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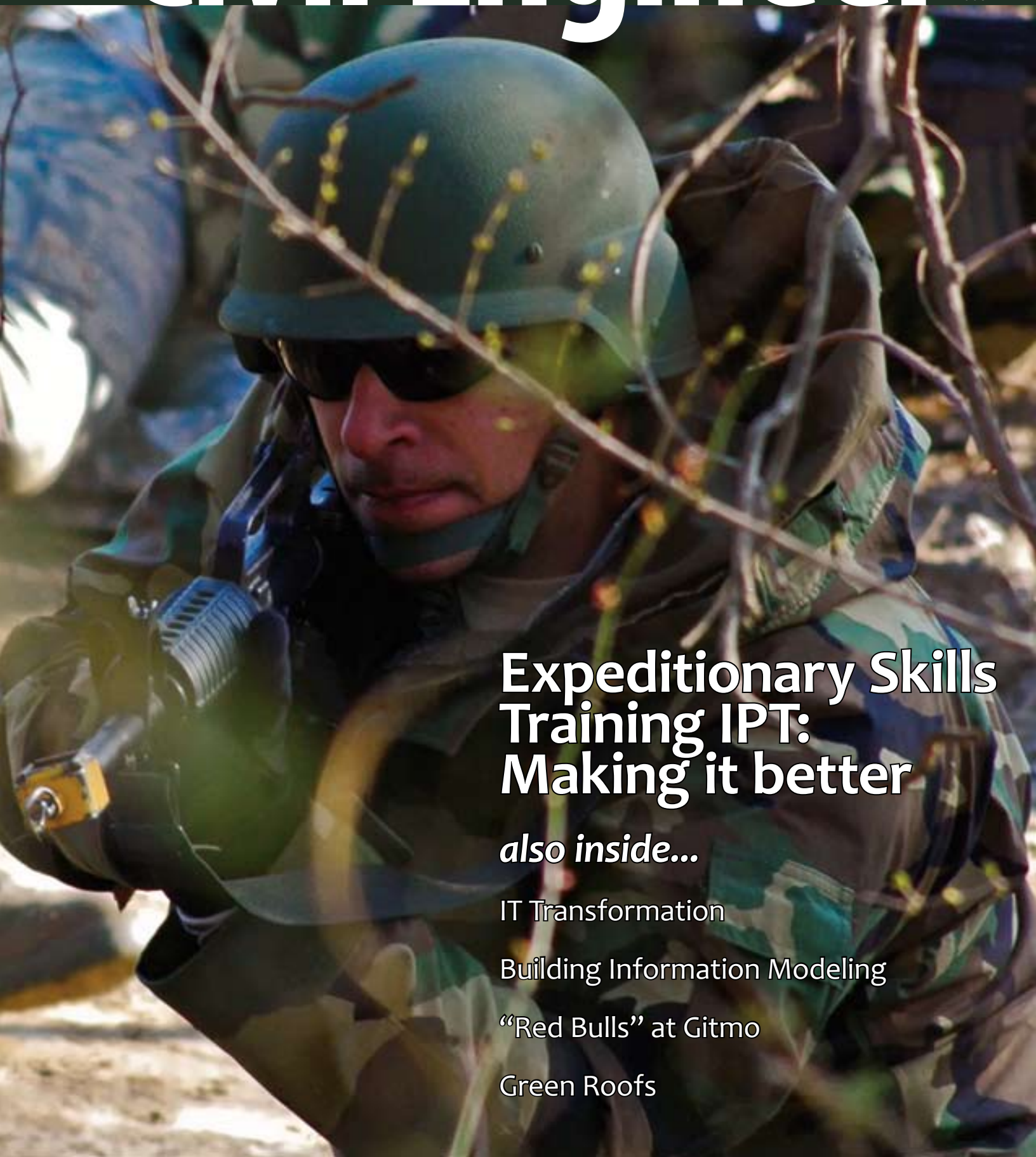

Expeditionary Skills Training IPT: Making it better

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IT Transformation

Building Information Modeling

"Red Bulls" at Gitmo

Green Roofs

Report Documentation Page

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On the Cover

Under a high deployment tempo, expeditionary training is important for civil engineers like SSgt Saul Bookman. (photo by TSgt Scott T. Sturkol)

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Strategic Planning: Keeping Us Focused

Civil engineers are extraordinarily busy. We're transforming our CE enterprise as our high deployment tempo is increasing and our home station CEs — military and civilian — keep our installation warfighting platforms operational with historically low funding and personnel levels. Times like these challenge us to stay focused on the strategic goals that will ensure our long-term success.

A strategic plan can be essential to successfully navigating our often busy and demanding lives. Every person and every organization should have a strategic plan, whether it's a personal plan on what you want in life and how you're going to get there, such as college, career, and retirement; a CE shop plan on how you are going to support your squadron and installation customers; or a squadron plan defining your mission and how you will prioritize resources to support the installation mission. A strategic plan can define why you exist (mission or purpose), what you want to become (vision), what constitutes success (goals), and how you're going to get there (objectives). You can then better determine where and when to commit limited resources (time and funds).

Civil Engineering is no different. Our recently published 2008 CE Strategic Plan defines our mission, vision, goals, and objectives and outlines how we will support the larger Air Force and Department of Defense teams. Since this plan is useless until it guides our everyday actions, the "owners" of each objective are currently developing implementation plans to define how we will meet our goals and track progress.

AFCESA has also published their Strategic Plan and AFCEE will publish their plan later this summer. The CE and AFCESA plans are available on our A7C CoP (https://afkn.wpafb.af.mil/afce). I encourage you to read these plans to see where we are heading and to see where you fit in the bigger picture. Your shop, flight, squadron, or MAJCOM strategic plan should support the CE Strategic Plan to ensure that your efforts and resources are focused on the key things we should be doing to support the Air Force and joint team.

A key enabler of our strategy is information technology. Acquiring modern IT systems is critical to the business process transformation efforts that will help us meet our strategic goals. More capable IT systems will enable our most valuable asset, our people, to make the most effective and efficient use of their time and talents. You can read more about our IT acquisition strategy in my article on page 4.

We are extraordinarily busy, but we live in extraordinary times. You are all making our nation proud as we fight the global war on terrorism. From my conversations with senior Air Force and joint leaders in the AOR and in the Pentagon, and from my interaction with members of Congress and their staffs, I can assure you that your significant sacrifices are in the forefront of their minds. Thank you for all that you do every day for our nation and our Air Force.

Del Eulberg
Major General, USAF
The Air Force Civil Engineer

IT Transformation

Maj Gen Del Eulberg, The Air Force Civil Engineer

Change is in the air. Our Air Force, as never before, recognizes that fundamental change is essential to "staying in the fight." We simply cannot be the same Air Force we are today and effectively support our national interests. As Air Force civil engineers, we all know our jobs continue to become more difficult and demanding due to budget constraints, a high deployment ops tempo, and the simple fact that the facilities and infrastructure we have to maintain are larger than what the Air Force requires. These and many other important factors, such as energy costs and conservation, Base Realignment and Closure actions, joint basing, new organizational constructs, and changes in information technology systems and requirements, are driving Air Force civil engineers to develop new ways of thinking. We are using this opportunity to transform how we do business across our Civil Engineering mission areas and to institute the industry-proven Asset Management approach; all enabled by proven commercial off-the-shelf technology solutions.

During our Corps of Discovery visits with General Electric, Exxon-Mobile, General Motors, Bank of America, CB Richard Ellis, IBM, and others, we learned that their successful business process changes rely on an IT transformation plan focused on supporting new corporate business processes. The Civil Engineering community, however, has struggled to successfully implement an enterprise (Air Force-wide) IT solution that accomplishes this goal. We've tended to use computers to solve our existing business problems rather than instill an enterprise focus in the way we manage our business and IT capabilities. We are changing that paradigm by developing Agile Installation Management, or AIM.

Agile Installation Management

Agile Installation Management is not a system or software. AIM is an initiative that fuses our day-to-day business processes with IT to transform how we do business. It is focused on making what we do — our processes — at all installations more effective and efficient, and enabling those processes with IT to have an enterprise view of all our installation assets. Our AIM initiative will enable real estate officers and planners to manage space to reduce the physical footprint of our facilities and our overall sustainment costs. It will enable engineers to plan and prioritize projects based on a standard set of business rules for facilities, airfields, roads, or utilities that link priorities to mission-critical assets and common levels of service. It will enable strategic sourcing to maximize our buying power by consolidating all like purchases into one contract action; an example is the purchase of 250 chillers with one contract rather than 250 individual base contracts, thus providing significant savings. And it will enable resource managers to capitalize all reimbursable costs and provide better management of our true costs of doing business.

AIM will help us achieve our "20/20 by 2020" vision, and transform how we support the Air Force mission today.

IT Governance

Public law (National Defense Authorization Act 2005 and Clinger Cohen Act) requires that we establish a formal governance structure for our IT investments. Consequently, all IT purchases for software, hardware, systems, or applications must be approved through the Civil Engineer Investment Review governance process, prior to Air Force and OSD reviews and approval. As a first step, before any IT investment is considered, the civil engineer business process owner at the Air Staff must validate the requirement. Once validated, the requirement can be approved at the appropriate level of the governance structure (see figure 1). This approval process centralizes how we identify, approve, develop, and implement IT capabilities. We will invest once in a capability and then implement it across the Civil Engineering enterprise at all bases, major commands, and field operating agencies to eliminate duplicate efforts and ensure that our IT investments are consistently focused on what really matters.

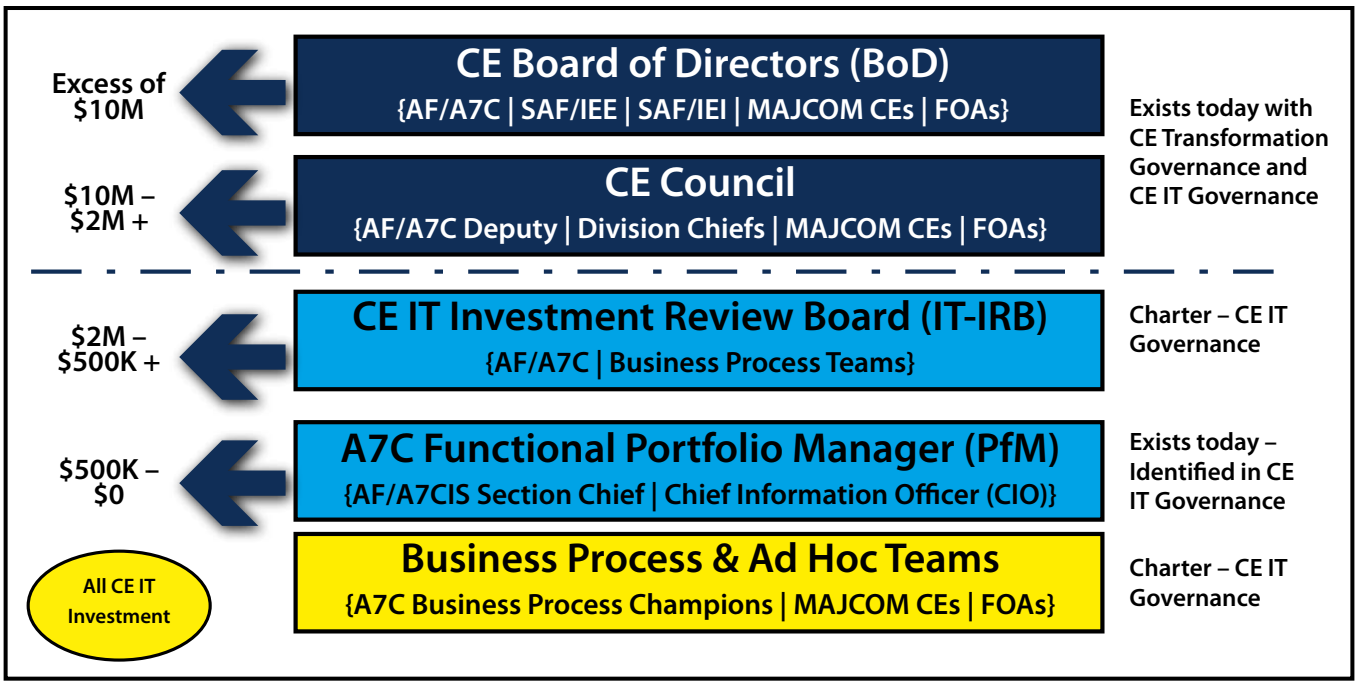


Figure 1. IT investments are validated and approved at the appropriate level to ensure that resources are used wisely, and to avoid duplication.

The days of BEAMs, Wang, IWIMS, and our current ACES legacy IT solutions are behind us. We are utilizing industry best practices to redefine how we do business up front, then using "best-in-breed" COTS solutions to achieve the "Art of the Possible." Our inclination as engineers is to focus on the IT tool or widget that we need to do our immediate job. While this approach may solve a problem for one small area of our business process, it does not take into account all of the capabilities required to enable an enterprise solution across the Air Force. We have lacked a disciplined approach in implementing IT solutions, allowing anyone — and everyone — to develop IT capabilities at all levels. This approach has resulted in duplicate investments in IT many times over. For instance, across Civil Engineering we have invested in eight different work order automation tools, 10 different geospatial system architectures, four different airfield waiver applications, and five different emergency response tools. Imagine what we could have done if we had focused on just one enterprise capability.

IT Transformation Philosophy

Our IT Transformation efforts all start with the Civil Engineering mission, which leads to the capabilities and business processes required to enable the Air Force's vision for "Global Vigilance, Global Reach, and Global Power." We cannot focus on IT requirements until we define our existing business processes and then reengineer these business processes to be more effective and efficient.

Once our reengineered CE business processes are defined, we can determine which IT options best enable our business capabilities (see figure 2).

Central to our transformation efforts is the incorporation of an asset management approach throughout all of our business processes. An asset management philosophy allows us to make more informed decisions, basing our facility and infrastructure investments on costs, benefits, and risks across the entire portfolio of our real estate and infrastructure assets. We recently completed an effort to reengineer our core business processes for financial, personnel, budget, real estate, work management, supply management, and project management capabilities as part of our Agile Installation Management initiative. We are moving forward with an IT Transformation plan to enable our reengineered processes.

Enabling CE Transformation with IT

Our history of IT investment is mixed. In many cases, our functional expertise was not adequately translated into effective IT tools. We have hired Gartner, Inc., considered the "Consumer Reports" of IT, as our Strategic Partner to validate our acquisition plans for our "NexGen" Civil Engineering IT capabilities. With over 600 experts who are familiar with all the latest IT capabilities, Gartner will be a key player as we move forward and make decisions on IT investments and implementation. This partnership will ensure that we do not go down the wrong path. We are also developing a concept of operations to create a centralized IT and Business Process Transformation Center of Excellence at AF/A7C, as well as establishing a Civil Engineering Chief Information Officer position. This center will place all IT development and sustainment activities in one location to lead and manage all Civil Engineering business process change management and IT activities as we transform the way we do business in the future. This means that bases, MAJCOMs, and FOAs will no longer need to manage or develop IT investments. Together, the Gartner strategic partnership and a centralized management structure provide a foundation for us to move forward with our IT transformation efforts.

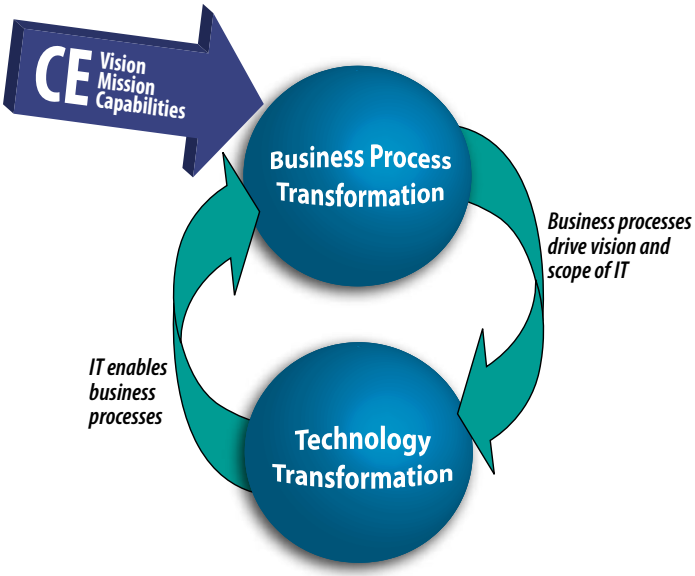


Figure 2. Business process and information technology decisions are interrelated. Correctly defining processes is key to implementing the right enabling technology, which helps organizations realize business goals.

Process mapping for our core business areas is complete (see figure 3). Our next step is to complete an analysis of alternatives and select the best COTS software to enable our redefined business processes. We are on target to complete the analysis of alternatives by January 2009 and hire an IT integration contractor to start implementing our NexGen CE IT capabilities in May 2009. Our focus is to deliver solutions based on an incremental approach for each capability. We will start with the core resource areas for financial, personnel, and budget, using existing Department of Defense and Air Force investments in Oracle to avoid "reinventing the wheel." From there we will focus on real estate, work management, supply management, space management, energy, planning, and project management to deliver capabilities with the asset management approach built into each area. You will start to see these new capabilities on your desktop starting in early 2010, with future capabilities rolling out every four to six months. This may

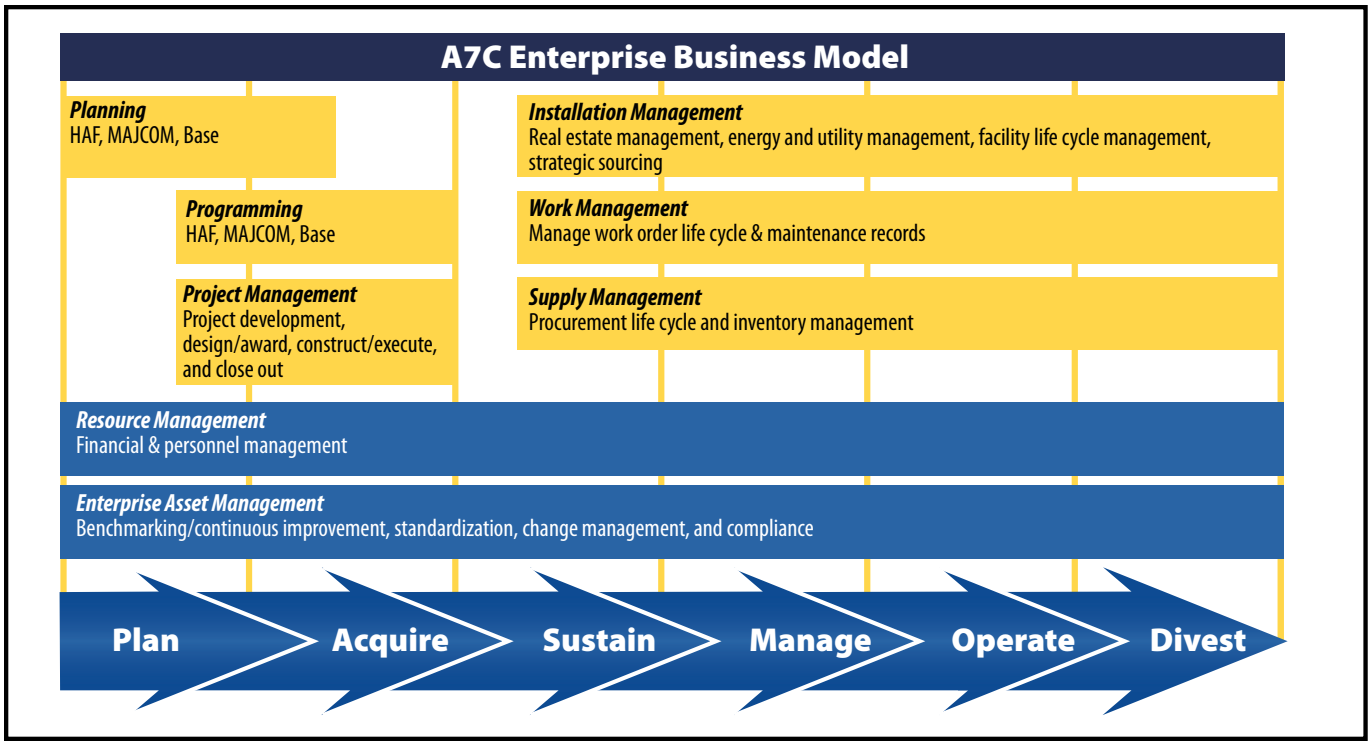


Figure 3. The enterprise business model shows the relationship between CE business capabilities and the infrastructure life cycle.

seem like a long time away, but we will also be making more immediate investments to provide our bases with the tools to easily access our legacy data.

Starting in August 2008, we will enable access to real property, housing, project management, and environmental data through the Air Force Portal and CAC cards. This will provide ad hoc query and data reporting capabilities to anyone having an Air Force Portal account. We are also standardizing an automated Work Requirements, Work Clearance, and Environmental Impact capability that will do away with the AF332, AF103, and AF813 paper forms, and standardize the process for all bases. This will make all of our jobs easier and will provide tremendous efficiencies in how we identify and approve work requirements at our bases. While we work toward delivering the NexGen Civil Engineering IT capabilities, we will continue to make centralized investments using our business capabilities to define what areas IT needs to enable.

Summary

Change is a difficult endeavor for any organization, but without change there is no way we as civil engineers can continue to successfully accomplish our mission, given the challenges we face today. Our legacy IT systems cannot enable the business process changes and IT transformation necessary to get us where much expert thought and effort has determined we need to be — Agile Installation Management. Civil Engineering's AIM transformation effort is a journey that begins with reengineered processes and new IT solutions, and moves forward only with input from every civil engineer. I look forward to continuing our exciting journey.

THE RED BULL CONSTRUCTION COMPANY

Lt Col James Starnes, 122nd CES/CC

Air National Guard CEs mobilized in 2007 for a special mission — constructing a legal complex for Camp Justice at Guantanamo Bay. PRIME BEEF civil engineers from the Guard worked with active duty RED HORSE engineers as the "Red Bulls" of the 474th ECES to complete this important mission.

In 2007, the Office of Military Commissions needed a legal complex to conduct commissions, or trials, for detainees held at Guantanamo Bay, Cuba. A short timeline made it impossible for the Department of Defense to effectively negotiate a contract with civilian firms for construction of the complex, so military construction units were assigned the task. Because of worldwide operations activities and the fixed time frame, active duty units weren't available. The National Guard Bureau volunteered for the mission, and Air National Guard CEs were given the task of constructing the legal complex.

As the commander of the 122nd Civil Engineer Squadron in Fort Wayne, Ind., I received a phone call in the spring of 2007 informing me that our unit would lead this high-profile mission. We would be joined by CEs from five other Guard units — the 121st CES from Columbus, Ohio; the 128th CES from Milwaukee, Wis.; the 150th CES from Albuquerque, N.M.; the 158th CES from South Burlington, Vt.; and the 163rd CES from March ARB, Calif. — to make up the construction team. Engineers from the 823rd RED HORSE Squadron, Hurlburt Field, Fla., were responsible for most of the design work. The 474th Expeditionary Civil Engineer Squadron, attached to the 474th Air Expeditionary Group out of Davis-Monthan AFB, Ariz., was established and with a PRIME BEEF construction team and a RED HORSE design team, we quickly became known as the "Red Bulls."

The advance party — consisting of the first sergeant, the chief of operations, the engineering officer, the engineer-

Maj Chad Warren, 474th ECES, examines the plans for the new Expeditionary Legal Complex where military commissions will resume pending court review. (photo by Army Sgt. Sarah Stannard)

ing noncommissioned officer-in-charge, the electrical NCOIC, and me — arrived in Cuba in mid-July. A Joint Task Force Guantanamo liaison showed us the proposed location for the complex: an old, abandoned airfield with waist-high grass, overgrown weeds, and many small trees. A lot of coordination and preparation was necessary to get the site and the rest of the naval base ready for the arrival of the construction team and project materials.

Red Bulls in Action

Air Force CEs built a total of 150 structures to complete the legal complex, consisting of a courthouse, 15 administrative support facilities, and an expeditionary lodging facility (tent city) to house up to 500 personnel. The project occurred in two phases: Phase I was installation of the lodging facilities and utility infrastructure, and Phase II was the legal complex facility construction.

Phase I began on July 25, with the arrival of over 40 shipping containers of BEAR assets for the tent city. Due to the nature of the project, all utility and support infrastructure had to be installed with temporary expeditionary assets.

As the team started receiving and staging the tent city assets, we also coordinated with the local naval station base facilities command for water, sewer, fuels, waste, and various operations supply support activities.

Construction at U.S. Naval Station Guantanamo Bay, located in a communist country and on an island, presented many supply challenges. We had to add all of our project materials to the normal supply delivery methods (a biweekly barge and a twice-weekly cargo plane) or develop special delivery methods. Because the naval station is primarily operated by civilian contractors, schedules had to be carefully planned to minimize costs.

The abandoned airfield was cleared and prepared, and most of the tent city facilities were up and operational by the end of August. The 474th ECES began improving the lodging facilities even before all of them were erected. Because of the time required to order and deliver the courthouse and other legal complex facility materials, we had most of the month of September to prepare the foundation of the courthouse, make tent city quality-of-life improvements, and support the naval station with various projects.

Work on Phase II began on September 11, an interesting coincidence in relation to our mission. The courthouse foundation work progressed throughout the months of September and October. Supply difficulties and weather put the project almost two weeks behind schedule. On two separate occasions, storms dumped upwards of 12 inches of rain on the project site, thoroughly testing the expeditionary housing. Rivers of water ran through the tents and high winds tried the stability of the tie-down ropes and stakes. Fortunately, there were no injuries or facility damage from the severe weather.

Once the bulk of the construction materials arrived in late October, we started a multi-shift operation that allowed us to catch back up. By the middle of December, the project

"Dirt Boys" from the 474th ECES prepare to lay a permanent foundation for Naval Station Guantanamo Bay's new military commissions courtroom. (photo by Army Sgt. Sarah Stannard)

SrA Nick Skinner and SSgt John Heiser weld a detainee cell door at Naval Station Guantanamo Bay. Both are members of the 474th ECES, which was assigned the task of building the Expeditionary Legal Complex. (photo by Army Spc. Shanita K. Simmons)

was officially back on schedule. Through the rest of December and into January 2008, the entire legal complex was completed to 100% of initial design requirements.

In addition to completing the assigned legal complex mission, the 474th ECES assisted the naval station with various other projects. We provided vital power generator support for a runway repaving project, allowing it to be completed on time. We assisted the Navy Seabee detachment with several barracks demolition and remodeling projects, and improved several base MWR park facilities.

Harnessing a Team

The Camp Justice legal complex project was a unique collaborative effort. It was a Department of Defense/Office of Military Commissions project; designed by active duty Air Force engineers from Hurlburt Field in Florida; managed by U.S. Southern Command, located in Miami; supported financially by U.S. Army South out of San Antonio; and constructed by Air National Guard engineers from six different states on a U.S. naval base operated by civilian contractors, located in a communist island country.

Partnership was essential to completing this important project ahead of schedule and under budget. A large group of people, from the suppliers in the States, to the local civilian contractors, to the JTF engineers who provided purchasing support and the suppliers at the naval station's various material acquisition points (e.g., scrap and junk yards), worked with the project team to successfully complete this project.

But the Airmen of the 474th ECES, the "Red Bulls," really made this project happen. Members of many of the civil engineer trades — engineering, HVAC, electrical, power production, structures, heavy equipment and utilities — as well as supply and admin control, contributed immensely to the success and accomplishments of the 474th ECES. They worked tirelessly as a team to complete the historic project and when supply delays, equipment shortfalls, and material deficiencies seemed to impede progress, they always found a way to get the job done.

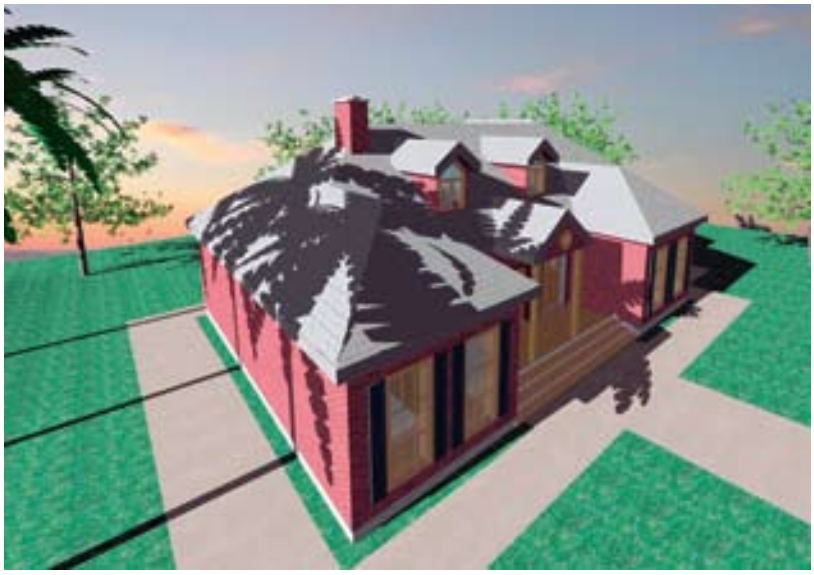
Editor's note: See page 32 for an update on the legal complex at Naval Station Guantanamo Bay.

Lt Col Starnes is the commander of the 122nd CES, Ft. Wayne, Ind. He was the commander of the 474th ECES, which is attached to the 474th Air Expeditionary Group based out of Davis-Monthan AFB, Ariz.

BUILDING INFORMATION MODELING *in the Air Force*

Maj Patrick Suermann, P.E., AFIT/CIP
Raymond Issa, Ph.D., J.D., P.E., University of Florida

Wherever professionals want to eliminate redundant creation of data in favor of reusing building data, you will find Building Information Modeling.



While the Air Force is not a business, the Air Force's mission is executed most successfully when we make good business decisions. Like any company, the Air Force periodically needs to re-evaluate its primary mission requirements and tailor its core competencies and accompanying information management practices accordingly. This consideration is the driver for one part of Civil Engineering's Transformation goal of "20/20 by 2020": to reduce the Air Force's infrastructure life cycle funding requirement 20% by 2020, through efficiencies and management strategies.

Many stakeholders in the AECO — architecture, engineering, construction, and operations— community have already accomplished such business process reengineering. Regarding designing and managing facilities, Building Information Modeling, or BIM, is one shared solution among those who have implemented successful strategies for improving their business processes and information management.

What is BIM and who uses it?

BIM is a method for incorporating valuable information into a facility model. The information can be used throughout the facility's life cycle: design, construction, operations, and sustainment. As defined by the National Institute of Building Sciences in their National BIM Standard, the "M" in BIM is used interchangeably for both "Model" and "Modeling." The "Model" is a virtual representation of physical and functional characteristics of a facility, and "Modeling"

is the creation, manipulation, and collaboration of the data stored within the virtual building model.

Wherever professionals want to eliminate redundant creation of data in favor of reusing building data, you will find BIM. General Motors and the General Services Administration have already mandated BIM for design, construction, and asset management. While there are significant real property asset management benefits to be derived from BIM, there are also many benefits of a BIM approach in the design phase of a project, which explains why architects are currently the greatest BIM proponents.

The U.S. Army Corps of Engineers has done a great deal of research and work with BIM and is regarded as an industry expert (see "How BIM Is Different from CADD and Why You Should Care" below). In 2005, two USACE Districts (Seattle and Louisville) implemented pilot BIM projects that served as test beds for creating the virtual models used in estimating, phasing, and geospatial integration that have changed how the Army designs, constructs, and operates its facilities. BIM is the primary technological component for the Army's solution to accomplishing its MILCON Transformation initiative that seeks construction improvement through a 15% cost decrease, 30% quicker execution, and quality improvements associated with 50-year facility life cycles. On the heels of the BIM pilot projects and MILCON Transformation mandates, the Army's Engineer Research and Development Center in Vicksburg, Miss., published the "USACE BIM Roadmap" (ERDC TR-06-10). This 100-page, easy-to-read publication has served as a relative "BIM for Dummies" for many AECO firms in private industry as they begin to wade into the waters of BIM implementation.

BIM in the Air Force

Although not widely adopted, BIM has already been used in the Air Force in a variety of ways.

The Air Force Theater Hospital at Balad AB, Iraq, is a facility designed and coordinated through BIM. In the spring of 2006, Army Capt Russell Manning, an architect and doctoral candidate at Penn State University, was recalled to active duty to help the Army Health Facility Planning group rapidly redesign a modular hospital for Balad.

According to Capt Manning, the original 2D concept drawings were completed by a seasoned stateside architect in 2-D CADD, but took over 350 hours and 24 months to design. Using a leading BIM software platform, Capt Manning redesigned the entire facility with major modifications in only 214 hours of design time over 44 days. Even more impressive, the redesign was done "on the ground" in-theater, but thoroughly scrutinized and coordinated with stateside subject matter experts, as well as a planning team and contracting office in Europe. A significant change in mission and scope during design coordination required a great deal of modifications to the design concept. Through the parametric connectivity of the data within the model, Capt Manning was able to validate programming requirements and make the necessary changes in hours, rather than months. The true testament to BIM's efficacy was that, after construction by a design-build contractor in 2007, the hospital had a layout and functionality nearly identical to Capt Manning's conceptual design.

Closer to home, BIM has already been implemented in the Department of Civil and Environmental Engineering at the U.S. Air Force Academy. Since the spring of 2004 (more than three years before the publication of the National BIM

How BIM Is Different from CADD and Why You Should Care

Mr. Stephen Spangler, ERDC-ITL

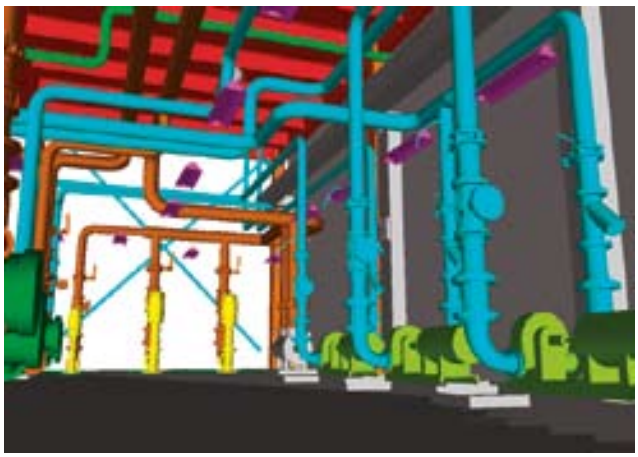
Building Information Modeling, or BIM, represents an important technology leap in the capturing of design information about a building or structure. It has significant value as an interchange mechanism between the tools used to perform the various functions of architecture, engineering, and construction.

A common misconception is that CADD is for 2D design and BIM is for 3D design. This is definitely not the case, since you can easily create 3D designs with CADD technology. The main difference between CADD and BIM all comes down to how an object perceives itself after it is placed. In CADD, when you place window or door symbols in a wall, you have to break the wall's lines and do some clean up to create your openings. If the walls or doors have to be moved later in the design process, the wall lines have to be reconnected and a new opening has to be created. With BIM, you are dealing with objects that are simulations of building components. When you place a wall in BIM, it knows that it is a wall. A wall object contains information about its materials, its fire rating, and height (just to name a few). When you place a door object into a wall object, the opening is automatically created. If you have to move the door, the wall opening is filled in and an opening is created in the door's new location.

While CADD is still an excellent tool for design, BIM technology allows the passing of information throughout all the phases of a structure's life cycle. But CADD skills won't be wasted. Many traditional drafting skills are constantly used working in BIM software and, after a BIM model is created, extractions are taken from the model and used to create model files and sheet files. Once at the stage where construction documents are assembled, CADD skills are used 100%.

BIM also allows for time and cost savings that could not be realized through CADD technology. Problems are more easily discovered in the design phase because the developed model more accurately reflects what is being constructed in the field. Interference detection analyses can be run on the model prior to construction, determining where beams run into each other, or where ducts run into pipes. Besides interference detection, BIM technology can be used for modeling, drafting, visualizing, animating, simulating, analyzing, and plotting to name a few of its capabilities.

Mr. Spangler is a mechanical engineer, CAD/BIM Technology Center, U.S. Army Engineer Research and Development Center, Vicksburg, Miss.



Designed in 2000 using BIM software, this award-winning F-22 robotic coatings facility ended up with a layout and functionality almost identical to the conceptual design. (design drawing and photo courtesy of Burns and McDonnell)

Standard), sophomore cadets have been creating parametric information-attributed virtual building models. In only ten lessons and approximately 30-60 hours, cadets have designed "dream homes" that were completely furnished, landscaped, and rendered for worldwide locations with real-world lighting conditions specific to the area and time of day of their choosing.

Cadets' knowledge of BIM has led to success in regional competitions. In both 2006 and 2007, they placed in the top three at the Associated Schools of Construction Commercial and Design Build Competitions, beating teams of architects and construction science students from civilian schools who had devoted far more time to preparing for the competition. Cadet renderings have also been used to convey design intent to general officers for renovation of Fairchild Hall, the Academy's 1 million square foot academic building.

The Future

Where do we go from here? Strategically, BIM is being evaluated by the teams accomplishing the "high-level capabilities mapping" efforts for possible inclusion in the next generation Civil Engineering IT framework, "Agile Installation Management," although they are first looking to practitioners to demonstrate successful business cases that will provide a compelling argument for Air Force-wide adoption.

Operationally, engineers and architects like Mr. Gene Mesick, AIA, and Mr. Rick Sinkfield, AIA, from the Air Force Center for Engineering and the Environment have already made efforts to incorporate BIM on some projects to determine the best way forward with the process. Eventually, AFCEE plans to roll the BIM effort into a spectrum of prescriptive- to performance-based request-for-proposal development tools called Dynamic Prototyping. However, much work remains in the areas of cost integration, model development, customer/stakeholder buy-in, and sustainable performance measures. The vision is a dynamic model that can be developed throughout the programming, design, construction, and, ultimately, operational phases of a building.

Tactically, Civil Engineering education centers like the U.S. Air Force Academy, the Air Force Institute of Technology, and the Air Force Civil Engineer Support Agency should supplement their existing successful training programs and build an Air Force-wide BIM training curricula to help our overtaxed engineers and engineering assistants add this new skill to their burgeoning skill sets.

As the AECO industry evolves, and in order to align our operations with industry best practices, it is critical that we integrate Building Information Modeling into the Air Force roadmap for success.

Authors' note — For more information about BIM, visit the following Web sites:

- http://www.facilityinformationcouncil.org/bim
- http://www.gsa.gov/bim
- https://cadbim.usace.army.mil
- https://cadbim.usace.army.mil/Myfiles/1/ERDC_TR-06-10.pdf
- http://www.bimforum.org/
- http://vector1media.com/spatialsustain/?p=448

Maj Suermann is a former Assistant Professor, U.S. Air Force Academy, Colo. He is currently a doctoral candidate in Design, Construction, and Planning at the University of Florida, Gainesville, Fla., as the first Rinker Scholar. He serves on the National BIM Standard executive committee as the Testing Team Leader and co-wrote several sections of the standard.

Dr. Issa is the Director of Graduate and Distance Education Programs as well as a tenured Rinker Professor at the M.E. Rinker, Sr., School of Building Construction at the University of Florida. He is an internationally recognized expert and consultant on implementing technology in construction.

Joining Forces

Just because the Department of Defense lists "ECS" as a joint acronym doesn't mean every service does expeditionary combat support the same way.

Capt Michelle M. G. Hill, HQ USAF/A7CX

Last year nearly half of the Air Force civil engineers who deployed for contingency operations supported the Army or served in other joint or "in-lieu-of" missions. So far, this year's deployed CEs are doing the same. Joint military engineering is now the norm, and can bring with it "issues" that need attention. The Joint Operational Engineering Board is the chartered senior advisory board responsible for the identification, resolution, and continued support of any joint engineering issues.

The Air Force Civil Engineer, Maj Gen Del Eulberg, is a voting member of the JOEB, with the responsibilities of ensuring that joint initiatives developed through the board are in line with current Air Force capabilities and determining what training and equipment — or even new capability development — will be needed to fulfill the growing demands of joint operations.

Chaired by the J-4 (Director, Joint Staff Logistics), the JOEB specifically focuses on identifying capability gaps and redundancies within the current joint operational engineering program. The JOEB utilizes a subgroup, the JOEB Coordination Group, to act upon issues identified by the board's at-large membership. As the senior Air Force member, Maj Gen Eulberg appoints a representative to the JOEB Coordination Group. Currently, the slot is filled by the Readiness and Emergency Management Division Chief, HQ USAF/A7CX.

The JOEB Coordination Group divides its responsibilities among its four working groups: the Capabilities Working Group, the Transformation Working Group, the Interoperability Working Group, and the Doctrine and Training Working Group. Each of the working groups is chaired by a lead service; Maj Gen Eulberg is the chair of the Doctrine and Training Work Group, and has delegated the Expeditionary Engineering Branch Chief, HQ USAF/A7CXX, as the Doctrine and Training Working Group lead. The working groups can also raise issues not yet addressed and receive guidance for further action from the Joint Coordination Group or directly from the JOEB.

Current Working Group Initiatives

The Capabilities Working Group is examining strategic documents, such as the National Military Strategy and the National Defense Strategy, to determine current and future joint engineer requirements. Comparing these requirements with the current joint capabilities, they determine if changes and corrective courses of action are needed. They also compare all engineering concepts of operations and identify and recommend fixes for any existing capability gaps or redundancies.

The Transformation Working Group is currently focused on delivering an Operational Engineering Capabilities Roadmap and a Joint Integrating Concept Proposal document. The results of these efforts will shape the operational engineering capabilities within the Joint Logistics Capability Area Portfolio that determine how to best bring engineer capabilities to the joint warfighter.

The Interoperability Working Group has been working a number of issues to enhance the interoperability between engineer forces from all the services. One important initiative is developing a plan to synchronize the procurement of heavy equipment. While each service currently works through their own acquisition channels, a joint procurement plan would yield substantial savings through bulk buys and reduce the overall number of makes and models to gain efficiencies in interoperability, training, start-up, maintenance, and supply chain management.

The Doctrine and Training Working Group, chaired by the Air Force, is acting on a number of initiatives, the most noteworthy of which is probably the Joint Engineer Operations Course. With a sixth offering in June, the course has received rave reviews from attendees. The DTWG also provides oversight to the Joint Airfield Damage Repair

For Air Force civil engineers, working directly with their counterparts in the Army, Navy, and Marine Corps is becoming more common. The goal of the JOEB is to ensure compatibility and reduce redundancy during joint missions. (photo by Msgt Jim Varhegyi)

Working Group, which coordinates research and development initiatives to update tactics, techniques, and procedures to better meet the needs of combatant commanders worldwide. The DTWG is also working on the development of joint guidance to help clarify service engineer roles and responsibilities regarding base operating support integration, as well as the creation of a Web site to share joint-engineer lessons learned.

The Air Force Role

Air Force personnel brief the JOEB and the JOEB Coordination Group on ongoing programs. In March 2008, the DTWG briefed the JOEB on the status of the Joint Engineer Operations Course, ADR, and assessment of combatant command joint engineer billets.

The Joint Engineer Operations Course has been operating under funds provided by the Joint Staff and the services, but the goal is to have it offered under the Joint Forces Staff College via the National Defense University. The NDU will then have funding and oversight responsibility for the course, and students will receive joint credit.

The ADR Working Group update was also provided to the JOEB. The Office of the Secretary of Defense recently directed a Critical Runway Assessment and Repair Joint Capabilities Technology Demonstration that leverages existing ADR Working Group efforts to more quickly identify technical solutions to current ADR assessment and repair limitations.

Finally, combatant command engineer staff billets were discussed. Under the current construct, Army, Navy, and Air Force engineers are fairly evenly distributed across the combatant command staffs. However, a lack of Air Force O-6 positions means our engineers are not afforded the career progression opportunity to grow as a joint engineer at the senior level. The DTWG is currently working on a proposal to create these opportunities.

Through its various working groups, the JOEB is focused on an array of issues aimed at improving our joint engineering capability and interoperability to best serve the warfighter now and in future conflicts. While this group has already enjoyed some successes, there is much work to be done as the need for joint engineering capability continues to be in high demand around the globe.

Capt Hill is the Joint Training and Doctrine Program Manager, Office of The Air Force Civil Engineer, the Pentagon, Washington, D.C.

Making It Better

For several months, an integrated process team has been diligently working on "reworking" something near and dear to all CEs — expeditionary training.

Ms. Teresa Hood, *AFCE* editor

A1C Richard Penny (right), a utility systems apprentice with the 28th CES, replaces the firing pin on an M-16 assault rifle during a field training exercise at Ellsworth AFB, S.D. (photo by SrA Marc Lane)

The know-how of Air Force civil engineers is a hot commodity, in high demand in today's high operations tempo world. So on any given day, Air Force CEs somewhere are training, making sure that their contingency knowledge and skills are developed, maintained, and updated.

Since October, an integrated process team of CEs has been working hard to make sure that their expeditionary engineering training is also right — the right skills for the right specialty at the right time and the right place.

The IPT was created in response to feedback from CEs returning from contingency deployments, and to action items resulting from visits to the Southwest Asia area of responsibility by Maj Gen Del Eulberg and other senior leaders. One of Civil Engineering's primary Transformation initiatives, Spiral Initiative Five, speaks directly to the team's purpose: enhancing RED HORSE and Prime BEEF capabilities, both in training and equipment.

"There are two very specific issues we're trying to address," said Maj Lance Clark, who is the Expeditionary Engineer Program Manager in the Office of The Air Force Civil Engineer at the Pentagon. Maj Clark co-chaired the IPT with Maj Don Henley, Chief, Contingency Training, Headquarters Air Force Civil Engineer Support Agency, Tyndall AFB, Fla. "First, how do we ensure that we have a battle-ready civil engineer who arrives at a contingency fully trained?" continued Maj Clark. "Second, how do we achieve the right mix of home-station and specialty-site training? We're looking at training from a general sense — 'What capabilities do we deliver as engineers?' — as well as from an AFS-specific sense — 'What skills do I provide as a carpenter or as a firefighter?'"

The 42 CEs forming the governing body of the IPT were active duty, Guard, and Reserve and included representatives from all the major commands, AFCESA, the training sites, and the schoolhouses.

"We asked for — and I think we got — the best experts in each career field," said Maj Henley. "At the first meeting from Oct. 10–19, we established what we call our 'general' tasks, the core tasks that every civil engineer needs. Then we turned the work over to our 15 working groups (13 enlisted, one officer, and one specialty training site) so that each Air Force specialty could look at what skills they need in particular and also how to better utilize our nine CE training sites, such as Silver Flag and the Guard and Reserve training sites."

"We're being asked to do some things in our ongoing global operations that we were not expected to have done in our previous training regimen," said Maj Clark. "As always, engineers continue to do a marvelous job of adapting and overcoming, but we're trying to provide more of a standard baseline — so we don't necessarily have to adapt and overcome as much — and an implementation plan to get us there. We want to make sure we have a solution that meets our Total Force training requirements and prepares us to succeed in the joint environment, and will employ recommendations from the general IPT and each of the working groups to chart that course."

"A lot of the training tasks will probably remain the same," said Maj Henley. "I think where we'll see the biggest shift is in how we actually do the training; how we shift from a currency-based training to a battle rhythm–based training, where we provide a civil engineer to a combatant commander with the right skills at the right time. This has been a big undertaking because ultimately it's going to affect all of Civil Engineering, all 32 thousand-plus military CEs."

Senior leaders are currently reviewing the CE Training IPT's findings and recommendations, which were presented to them in May.

"The 100% solution will be determined once senior leadership has decided which course of action is best and tells us to 'finalize and implement,' said Maj Henley. "There are high expectations for what we will propose, but by having more than 230 people from the Civil Engineering community involved in the process, we're confident that we'll hit the target."

"There were hundreds of years of experience just at the first meeting," said Maj Clark. "And we've had a lot of support from the field, from the commands, from senior leaders; everyone has been eager to help. That's the great thing about engineers: we don't just gripe — we actually want to fix things and make them better."

Recouping Value with EULs

The Enhanced Use Lease Program helps the Air Force partner with industry to reduce installation footprints while gaining valuable assets

Ms. Linda Geissinger, AFRPA/PA

A key part of Air Force Civil Engineering transformation is finding and returning value on underutilized real property assets. To return millions of dollars in value to the Air Force, the Air Force Real Property Agency is using unique "tools" — legal authorities that allow for what's known as value-based transactions. The transactions typically involve enhanced use leases but can also involve real property exchanges, including trading excess property for military construction.

An EUL is a lease of non-excess, underutilized land, natural infrastructure, equipment, or buildings for cash or in-kind consideration equal to the assets' fair market value. The fair market value consideration enables the Air Force to leverage its property and return value to the warfighter.

A good example of this innovative asset management approach is evident at Hill AFB in Utah. This year, a deal team (comprising staff from Hill AFB, AFRPA, AAFES, Services, The Air Force General Counsel, and Air Force Materiel Command) plans to complete an EUL with a private developer to replace old offices with a National Aerospace Research and Development Park. This development on the base's west side could total more than 500 acres, serving both the military and the community with office and retail space, hotels, and restaurants. The Hill project is planned in phases, with the first covering up to 180 acres.

Currently, the developer, Sunset Ridge Development Partners, LLC., is determining how it will finance, plan, design, construct, and operate the complex. Over the next 5 to 10 years, the plan contemplates providing approximately 600,000 square feet of office space for the Air Force as in-kind payment for the land lease.

Hill is just one of 32 EUL projects underway through the Air Force's value-based transaction initiative. The 32 projects include 20 Phase I projects (project identification); 8 Phase II projects (project definition and acquisition); and 4 Phase III projects (lease negotiation and closing). Four projects have been completed (executed leases). The benefits are enormous: The first four completed EULs total a net present value to the Air Force of approximately $28M over the life of the lease terms. Three other projects are in the final phase of negotiation and are expected to be completed this year, with an NPV of approximately $200M over the years, according to Mr. Jeff Domm, AFRPA's Acting Director.

Last year, the Secretary of the Air Force designated the EUL program as a High Value Initiative and provided $3M in seed money. This helped AFRPA asset managers launch the development of the program, including publishing EUL guidance documents and establishing performance standards. With substantial input from the MAJCOMs and installations, the program is evolving and maturing. Developer feedback from early deals has helped the agency leverage commercial best practices.

"As the Air Force EUL program grows and matures, credit is due to the bases and organizations that helped AFRPA refine the steps to complete them," said Ms. Kathryn Halvorson, who recently retired as Director of AFRPA and oversaw much of the early work on EUL. "They include the Hill deal team, and also the folks at Kirtland where the first Air Force EUL was signed two years ago." Ms. Halvorson also cited the Office of The Air Force Civil Engineer for playing a critical role, integrating EUL opportunities with the mission beddown process.

AFRPA is partnering with the Air Force Energy, Environment, Safety, and Occupational Health Office, with the Office of the Air Force Civil Engineer, and with the Air Force Civil Engineer Support Agency to investigate and execute several energy EUL initiatives. These initiatives potentially include three commercial-scale solar energy projects at Kirtland, Edwards, and Luke AFBs, and a coal-to-liquid plant at Malmstrom AFB.

In addition to EULs, the Air Force is working several property-for-military construction exchange projects, such as those at the Norwalk Defense Fuel Depot, Calif. (50 acres in exchange for construction at March ARB, Calif.); the Lynn Haven Fuel Depot, Fla. (144 acres in exchange for construction at Tyndall AFB, Fla.); and the Buckley Annex

Hill AFB and Sunset Ridge Development Partners are about to close an EUL deal that will turn a portion of the base's west side — possibly more than 500 acres in total — into Falcon Hill, an aerospace research park. The surrounding community will gain economic opportunity for local contractors, suppliers, and workers. Initial groundbreaking is set for late 2008. (conceptual renderings provided courtesy of Sunset Ridge Development Partners and may not represent the final plan)

Air Force BRAC 2005 property in Denver, Colo. (72 acres in exchange for construction for Air Force Reserve Command at Wright-Patterson AFB, Ohio).

To make an EUL happen, the Air Force must first identify opportunities where land or facilities can potentially be leased to private industry. The Air Force then defines and markets these opportunities. Once potential development partners step forward, the Air Force negotiates to get the best deal possible.

"Executing EULs and value-based transactions is the heart of my agency's transformation," said Mr. Domm. One of AFRPA's top goals in this endeavor is to continue partnering with A7C, AFCEE, AFCESA, and other Air Force stakeholders.

EUL benefits are tremendous not just for the Air Force, but also for developers and local communities. The developers establish long-term relationships with the government and local communities, ensuring a return on their investment. Communities across America gain jobs and economic growth. The Air Force strengthens its ties to the community and capitalizes on underutilized assets by leasing them to private entities. The lease payments to the Air Force can be paid in cash or in-kind and can be used for Air Force facility construction, maintenance, improvements, and some transaction costs. Cash or in-kind consideration benefits the warfighter and their families.

Given the budget shortfalls for sustaining, restoring, and modernizing Air Force infrastructure and the trend to "lean" the Air Force, enhanced use leases and other value-based transactions are critical tools to return value to the warfighter and leverage real property for mission needs.

"I'm really excited about the direction the EUL program is taking," Mr. Domm said. "This program is vital to the Air Force's transformation to a better, leaner organization. I encourage civil engineers, commanders, and asset managers to learn about EULs and help identify viable opportunities to transform real property into value."

Vegetative Roofing

Mr. Jeffrey Nielsen, HQ AFCESA/CEOA

The Air Force is investigating the feasibility of using vegetative or "green" roofs, a promising new construction technique that will help installations meet mandated energy reduction goals and reduce facility life-cycle costs. A vegetative roof can also help construction projects meet the U.S. Green Building Council's Leadership in Energy and Environmental Design, or LEED, criteria by providing up to 14 sustainability credits toward certification.

Facility energy is an important factor in the Department of Defense's continued effort to reduce energy consumption and meet the goals set by Executive Order 13423, which includes a requirement to reduce energy consumption 3% per year from a FY03 baseline. The Air Force annually spends 18% ($1.1B) of its total energy expenditures on facility energy, so any reductions in facility heating and cooling costs can provide substantial savings.

Although used in Europe for the past 30-40 years, modern vegetative roofs only recently (since 2000) came to be used in the United States and have not yet become widespread. Their use has been primarily in urban areas where storm water runoff and urban heat island effects are concerns. But uses are now expanding to commercial industries as they too want to reduce their energy cost, increase the life span of their roofs, and improve the quality of their environment.

The Air Force and Green Roofs

There are two types of vegetative roofing systems: intensive and extensive. Intensive systems are roof top landscapes with container depths of 8-12 inches or more that often incorporate shrubs, walkways, patios and benches. As the name implies, intensive systems require continual maintenance and irrigation, similar to a conventional garden. Extensive vegetative roofs (see sidebar) are used in the majority of applications and are the focus of the Air Force's effort. Saving money is the reason for selecting extensive over intensive vegetative roofs: lower initial costs and maintenance with essentially the same energy savings.

Since 2000, a number of studies on vegetative roofs were performed by Michigan State University, the Federal Energy Management Program, and the U.S. Green Building Council; all showed positive results. Before recommending full-scale use of the system, the Air Force is conducting its own investigation on the economics, maintenance, longevity, and effectiveness of vegetative roofs by contracting with an A-E firm to install a demonstration roof at Peterson AFB, Colo. Under the direction of experts from the Office of The Air Force Civil Engineer, the Air Force Civil Engineer Support Agency, Air Force Space Command, and Peterson AFB, the vegetative roof was installed in November 2007 on one of Peterson's existing administrative facilities. The

Workers bring racks of planting media trays onto the roof of a buliding at Peterson AFB, Colo. (U.S. Air Force photo)

The Elements of a Green Roof

Extensive green roofs are not lawns and do not require any type of mowing. An extensive vegetative roof system uses a shallow soil with low-growing, succulent alpine plants with horizontal roots and vegetation that can thrive in the poor soils and harsh conditions common on roof tops. Once the plants are established, usually within the first year or two, maintenance can be reduced to a biannual inspection and weeding, and an annual fertilization.

The elements of a green roof are essentially the same from one manufacturer to another, regardless of whether the vegetative roof materials are assembled on the roof or placed on the roof as preplanted growing trays. From the top down, each vegetated roof includes several components. First is vegetation consisting of several species of sedum or other hardy alpine plants specifically selected for the regional climate and conditions. Below the plant layer is a lightweight growth medium commonly engineered from aggregates like expanded shale or clay mixed with an organic filler. Supporting the soil is a filter fabric, required to prevent the soil from being washed into the drainage layer or down the roof drain. Below the filter fabric is a water retention mat for storing water for plant growth and reducing runoff. Under the water retention mat is a drainage layer — usually synthetic — that provides excess water a ready path to the roof drainage outlets after the soil and water retention fabric is saturated. Below the drainage layer is a protective membrane called the root barrier which blocks any damaging root growth and acts as a cushion to protect the conventional roof system below. The protective membrane/root barrier could be placed on the waterproofing membrane, or in the case of an inverted roof system, placed on the insulation as shown at right.

diagram courtesy American Wick

demonstration project included replacement of the building's built-up roof with a new single-ply roof with upgraded R-30 insulation, followed by installation of a lightweight vegetative roof system composed of interlocking plant trays on top of the new membrane.

The Air Force contracted with a separate A-E firm to monitor the performance of the roof for a year, measuring the savings and comprehensive costs and developing a model for estimating the energy savings. Thermal sensors installed in and on the vegetative roof measure the cooling effect generated by the system. The A-E firm will evaluate the green roof building against a control — a similar building at Peterson. They will provide a recommendation on the sustainability and life cycle cost of this roof system over conventional roof systems, and will use the collected data to develop a procedure to evaluate other roofs for the application of vegetative systems.

The Air Force will share its findings and conclusions with the Army, which is performing a similar test at Tobyhanna Army Depot, Pa. Installed in August 2006, the Army's test project is a year ahead of the Air Force's project. The Tobyhanna roof vegetation is not yet fully established, but preliminary data indicates a 25% energy savings and a 15% reduction in storm water runoff. It's expected that the benefits will increase as the plants mature and become fully established.

Pros & Cons of Green Roofs

Vegetative roofs are not cheap; there is a large initial investment. Life cycle cost is the primary factor in deciding to use a vegetative roof; for each project, life-cycle cost savings should sufficiently outweigh any additional capital investment.

Pros

Expected benefits of a vegetative roof are prolonged life of the roof membrane, energy savings, cost avoidance, less maintenance, and reduced storm water runoff.

Through the processes of shading, transpiration, and evaporation, the vegetative roof substantially reduces the temperature of the roof membrane. The dark surface of the conventional roof membrane absorbs the sun's energy while the vegetative roof shades the surface. Evaporation of moisture in the soil and plants also works to cool the roof surface. All the processes work together to effectively cool the roof membrane surface beneath the soil. On a typical summer day, the surface temperature of a conventional ballasted roof could rise to 140 degrees, while a vegetative roof on an adjacent building would rise to only 95 degrees, creating a substantial drop in the cooling demand within the latter building. The benefits from a vegetative roof are most pronounced on one- to three-story facilities where the roof area contributes a large percentage of the building's exterior envelope. Reducing the cooling load over such

a large area of the building envelope will provide substantial energy savings. The majority of Air Force facilities are low-rise facilities which are ideal for this type of roof.

The vegetation and soil cover also provides another very important benefit. Based on conservative estimates, it prolongs the life of the roofing membrane by 100%, protecting it from the damaging effect of ultraviolet radiation and extreme temperature fluctuations. Conventional roof membrane temperature can fluctuate daily by as much as 100 degrees. This places extreme stress on the membranes and ultraviolet light quickly degrades the membrane. Vegetative roofs greatly reduce the daily temperature fluctuations that damage roof membranes.

Some roofing membrane and vegetative roofing manufacturers have partnered in order to provide a complete roofing system. Because the membrane manufacturers recognize the protective benefits, this type of partnership is resulting in longer manufacturer's warranties on the roof membranes. Essentially doubling the life of roof membranes lowers the overall life-cycle cost of the roof system versus a conventional roof system.

Cons

A primary challenge for installing vegetative roofs on existing facilities is the additional load from the roof and the rain water retained by the soil. Extensive vegetative roof weight varies, ranging from 15 pounds/square foot to over 30 pounds/square foot. Even the lightest vegetative system may exceed the structural capacity of existing facilities built in accordance with older codes and design criteria. The first step in evaluating the suitability of any green roof retrofit is a structural analysis of the existing facility, not just looking at the roof span but also ensuring that the increased load can be safely carried to the foundation. If the structure is found to be inadequate, requiring a structural upgrade, a vegetative roof will likely be uneconomical and other energy saving methods, such as reflective roofing, can be considered.

Other factors to consider before deciding on a vegetative roof include wind and climate. Wind uplift resistance must be carefully evaluated. Green roofing systems are typically rated for 90 mph wind speed, so use of green roofs on some coastal regions would be restricted. In extremely

This roof at Peterson AFB will be completely covered in flats of growing media for various types of plants. But first, each one has to be lifted into place by hand. (U.S. Air Force photos)

After the plantings take off, Peterson AFB's green roof will look very similar to this one on the Forest Resources building at Penn State University. (photo courtesy Penn State Center for Green Roof Research)

arid climates, there may not be enough rainfall to support a roof's plants and the expense of irrigation could outweigh the energy cost saving. Because a main benefit is reduction of the building's cooling load, the application of a vegetative roof in cold climates where air conditioning is not required may offer little benefit.

Concerns are also raised by the initial high cost, the increased difficulty in finding and repairing leaks, and the lack of experienced contractors to install and maintain the roof.

It is more difficult to locate and repair leaks below vegetative roofs. Strict oversight and roof tightness testing is recommended to ensure the quality and tightness of a new roof before installing the vegetative system. However, once the roof is covered, the vegetative systems will provide better protection of the roof membrane.

Guidance on Green Roofs

The U.S. roofing industry has published guidance for roofing contractors. The National Roofing Contractors Association published the Green Roofing System Manual in 2007 to provide education and guidance.

University, commercial, and governmental research into vegetative roofs is promising. The Air Force vegetative roof study will help provide guidance to installations on roofing options that accomplish many objectives: energy cost savings, reduced environmental impacts, decreased life-cycle costs, and improved facility sustainability.

Editor's note: For further information on vegetative roofs, contact the author through AFCESA's Reach-back Center: afcesar@tyndall.af.mil; toll-free 1-888-232-3721 or DSN 523-6995.

Mr. Nielsen is the Air Force Roofing Engineer, HQ AFCESA, Tyndall AFB, Fla.

Fallen Civil Engineer Honored

On April 12, hundreds of Airmen and Soldiers gathered in the town hall at Balad AB, Iraq, to attend a memorial service for a hero and a friend. TSgt Anthony L. Capra, 31, died April 9 near Golden Hills, Iraq, of wounds suffered when he encountered an improvised explosive device during his 107th combat mission of this tour.

TSgt Capra was deployed from Detachment 63, 688th Armament Systems Squadron, Indian Head City, Md., as an explosive ordnance disposal team leader assigned to the 332nd Expeditionary Civil Engineer Squadron at Balad AB. He had volunteered for the six-month deployment, his fourth since 2001.

"As any person who has served with Tony can attest, he was the embodiment of what it means to be a warrior," said SSgt Jason Kreider, a fellow EOD team chief who spoke at the memorial. "Tony had a glow about his personality that could brighten any mood. He touched us all and left a part of him with us all. He is and will always be a great part of our EOD family."

TSgt Capra was posthumously awarded a Bronze Star, first Oak Leaf Cluster, for his heroic actions during this deployment.

TSgt Capra leaves behind his wife, Angie, and their five children, Mark, Victoria, Jared, Shawn, and Adrianna, as well as many other family members. He was the eldest of Anthony and Sharon Capra's 12 children, born into an Air Force family in Colorado in 1977. TSgt Capra joined the service in 1997 and was followed by three of his brothers, who currently serve in the Air Force.

TSgt Capra was buried at Arlington National Cemetery on April 18, following a funeral service in Fredericksburg, Va.

"The motorcade procession traveled through the center of Fredericksburg. Traffic came to a complete stop as we made our way onto I-95 N, where Virginia state troopers blocked all northbound traffic and every on-ramp north of Fredericksburg," said Lt Col Lamberto Braza, Commander of the EOD Detachment at Indian Head, Md. "…looking north, I could not see the front of the motorcade and looking south, I could not see the end."

As TSgt Capra's family wrote in his obituary, "His life encapsulated service to his country, love for his family, and dedication to Christ. He was protecting the things he loved — freedom, family."

Compiled from news stories by 1Lt Lisa Spilinek, 332nd AEW/PA, Balad AB, Iraq, and Ms. Lois Walsh, 96th ABW/PA, Eglin AFB, Fla., as well as the Fredericksburg Free Lance-Star obituaries.

Airmen remember their fallen comrade, TSgt Anthony Capra, during a memorial service at Balad AB, Iraq. (U.S. Air Force photo)

Quick Actions Save Airman's Life

TSgt Jerome Baysmore, 376th AEW/PA

Airmen driving a Manas AB fire truck rumbled down the street past the medical clinic Tuesday and honked their support.

Inside, A1C James Garrett, 376th Expeditionary Civil Engineer Squadron Fire Protection Journeyman, lay recovering and waiting for a medical evacuation after collapsing during a dodgeball game.

"I really don't recall what happened," the 19-year-old Airman said. "One moment, I was playing dodgeball and the next thing I knew was I was here [in the medical clinic], and they were sticking needles and things in me."

A1C Garrett, deployed from Shaw AFB, S.C., is part of the 376th ECES firefighter's dodgeball team, which was facing off against the 376th Air Expeditionary Wing Staff team when he went down. Players from both teams pulled together to assist him when they realized what had happened.

"He fell over, and we didn't think it was anything serious at first," said A1C Daniel Hogan, 376th ECES Fire Protection Journeyman and teammate. "He just spiraled downhill from there. I'm just thankful everybody was there."

The emergency medical technician–qualified firefighters provided first-responder care and then helped Medical Group personnel administer emergency care for A1C Garrett.

"(A1C Garrett) exhibited signs of sudden cardiac arrest. Starting basic life support and the quick use of the automated external defibrillator to get his cardiac rhythm normalized saved his life," said Col Dan Hansen, 376th Expeditionary Medical Group commander. "I've taken care of a few of these in my time and often this is not the outcome because of delays in BLS or AED use."

"It was great teamwork," he said. "It was people who knew what to do and the right equipment on hand saved a life."

Lt Col Ann Hoyniak-Becker, 376th EMDG, agreed. "It was a concerted effort," she said. "When I arrived on scene, the firefighters were performing basic life support and the AED was used within five minutes…. This maximized his chances of survival."

A1C Garrett was placed on an aeromedical evacuation flight to Germany for further evaluation at Landstuhl Army Regional Medical Center near Ramstein AB.

He was grateful for everyone's support in making that happen. "I'd just like to thank the staff and everyone who helped me," he said.

A medical team evacuates A1C James Garrett, 376th ECES Fire Protection Journeyman. The firefighter suffered sudden cardiac arrest during a dodgeball game. His teammates used an automated external defibrillator to normalize his heart rhythm. (photo by the author)

Red Tail Engineers Keep Balad Going

1Lt Eric D. Omundson, HQ ACC/CEX

At Balad AB, Iraq, the "Giant Voice" sounds an alarm and members of the 332nd Expeditionary Civil Engineer Squadron are among the first to respond. An indirect fire attack creates a spall and debris field that shuts down airfield operations at the Department of Defense's busiest single runway. Firefighters and Explosive Ordnance Disposal experts from the 332nd move quickly to render the scene safe. Next, Engineering Assistants and Heavy Equipment Airmen arrive to survey the damage and complete the necessary pavement repairs to reopen the runway before the base's high operations tempo is impacted.

This real-life scenario is all in a typical day's work for Balad's "Red Tail Engineers." Using skills learned and honed at Silver Flag and home stations, members of the 332nd ECES provide combat support for Tuskegee Airmen of the 332nd Air Expeditionary Wing to establish, sustain, and restore Balad's "airfield weapon system." In a world of increasing "in-lieu-of" taskings, the need for — and recognition of — Air Force civil engineering capabilities continues to rise.

As stated in AFPAM 10-219, Air Force CEs support "US Air Force operations anytime, anywhere, and in all conditions." Members of the 332nd ECES work diligently to ensure that, at Operation Iraqi Freedom's only Air Force fighter location, the 332nd AEW can execute combat operations without pause. Balad's missions include the largest combat search and rescue operation since Vietnam, the most forward deployed Predator operation, the largest C-130 squadron, and more than 2,000 combat sorties per month.

Since 2005, the Red Tail Engineers have completed $330M in contract and in-house construction projects, from hardened aircraft shelter renovations to placing enough concrete to build a sidewalk across the Atlantic. This past year marked the halfway point in the completion of a $650M master plan that expands the capabilities and improves the lethality of the joint warfighting platform at Balad. The continued success of our military efforts in Iraq, derived in part from the ability to deliver airpower anywhere in Iraq from Balad, hinges on continuing development of the base infrastructure.

Balad's CEs were recently called upon to prepare for the newest fighters to join the Tuskegee Airmen, this time a

Right: Spall repair crews stay busy at Balad AB. (U.S. Air Force photo)

Far right: SSgt Karl Ferree raises a lead rope over the skeleton of a relocated big-top shelter. (photo by SrA Julianne Showalter)

squadron of A-10s. In four months, the engineers had to expand 10 parking pads by 9,300 square meters, install 730 linear meters of B-1 revetments, expand two hot pits and a Radar Warning Receiver pad, and construct a complete set of new living trailers. This scope and timeline is typical for Balad. Over the last year, the Red Tail Engineers had to bed down two additional squadrons of F-16s and the largest MQ-1 Predator UAV mission outside the continental United States.

Civil engineers now serving with the 332nd AEW are proud to add these accomplishments to the distinguished heritage of past Tuskegee Airmen. As the Air Force's role of timely close air support for troops in contact evolves into providing increased intelligence, surveillance, and reconnaisance to Iraqi forces, and as its ground presence decreases, engineers will continue to be needed well into the future.

In the meantime, the need for Air Force Civil Engineering skills in the joint fight will remain and instances of "in-lieu-of" taskings will continue to be more and more common. This raises several questions about our future.

How will this affect our core competency—supporting Air Force operations? What can we, as civil engineers, expect to be called upon to do 10 years down the road? What do we need to do now to be prepared to meet these challenges?

One thing seems certain: When an alarm sounds in a place far from Iraq, CEs will be there to ensure that our Air Force is able to project and sustain combat power, "anytime, anywhere, and in all conditions."

1Lt Omundson was a project engineer with the 332nd ECES, Balad AB, Iraq.

Lending a Hand

Air Force CEs take on infrastructure projects to benefit American and Iraqi Soldiers

SSgt Ruth Curfman, 332nd AEW/PA

Airmen from Detachment 6 of the 732nd Expeditionary Civil Engineer Squadron recently returned to Balad AB from forward-deployed locations where they were instrumental in building infrastructures for coalition and joint forces in Iraq.

One project was to build a joint combat outpost in the Diyala River Valley, while another project was to construct various concrete pads for a motor pool at Forward Operating Base Caldwell.

After members of the 1203rd Engineer Battalion's 224th Engineer Support Company cleared and leveled the construction site and installed force protection, the engineers from Det. 6 went to work.

"We constructed more than 25,000 square feet of living, dining, and operations buildings from the ground up," said SSgt John Wernegreen, 732nd ECES Det. 6 structural craftsman, deployed from Nellis AFB, Nev. "This project gave the [U.S.] Army's [3rd Squadron, 2nd Stryker Cavalry Regiment] and Iraqi army [soldiers] a place to carry out their mission of controlling the battlespace around the Eastern Diyala Province."

"The area where JCOP Milledge was built had been an Al Qaeda in Iraq stronghold and was previously considered a safe haven for insurgents in the Diyala Province," said Army Capt Timothy Hsia, 3/2 Cav logistics officer. "As a result of the development of the JCOP, U.S. forces are now able to quickly respond and counter enemy actions in the Diyala River Valley."

The work the Airmen from the 732nd ECES executed was extensive. "The Det. 6 team planned, procured, resourced, and established several life-support functions at the JCOP, including a power grid; electrical wiring; generator set-up and maintenance; heating, ventilation, and air conditioning unit configuration; and latrine and shower unit establishment," Capt Hsia said. "They ensured all 72 living containers were wired for power and air conditioning units. The team also engineered and built several structures on the JCOP such as a civil military operations center building, the company tactical operations center, and five Iraqi army buildings."

The project provided Soldiers with quality work centers and has had a positive impact on troop morale.

(Left) A1C John Owings saws wall studs at the new Joint Combat Outpost Milledge, Iraq. (photo by A1C NIcholas Lane) (Right) SrA Dan Smith, SrA Dion Williams, A1C George Farrington, and A1C Richard Simmons pour and rake concrete pads at FOB Caldwell, Iraq. (photo by SSgt Josh Jeffreys)

SSgt Stephen Hansen grades an area of dirt where other Dirt Boyz will pour a concrete pad at FOB Caldwell, Iraq. (photo by SSgt Josh Jeffreys)

"The completion of this project gave coalition Soldiers a home, provided a facility for morale calls and Internet capability as well as the ability to establish joint operations with the Iraqi army," said Army Capt Vincent Morris, 3/2 Cav Iron Company commander. "The new infrastructure also provides IA soldiers the same quality of living as the coalition forces."

In addition to providing Soldiers a better quality of life, the Airmen were able to witness first-hand how their accomplishments affect the bigger picture in the Operation Iraqi Freedom mission.

"I personally feel that I did my part to enhance the security and strength of the coalition and IA forces," SSgt Wernegreen said. "This area was a stronghold of more than 300 insurgents for a long time. Now this area is patrolled on a regular basis by joint forces to eliminate that threat and win the war."

While Airmen from the structures section of the 732nd ECES were building the JCOP, the "Dirt Boyz" section were working hard to improve conditions at FOB Caldwell. The Airmen worked directly with the Army's 2nd Squadron, 3rd Armored Cavalry Regiment.

Both groups essentially fill in positions traditionally tasked to the Army's civil engineers. These in-lieu-of taskings allow Army Soldiers to serve in career fields where they are needed most — on convoys and clearing roads.

"We poured almost 1,577 cubic yards of concrete during three separate pad projects," said SSgt Josh Jeffreys, 732nd ECES Det. 6 heavy equipment operator, deployed from Minot AFB, N.D. "All three concrete pads will provide the Soldiers at FOB Caldwell a place to work on their vehicles without having to be in the dirt and mud."

The Airmen also placed 1,800 linear feet of barriers around the munitions holding area and completely rebuilt the entry control point to the U.S. compound at FOB Caldwell.

"The ammo holding area project efforts ensured $5 million in military munitions are preserved and protected," SSgt Jeffreys said. "We also placed 100 feet of Hesco barriers to enhance force protection measures."

To get to the FOB, the 732nd ECES Det. 6 Airmen convoyed almost 300 miles and hauled about $325,000 in assets to secure and support Soldiers at FOB Caldwell, SSgt Jeffreys said.

"I couldn't be prouder of these Airmen," said Maj Bryan Opperman, 732nd ECES Det. 6 commander, deployed from Whiteman AFB, Mo. "What used to be a gravel yard at FOB Caldwell is now an area suitable for the maintenance of the Army's tracked vehicles," Major Opperman said. "My guys built it and now the Army is taking the fight to the enemy."

Call a CoP!

Ms. Sandra Scott, HQ AFCESA/CEBI

The AFCESA Webmaster maintains an index of available CE-related CoPs at Air Force Knowledge Now.

Civil Engineering is undergoing an intense period of transformation to better support a 21st century Air Force. One tool in the transformation arsenal comes from Air Force Knowledge Now: the Communities of Practice. The heart of the AFKN system, CoPs are virtual workspaces — a Web-based collaborative environment where members can share critical project-related information.

Not all information necessarily has to be shared through formal channels. Nor should it be, when speed is of the essence or the information is aimed at a specific group of people. Add to the mix the fact that this is an era of asymmetric threats, workforce demographic pressures, and multiple deployments, and CoPs become an ideal way to share much-needed experience, as well as shorten learning curves. Civil Engineering troops are taking advantage of CoPs to make sure that lessons learned are shared with all as quickly as possible, and to help ensure continuity by making departing personnel's acquired knowledge available to their replacements.

The Air Force Explosive Ordnance Disposal Program Management CoP is one real-world example of how CEs take advantage of this tool. Mr. Dave Brown, EOD Chief Program Analyst at Headquarters Air Force Civil Engineer Support Agency, Tyndall AFB, Fla., points out, "The great thing about the CoP is that it goes straight to the Airmen without all the levels of bureaucracy. The EOD community uses this CoP to keep all members informed about safety, deployment policies, and career advice. They can also manage lessons learned and capture emerging issues via the Southwest Asia exit questionnaire."

All CEs can use the Civil Engineering CoPs Index, which is maintained by the AFCESA Webmaster. It includes links to the Base and Installation CoPs Listing and the Contingency Engineering Listings.

Users with a common access card can log in directly at AFKN's Web site (https://afkm.wpafb.af.mil). Users without a CAC can log in through the Air Force Portal (https://wwwd.my.af.mil/afknprod/ASPs/CoP/Entry.asp?Filter=00) with a user ID. If you are already on the Portal's home page, click the "Com-

A1C Victor Aldana, 732nd ECES/Det 6, Balad AB, Iraq, takes time to check the latest information available on AFCESA's Contingency Training CoP. A1C Aldana deployed from 7th CES, Dyess AFB, Texas. (photo by SMSgt Garry Berry)

munities" tab. (Contractors can also use CoPs by getting a CAC and applying to AFKN for an account; offsite contractors require a military or government civilian sponsor.) After you get to the AFKN Web site, click the "Mission Spt. & Civil Eng." link to reach the Civil Engineering CoPs. On the next page, click the "Civil Engineer CoPs" link under Neighborhoods to see a list of links to CE-related CoPs.

The AFKN support staff oversees creation of all CoPs, whether unclassified or classified. They ensure that each CoP is unique so that there is no duplication of effort. Any AFKN member can create a CoP by clicking the "Create new CoP" link on the AFKN Web site. AFKN's online questionnaire lets you choose the desired capabilities, revise the structure, and manage the content. The CoP can have any of these access levels:

- Open Access — Any visitor can view content without requesting access.
- Permission Access — Visitors can view content only after asking permission of the owner(s) to become a member.
- Closed Access — Visitors cannot view content, and membership is by invitation or assignment only.

All AFKN CoPs have the same "out-of-the-box" features and functions, but AFKN can help build a customized solution, if necessary.

For more information about AFKN and CoPs, visit https://afkm.wpafb.af.mil or call the AFKN Knowledge Solutions Support Center at DSN 986-2356 (937-986-2356).

Ms. Scott, a support contractor, is the Webmaster at HQ AFCESA, Tyndall AFB, Fla.

What are the benefits of using a CoP for your organization or career field?

- *Collaborative environment — saves on travel dollars*
- *Enables rapid information dissemination*
- *Action Item tracker — easy management of large documents and agency process & procedures*
- *Metrics & statistics available to track usage*
- *No cost (unless customization is required)*

Is Something Cooking?

Mr. Raymond N. Hansen, P.E., HQ AFCESA/CEOA

A very costly fire recently occurred at an Air Force installation — a fire that involved a "special range-top fire extinguishing system." While the official investigation results have not yet been released, it's clear that many installations could benefit from a review of the special requirements for such systems. Headquarters Air Force Civil Engineer Support Agency has also issued A-Gram 08-01, "Special Range-Top Fire Extinguishing Systems," which addresses ensuring system operability.

When and Where to Use the Systems

The Life Safety Code (NFPA 101) and the International Building Code classify all cooking equipment as "commercial" whenever it is not located in a residence (e.g., military family housing, dormitory rooms, or temporary living facilities). Therefore, any range — even one specifically manufactured for residential use — installed anywhere else (e.g., a dormitory common room, office building break room, chapel kitchen, or a cooking classroom) must be protected from fire with a range-top fire extinguishing system. Unified Facilities Criteria 3-600-01, *Fire Protection Engineering for Facilities*, allows the system to be an approved "residential range-top extinguishing system" if it's protecting a residential-type range. If it's not, a listed system for protecting commercial cooking must be installed.

Note that residential-type range top extinguishing systems are not authorized for new installations in dwelling units. Existing systems in dwelling units may remain to the end of their service life but should not be replaced (see UFC 3-600-01).

Several installations have identified residential-type ranges that were installed as "self-help" projects — without including the required range-top fire extinguishing system. These installations now have several options: 1) remove the range entirely; 2) install a range-top fire extinguishing system (typically costing about $1,000); or 3) if the range is electric, retrofit the range with fire safety range elements (burners) (costing about $250 per range).

This third option will be new to most Air Force installations. AFCESA has identified one commercial retrofit product that provides a level of fire protection essentially equiva-

Range-top fire extinguishing systems such as the one at right are installed above the range. (Note that the safey pin is out, which means the system is ready to deploy when needed.) The system's fusible links and nozzles are installed in the range hood (far right).
(photos by Mr. Guy Ivie)

Fire Safety Concerns with Special Range-Top Fire Extinguishing Systems

lent to a residential-type range top extinguishing system (with a side benefit of reducing energy consumption). The retrofit product adds a thermocouple under each burner along with a control circuit that prevents any burner from exceeding the maximum needed cooking temperatures. There still is plenty of heat for cooking, even when cooking on the "high" setting, but the retrofit system compensates for the causes of most cooking fires experienced by the Air Force: unattended cooking and combustibles exposed to the burners. A qualified electrician can install the unit in about one hour without any special training. The system is patented and, at this time, is sold by only one company. (Contact the author for more information.)

Residential vs. Commercial Systems

A residential-type range top extinguishing system shares several characteristics with a commercial-type system: both discharge fire extinguishing agent on the fire, activate the building fire alarm system, and automatically shut off all sources of fuel and electric power to the range. There are two major differences between them: residential-type extinguishing systems do not require an approved hood and exhaust duct, and the initial and annual costs are much, much less.

System Maintenance

Residential range-top extinguishing systems require annual maintenance, primarily to replace the fusible links. The links are directly exposed to heat from cooking and can gradually weaken over time, which might result in an unnecessary system discharge that causes a building evacuation, fire department response, and an expensive clean-up. After replacing the fusible links, it's very important to check that the system's safety pin has been removed to place the system back into operation (see A-Gram 08-01).

Who should do this annual maintenance? The installations with the best record of performance are those with these systems included in their maintenance contracts. However, the individual building manager of each facility is ultimately responsible for annual inspection and maintenance.

For additional information, please contact the author through the AFCESA Reach-back center at 1-888-AFCESA1 (DSN 523-6995) or afcesar@tyndall.af.mil.

Mr. Hansen is an electrical and fire protection engineer, HQ AFCESA, Tyndall AFB, Fla.

474th ECES Continues Work at Gitmo

MC2 Nathaniel Moger, JTFGTMO/PAO

The Expeditionary Legal Complex on U.S. Naval Station Guantanamo Bay is sure to be the site of history-making and groundbreaking events. The ongoing military commissions of detained enemy combatants require far more than a room, a couple of benches, and a place to bang a gavel. It also requires more than attorneys, a defendant, and a judge.

For every one of these major players, there are dozens of others in support roles, from the guards guaranteeing the safety of detainees and those around them to the external security specialists providing logistical support.

But before any of them can begin to do their jobs, they need to have a state-of-the-art facility and those don't just build themselves. Air National Guard engineering units have been rotating in to build and upgrade facilities to accommodate the commissions, and members of the 474th Expeditionary Civil Engineering Squadron from the Texas Army National Guard are continuing that mission.

"You could say we took the baton from our predecessors," said Lt Col Frederick Olison, 474th ECES commander. "Our primary mission going in was the sustainment, operations support, and maintenance of the facilities. Once we got here we realized that, due to the increased security requirements, we had a bit of construction left to do."

The ELC needs to not only accommodate the physical security concerns of the commissions process, but also the information security concerns. Due to the classified nature of much of the evidence in the cases, the ELC — out of necessity — became a sensitive compartmented information facility, or SCIF.

"Originally it was a normal courtroom, but now we've transformed it," said Lt Col Olison. "They'll be dealing with a lot of classified information so it's important to make sure that information is not leaked out."

Transforming the ELC into a facility capable of handling top secret/SCI documents wasn't the only thing the 474th did. The commissions process requires a lot of manpower, and all those bodies need a room and a bed. The 474th was more than willing to take on this task by installing modular barracks —double-wide trailer–style living units — for the attorneys and their staff.

"The prosecution and defense teams have modular units now, and they can stay there when court is in session," said Maj Kevin McKinney, 474th deputy commander and project engineer. "The purpose of those, instead of an open-bay tent, is to provide them some extra privacy, so they can get some work done at night."

SSgt Alfonso Castro, 474th ECES, cuts out wooden floorboards to prevent flooding in tents at JTF Guantanamo's Camp Justice. (photo by the author)

All of this extra construction on a previously fallow airfield meant the installation and maintenance of the unseen support structures needed to sustain modern human life, which most take for granted: electricity, sewage, phone lines, and the like.

"We've got the modular units and a gigantic tent city," explained Maj McKinney while pointing at the sprawling mass of tents. "There are six miles of wires and a couple miles of sewer lines. Who knows how many air conditioning units we've got. So we're putting in the work to maintain all of that."

While being activated and pulled from their civilian lives can be a demoralizing factor, these Texas Air National Guardsmen have jumped into this job with the best of attitudes.

"I challenge any other unit to show higher morale. Happy people work harder," said 474th ECES First Sergeant Scott Clarkson, who also noted that many of his people could be off doing other things. "There are a lot of people here with degrees and high-paying jobs back home that come out here and enjoy what they do. They just like to swing a hammer."

Airmen Complete Joint CBRN Course

Ms. Megan Sjostrom, HQ AFCESA/CEXR

Recently, sixteen Emergency Management Airmen successfully completed the CBRN Responders Course at Ft. Leonard Wood. Their graduation marks the first time Air Force personnel have participated in the joint chemical, biological, radiological, and nuclear response course.

Held at the Army's 1LT Terry CBRN Responder Training Facility, a brand new multimillion-dollar, 21-acre facility, the course certifies students to the Department of Defense Hazardous Materials Technician level in 12 fast-paced days. The course participants included active duty and National Guard Airmen and Soldiers.

Emergency Management personnel face a changing asymmetrical threat and must train to respond to new hazards. The CBRN Responder Course develops the skill sets needed to perform a streamlined response to emergency situations. The course provided students with classroom and hands-on training environments as well as a day-long exercise to test their new skills.

"The course was quite a lot of information in a short period of time," said SSgt Linda Pantoja, 775th CES Emergency Management Flight, Hill AFB, Utah.

Although the course has historically had a 40% failure rate, all enrolled Airmen passed with some of the highest class averages ever. Students completed five written tests and two separate hands-on practical tests for the HazMat certifications.

Airmen also participated in a day of Air Force–specific training. Students received a briefing from CMSgt Mike Connors, Emergency Management Career Field Manager. The briefing stressed the importance of maintaining perishable response skills through training and exercises, thus remaining ready, relevant, and reliable during emergency situations.

MSgt Daniel Simpson, 28th Test Squadron, Eglin AFB, Fla., briefed "Lessons Learned" from a recent deployment to the AOR. MSgt Simpson discussed how response capabilities change in a permissive environment versus a non-permissive environment. Airmen were encouraged to participate in the discussion and apply their new HazMat Technician skills to these different scenarios.

"This intensive training course taught us the procedures needed to fulfill our CBRN responder role. Now we have the training and technology to ensure our wartime and peacetime actions are the same," said TSgt Joseph Trenholm, CBRN Equipment Manager, Emergency Management Division, Air Force Civil Engineer Support Agency, Tyndall AFB, Fla.

Ms. Sjostrom is the Air National Guard Liaison for Emergency Management, HQ AFCESA, Tyndall AFB, Fla.

The joint CBRN course combines hands-on training and testing with classroom work. (U.S. Air Force photo)

New Mission Unfolds at Willow Grove

Capt Renee T. Lillis, 111th FW/PA

The most coveted uniform item at the 111th Fighter Wing is no longer the new Airman Battle Uniform, it's a red cap.

On April 5, more than 100 guardsmen sported the red caps for the first time and cheerfully yelled "to the HORSE" during the 201st RED HORSE Squadron, Det. 1, activation ceremony at Willow Grove ARS, Pa. Maj Geno J. Rapone accepted command of the new detachment.

"It's extremely exciting to bring home this mission," said Col Paul W. Comtois, 111th FW commander.

Air National Guard RED HORSE squadrons are typically split units that report to different commanders, but merge to form a whole squadron to deploy for contingency operations. The 201st RHS at Fort Indiantown Gap, Pa., used to combine with the 200th RHS, Ohio ANG. However, with the activation of the Willow Grove detachment, Pennsylvania became the only state to have a full RED HORSE squadron.

Now that the unit is activated, there is still a lot of work to be done. The unit has until 2010 to reach its initial operating capacity. In addition to engineers, the unit also needs

its own doctors, security forces, finance personnel, and more to be a self-sufficient, deployable unit.

In the coming months, the unit will continue setting up infrastructure and securing equipment and weapons, as well as staffing up and training personnel to prepare for their important wartime mission. And the red hats that distinguish them will become a proud and lasting fixture at Willow Grove.

Guam CE Squadron Converts to RED HORSE

SrA Christine Martinez, Guam NG/PAO

The Guam Air National Guard's 254th Civil Engineer Squadron held a Flagging Ceremony April 4 at Andersen AFB as they converted from a CES to a RED HORSE squadron.

"This is definitely an exciting time for us and we are happy to carry on the flag for one of the youngest RED HORSE units in the Air National Guard as we become an associate unit with the oldest RED HORSE unit in the Air Force," said Maj Audie Artero, 254th RHS Commander. "I already look forward to deploying with such an outstanding unit."

The Guam Air National Guard's 254th CES was federally redesignated from an engineering flight to a squadron on July 1, 1985. As the 254th RHS, the unit will be an associate unit with the Air Force's 554th RHS at Andersen, with current plans to relocate to Northwest Field. There will be no changes to the current chain-of-command at this time.

This conversion changes the primary skill sets from engineering sustainment to a small-scale engineering construction force.

"It's a big change for all our personnel, and it's a challenge we've been looking forward to," said 2Lt Leo Palomares, the unit's engineering flight chief.

Firefighters Save Lives and Money

TSgt Rey Ramon, 18th AW/PA

Airmen from around the Pacific took part in the Rescue I course offered at Kadena AB, Korea, by Det 1 of the 554th RHS. (photos by the author)

Kadena AB, Japan, is now home to a rescue technician course designed to help Pacific-region firefighters save lives and at the same time save the Air Force dollars.

The three-week course, offered by Detachment 1, 554th Red Horse Squadron, teaches firefighters how to manage personnel and resources during rescue situations.

The rescue technician course originated at Goodfellow AFB, Texas, and in the past, Pacific-region firefighters traveled thousands of miles to attend. With the establishment of the course here, the Air Force will save about $15,000 in travel costs for every course while providing the highest level of training.

The instructors teach practical application of mountain, industrial, and confined space rescues, according to SSgt Matthew Morris, rescue chief with the 51st Civil Engineer Squadron, Osan AB, Republic of Korea, and an instructor for the course. Students are taught high- and low-angle rescue techniques, water-rescue procedures, rappelling techniques, and the rope-tying methods necessary to build mechanical advantage systems.

"What they learned academically, they applied it out in the field with our guidance," SSgt Morris said.

"The Rescue One course is a very demanding course, mentally and physically," said Mr. Yuji Nakayama, 18th CES firefighter instructor. "It teaches how to manage all the emergency response personnel on the scene of a rescue situation."

"We learned how to work with people from different bases and built great teamwork," said SrA Brett Williams, a firefighter with the 3rd CES at Elmendorf AFB, Alaska.

"Hopefully we don't have to use it, but if we do, I'm looking forward to bringing my skills into action," said SSgt Roderick Marquez, a firefighter with the 36th CES at Andersen AFB, Guam.

"This is a great opportunity for all Department of Defense firefighters in PACAF," Mr. Nakayama said. "We teach the students what we do best, to protect and serve the community."

The course will be offered six to eight times a year.

Reserve Engineers Are PACAF Asset

Capt Torri White, 477 FG/PA

TSgt Jerry Hedstrom looks on as Tgt Todd McGee and TSgt Javier Vigil finish a new pipe and valve installation at the gate of Northwest Field, Guam. (photo by the author)

The 477th Civil Engineer Squadron recently deployed from Elmendorf AFB, Alaska, to Andersen AFB, Guam, for an opportunity to contribute once again to the building of facilities in the Pacific theater.

"This was a great opportunity to come back and do what we do best: build facilities to support and maintain air superiority in the Pacific," said Maj Kevin Thomas, 477th CES commander. "It also enabled us to complete core training that sometimes takes years."

The engineers embraced the opportunity to fine-tune their wartime skills and contribute to one of U.S. Pacific Command's top construction priorities. Northwest Field, an area constructed of two parallel abandoned runways on over 2,000 acres along Guam's north shore, will soon be home to a new Expeditionary Combat Support Campus for the 554th RED HORSE Squadron, the 607th Combat Communications Squadron, the 607th Commando Warrior Squadron and the 554th RHS, Det 1 (Silver Flag).

The 477th CES contributed by clearing and grading land, as well as assisting with the ground-up construction of several facilities.

The $200M beddown of the three squadrons and one detachment uses RED HORSE labor, with MILCON and O&M funding. The 554th RHS is currently busy with 18 construction projects that include road work and infrastructure. A contract to provide power, water, and sewer is in progress. With over five million square feet to clear and more than 50 facilities to build, the help was well received.

"This is no small project and the Reserves being here helps us bulk up our resources," says SMSgt Stephen Batherson, Chief of Operations for the 554th RHS. "It starts raining a lot from July through November, so it's good to have the help now getting the walls and ceilings up. Then we can work on the interior when the rain starts."

"We were able to use all of our AFSCs for this project," said CMSgt David Lishman, 477th CES Civil Engineer Manager. "We brought 34 trained and qualified civil engineers to the island, including heavy equipment operators, power production, structures, electrical, liquid fuels, HVAC, utilities, engineering assistants, and even an entomologist."

Cementing Balad Hospital in History

SSgt Ruth Curfman, 332nd AEW/PA

Airmen from the 332nd Expeditionary Medical Group and the 332nd Expeditionary Civil Engineer Squadron worked together to preserve a piece of Balad AB, Logistics Support Area Anaconda, and Operation Iraqi Freedom history.

The emergency room from the old Balad hospital, which was a temporary tent structure, was recently dismantled and shipped to the National Museum of Health and Medicine in Washington, D.C., where it is slated for exhibition because it is known by the medical community as the place where the most American blood was spilled since the Vietnam War. After the newly built Air Force Theater Hospital became fully operational, Airmen were tasked to tear down the old hospital, which drew the attention of some Congress members who toured the facility.

TSgt Troy Parlin, 332nd ECES heavy repair operator, lifts a piece of concrete known as Bay II in preparation for transporting it to the National Museum of Health and Medicine. (photo by Maj Scott Bryant)

"As we stood near Bay II, we realized that perhaps more lives have been saved, and lost, on this spot [Bay II] than perhaps any other during Operation Iraqi Freedom," stated a letter authored by four congressmen, addressed to Army Maj Gen Galen Jackman, Office of the Secretary of the Army legislative liaison chief. "The scuff marks and antiseptic stains on the floor tell a story of heroic efforts to give our wounded the best emergency medical care in the history of warfare."

The new Air Force Theater Hospital is part of the Balad AB and LSA Anaconda's transformation into a medical hub for those injured in the OIF theater.

Beginning in August, with the congressional request, plans were discussed on the issues surrounding the ability to save Bay II and as much of the old hospital as possible — not an easy task to figure out.

"We were able to preserve and package up most of the artifacts, pictures, cards, wall panels, vestibule, and Bay II from the old hospital," said Lt Col Jeff Ullmann, 332nd ECES commander, deployed from Langley AFB, Va. "We had to do some experimenting and think about how we would be able to save these items, using the tools we have available. We decided the best course of action was to remove another piece of the floor and see how it went before we actually went in to remove Bay II."

One of the biggest obstacles the 332nd ECES team faced was being able to remove Bay II without damaging the protective vinyl covering and not cutting it or breaking the concrete floor, which would result in the floor no longer being historically significant.

Another challenge of the removal project was the size of the particular area.

"Successfully removing the 7-foot by 7-foot, 6-inch thick solid concrete slab, weighing more than 6,000 pounds, without an extra crack or chip shows the tremendous effort, dedication, and pride our civil engineers took in preserving this piece of history," said Maj Scott Bryant, 332nd ECES operations flight commander, deployed from Wright-Patterson AFB, Ohio. "We are honored to be able to play a role in helping to share the stories of this small foundation's role in supporting the healing hands and victims of war's tragedy."

"The preservation of Trauma Bay II is a tribute to all who shed blood, sweat, and tears — the price of freedom," said then-Maj Jody Ocker, 332nd EMOS emergency department nurse manager, who was deployed to Balad from May to September.

Keeping it on the level.

TSgt Christopher Moffett, deployed from the 509th CES, Whiteman AFB, Mo., looks on as SrA Daniel Smith, deployed from the 5th CES, Minot AFB, N.D., grades an ammunition holding area. Both are assigned to the 732nd ECES at Balad AB, Iraq.

(photo by SMSgt Garry Berry)