EOD will prove to be crucial when everything gets handed over to the Iraqi people," said SrA Gnuechtel. (photo by SrA Tony R. Ritter)*

*For more photos and information about EOD in Iraq go to www.afcesa.af.mil/library/cemagazine*

# BUILD IT UP!

# TEAR IT DOWN!

Lt Col Terry Walter
HQ JFC Brunssum

Maj Kevin Brown
AFIT/CEM

The opening track of Fatboy Slim's platinum album, You've Come a Long Way Baby, is "Right Here, Right Now," which is exactly how the 332 AEW at Joint Base Balad delivered "Combat Power for America," according to their motto. But, for the 332nd's Red Tail civil engineers a different track on the same album better describes their mission in Iraq in the last half of 2011: "Build it Up, Tear it Down."

The 332 ECES was given the task of building up a warm base, a cooperative security location (CSL), at an undisclosed location in Southwest Asia, at the same time they were "tearing down" JB Balad (JBB), a major hub of operations in Iraq. The CSL would provide continuous sortie generation capability during U.S. Forces in Iraq (USF-I) retrograde operations. "Tear it down" began first.

## Tear It Down

JBB was scheduled to shut down on Nov. 30, 2011, with the early summer's population of about 17,000 personnel dropping to zero on a relatively steady glide slope. The 332 ECES had base operating support oversight and control of all facilities, infrastructure, and essential services for the 6,400-acre complex housing both Balad AB and Logistics Support Area (LSA) Anaconda. JBB was USF-I's second largest base, a platform for many units, agencies, and people providing contract support through the Logistics Civil Augmentation Program (LOGCAP), Air Force Contract Augmentation Program (AFCAP), and Army Corps of Engineers (CoE). All of the units and contractors needed to demobilize prior to JBB closing.

## Planning

The draw down plan was continually modified in a delicate balance of two objectives. The first was peeling away operational and logistic support to shrink JBB and USF-I populations down as early as possible for optimal theater movement capability in the later stages. The second was removing this support as late as possible to prevent unacceptable risk for USF-I in surveillance; combat air, search and rescue; theater-level maintenance, supply, medical, life support; and other areas.

Per JBB's transition plan, contractors were to vacate by Nov. 1. As early as Sept. 1, gaps began to show and the 332 ECES had to fill them through blue suit engineers and troop-to-task labor.

In January 2011, then ECES commander Lt Col Bo Bloomer and his team had estimated the workload manpower required for facility and essential service support during and after the estimated 850 AFCAP and CoE contractors left. By the end of August, 41 traditional engineers were augmenting the 71 existing ones. After shadowing O&M contractors for two weeks, on September 30, the Red Tail Engineers were ready to take over O&M of two 1.2-Mgal/day ROWPU plants; a wastewater treatment plant; a 29-MW power plant with extensive high-voltage distribution; 278 low-voltage spot generators; sweeper operations; airfield pavement repair; and facility repairs for the roughly 6,000 facilities still occupied.


## Executing

As the bluesuit takeover plan was executed, the devils in the details emerged. First, JBB's closure changed to Nov. 11, a three-week push to the left from the scheduled closure of USF-I's largest installation, Victory Base Complex in Baghdad. (The main supply route and transportation assets could not feasibly handle both.) Second, rather than declining steadily as expected, in early August JBB's population actually began to increase as USF-I delayed redeployments to preserve operational flexibility. Units cleared out of JBB, but new ones arrived as smaller FOBs shut down and larger main bases began their retrograde process. FOB closure delays meant LSA Anaconda's tenants had to stay for their support mission. Bottom line, JBB had 14,000 personnel (instead of the planned 5,000) to be supported by only 102 Air Force engineers.

The 332 ECES needed more manpower and in late August we began a rushed acquisition effort for manpower through local national (LN) contractors. On Sept. 29, although not initially prepared or sufficiently staffed in some areas, LN contractors began work. Within 24 hours, 60 percent of the truck fleet was down; another 24 hours saw water tanks across base dry and septic tanks and dumpsters overflowing. The engineers teamed with vehicle operators and maintainers from the 332nd Expeditionary Logistics Readiness Squadron, and tenant Army sustainment units to reestablish and sustain delivery of essential services. Within two weeks, the contractor was managing almost the entire essential services operation with minimal oversight.

A painted T-wall at JB Balad, Iraq illustrates the motto and pride of members of the 332 AEW. During preparation for the transition at Balad and other bases in Iraq, all T-wall murals were painted over.
(photo by SSgt Keyonna Fennell)

We also underestimated management of JBB's solid waste stream. Departing units clearing out housing/office areas created "waves" of trash that overwhelmed the three working incinerators, our only source of waste disposal after DRMO closed. Through an aggressive communication effort, we eventually got most people to leave lodging rooms, offices, and industrial areas as operational as possible for the Government of Iraq (GOI). We secured multiple vendors to remove JBB's scrap wood and metal. Even with these efforts, we were still averaging 200 cubic yards a day of solid waste to go through because, guidance to the contrary, it contained items of military value (e.g., body armor plates, munitions, etc.) and was comingled among the bins clearly marked "wood only," "metal only," or "trash."

Three days into the contract, the "pile" of trash to be burned tripled in size. and although not prepared or resourced to take over, to prevent an environmenal disaster, we did just that. Our two alternatives were to landfill or incinerate (open burn pits were prohibited). The level of effort for landfilling and heavy equipment requirements made incineration the better choice. MSgt Joseph Osborne (HVAC) and TSgt Robert Sheipline (Structures) led the effort in learning to troubleshoot the multitude of electronic, hydraulic, and burner system failures. With this aid, the contractor maintained sufficient throughput and we returned

JBB to the GOI with less than three days worth of trash rather than a 38-day accumulation.

O&M of infrastructure is not the only area where we managed risk with minimal manning. At 72 hours out from last fixed wing aircraft, there were just six firefighters operating six crash response trucks and the EOD team used the last of its demolition material 24 hours out.

Nov. 7, 2011 at JBB was a beautiful, sunny day and eerily quiet. Tumbleweeds and not much else were rolling down JBB's "main street," Pennsylvania Avenue, normally a heavily trafficked artery. With a satisfied sense of accomplishment, the 332 ECES Red Tail Engineers lifted off from JBB, five days before anticipated. Most were headed home, but nine of us had enough time left on our deployment to join the bridge force engineers in the "build it up" effort for a CSL at an undisclosed location in Southwest Asia (ULISWA). (At the time of publishing, host nation sensitivities prevent us from using the name or location of the base).

## Build It Up

At the same time we were transitioning JBB, we were standing up a CSL for the 332 AEW to provide uninterrupted support to the theater Air Tasking Order during phased redeployment. We had to enable sortie generation at JBB through mid-October; the CSL had to be operational by late September.

The 332 AEW/CC requested each squadron to take risks where they could in the JBB closure mission, and send a leadership core to the ULISWA, which is a warm base with developed infrastructure, typically used for exercises a few times a year and minimumly funded for maintenance. The 332 ECES was able to release from JBB one officer, an engineering superintendent, an engineering assistant, 12 firefighters, five emergency managers, and 40 third country national escorts. In late August, the 60+ members of 332 ECES from JBB forged with 110 "bridge force" engineers from several CONUS bases. Unfortunately, the mission's rapid execution timeline caused problems in the planned force flow and the Contingency Response Element had no organic engineer capability. These factors, coupled with a delay in the AFCENT-hired contractors transitioning the CSL from "warm" to "hot operational" created an immediate priority for us to provide life support instead of prepping the airfield for receiving aircraft.

The contractor was supposed to transition the CSL from dormant to operational in 14 days, a huge undertaking that proved to be unachievable for several reasons. Areas of the performance work statement were too vague, some identified O&M requirements were unfunded or unexecuted, and contract oversight, an additional duty for someone many miles away, wasn't always a priority. But, the biggest impact came from the influx of customers, all of whom preceded the engineer force. The "supported" population quickly exceeded the capability of the "supporters," as units sent advance elements to their pre-advon teams to their advon teams. The teams all came with functional timelines that needed "emergency" manpower, frequently forcing the six-person contractor team to drop their planned tasks.

Our initial experience of the base was like rolling into a western movie ghost town — facilities were up, but no one was home. Tumbleweed was literally blowing around and it was so quiet you could hear a pin drop. Civil engneers' first task was to take care of the basic needs of food (MREs), water (500,000-gallon non-potable water tanks) and shelter, (hard facilities). The latter needed a lot of work.

Every room needed cleaning; dust was in and on everything. The cleaning supplies we brought barely scratched the surface. Contractor-hired laborers started cleaning priority facilities, but individual occupants spent hours removing dust and sand from everything in their dorm rooms or work areas.

Power production craftsmen from the 332 ECES at JB Balad disassemble the anchor plates of a mobile aircraft arresting system on Oct. 15, 2011 to ready the base for transition to the Iraqi government. (Photo by MSgt Cecilio Ricardo)

On Jan. 25, 2012, at an undisclosed location in Southwest Asia, Airmen sort one of 125 Alaskan tents for storage after the end of Operation New Dawn in Iraq. (Photo by TSgt Stacy Fowler)


With the first tier of needs manageable and with launching sorties one month out, we focused on the F-16 beddown, plus the "unknown." Based on force flow of personnel, equipment, and supplies, we established the following priorities, and accomplished them all in less than five weeks, even while responding to the daily onslaught of repair work orders:

Built infrastructure proved to be a double-edged sword. The benefits of having four walls, a ceiling, and indoor plumbing for everyone were offset by the huge task of

- Prepare (secure and power) the dilapidated munitions storage area
- Open the flightline fire department because C-130 missions were coming in fairly regularly
- Power and plumb the dining facility (DFAC) because war reserve materiel (WRM) kitchen assets were on their way and hot meals became a priority
- Support the Combat Communications Squadron in establishing their communications network
- Improve physical security; construct and repair defensive fighting positions, bunkers, and other security measures
- Establish a flightline maintenance area to protect crews from the harsh desert elements

cleaning it all and having manpower to keep up with work orders for burned-out lights, inoperable HVAC units or water heaters, clogged drains, leaking plumbing fixtures, and other such quality of life issues. In the first six weeks, working as smaller multi-craft task-force teams, we replaced 1,200 electrical contacts in HVAC systems and by seven weeks, had closed out 1,939 work orders and spent about $600,000 in material, equipment, and supplies. Following is a short list of our accomplishments:

## Lessons Learned

- Installed two BAK-12 barrier systems after heavy coordination with our host nation flying wing
- Established two fire stations and conducted prerequisite training to ensure flying ops and living areas were safe
- Set up maintenance area, in one week, for 450 personnel (17 Alaska and California shelters with associated power and infrastructure); relocated latrine trailers and built a septic holding tank; placed T-walls to attenuate noise and jet-blast, and laid AM-2 to minimize FOD hazards.
- Secured materials and contracts for airfield projects, including parking apron painting and lighting and asphalt repairs
- Re-opened the 2,000-gallon hazardous waste storage site

While beddown experiences are highly dependent on mission, force flow, location, and built infrastructure, some of our observations from the ULISWA are readily transferable.

Less communication equipment actually improves communication at the tactical level. With only cell phones and a few computers for the whole wing, the main communication locus was the DFAC. Breakfast meetings set jobs/priorities, followed by a lunch-time vector check, and dinner was to evaluate and plan next day's work. At daily leadership meetings, we discussed 5/10/25-meter targets.

Understanding of logistics and movement was also important. While we often build competency within our deploying units as Unit Deployment Manager, there are some differences when on the receiving end of the process. After grasping the logistics community's language and how personnel and equipment UTCs were built and deployed, we were able to streamline the process from our end and could better request and posture for future WRM assets.

Pre-built basic life support and supply contracts get you out of the starting blocks early. While still at JBB, we worked with AFCENT A7 on contract development and award for some essential services and commodities (the beddown team had a $1M line of credit for Class IV supplies, parts, and materials). This enabled us to handle the onslaught of too much supported population too soon.

One of the biggest keys to success was ownership. We developed labor partnerships with other squadrons (e.g., security, maintenance, force support, communications, etc.) as they deployed in. Engineer leads trained other units to help themselves, and the entire wing developed a pride of ownership. It is amazing how well units take care of a facility when they helped to build it, clean it, or repair it.

To be motivated, the Airman needs to truly understand the purpose of the mission. Ours was not just to build, but to open a warfighting platform to ensure the safe passage of U.S. Forces out of Iraq. We did not want to be an excuse, but a reason for the success the largest U.S. Forces drawdown since Vietnam — mission accomplished!

*Lt Col Walter is a staff infrastructure engineer at NATO Joint Forces Command HQ, Brunssum, The Netherlands. Maj Brown is an instructor in the Engineering and Services School, Air Force Institute of Technology, Wright-Patterson AFB, Ohio. They were deployed as the 332 ECES Commander and Plans and Programs Flight chief, respectively. Maj Brown led the squadron's team to the CSL.*

# PM... Not Just A list

Ms. Venus R. Larson, P.E.
HQ AFCESA/CEOA

Preventative Maintenance (PM), which will be replacing the Recurring Work Program, or RWP, is so much more than just completing a list of tasks. It is vital to extending the useful life of Air Force assets by providing the necessary infrastructure systems O&M to sustain the mission and provide critical life and safety capabilities.

Base infrastructure lines and systems (water, wastewater, gas, and electric) are valued in the multi-millions of dollars. Depending on the type of construction and local environment, the useful life of these systems can range from 15-50 years with proper and regular maintenance. Since these systems are largely buried or are out of sight, the need to maintain, service, or repair them can be easily overlooked. More often than not, they receive attention when they fail and require emergency repair. In these situations, there is often immense damage to vital equipment, a complete drop in service, and dramatic mission impact; the associated costs can easily triple or quadruple the cost of regular O&M.

Why does emergency repair tend to be the preferred choice of execution? Budget constraints, time limitations, and undermanned shops make it difficult to schedule and fund O&M. Civil engineers can track and schedule O&M requirements in the PM, but there are often too many requirements (essential and optional) to accomplish and tasks end up being deferred. Whatever financial, manpower, or organizational challenges exist, PM needs to be completed if the Air Force is to maintain necessary mission support.

Eliminating excess PM requirements gives shops a better ability to complete the overall PM tasks. During the required annual PM review, shop managers and leadership can add and subtract requirements. However, because no standards currently exist, there is a danger in losing the essential O&M from the PM program by adding or deleting tasks over the years. Acknowledging this, some bases and MAJCOMs are conducting a thorough PM scrub and AFCESA is heading up a corporate-wide initiative that utilizes the expertise and lessons learned from MAJCOMs to establish a minimum PM standard for the Air Force.

Even after a good PM scrub, other obstacles exist. A given system's age or condition may require levels of work beyond regular PM. Undocumented changes or faulty records can even lead to a situation where systems requiring PM can no longer be physically located. Alterations to existing infrastructure are not always adequately communicated to the shops. Adding a mapping, inventory, and condition assessment to shop tasks can greatly help them overcome these obstacles

For example, if in the process of exercising valves, some valves on an old line are found not working, the shop can map/document the failed valves for future direct schedule work, a large repair project, or for reference during an emergency. Knowing the location of faulty valves can save time when isolating a water break. In addition, for a project or direct schedule work, mapping/documenting these difficulties can assist in cost estimating, developing, and justifying a complete repair.

Another benefit of conducting an inventory, condition assessment, and mapping, especially in times of financial challenges, is that PM can be adjusted based on the condition and impact of the system. Some private companies or municipalities are basing their O&M on a system's performance. For example, if one pump is located in an isolated, protected area and another identical one is not as protected and exposed to a corrosive environment, the first can be managed with annual maintenance while the other needs more frequent care. The O&M schedule is adjusted to focus effort where needed most, saving both time and money. While a complete inventory and assessment are not always economically possible, having a procedure to collect data will still help engineers maintain base infrastructure.

The resulting collected data can be useful to provide a clear picture of base needs in the activity management plan, or AMP, process. In the recent past, bases were able to secure necessary funds simply by having ample documentation (mapping, condition assessment, and PM impact). The bases can show the need for extra funding/manpower to complete PM or why the lack of repair is preventing PM completion.

If PM scrubs and inventory/assessments fail to make the in-house PM economically feasible, utility privatization (UP) may be considered. However, even though UP makes a contractor responsible for maintenance and repair, it requires active government oversight. Contracting officer representatives (CORs) ensure the tasks of the UP contract are adequately met. These CORs need feedback from other base personnel on the system performance and there is a process to notify them if any situations should arise. The UP maintenance, different from Air Force standards, is up to the contractor and still needs to be completed to provide the contracted level of service. Lack of oversight has recently resulted in multiple hydrant failures on fire protection lines, a sign of lack of maintenance. Though these failures occurred during an exercise, it would have been catastrophic if these failures were discovered during an actual fire event.

A1C William Davey, an HVAC apprentice with the 633 CES, replaces a water line for a chiller at JB Eustis-Langley, Va. (photo by SrA Stephanie Rubi)

Sometimes, bases consider it a wasted effort to invest in systems that may be privatized. However, the better the systems are inventoried and maintained, the lower the UP costs. A contractor can win the UP contract, conduct an inventory assessment, then eliminate unnecessary systems and implement energy saving repairs, resulting in a lower operating cost and an increase in their profit on the contract. Contractor's bid prices tend to be high on unknown systems, but if the condition and inventory are well documented, the government may be able to negotiate a lower price. It's important to remember that UP cannot be treated as a complete transfer of responsibility to the contractor; the bases still have their part to play.

Proactively maintaining the Air Force's multi-million dollar infrastructure systems is vital to our mission success. We know that more than money is at risk. Bottom-line, there is not enough manpower and funding to repair all failed items, making it necessary to focus resources efficiently. A thorough PM scrub, inventory/condition assessment/mapping, and possibly, engaged contractor oversight, can help overcome the obstacles to adequately complete PM.

*Ms. Larson is Civil Engineering's Water/Wastewater Subject Matter Expert, AFCESA, Tyndall AFB, Fla.*

# Civil Engineering's First SUPERFOA

Dr. Ronald Hartzer
AFCESA/CEBH

A major facet of Civil Engineer Transformation…Accelerated is the creation of a new field operating agency, or FOA, through consolidation of the Air Force Civil Engineer Support Agency, the Air Force Center for Engineering and the Environment, and the Air Force Real Property Agency. The new FOA will centralize several functions currently accomplished at the bases or MAJCOMs. It will become a worldwide center of excellence for installation support, providing centralized support efficiently, while offsetting upcoming reductions of manpower at the squadrons and MAJCOMs.

This new organization is not the first "Super FOA" within Civil Engineering. In 1977, the Air Force created a new "Super SOA" (separate operating agency, as FOAs were known until 1991) — the Air Force Engineering and Services Agency, or AFESA.

## Background

In the 1970s, the Air Force and the federal government were experiencing fiscal challenges similar to those faced today. The Air Force was trying to reduce overhead by streamlining and consolidating organizations. In 1975, Engineering and Services had combined at the Air Staff to create a team responsible for improving the quality of life for Airmen and their families.

A study showed that there was merit in reducing manpower at the Air Staff, realigning some organizations from several MAJCOMs, and centralizing responsibility for these activities into one organization. This realignment would better utilize specialized skills of personnel to strengthen the services being provided to the bases and MAJCOMs.

## AFESA Organization

AFESA was headquartered at Kelly AFB, Texas, with locations around the world and approximately 10,500 people. The SOA brought together myriad organizations, including those below. All of the organizations remained at their locations with only a handful of personnel moves.

- **The Air Force Commissary Service (AFCOMS), Kelly AFB, Texas**
- **The Air Force Civil Engineering Center (AFCEC), Tyndall AFB, Fla. (from Air Force Systems Command)**
- **CEMIRT (from Air Defense Command)**
- **Air Force Regional Civil Engineer Offices (AFRCEs) located in Atlanta, Dallas, and San Francisco**
- **The Air Force Services Office, located in Philadelphia (from Air Force Logistics Command)**
- **The Mortuary Services Office, located at Bolling AFB, D.C.**

The new organizational structure was described as "simple and direct lines of authority." For purposes of manpower efficiency, the Air Force Director of Engineering and Services, Maj Gen Robert C. Thompson, was dual-hatted as AFESA commander, exercising clear direction and control from Washington, D.C. through the commanders and the chiefs of the component units. The AFCOMS Commander, Maj Gen Daniel L. Burkett, also dual-hatted, was the AFESA Deputy Commander.

The chain of command for AFCOMS was a bit convoluted. It also reported to its own six-member board of directors that approved basic policies, plans, and programs; reviewed

and approved financial goals; and periodically reviewed operating results. The board was chaired by Maj Gen Thompson.

Resource management and staff support functions were performed at AFESA Headquarters in Texas. With the SOA commander 1,600 miles away, the agency's day-to-day management was done by the AFESA chief of staff at Kelly. AFCOMS' comptroller, director of personnel, director of plans and programs, and director of administration were all dual-hatted for AFESA.

AFESA's mission directive granted authority to bases and MAJCOMs to communicate directly with AFESA components. Because the agency was to provide responsive technical assistance on problems, the direct line of communication between base-level managers and AFESA experts was essential.

## AFESA's Mission

In spite of organizational changes, the mission for most components remained the same; AFCEC was the exception.

AFCEC began as an Air Staff agency assigned to the Directorate of Civil Engineering, with primary functions of providing CE policy and assistance to the field. In June 1972, AFCEC was placed under Air Force Systems Command and gained a research and development (R&D), test, and evaluation role in addition to its assistance role, but lost its policy function. The R&D mission expanded in 1975; AFCEC gained responsibility for all civil engineering R&D efforts, including environmental research.

When the decision was made to create AFESA, AFCEC was split into two organizations: AFCEC became part of AFESA while the R&D functions (still collocated with AFCEC at Tyndall) remained with Systems Command as the Civil and Environmental Engineering Development Office.

The benefits expected from AFESA included cost-effective mission support; efficiencies from the centrally controlled Air Force-wide assistance concept through streamlined management; better coordination and interface on environmental matters; and consolidation of specialized Engineering and Services operative functions.

## AFESA'S Brief Existance

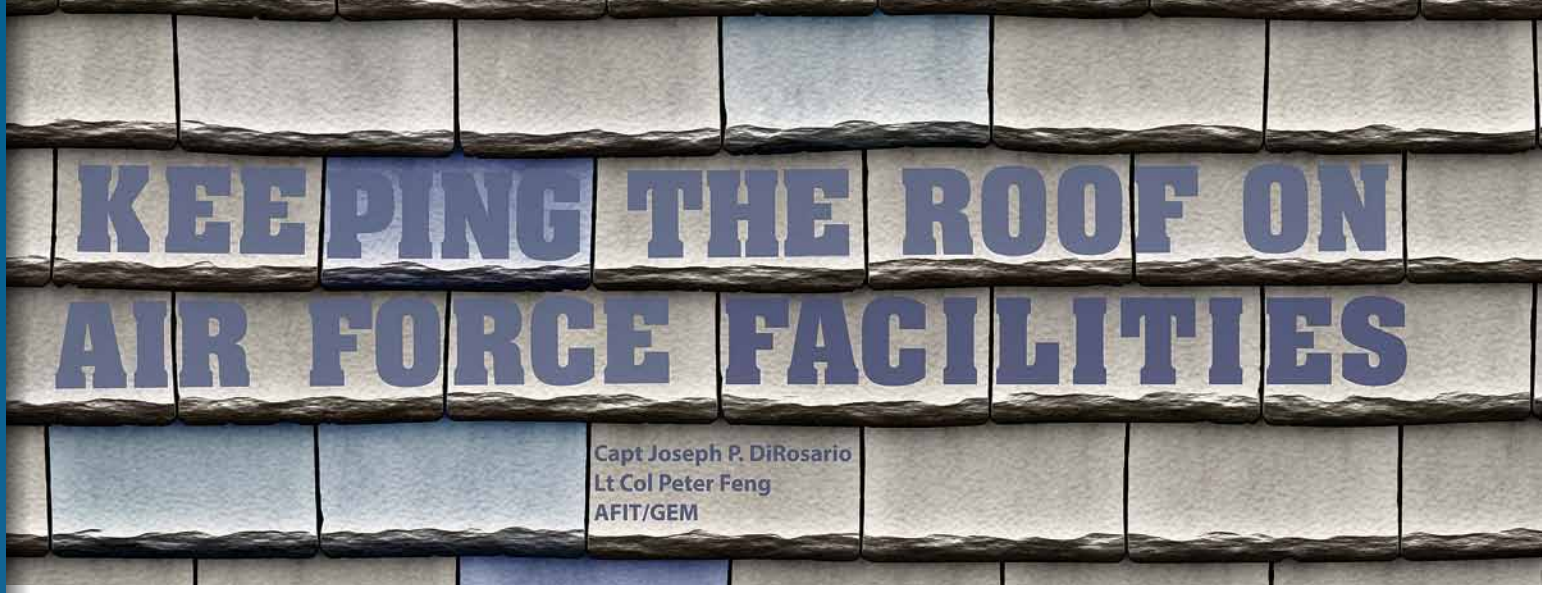
AFESA was established on April 8, 1977 with full operational capability on July 1, 1977, but after only one year in existence, it was re-designated as the Air Force Engineering and Services Center (AFESC), as part of an overall Air Force restructuring. Years later, Maj Gen Clifton D. "Duke" Wright, Jr. described it as "paper organization." AFESA's various components never really integrated and whether it could have ever gelled into an effective organization was never really answered.

## AFESC Created

In April 1978, the Air Force decided to reduce staff in the National Capital Region and began reducing the number of directorates, as well as elements reporting directly to the Secretary of the Air Force and the Chief of Staff. The Directorate of Engineering and Services was transferred from the Deputy Chief of Staff, Programs and Resources into the new DCS, Logistics and Engineering. A total of 153 positions were to move from the Directorate of Engineering and Services to the new SOA at Tyndall and take their policy responsibilities for the areas of Readiness, Operations, Fire, and Services.

Although AFCOMS was originally designated to become part of AFESC, it never happened. As General Wright, who became AFESC's first commander, later described the situation, "… when AFESC was created AFCOMS was commanded by Maj Gen [Daniel L.] Burkett and he didn't like the idea of reporting to a brigadier general. I understand that."

Eventually, AFESC matured into an effective and efficient organization with approximately 1,000 people at its peak. It's span of responsibilities included four CEMIRT regions; food service; AFRCEs; the Engineering and Services Laboratory; readiness training at Eglin's Field 4, ; fielding of the WIMS/SIMS computer systems Air Force-wide; and numerous traveling teams. AFESC existed until 1991 when it was re-designated the Air Force Civil Engineering Support Agency as part of the massive Air Force restructuring of the early 1990s that also created the Air Force Center for Environmental Excellence.



# KEEPING THE ROOF ON AIR FORCE FACILITIES

Capt Joseph P. DiRosario
Lt Col Peter Feng
AFIT/GEM

## Introduction

Roofing systems constitute up to 25 percent of a building's total value and an active focus on the construction and maintenance of a "solid" roof can extend its life as much as 10 years. Recent research by members of the Graduate Engineering Management program at the Air Force Institute of Technology underpins the importance of construction inspections and warranty compliance programs in saving roofing-related costs and suggests strategic sourcing for an Air Force-wide roof preventive maintenance program might generate additional savings.

Our research began as part of a joint partnership with the 771st Enterprise Sourcing Squadron to establish the current state of the Air Force roofing system maintenance program, using ACC 's roofing systems as a sample for a case study analysis. To manage its roofing systems, ACC uses RoofExpress, a geospatial information system-enabled database that provides both inventories and condition assessments. During the period studied, ACC's engineers were charged with supporting approximately 47 million square feet of roofing on 18 different bases for a variety of roof systems. Top roof systems were metal (50 percent), built-up membrane (25 percent), and thermoset single-ply membrane (11 percent); other systems included modified bitumen, thermoplastic single-ply membrane, clay tile, slate, and spray polyurethane foam. Average system age varied between 7 and 18 years. For the various roofs, we examined reports of Roof Condition Score (RCS), an index formulated by creators of RoofExpress and the Roof Consultants Institute (RCI), Inc., an international association of professional roofing experts. Overall, ACC's roofs were in good condition, averaging 75-85 on the RCS scale.

In terms of construction, the database contained defects and inventory data separated by a vector-based format composed of points, lines, and polygons used to represent geographical features. For example, from a geographical standpoint, the best representation of a missing asphalt tile on a roof is a point. (Database managers ensured the double counting of defects was not an issue in data collection.) Based on the results of our case study of ACC's roofing systems, we were able to formulate some general conclusions. Our findings and suggestions are given below.

## Common Defects

Defects were catalogued by geographical feature for each of the roof types (the Table shows defects for the top three types). Overall, 5 to 35 percent of the point and polygon geographical defects categories on most roofs were associated with debris. Damage to fasteners and flashing were also high percentage areas. (According to industry reports, improper flashing causes almost 80 percent of the issues that result in extensive repair or roof replacement.) Some top issues for metal roofs involved fasteners and flashing, as well as seam defects that could cause water leaching to membranes. For built-up roofs, across the different geographical categories, blistering incidents (50 percent) were the largest problem followed by flashing deficiencies (35 percent). Other major problem areas for built-up roofs included membrane splits and bare felt issues.

## Inspection and Education Are Key

Our findings suggest that many of the cataloged defects (e.g., metal roof fastener and flashing, etc.) could have been avoided with better construction inspection procedures and education programs for project managers on roofing systems, a conclusion we verified with Air Force roofing experts. Maintenance inspections could have discovered and mitigated issues falling in the top four defect areas (debris, fasteners, flashing, and blistering).

Depending upon the project, most experts recommend at least 2 to 12 inspections during construction to ensure proper setup, application, and completion and AFI 32-1051, Roof Systems Management, mandates semi-annual maintenance inspections. However, the Air Force career fields responsible for construction and maintenance inspections are in high demand and civilian personnel, who already provide a significant portion of the construction inspection program, are expected to fill in manpower gaps during deployments.

Searching for low-cost, high-impact solutions for installations, we consulted with Air Force roofing experts. They suggested programs flight have on hand National Roofing Contractor Association manuals (approximately $650), which are heavily referenced in Unified Facilities Criteria specifications. They may help engineers and managers in roof project design, specification, and inspection and in writing more specific statements of work. Another suggestion was online courses on roofing systems basics (approximately $50-$150).

## Leveraging Warranties

We looked at the RCSs during basic warranty period (usually one year) after initial construction for all roof types; they averaged between 89.5 and 95. While these scores were good, they could have been much higher when considering that the roofs were relatively new. Generally, most contracts involve at least one of three warranty types —material; material and workmanship; and full-system — that range between 1 and 20 years in terms of the insurance coverage provided to installations. Ensuring warranty compliance — and associated savings — requires regular inspections, which must be tracked and recorded in compliance with warranty requirements. For maximum paybacks from warranty investment, during inspections, engineers and managers should ensure support structures, flashings, pitch, pockets, caulk, roof edging materials, and termination points are covered.

Program flights should review the current status and disclaimers of their roof warranty programs, which may often be voided by lack of notification of issues. Contractors usually guarantee against defects caused by their labor for no more than two years, while manufacturers warrant their materials for no more than 10 to 20 years.

## Strategic Sourcing of Maintenance

Preventive maintenance programs cut costs and maximize roof life. Industry experts estimate a preventive maintenance program can extend roof life as much as 40 percent.

Our findings support the idea that roofs are financial assets and preventive maintenance programs are a necessity when roof replacement costs average $3 to $20 per square foot.

Based on our findings, we propose strategic sourcing as a viable solution to revitalizing Air Force rooftop preventive maintenance programs. Private companies and city and county governments have reported success with it. Strategic sourcing would streamline program costs, reporting, and other administrative issues, thus freeing Air Force personnel to concentrate on other maintenance requirements and it would provide added control, convenience, responsiveness, and fully certified experts in all roof system maintenance processes. However, strategic sourcing must be coupled with thermal scans of rooftops ($0.01 and $0.03/square foot) every three to four years and a strong roofing database management program.

## Conclusion

In summary, our research pinpointed several actions that would enhance the performance and longevity of Air Force roofing systems and generate cost savings. Construction inspection procedures for roofs and maximizing on-site inspection time with additional education can avoid future problems. Warranties need to be better employed in everyday operations; maintenance and notification procedures should be followed to avoid default. The preventive maintenance program should be reinvigorated and strategic sourcing should be further investigated as a viable solution to the task.

Editor's Note: An extended version of this article, including an additional table and figure, is available at http://www.afcesa.af.mil/shared/media/document/AFD-120412-044.pdf

*Capt DiRosario is a recent graduate of the Air Force Institute of Technology (AFIT), Wright-Patterson AFB, Ohio and will be stationed at JB McGuire-Dix-Lakehurst, N.J. Lt Col Feng is a professor at the Graduate School of Engineering Management at AFIT.*

| ROOF TYPE | DEFECT | | | | | |
|---|---|---|---|---|---|---|
| | POINT | % | LINE | % | POLYGON | % |
| Built-up Membrane | Debris | 36 | Flashing damage/deterioration | 20 | Blueberries | 16 |
| | Blistering | 20 | Flashing seam/side lap defects | 7.7 | Blistering | 15 |
| | Membrane hole | 8.6 | Damaged/missing metal flashing | 7.2 | Membrane aging | 13 |
| | Leak location | 7.9 | Exposed gaps/open side laps | 7.2 | | |
| Metal | Fastener backout | 27 | Lap/seam defects | 17 | Panel damage/deterioration | 69 |
| | Debris | 20 | Membrane split | 13 | Patched/repaired areas | 11 |
| | Leak location | 19 | Damaged/missing flashing | 12 | Debris | 5.2 |
| | Fastener defects | 11 | Corrosion | 11 | Ponding | 4.0 |
| Thermoset | Membrane hole | 27 | Alligatoring | 26 | Surface defects | 34 |
| | Debris | 26 | Seam defects | 17 | Ponding | 24 |
| | Leak location | 19 | Flashing damage/deterioration | 13 | Debris | 19 |
| | Vegetation | 12 | Membrane split | 11 | Physical damage | 8.0 |

Table. Defects found on ACC's top three roofing system types based on analysis of ACC's RoofExpress.

# pavement marking prediction models for asset managers

Capt Joshua D. Hollingsworth
Lt Col William Sitzabee, P.E., Ph.D
AFIT/GEM

A recent article in Air Force Civil Engineer (Vol. 19, No. 2, p. 24) presented ACC's implementation of a robust traffic control management system to improve roadway safety, comply with the new federal regulations, and effectively manage transportation infrastructure. It particularly highlighted ACC's actions to maintain and manage road signs at their bases in light of recent retroreflectivity standards established by the Federal Highway Administration (FHWA). A similar set of regulations, which focus on pavement markings, is on the horizon and is set to be finalized in the near future. Engineers at the Air Force Institute of Technology (AFIT) are conducting ongoing research to develop predictive degradation models for various pavement marking materials that can be used by asset managers to shape the decisions that impact our roadway's safety, compliance with federal regulations, and infrastructure asset management.

An estimated 60 percent of all highway fatalities result from lane departures. Pavement markings are essential in establishing lane awareness and reducing lane departures, especially during nighttime and other periods of diminished visibility. Glass beads embedded in pavement marking material increases its retroreflectivity — the amount of light returned from a vehicle's headlights to its driver. Retroreflectivity improves nighttime visibility; as it decreases the chance of lane departure grows.

Based on direction by Congress to establish minimum standards for retroreflectivity of highway signs and pavement markings, the FHWA included minimum retroreflectivity standards for traffic signs in a 2008 update of the Manual on Uniform Traffic Control Devices. In 2010, the FHWA released proposed guidance for regulating pavement markings that establishes minimum retroreflectivity standards and requires management plans. Pending any significant changes or events, these standards will be put into effect in the near future. Federal agencies across the nation, including the Air Force and other DOD organizations, will be required to establish management plans to ensure pavement markings remain in acceptable condition. Undoubtedly, the manpower and resources required to carry out the directive will increase and the financial impact will be substantial.

Asset managers consider traffic control devices to be high-quantity, low-cost assets. The resources required for monitoring and maintaining these assets, particularly pavement markings, on an individual level may be minimal, but the aggregated impact can be quite large. It's not financially feasible to manually measure the retroreflectivity of every square inch of pavement markings, so transportation departments and agencies often replace them on an annual basis, under the assumption that their service life is approximately one year. However, recent research shows that pavement markings may actually have a service life of two years or more for waterborne paints and eight years or more for durable markings such as thermoplastics and polyurea. This creates the potential to cut pavement marking maintenance costs in half.

Civil engineers in the AFIT's Graduate Engineering Management program have focused several recent and ongoing research efforts on pavement markings — the contributing factors of degradation and the development of prediction models (Table). The models allow asset managers to predict the life cycle of various pavement marking types under a variety of environmental and maintenance conditions. The 2011 research results are available now at www.dtic.mil (others will be available by summer 2012).

*Capt Hollingsworth is a graduate student and Lt Col Sitzabee is a professor of civil engineering in the engineering management program at AFIT, Wright-Patterson AFB, Ohio. This article is based on thesis efforts of several students under the direction of Lt Col Sitzabee.*

Table. AFIT research studies on pavement marking degradation factors and prediction models, 2011-2012

| Year | Author | Research |
|---|---|---|
| 2011 | Monfette, M.L. | Impacts of snow removal operations on thermoplastic pavement markings |
| 2011* | Mull, D.M. | Paint pavement marking performance prediction model that includes the impacts of snow removal operations |
| 2011 | Needham, J.D. | Degradation models for polyurea pavement markings to include impacts of bead type |
| 2012 | Hollingsworth, J.D. | Impacts of bead type on paint and thermoplastic pavement markings |
| 2012 | Jaszkowiak, J.C. | Impacts of rubber removal operations on airfield pavement markings |

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# Ceramic Coatings and Energy Savings

Ms. Amy Ausley
HQ AFCESA/CEBH

Can a new coat of paint help the Air Force toward its energy goals? That's what Air Force engineers and researchers are hoping to find out.

Engineers at AFCESA, Tyndall AFB, Fla., are preparing to put a specialized type of ceramic coating or "paint" to the energy-savings test. The Air Force has reduced facility energy use 15 percent since 2003, but federal mandates require government agencies to reduce it even further, cutting energy use 30 percent by 2015.

Tests of the ceramic coating material will begin in June 2012 at the Silver Flag Exercise Site at Tyndall with two nearly identical buildings used as barracks for students.

The two buildings are the same in almost every way, right down to the air-conditioning systems. According to Mr. Steve McLellan, an energy program manager at AFCESA, this fact makes the site a perfect real-world test lab.

"It's a unique situation. The buildings are identical in size and construction as well as how they're used and the number of students assigned to them. We can keep everything as similar as possible so the only real difference is the coating."

According to Mr. McLellan, this gives AFCESA engineers a chance to see firsthand how the product works on a full-scale building as opposed to just using test panels. One barrack will serve as the test building with the new ceramic coating on the roof, while the other will be the control building and will remain "as-is."

During phase one of the project, energy use in both buildings will be metered for one year. With the high temperatures in Florida through the summer months, there may be significant comparison data from the project as early as the fall of 2012.

Phase two will come after the initial year of data is collected. The control building will then get a layer of non-ceramic material and the metering will continue for another year to see if the ceramic coating outperforms the non-ceramic material.

***(above)*** Engineers and researchers will use these two buildings at the Silver Flag Exercise Site at Tyndall AFB, Fla. in a test to determine the heat reflectivity value of a ceramic coating. The building on the right will receive the ceramic coating on its roof while the building on the left will remain "as-is."
***(below)*** The interior of a barracks being used for a ceramic coatings test at the Silver Flag Exercise Site at Tyndall AFB, Fla.
(photos by Mr. Eddie Green)

If the ceramic coating performs well it could have multiple applications in warm climates, possibly even in an expeditionary setting. "Ceramic coating is one of the products being tested as a coating for the flys over the expeditionary tents because it is flexible and can be folded multiple times as they erect and then disassemble the tents," said Mr. McLellan.

"Ceramic coating performed well in the lab, and now we're all anxious to see if it can bring those same results to practical applications on bases and on the battlefield," said Mr. McLellan.

*Ms. Ausley provides contract support as a communications coordinator at HQ AFCESA, Tyndall AFB, Fla.*

# 2011 Air Force Civil Engineer Awards

## Outstanding Civil Engineer Unit
and the
## Society of American Military Engineers Maj Gen Robert H. Curtin Award

Large Unit
**52 CES, Spangdahlem AB, Germany**
633 CES, JB Langley-Eustis, Va.

Small Unit
**55 CES, Davis-Monthan AFB, Ariz.**
92 CES, Fairchild AFB, Wash.

Air Reserve Component
**115 CES, DCRA TRUAX ANGB, Wis.**
934 CES, Minneapolis, Minn.

## Brig Gen Michael A. McAuliffe Award

(Housing Excellence)
**48 CES, RAF Lakenheath, United Kingdom**
718 CES, Kadena AB, Japan

## Maj Gen Robert C. Thompson Award

(Resources Flight)
**96 CEG, Eglin AFB, Fla.**
28 CES, Ellsworth AFB, S.D.

## Brig Gen Archie S. Mayes Award

(Programs Flight)
**88 ABW, Wright-Patterson AFB, Ohio**
45 CES, Patrick AFB, Fla.

## Maj Gen Clifton D. Wright Award

(Operations Flight)
**5 CES, Minot AFB, N.D.**
92 CES, Fairchild AFB, Wash.

## Maj Gen Del R. Eulberg Award

(Asset Management Flight)
**633 CES, JB Langley-Eustis, Va.**
52 CES, Spangdahlem AB, Germany

## SMSgt Gerald J. Stryzak Award

(Explosive Ordnance Disposal Flight)
**2 CES, Barksdale AFB, La.**
1 SOCES, Hurlburt Field, Fla.

## Col Frederick J. Riemer Award

(Readiness and Emergency Management Flight)
Active Duty
**35 CES, Misawa AB, Japan**
96 CES, Eglin AFB, Fla.

Air Reserve Component
**439 CES, Westover ARB, Mass.**

## Maj Gen Joseph A. Ahearn Enlisted Leadership Award

**CMSgt Leslie E. Jones**
**52 CES/CEM,**
**Spangdahlem AB, Germany**
CMSgt Bruce D. Smalls
379 ECES/CEM, Al Udeid AB, Qatar

## Maj Gen William D. Gilbert Award

(Outstanding Staff Action Officer)
Officer
**Lt Col Troy M. Twesme**
**AFCENT A7 FWD, Al Udeid, Qatar**
Lt Col David M. Jurk
HQ AFMC/CSH,
Wright-Patterson AFB, Ohio

Enlisted
**SMSgt Mark J. Thrower**
**HQ AFDW/A7CX, JB Andrews, Md.**
MSgt Patrick O. Glass
HQ AFSPC/A4/7, Peterson AFB, Colo.

Civilian
**Mr. Patrick M. Atkinson**
**HQ AETC/A7CAI, Randolph AFB, Texas**
Ms. Donna C. Young
HQ USAF/A7CRT, Pentagon, D.C.

## Harry P. Rietman Award

(Senior Civilian Manager)
**Mr. Dennis G. Goodson**
**4 CES/CD, Seymour Johnson AFB, N.C.**
Mr. Mark T. Guiliano
96 CES/CEF, Eglin AFB, Fla.

## Maj Gen L. Dean Fox Award

(Senior Military Manager)
**Lt Col Andrew J. Muser**
**4 CES/CC, Seymour Johnson AFB, N.C.**
Lt Col Douglas F. Tippet
2 CES/CEX, Barksdale AFB, La.

## Maj Gen Eugene A. Lupia Award

Company Grade Officer
**Capt Christopher D. Callaway**
**HAF/A7CR, Pentagon, D.C.**
Capt Kelly J. Mattie
18 CES/CED, Kadena AB, Japan

NCO
**TSgt Dallas G. Bozeman**
**820 COS/S3T, Moody AFB, Ga.**
SSgt Zachary D. Burnash
48 CES/CED,
RAF Lakenheath, United Kingdom

Airman
**SrA Andrew M. Dye**
**341 CES/CEOFE, Malmstrom, Mont.**
SrA Daniel N. Franco
87 CES/CED
JB McGuire-Dix-Lakehurst, N.J.

## CMSgt Larry R. Daniels Award

(Military Superintendent)
**SMSgt Christopher A. Vansile**
**35 CES/CEO, Misawa AB, Japan**
MSgt Courtenay M. Sartain
668 ALIS/IPR, Lackland AFB, Texas

## Outstanding Civil Engineer Manager

Civilian Manager

**Mr. Todd W. Barnes, 633 CES/CEO, JB Langley-Eustis, Va.**

Ms. Teresa A. Nunn
100 CES/CEOSC,
RAF Mildenhall, United Kingdom

Civilian Technician

**Mr. Michael T. Bear**
**AFCESA/CEMR, Tyndall AFB, Fla.**

Ms. Tammy S. Elam
60 CES/CEOS, Travis AFB, Calif.

## Outstanding Civil Engineer Manager

(Air Reserve Component)
Officer

**Maj Susan E. Kennedy**
**375 CES/CC, Scott AFB, Ill.**

Lt Col Daniel K. Miller
27 SOCES/CES, Cannon AFB, N.M.

SNCO

**SMSgt Nathan A. Colborn**
**434 CES/CEOH, Grissom ARB, Ind.**

CMSgt Francis T. Shattuck
HQ AFCESA/CEOM, Tyndall AFB, Fla.

NCO

**SSgt Aimi M. Mlekoday**
**507 CES/CEO, Tinker AFB, Okla.**

TSgt William R. Williams
31 CES/CED, Aviano, Italy

## Outstanding Community Planner

**Ms. Mary Jane Brady**
**460 CES/CEA, Buckley AFB, Colo.**

Ms. Marion Cook
96 CEG/CEPP, Eglin AFB, Fla.

## Society of American Military Engineers Newman Medal

**Col Nicholas Desport**
**HQ AFRC/DA7, Robins AFB, Ga.**

Lt Col Paul Cotellesso
AFIT/CEM, Wright-Patterson AFB, Ohio

## Society of American Military Engineers Goddard Medal

Active Duty

**SMSgt Joel A. Jones**
**86 CES/CEM, Ramstein AB, Germany**

SMSgt Bradley E. Branfield
27 SOCES/CEO, Cannon AFB, N.M.

Air Force Reserve

**CMSgt Michael L. Bowden Jr.,**
**434 CES/CEOH, Grisson ARB, Ind.**

## National Society of Professional Engineers Federal Engineer of the Year

Military

**Capt Matthew R. Altman**
**HQ USAFE/A7PDM,**
**Ramstein AB, Germany**

Civilian

**Ms. Paula Shaw, AFCEE/TDBS**
**Lackland AFB, Texas**

## Maj Gen Augustus M. Minton Award

(Outstanding *Air Force Civil Engineer* Article)

**Lt Col Dwayne M. Robison**
**35 CES/CC, Misawa AB, Japan**

Capt Kenneth W. Cooper and
SMSgt Richard Buchalski
820 RHS/CA, Nellis AFB, Nev.

## Air Force Energy Conservation Award

Individual

**SMSgt William J. Arcuri**
**374 CES/CEOF, Yokota AB, Japan**

Mr. Lucas M. Bittick
52 CES/CEAO, Spangdahlem AB, Germany

Team

**355 CES, Davis-Monthan AFB, Ariz.**
100 CES, RAF Mildenhall, United Kingdom

## Balchen/Post Award

(Snow and Ice Removal)

**92 CES, Fairchild AFB, Wash.**
52 CES, Spangdahlem AB, Germany

## Bulldog Award

**Col Doug Hardman**
**823 RHS/CC, Hurlburt Field, Fla.**

# General Thomas D. White Environmental Awards

## Environmental Quality Award

(Non-Industrial Installation)

**96 CEG, Eglin AFB, Fla.**

## Environmental Quality Award

(Overseas Installation)

**52 CES, Spangdahlem AB, Germany**

## Environmental Quality Award

(Air Reserve Component)

**187 FW, Montgomery, Ala.**

## Environmental Quality Award

(Individual/Team)

**Ms. Kristin A. Nester**
**92 CES, Fairchild AFB, Wash.**

## Cultural Resources Management Award

(Installation)

**30 CES, Vandenberg AFB, Calif.**

## Natural Resources Conservation Management Award

(Small Installation)

**319 CES, Grand Forks AFB, N.D.**

## Natural Resources Management

(Individual/Team)

**30 CES, Vandenberg AFB, Calif.**

## Environmental Restoration Award

(Installation)

**75 CEG, Hill AFB, Utah**

## Environmental Restoration Award

(Individual/Team)

**673 CES**
**JB Elmendorf-Richardson, Alaska**

## Sustainability Award

(Industrial Installation)

**75 CEG, Hill AFB, Utah**

## Weapon System Acquisition Award

(Individual/Team)

**92 CES, Fairchild AFB, Wash.**

# A CE Enlisted Leader Passes

CMSgt Larry Daniels, Civil Engineering's first Chief of Enlisted Matters, passed away on Feb. 15, 2012, at his home in Arizona. CMSgt Daniels enlisted in the Air Force in 1966 and became a carpenter. In 1967, he was selected to be part of the 820th RED HORSE, and deployed to Vietnam. In 1973 he retrained as a Programs and Work Control Technician while at Luke AFB, Ariz.

He served several tours in Europe, including one to Ramstein AB, Germany in 1982 as a program manager for Southwest Asia, working for Brig Gen Joseph A. "Bud" Ahearn. In 1987, he was the first Chief of Technology Transition at the Air Force Engineering and Services Center at Tyndall AFB, Fla. and in 1989, the first-ever Chief of Enlisted Matters for Engineering and Services in the Pentagon, hand-picked for the position by Maj Gen Ahearn, the director of Air Force Engineering and Services. CMSgt Daniels often said that his proudest achievement was a year-long effort to gain OSD's approval for single Airmen to have private dorm rooms—a huge quality of life issue for the enlisted force.

CMSgt Daniels was awarded the Legion of Merit when he retired, a rare event for an enlisted Airman. Following his retirement, the Air Force named the prestigious Air Force Civil Engineer Outstanding Military Superintendent Award in his honor.

Maj Gen Bud Ahearn (ret) (standing, left) listens as CMSgt Larry Daniels (ret) speaks to students in the CE Superintendent Course, the first enlisted course at the Air Force Institute of Technology. (U.S. Air Force photo).

# CE Earns Top Spot at SOS

Capt Corey L. Alfred, 554 RHS, Andersen AFB, Guam, was recently awarded the Commandant's Leadership Award for Squadron Officer School (SOS) at Maxwell AFB, Ala., making her number one of the 810 students in the 12B graduating class. Based on her academic and physical fitness scores and flight commander and peer rankings, she earned her squadron's top graduate honor, then was chosen from among all eight top squadron graduates as SOS Class 12B's number one graduate.

Capt Alfred is a project engineer and the demolition team OIC for the 554 RHS. She manages six troop construction projects worth $4M, provides project support for the completion of the $251M PACAF Regional Training Center at Andersen's Northwest Field, and leads PACAF's only base denial and quarry demolition team. Capt Alfred deployed to both Iraq and Afghanistan, and will complete her masters in international construction management in 2012.

Squadron Officer School Commandant Col Terrance J. McCaffrey presents Capt Alfred with her award. (U.S. Air Force photo)

# AFCENT Stands Up 1st ECEG

TSgt Beth Del Vecchio
USAFCENT/PA

On March 26, U.S. Air Forces Central redesignated the 1st Expeditionary RED HORSE Group to the 1st Expeditionary Civil Engineer Group (ECEG). The new group comprises the 777th and 577th Expeditionary Prime BEEF Squadrons (EPBSs) and the 557th Expeditionary RED HORSE Squadron (ERHS).

With the completion of Operation Enduring Freedom, AFCENT had an opportunity to reorganize Air Force civil engineer units in the area of operations, officials said.

"There is a need for a theater engineer command that is capable of supporting emergency repair, construction, and theater security cooperation," said Col John Allen, the new 1 ECEG commander, who took over the command from Col Darren Daniels. "This new engineer command will allow us to continue to provide vital expeditionary engineer capability for the AFCENT commander, as well as provide support of U.S. Forces-Afghanistan from over the horizon, in an effective and efficient manner," he said.

The 1 ECEG provides troop construction and repair and engineering technical services within the CENTCOM theater of operations in order to establish and sustain combat platforms for AFCENT and U.S. Forces-Afghanistan.

"For those Airmen who have previously served in an Expeditionary Prime BEEF or RED HORSE Squadron, this new organization won't feel any different," Col Allen said. "The mission sets for these squadrons is not new. We will continue to provide the installation engineering core competencies for which we have become so well regarded."

The 777 EPBS will provide professional engineering services like master planning, project programming, design, contract development and oversight, and surveying. The 577 EPBS will conduct light troop labor construction and repair, including smaller-scale expeditionary projects. The 557 ERHS will conduct heavy vertical and horizontal construction.

The colonel said that although the Airmen of the command will be charged with significant responsibility and will face unique challenges, he knows they will continue to step up and deliver mission success.

"Our craftsmen will build and repair, our engineer assistants will survey and inspect, our logisticians and controllers will feed the fight, and our officers and senior non-commissioned officers will lead," he said. "We will rely on their ingenuity, tenacity, and perseverance to deliver mission success — all traits for which Airmen are so well known."

The 1 ECEG will be headquartered in Southwest Asia, while maintaining forward operating "hubs" in Afghanistan. These hubs will serve as the embarkation points for 1 ECEG Airmen moving deeper into the battle space to perform missions.

"The legacy built by the tens of thousands of Airmen-engineers who have deployed to Southwest Asia over the last two decades is superb and firmly intact," the colonel said. "As Airmen come into theater, they should remember they're here to continue to sustain and grow the legacy of those that came before them, to continue to make things better. I have no doubt that is exactly what they will do."


On March 26, 2012, the 1 ERHG was redesignated the 1st Expeditionary Civil Engineer Group in a ceremony that included a change of command from Col Darren Daniels to Col John Allen. Maj Gen James Jones, U.S. Air Forces Central deputy commander, presided over the event. (photo by SSgt Nicole Manzanares)

## New Colorado Law Grants Licensing Waivers To Active Duty Military

Colorado Governor John Hickenlooper (seated) signs a Colorado House Bill 11-1013, which waives professional license renewal fees and continuing education requirements for military personnel who have served in support of war, emergency, or contingency operations for at least 120 days during a renewal cycle. The law will benefit licensed professionals such as accountants, architects, dentists, electricians, engineers, pharmacists, physicians, plumbers, and nurses. Watching (left to right) are TSgt Michael Retland, 140 CES, and his daughter, Rachel; Mr. Mike Griffeth, P.E.; Colorado State Representative Sue Schafer; and 2 Lt Rexford Canady and Maj Ronald Geurts, 240th CES. Mr. Griffeth spearheaded the campaign to get the waiver law bill introduced because he understands how difficult it is for deployed military personnel, particularly professionals who serve in a part-time capacity in a National Guard unit or as a reservist. Mr. Griffeth served nearly seven years in the Colorado Air National Guard and spent nine months deployed in Iraq in 2009. "More professional engineers like me should get this moving in other states," he said. (Photo by Mr. Gabriel Christus)

# CE Receives 2011 Sijan Award

On April 6, SMSgt Timothy Sterner (third from left), an Air Force civil engineer, was one of four Airmen to receive the 2011 Lance P. Sijan U.S. Air Force Leadership Award during a ceremony at the Pentagon's Hall of Heroes. Other recipients were (from left) Maj Laura DeJong, Capt Gilbert Wyche, and TSgt Nathaniel Hoag. Named in honor of the first U.S. Air Force Academy graduate to receive the Medal of Honor, the award annually recognizes officer and enlisted honorees in senior and junior categories who best exemplify the service's core values of integrity, service, and excellence. SMSgt Sterner is HQ PACAF's explosive ordnance disposal superintendent at JB Pearl Harbor-Hickam, Hawaii. He expertly led EOD teams in the successful completion of over 600 combat missions while deployed. He managed over $20M worth of vehicles and equipment as his teams supported joint and coalition forces across a 100-square-mile area in southern Afghanistan. (photo by Mr. Jim Varhegyi)

# Emergency Management Gets Personal


Capt John T. Stamm
AFRC/PA

In the Air Force, we are used to participating in safety drills designed to teach us emergency survival skills and techniques.

That training started in grade school with fire and tornado drills that provided a nice diversion from class work and matured to chemical, biological, radiological, nuclear and high-yield explosives training in Air Force. Being ready for the worst is nothing new.

However, how many Airmen take that training to the next level and devote time to running drills at home with their families? The answer is probably too few. That's why the Air Force launched its "Be Ready" campaign.

According to the campaign's website, everyone should have a plan. Disasters come in many forms — explosions, hurricanes, tornadoes, floods and others.

Being prepared can reduce fear, anxiety and the losses that accompany these disasters. Individuals, families and communities should know what to do in the event of a fire and where to seek shelter during a tornado. Knowing what to expect and how to prepare makes any crisis more manageable.

The program recommends the following three steps to increase individual disaster readiness:

## Build A Kit

Assemble a collection of first aid supplies, food, water, medicines and important papers to sustain family and pets until the emergency passes.

## Make A Plan

Everyone in the family may not be together when an emergency strikes. Decide how to contact each other, where to go and what to do in an emergency. Write down where the family spends the most time, such as work and school, and any site-specific emergency plans that family members need to know. The plan should include escape routes, a utility shut-off checklist, insurance and vital records, and other safety guides.

## Be Prepared

Anticipate emergencies most likely to occur and be ready for the unexpected, such as a tornado in New England.

"The goal of this program is to reduce individual's vulnerability to hazards that may affect them, their family members, or the installation where they work and live," said Mr. Tom Morris, AFRC's emergency management program manager.

The website has several links to important information including basic preparedness, key resources, disaster and emergency definitions, and what to do after a disaster.

It also has a section geared specifically for children titled "Be Ready Kids." This section provides games, puzzles, and other activities that educate while entertaining. There are resources for children ages 4-7 and 8-12.

MSgt Melissa Broussard, HQ AFRC Force Management superintendent, implements the program in her home. She said it has been a great learning experience for her daughter.

"She is the one who keeps the plan up to date," MSgt Broussard said. "I think she may be a future emergency management instructor."

*For more information on how to prepare family and home for emergencies and disasters, visit the Air Force Be Ready website, www.beready.af.mil or check with the installation Civil Engineering Readiness and Emergency Management flight. Posters, coloring pages and other displays may be available in community areas on base such as the base exchange, commissary, child care center and fitness center.*

# CEs in Iraq

## by the numbers

**36,000** EOD Missions
including **13,400** IED Operations

**Opened 206** operating locations
then closed them ahead of schedule

**Paved 14 Million** cubic feet of runways and roads

**Over 18,000 CE members deployed to Iraq**

**Operations Iraqi Freedom - New Dawn**
**19 March 2003 - 15 December 2011**

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